



Quick Start Guide

PTP 820C

System Release 10.9



Introduction

Thank you for purchasing Cambium Networks PTP 820C equipment. This guide is provided to assist operators in setting up and configuring a PTP 820C 2+0 dual-polarization direct-mount link with Multi-carrier ABC and XPIC.

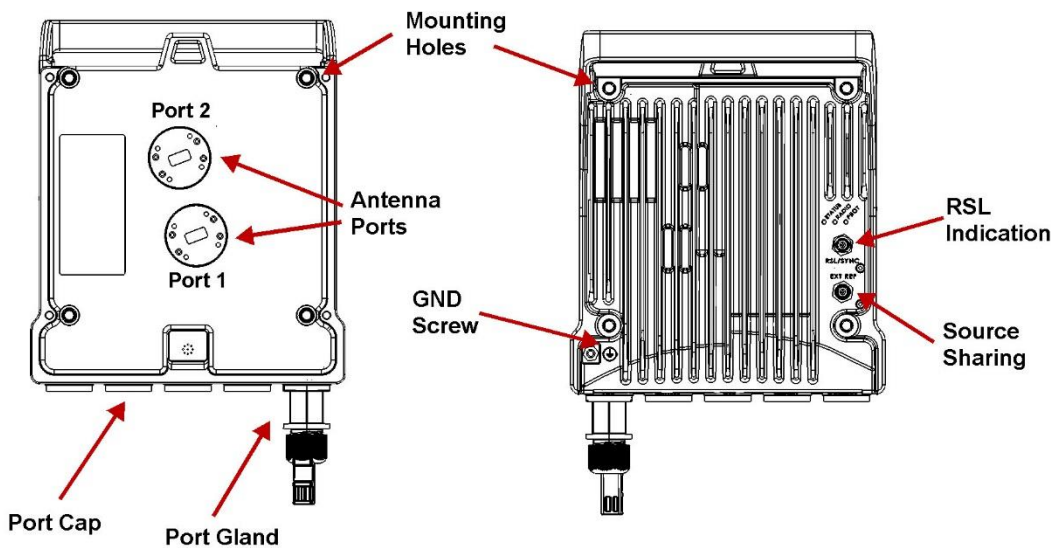
For detailed instructions of all supported PTP 820C link types, refer the *PTP 820C Installation Guide*.

For detailed instructions of software configurations, refer the *PTP 820 C/S User Guide*.

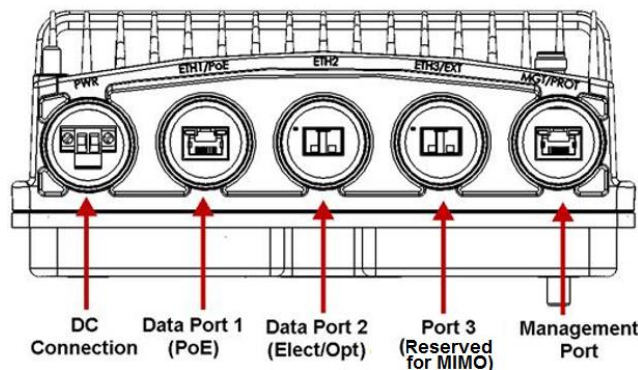
The documents can be located here:

<https://support.cambiumnetworks.com>

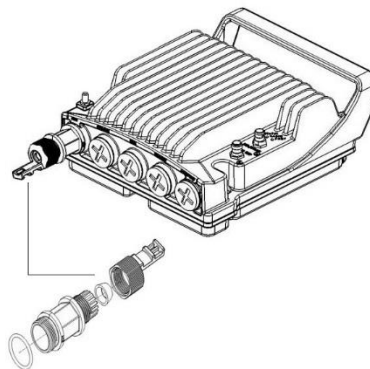
PTP 820C Rear View and Front View



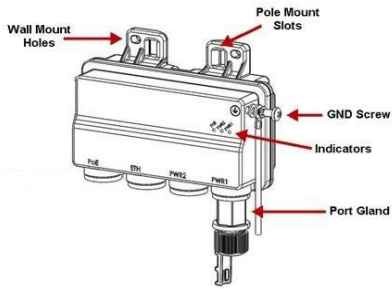
PTP 820C Interfaces



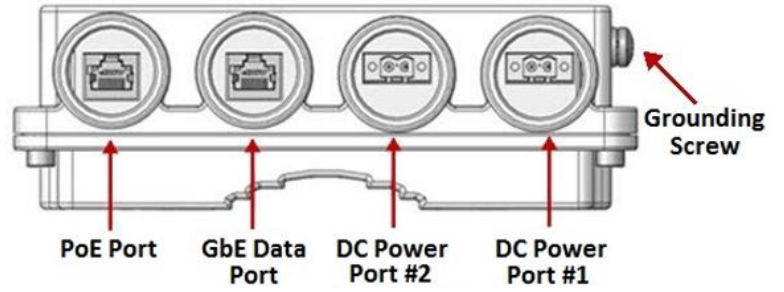
Cable Gland Constructor



PoE Injector



PoE Injector Interfaces



Installing the Unit

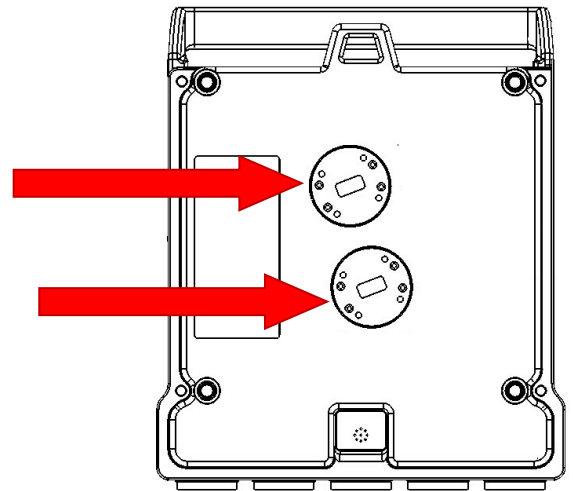
This Quick Setup guide provides instructions for installing and configuring a 2+0 dual-polarization direct-mount pipe configuration using XPIC. These instructions can also be used for a direct-mount 1+0 configuration that can later be upgraded to 2+0 with an additional activation key and minimal software configuration, no additional hardware installation required.

Hardware configuration, including the type of mediation devices required, differs for different configurations. For other configurations besides the 2+0 dual-polarization direct-mount XPIC configuration described in this Quick Setup guide, refer to the PTP 820C Installation Guide.

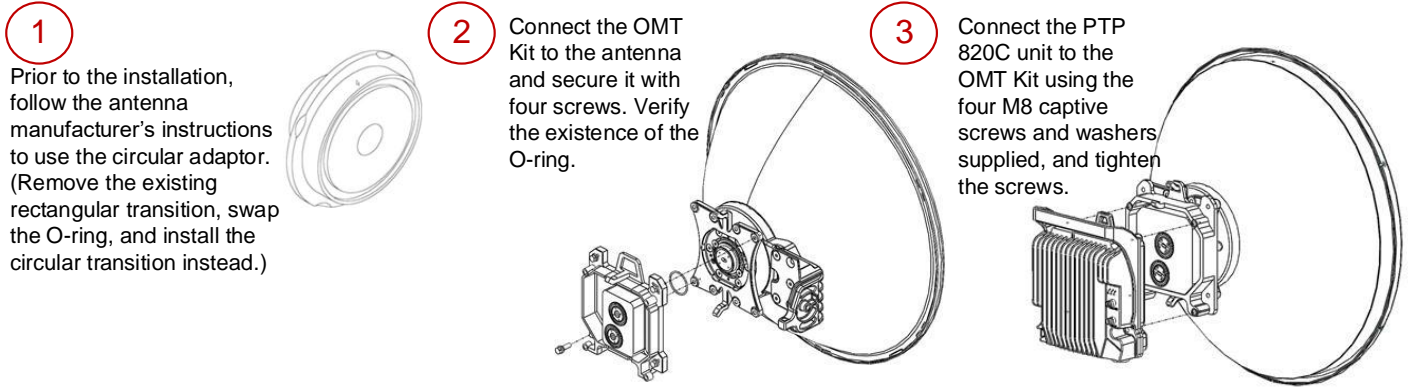
When tightening the captive screws, use 20 Nm torque for radio-antenna, radio-mediation device, and mediation device-antenna connections. In order to avoid misalignment, screws should be tightened progressively.

**Note**

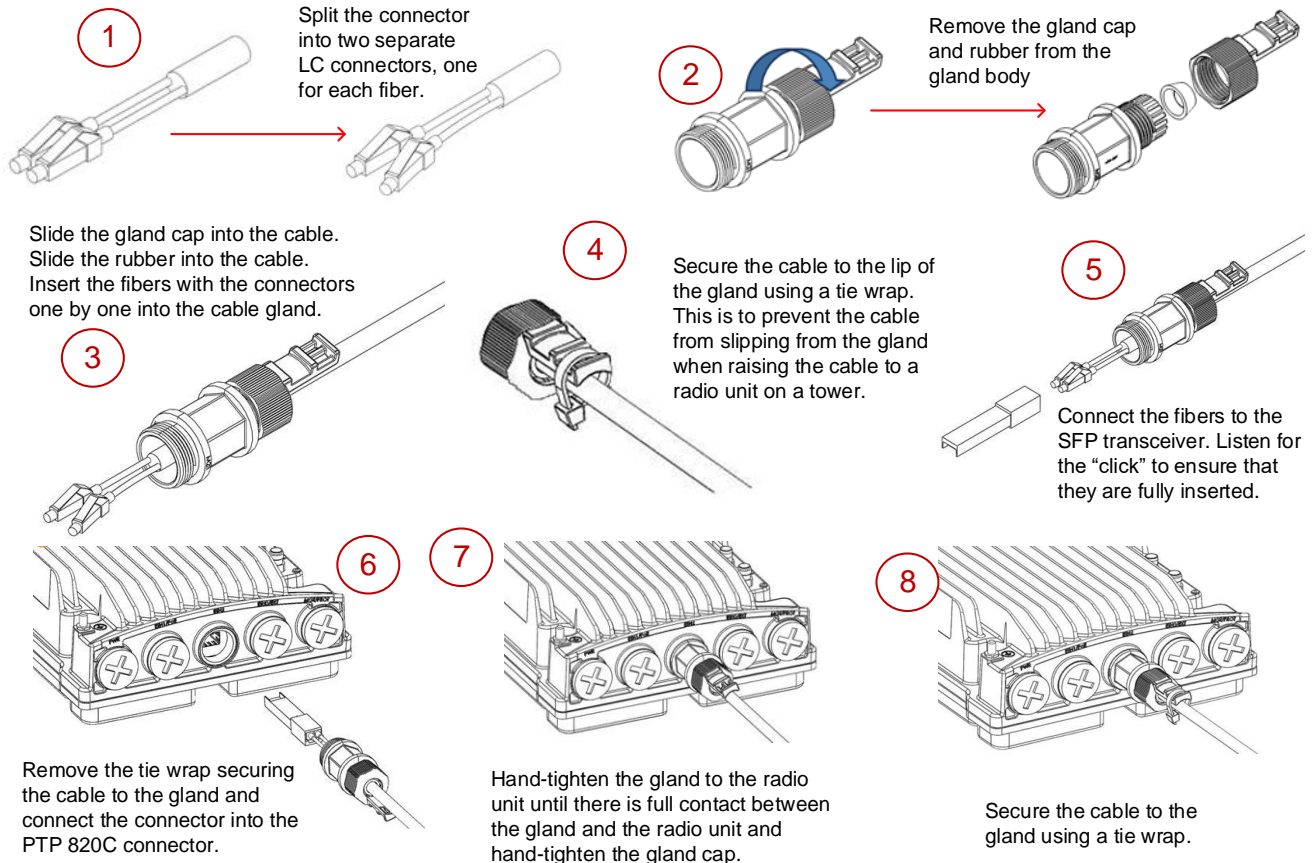
Do not remove the transparent pressure window located on the antenna interface.



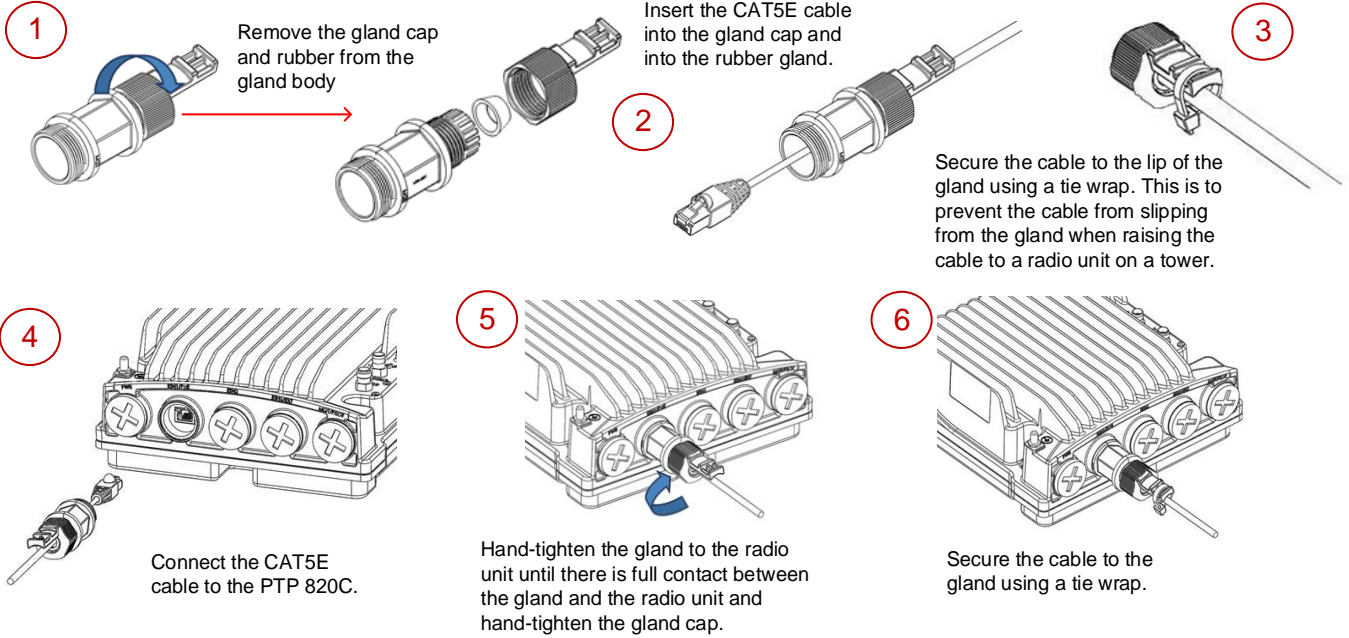
To install a PTP 820C unit in a direct-mount dual-polarization configuration



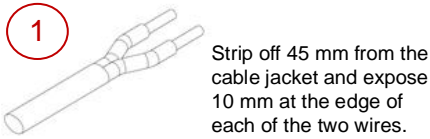
To connect an optical Ethernet cable and SFP



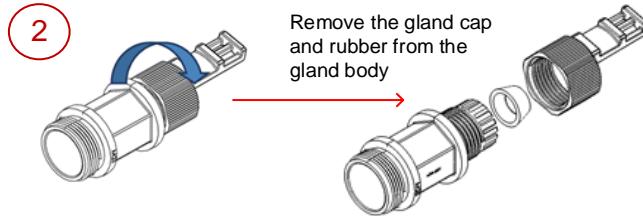
To connect an electrical Ethernet cable



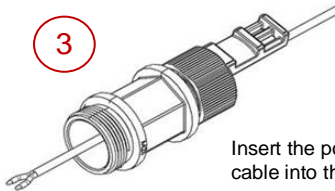
To connect a DC power cable



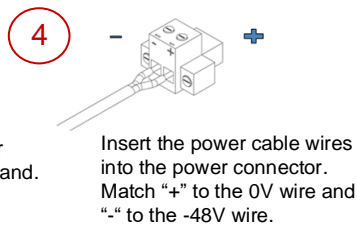
1 Strip off 45 mm from the cable jacket and expose 10 mm at the edge of each of the two wires.



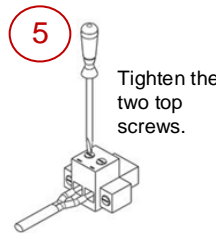
2 Remove the gland cap and rubber from the gland body



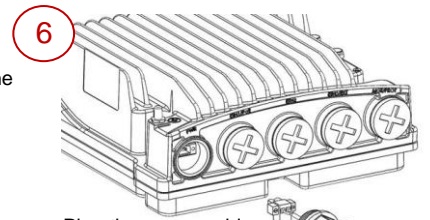
3 Insert the power cable into the gland.



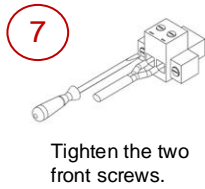
4 Insert the power cable wires into the power connector. Match "+" to the 0V wire and "-" to the -48V wire.



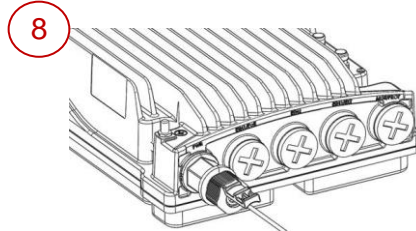
5 Tighten the two top screws.



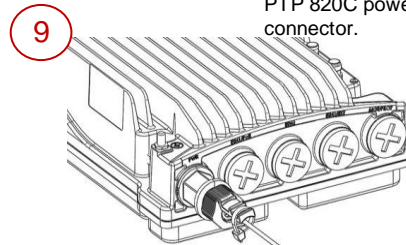
6 Plug the power cable with connector into the PTP 820C power connector.



7 Tighten the two front screws.

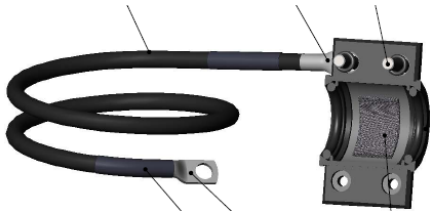


8 Hand-tighten the gland to the radio unit until there is full contact between the gland and the radio unit and hand-tighten the gland cap.



9 Secure the cable to the gland using a tie wrap.

Cable Grounding

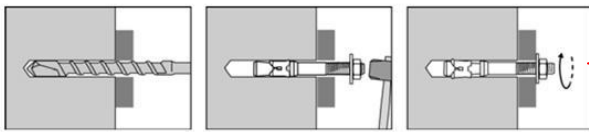


- No grounding is required for optical (SFP) cables.
- External shielded CAT5E cable should be grounded to the antenna tower at the top (next to the PTP 820 unit) and the bottom of the external run and every 50m using the PTP 820 Grounding kit for CAT5E F/UTP 8mm cable.

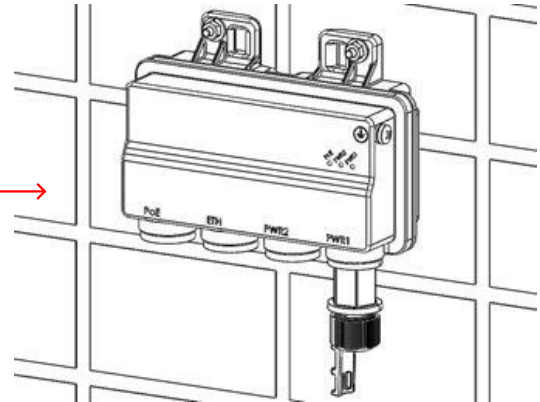
Installing and Connecting a PoE Injector

To mount a PoE Injector on the wall

- 1 Mount and tighten the PoE Injector to a wall using two M6 bolts and anchors. Use Anchor Stainless Steel with flanged Hexagonal nut M6X70.
- 2 Drill two 6mm diameter holes with 100mm between the center of the holes.



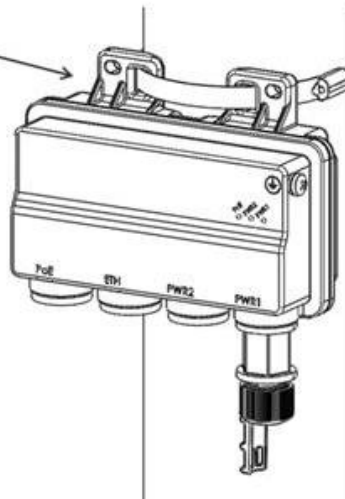
- 3 Insert the anchors with the bolts, place the washers on the bolts, and tighten the nuts.



To mount a PoE Injector on a pole

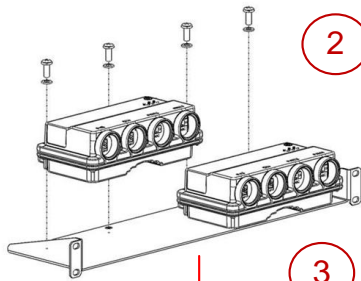


- 1 Mount and tighten the Injector to a 114mm pole using a stainless steel hose clamp.
- 2 Pass the hose clamp through the pole mount slots.
- 3 Attach the Injector to the pole.
- 4 Connect the ends of the hose clamp and tighten using the captive screw.



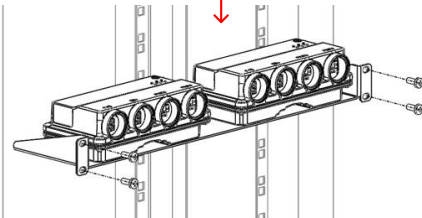
To mount a PoE Injector on a 19" rack

1 Mount the Injector to a 19" rack using a 19" rack adaptor.

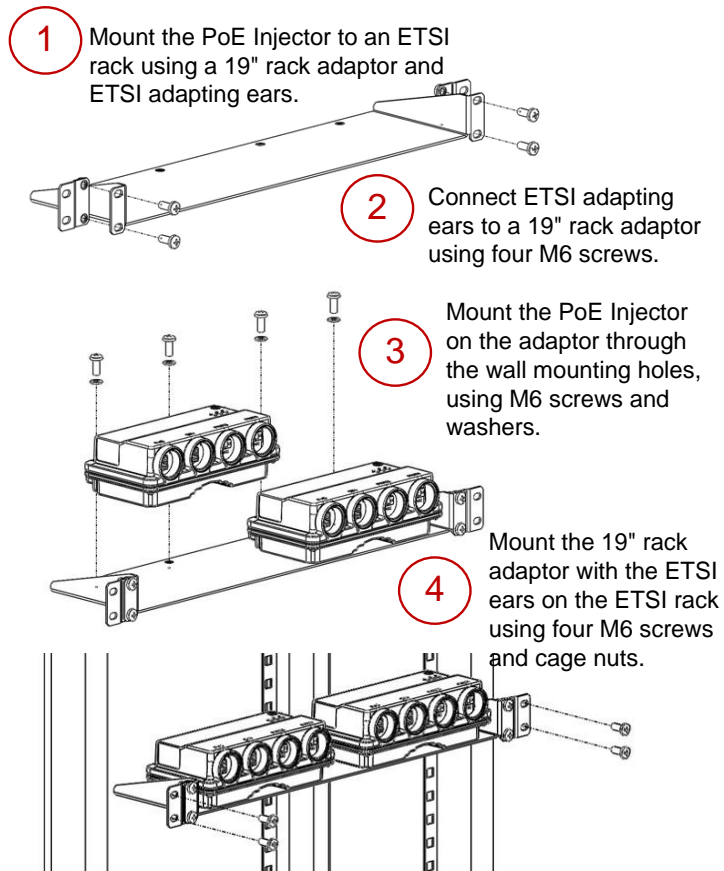


2 Mount the Injector on the adaptor through the wall mounting holes, using M6 screws and washers.

3 Mount the adaptor to the rack using four M6 screws and cage nuts.



To mount a PoE Injector on an ETSI rack

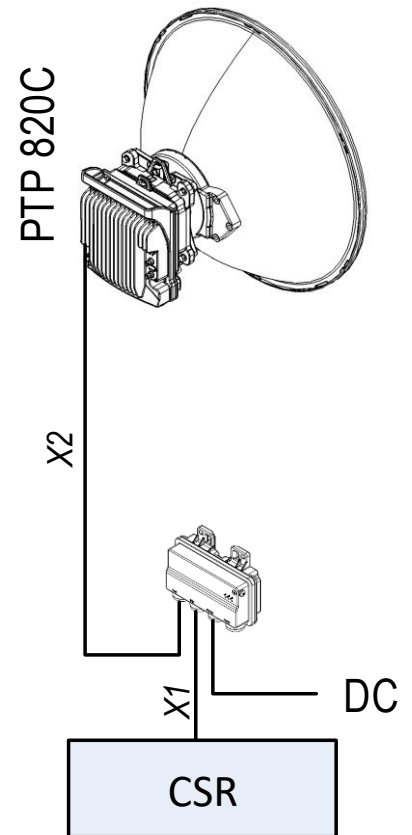


To ground a PoE Injector

1. On the right side of the PoE Injector, loosen the screw, plain washer, and serrated washer.
2. Place the cable lug supplied with the PoE Injector kit between the plain and serrated washer.
3. Tighten the screw.

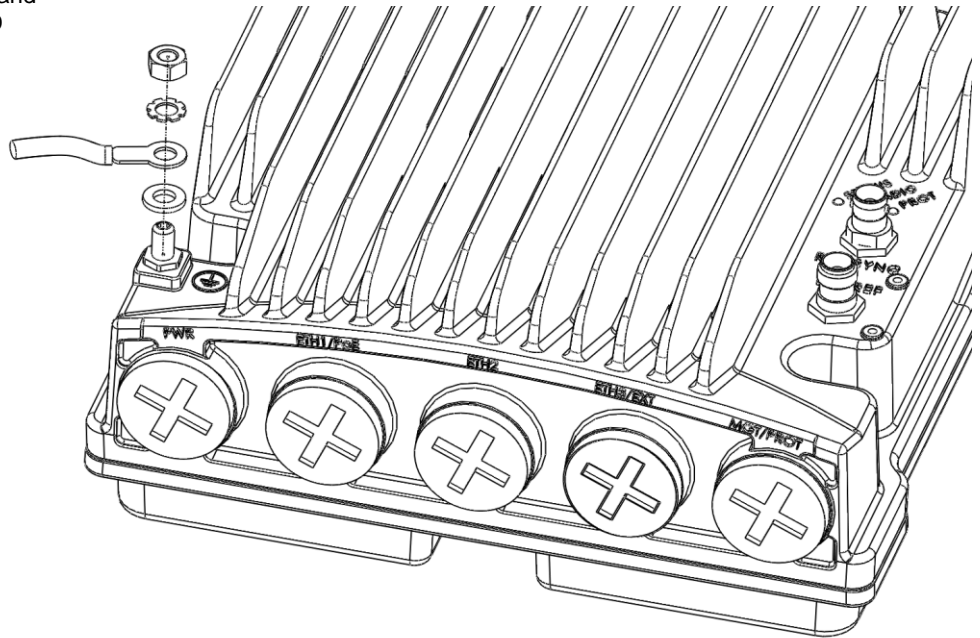
To connect the PoE Injector cables

- The total length of the cable between the PTP 820C port and the Switch/Router the device is connected to should not exceed 100m/328ft. This length includes the connection between the PTP 820C and the PoE Injector ($x_1 + x_2 \leq 100\text{m}/328\text{ft}$ in the figure to the right).
- The length of the cable connecting the customer equipment to the PoE injector should not be longer than 10m (according to ANSI/TIA-568 standard).



Grounding the PTP 820C

- 1 Loosen the nut, plain washer, and serrated washer from the GND stud, using the metric offset hexagon key and the wrench.
- 2 Place the cable lug supplied with the grounding kit in place on the screw and secure the cable lug.
- 3 Connect the second side of the GND cable to the main or terminal ground bar of the site.
- 4 Perform a resistance test between the 2 lugs of the GND cable and verify that the result is 0-2 ohms.



Notes:

The unit's earthing screw terminal shall be permanently connected to protective earth in a building installation in accordance with applicable national code and regulations by a service person.

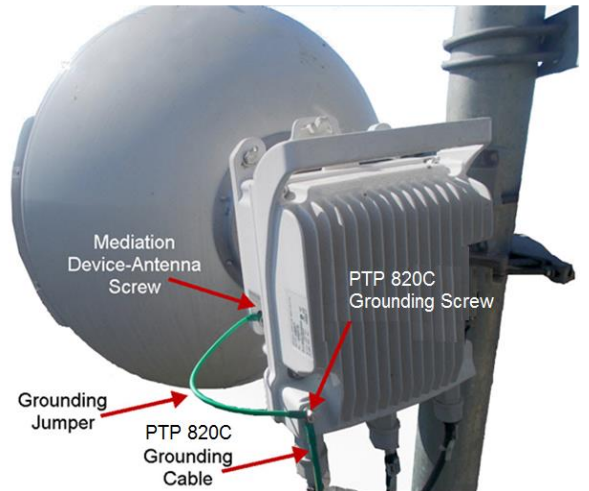
A 2-pole circuit breaker, a branch circuit protector, suitably certified in accordance with applicable national code and regulations, rated maximum 20A, shall be installed for full power disconnection in a building installation.

Any outdoor antenna cable shield shall be permanently connected to protective earth in a building installation.

Grounding for MultiCore Mediation Devices

MultiCore Mediation Devices (MCMDs) are not grounded. In order to add grounding, the MCMD can be connected to the PTP 820C using a Grounding Jumper. To connect the Grounding Jumper:

- 1 When you secure the MCMD to the antenna, connect one end of the Grounding Jumper to the lower left screw that connects the MCMD to the antenna.
- 2 When you perform the PTP 820C grounding procedure described above, connect the other end of the Grounding Jumper to the PTP 820C grounding screw, along with the PTP 820C grounding cable. The order in which you place the two cables is not important.



Connecting to the Unit

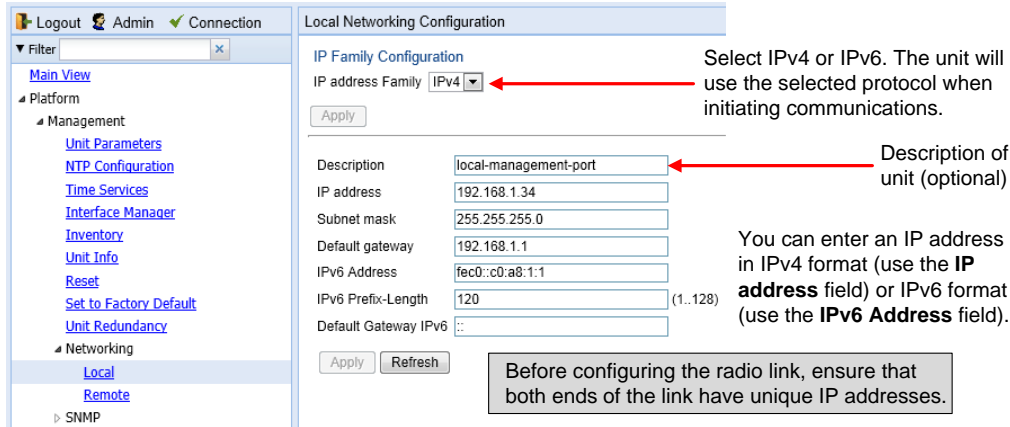
1. Connect your laptops LAN port to the MGT port on the PTP 820C.
2. Configure an IP address on the laptop within the same subnet as the PTP 820C unit. The default PTP 820C IP address is 192.168.1.1. Set the PC address to e.g. 192.168.1.10 and subnet mask to 255.255.255.0. Record the initial settings before changing.
3. On the laptop, open the Internal Protocol (TCP/IP) Properties page and set the parameters shown in the figure on the right.
4. Open a web browser (Internet Explorer or Mozilla Firefox), enter the default IP address "192.168.1.1" in the Address Bar. Once the Login page opens, enter "admin" in both the **User Name** and **Password** fields, and click **Apply**.

The screenshot shows a 'Login' window with two input fields: 'User Name' and 'Password'. Below the fields are two buttons: 'Apply' and 'Clear'.

The screenshot shows the 'Internet Protocol (TCP/IP) Properties' dialog box. The 'General' tab is selected. The 'Use the following IP address' radio button is selected. The IP address is set to 192.168.1.10 and the Subnet mask is set to 255.255.255.0. The 'Use the following DNS server addresses' radio button is also selected, with both Preferred and Alternate DNS server fields empty. There are 'OK' and 'Cancel' buttons at the bottom.

Changing the Default IP Address

Select **Platform > Management > Networking > Local**. The Local Networking Configuration page opens.



IP Family Configuration

IP address Family **IPv4** ← Select IPv4 or IPv6. The unit will use the selected protocol when initiating communications.

Apply

Description **local-management-port** ← Description of unit (optional)

IP address **192.168.1.34**

Subnet mask **255.255.255.0**

Default gateway **192.168.1.1**

IPv6 Address **fec0::c0:a8:1:1**

IPv6 Prefix-Length **120** (1..128)

Default Gateway IPv6 **::**

Apply Refresh

Before configuring the radio link, ensure that both ends of the link have unique IP addresses.

Installing the Activation Key

New PTP 820C units are delivered with a default activation key that enables you to manage and configure the unit. Additional feature and capacity support requires you to enter an activation key cipher in the Activation Key Configuration page. Contact your vendor to obtain your activation key cipher.

If the activation-key-enabled capacity and feature set is exceeded, an Activation Key Violation alarm occurs and the Web EMS displays a yellow background and an activation key violation warning. After a 48-hour grace period, all other alarms are hidden until the capacity and features in use are brought within the activation key's capacity and feature set.

Demo mode is available, which enables all features for 60 days. When demo mode expires, the most recent valid activation key goes into effect.

To enter a new activation key, select

Platform > Activation Key > Activation Key Configuration. The Activation Key Configuration page opens.

The screenshot shows the 'Activation Key Configuration' page. On the left is a navigation menu with 'Platform > Activation Key > Activation Key Configuration' selected. The main content area is divided into two sections:

- Activation Key - Status Parameters:** A table with fields for Type (Demo), Validation number (0x0), Date code (NA), Violation runtime counter (hours) (48), and Sanction state (No).
- Activation Key Configuration:** A section with a 'Default Activation Key' text input field. A red arrow points to this field with the text: 'Enter the activation key cipher here and click **Apply**.'
- Demo Mode Configuration:** A section with a 'Demo admin' dropdown menu set to 'Enable' and a 'Demo timer (hours)' input field set to '1368'. A red arrow points to the 'Enable' dropdown with the text: 'To activate Demo mode, select **Enable** here and click **Apply**.' Another red arrow points to the '1368' input field with the text: 'Displays the number of hours that remain before demo mode expires.'

At the bottom of the configuration section are 'Apply' and 'Refresh' buttons.

Configuring the Link

The Web EMS provides wizards to configure radio links. The wizards guide you through configuration of the basic radio parameters and services necessary to establish a working pipe link.

To configure a 1+0 link using the Quick Configuration wizard, select **Quick Configuration > PIPE > Multi-Carrier ABC > 2+0**. Page 1 of the 2+0 Quick Configuration wizard opens.

1

Select one Ethernet and one radio interface. Then select the total number of radio interfaces in the ABC group and the PIPE type. The selected radio interface will be the first radio in the ABC group. In the next step(s) you will select the other interfaces.

Select an Ethernet interface or LAG for the link. Click **Create LAG** to open a wizard that guides you through the steps to create a LAG.

Interface Selection, 2 + 0 ABC

Ethernet Interface: Ethernet: Slot 1, Port 1 (LAG: Group #1)

Radio #1 Interface: Radio: Slot 2, Port 1

Number of Radio interfaces: 2

PIPE Type: dot1q

- **s-tag** – All S-VLANs and untagged frames are classified into the service.
- **dot1q** – All C-VLANs and untagged frames are classified into the service.

<< Back Next >> Finish

2

Select the second radio interface.

Radio #2 selection, 2 + 0 ABC

Radio #2 Interface: Radio: Slot 2, Port 2

<< Back Next >> Finish

3

Select XPIC groups by checking the desired radio interfaces.

Radio XPIC Configuration

XPIC - Radio: Slot 2, Port 1 & Radio: Slot 2, Port 2

<< Back Next >> Finish

4

Link Setup (PIPE) 2 + 0 Multi Carrier ABC

Link Setup Progress 30%

Enter the radio parameters for the selected radio interfaces.

Radio Parameters Configuration - XPIC: Radio: Slot 2, Port 1 & Radio: Slot 2, Port 2, 2 + 0 ABC

TX Frequency (MHz) (5850.000..6450.000)

RX Frequency (MHz) (5850.000..6450.000)

TX Level (dBm) ← Enter the desired TX signal level (TSL). The range of values depends on the frequency and RFU type.

TX Mute ← Select On or Off to mute or unmute the TX output of the RFU.

<< Back Next >> Finish

5

Link Setup (PIPE) 2 + 0 Multi Carrier ABC

Link Setup Progress 50%

Select an MRMC script and profile for the selected radio interfaces

Radio MRMC Script Configuration - XPIC: Radio: Slot 2, Port 1 & Radio: Slot 2, Port 2, 2 + 0 ABC

Script ID ↓ Select the MRMC script you want to assign to the radio. Make sure to assign a script that supports XPIC.

Operational Mode ← Select the ACM mode: **Fixed** or **Adaptive**.

Maximum profile

Minimum profile

- Fixed ACM mode applies constant TX and RX rates.
- In Adaptive ACM mode, TX and RX rates are dynamic. An ACM-enabled radio system automatically chooses which profile to use according to channel fading conditions.

<< Back Next >> Finish

If you selected **Fixed** in the **Operational Mode** field, the **Profile** field appears instead of these fields. Select the ACM profile for the radio in the **Profile** field.

If you selected **Adaptive** in the **Operational Mode** field, enter the maximum and minimum profiles for the script in these fields.

6

Link Setup (PIPE) 2 + 0 Multi Carrier ABC

Link Setup Progress 75%

To configure In Band management, choose 'Yes' If you choose 'Yes', you will need to select a Management VLAN.

Management Configuration, 2 + 0 ABC

In Band Management ← Select **Yes** to configure in-band management or **No** if you do not need in-band management.

Management VLAN ← If you selected **Yes** above, select the management VLAN.

In Band includes Ethernet interface ← Select this box if you want to use the Ethernet interface as well as the radio interface for in-band management.

<< Back Next >> Finish

7


Link Setup (PIPE) 2 + 0 Multi Carrier ABC

Link Setup Progress 100%

Following are the parameters that you have selected, 2 + 0 ABC

XPIC: Radio: Slot 2, Port 1 & Radio: Slot 2, Port 2
TX Frequency: 6400 MHz, RX Frequency: 6150 MHz
TX Level (dBm): 5 TX Mute: Off
MRMC Script ID: 1507, Operational Mode: Adaptive, Maximum profile: 10, Minimum profile: 0

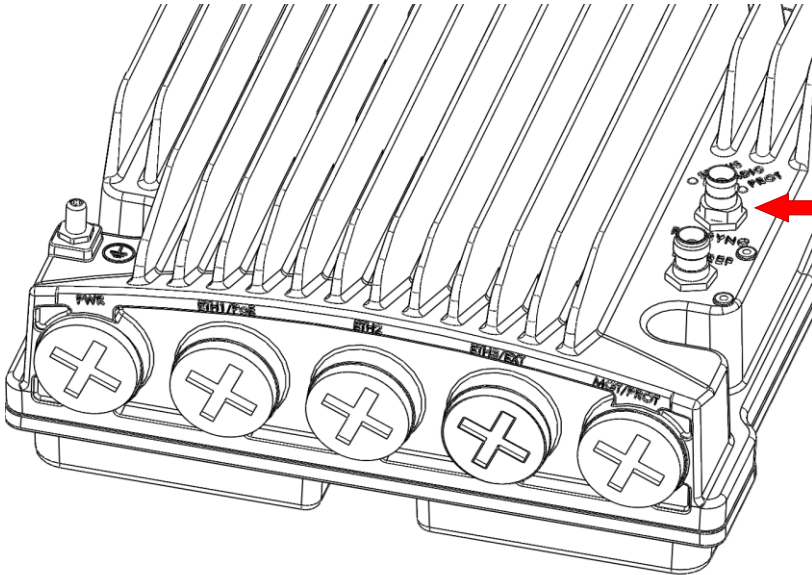
Ethernet Interface: LAG: Group #1
PIPE Type: dot1q
In Band Management: Yes, Management VLAN: 1, Ethernet included: No

 Warning: After you click Submit, the system will be configured with these parameters and the interfaces will be reset. Traffic will be affected.

<< Back Next >> **Submit**

Review the parameters and click **Submit** to complete configuration of the link. After you click **Submit**, the unit is reset.

Link Verification



To display the BER using the Web EMS, go to the Aggregate PM report (**Radio > PM & Statistics > Aggregate**).

To display the RSL PMs using the Web EMS, go to the Radio Parameters page (**Radio > PM & Statistics > Signal Level**).

Verify that the Received Signal Level (RSL) is up to ± 3 dB from the expected (calculated) level at both ends of the link.

You can measure the RSL at the BNC port indicated in the figure to the left. The voltage at the BNC port is 1.XX where XX is the RSL level. For example: 1.59V means an RSL of -59 dBm. Note that the voltage measured at the BNC port is not accurate and should be used only as an aid.

Verify that the Radio Bit Error Rate (BER) is $10E-11$ or higher.

If working with ATPC, verify that ATPC is operating as expected (RSL = reference level).

To display the current RSL (RX) using the Web EMS, go to the Radio Parameters page (**Radio > Radio Parameters**).

Antenna Alignment and Optimization

- Align the antennas with only one co-polarized carrier activated. To mute the second carrier, select the carrier in the Radio Parameters page of the Web EMS (**Radio > Radio Parameters**) and set **TX mute** to **O**
- Adjust the antenna alignment until you achieve the maximum RSL for the first-carrier link (the "RSLwanted"). This RSL should be within approximately +/-3 dB from the expected level.
- Unmute all carriers.
- Check the XPI in the **Modem XPI** field of the Radio Parameters page in the Web EMS. The XPI should be at least 25dB. If it is not, adjust the OMT assembly on the back of the antenna *at only one side of the link* to maximize the XPI. Adjust the OMT by rotating the OMT and its attached ODU on the back of the antenna. Loosen the four bolts that connect the OMT to the antenna. Move the OMT in small increments. After each increment, refresh the Web EMS screen and review the XPI reading. It is recommended to achieve XPI levels between 25dB and 30dB. Once a good XPI has been achieved, lock-off the OMT by securing the bolts, progressively, so as to not de-align the OMT.

Radio Parameters Page

Status parameters	
Radio location	Radio: Slot 2, port 1
Type	RFU-N-DC
XPIC support	Yes
Radio Interface operational status	Down
Operational TX Level (dBm)	15
RX Level (dBm)	-93
Modem MSE (dB)	-99.00
Modem XPI (dB)	99.00
Defective Blocks	0
TX mute status	On
Adaptive TX power operational status	Down
Frequency control (Local)	
TX Frequency (MHz)	8488.000 (7700.000..8600.000)
RX Frequency (MHz)	7714.000 (7700.000..8600.000)
TX to RX frequency separation (MHz)	772.000
<input type="checkbox"/> Set also remote unit	
Configuration parameters	
TX Level (dBm)	15 (2..28)
TX mute	On
RSL Connector Source	PHY1
Link Id	1 (1..65535)
Remote Unit link ID	1 (1..65535)
Adaptive TX power admin	Disable
<input type="button" value="Apply"/> <input type="button" value="Refresh"/> <input type="button" value="Close"/>	

Modem XPI field. (points to 99.00)

TX mute field. (points to On)

RSL Connector Source field. (points to PHY1)



Note

In some cases, the XPI might not exceed the required 25dB minimum due to adverse atmospheric conditions, such as heavy rain. If you believe this to be the case, maximize the XPI by following the alignment process described above. Afterwards, monitor the XPI to ensure that it exceeds the 25dB minimum when propagation conditions improve.

Problems and warranty

Reporting problems

If any problems are encountered when installing or operating this equipment, follow this procedure to investigate and report:

- 1 Search this document and the software release notes of supported releases.
- 2 Visit the support website.
- 3 Ask for assistance from the Cambium product supplier.
- 4 Gather information from affected units, such as any available diagnostic downloads.
- 5 Escalate the problem by emailing or telephoning support.

Repair and service

If unit failure is suspected, obtain details of the Return Material Authorization (RMA) process from the support website (<https://support.cambiumnetworks.com>).

Hardware warranty

Cambium's standard hardware warranty is for one (1) year from date of shipment from Cambium Networks or a Cambium distributor. Cambium Networks warrants that hardware will conform to the relevant published specifications and will be free from material defects in material and workmanship under normal use and service. Cambium shall within this time, at its own option, either repair or replace the defective product within thirty (30) days of receipt of the defective product. Repaired or replaced product will be subject to the original warranty period but not less than thirty (30) days.

To register PMP and PTP products or activate warranties, visit the support website. For warranty assistance, contact the reseller or distributor. The removal of the tamper-evident seal will void the warranty.

**Caution**

Using non-Cambium parts for repair could damage the equipment or void warranty. Contact Cambium for service and repair instructions.

Portions of Cambium equipment may be damaged from exposure to electrostatic discharge. Use precautions to prevent damage.

Cambium Networks

Cambium Networks provides professional grade fixed wireless broadband and microwave solutions for customers around the world. Our solutions are deployed in thousands of networks in over 153 countries, with our innovative technologies providing reliable, secure, cost-effective connectivity that's easy to deploy and proven to deliver outstanding metrics.

Our flexible Point-to-Multipoint (PMP) solutions operate in the licensed, unlicensed and federal frequency bands, providing reliable, secure, cost effective access networks. With more than three million modules deployed in networks around the world, our PMP access network solutions prove themselves day-in and day-out in residential access, leased line replacement, video surveillance and smart grid infrastructure applications.

Our award-winning Point to Point (PTP) radio solutions operate in licensed, unlicensed and defined use frequency bands including specific FIPS 140-2 solutions for the U.S. Federal market. Ruggedized for 99.999% availability, our PTP solutions have an impeccable track record for delivering reliable high-speed backhaul connectivity even in the most challenging non-line-of-sight RF environments.

Cambium Networks solutions are proven, respected leaders in the wireless broadband industry. We design, deploy and deliver innovative data, voice and video connectivity solutions that enable and ensure the communications of life, empowering personal, commercial and community growth virtually everywhere in the world.

Contacting Cambium Networks

Support website:	https://support.cambiumnetworks.com
Main website:	http://www.cambiumnetworks.com
Sales enquiries:	solutions@cambiumnetworks.com
Support enquiries:	https://support.cambiumnetworks.com
Repair enquiries:	https://support.cambiumnetworks.com
Telephone number list:	http://www.cambiumnetworks.com/contact
Address:	Cambium Networks Unit B2, Linhay Business Park, Eastern Road Ashburton, United Kingdom, TQ13 7UP