Cambium Networks™

Quick Installation Instructions

PTP 820E
System Release 10.9

Accuracy

While reasonable efforts have been made to assure the accuracy of this document, Cambium Networks assumes no liability resulting from any inaccuracies or omissions in this document, or from use of the information obtained herein. Cambium reserves the right to make changes to any products described herein to improve reliability, function, or design, and reserves the right to revise this document and to make changes from time to time in content hereof with no obligation to notify any person of revisions or changes. Cambium does not assume any liability arising out of the application or use of any product, software, or circuit described herein; neither does it convey license under its patent rights or the rights of others. It is possible that this publication may contain references to, or information about Cambium products (machines and programs), programming, or services that are not announced in your country. Such references or information must not be construed to mean that Cambium intends to announce such Cambium products, programming, or services in your country.

Copyrights

This document, Cambium products, and 3rd Party software products described in this document may include or describe copyrighted Cambium and other 3rd Party supplied computer programs stored in semiconductor memories or other media. Laws in the United States and other countries preserve for Cambium, its licensors, and other 3rd Party supplied software certain exclusive rights for copyrighted material, including the exclusive right to copy, reproduce in any form, distribute and make derivative works of the copyrighted material. Accordingly, any copyrighted material of Cambium, its licensors, or the 3rd Party software supplied material contained in the Cambium products described in this document may not be copied, reproduced, reverse engineered, distributed, merged or modified in any manner without the express written permission of Cambium. Furthermore, the purchase of Cambium products shall not be deemed to grant either directly or by implication, estoppel, or otherwise, any license under the copyrights, patents or patent applications of Cambium or other 3rd Party supplied software, except for the normal non-exclusive, royalty free license to use that arises by operation of law in the sale of a product.

Restrictions

Software and documentation are copyrighted materials. Making unauthorized copies is prohibited by law. No part of the software or documentation may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language or computer language, in any form or by any means, without prior written permission of Cambium.

License Agreements

The software described in this document is the property of Cambium and its licensors. It is furnished by express license agreement only and may be used only in accordance with the terms of such an agreement.

High Risk Materials

Cambium and its supplier(s) specifically disclaim any express or implied warranty of fitness for any high risk activities or uses of its products including, but not limited to, the operation of nuclear facilities, aircraft navigation or aircraft communication systems, air traffic control, life support, or weapons systems ("High Risk Use"). Any High Risk is unauthorized, is made at your own risk and you shall be responsible for any and all losses, damage or claims arising out of any High Risk Use.

Introduction

This guide provides basic instructions for setting up and configuring a PTP 820E 1+0 link. For more detailed instructions:
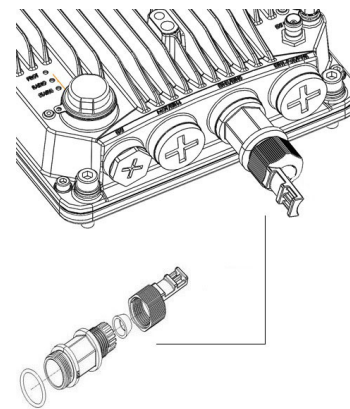
- Installation Guide for PTP 820E – Detailed instructions for hardware assembly of all supported PTP 820E link types.

- User Guide for PTP 820C, PTP 820S, and PTP 820E – Detailed instructions for software configuration.
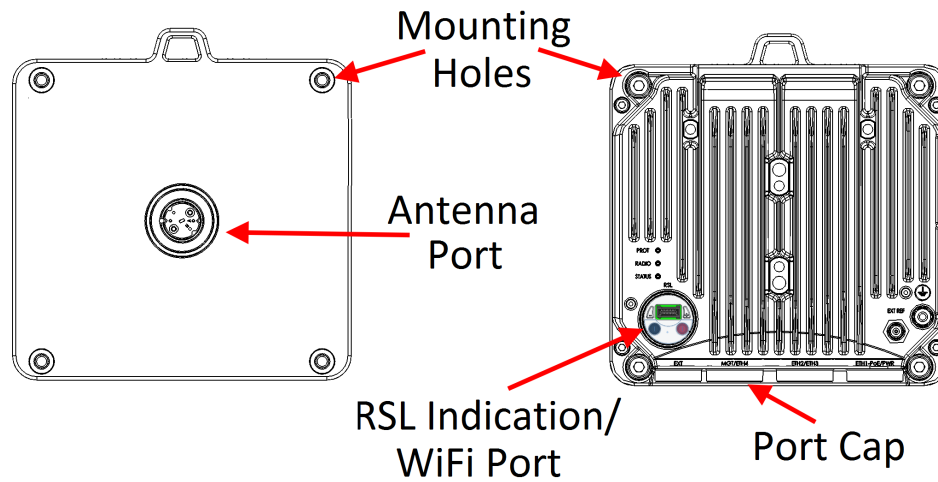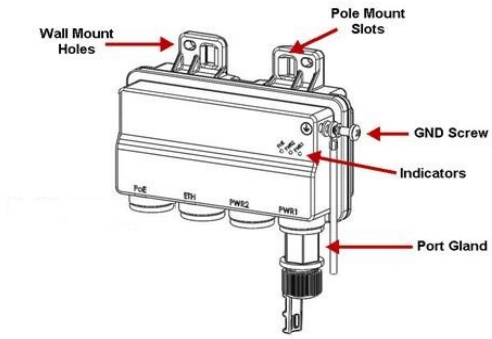

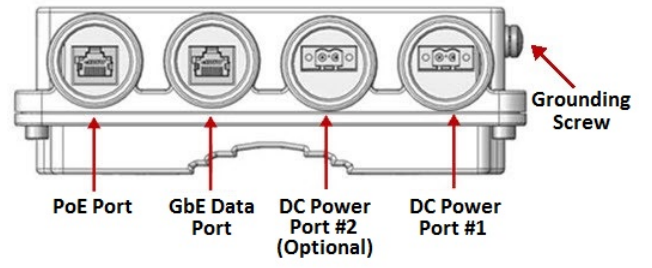PTP 820E Rear View (Left) and Front View (Right)
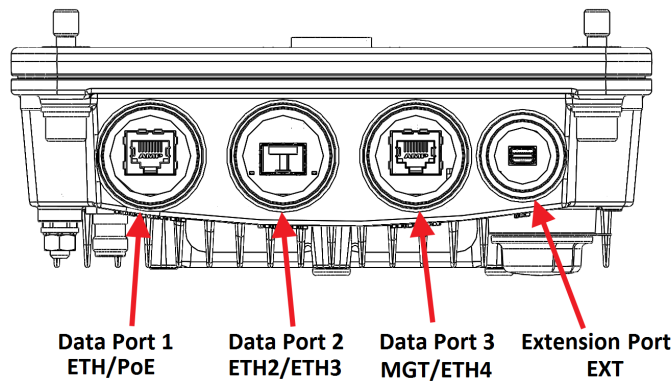
PTP 820E Interfaces

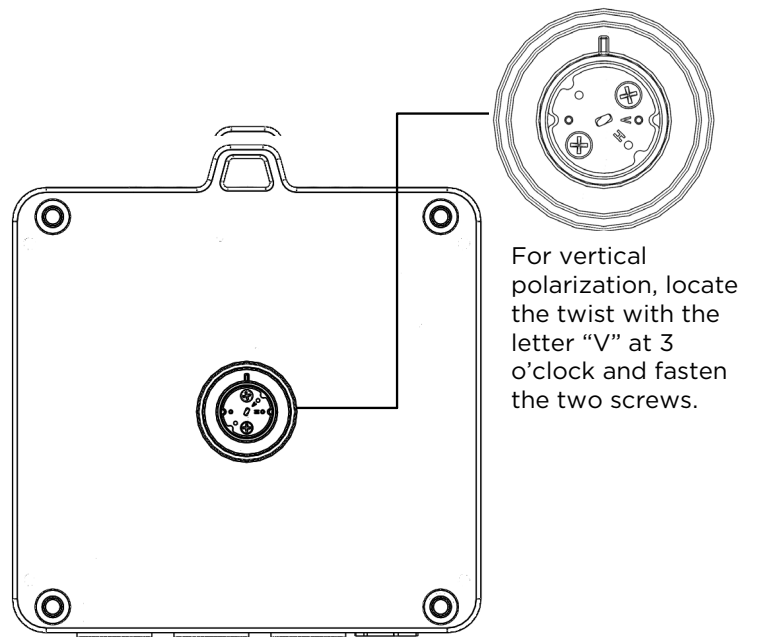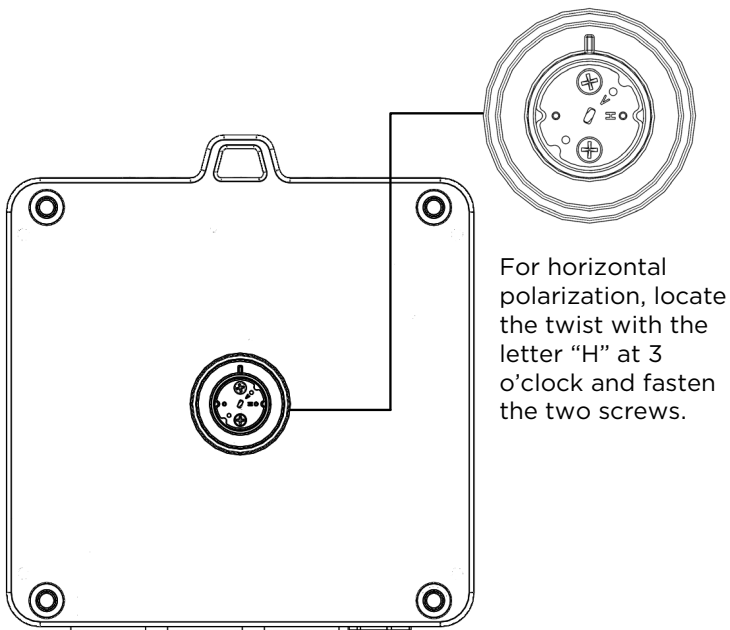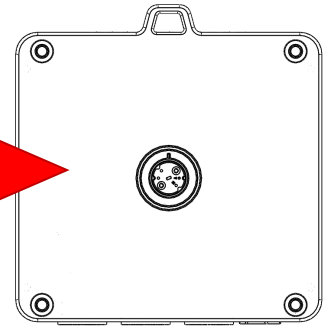Cable Gland Construction

PoE Injector

PoE Injector Interfaces

Pole Mount Assembly and Installation

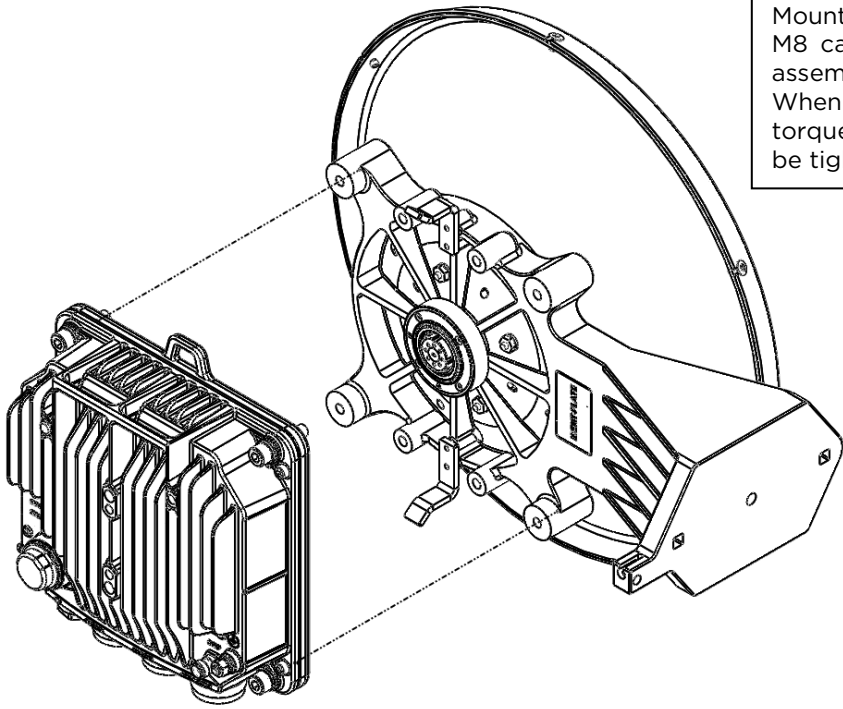> **Note**
>
> Do not remove the transparent pressure window located on the antenna interface.

For horizontal polarization, locate the twist with the letter "H" at 3 o'clock and fasten the two screws.

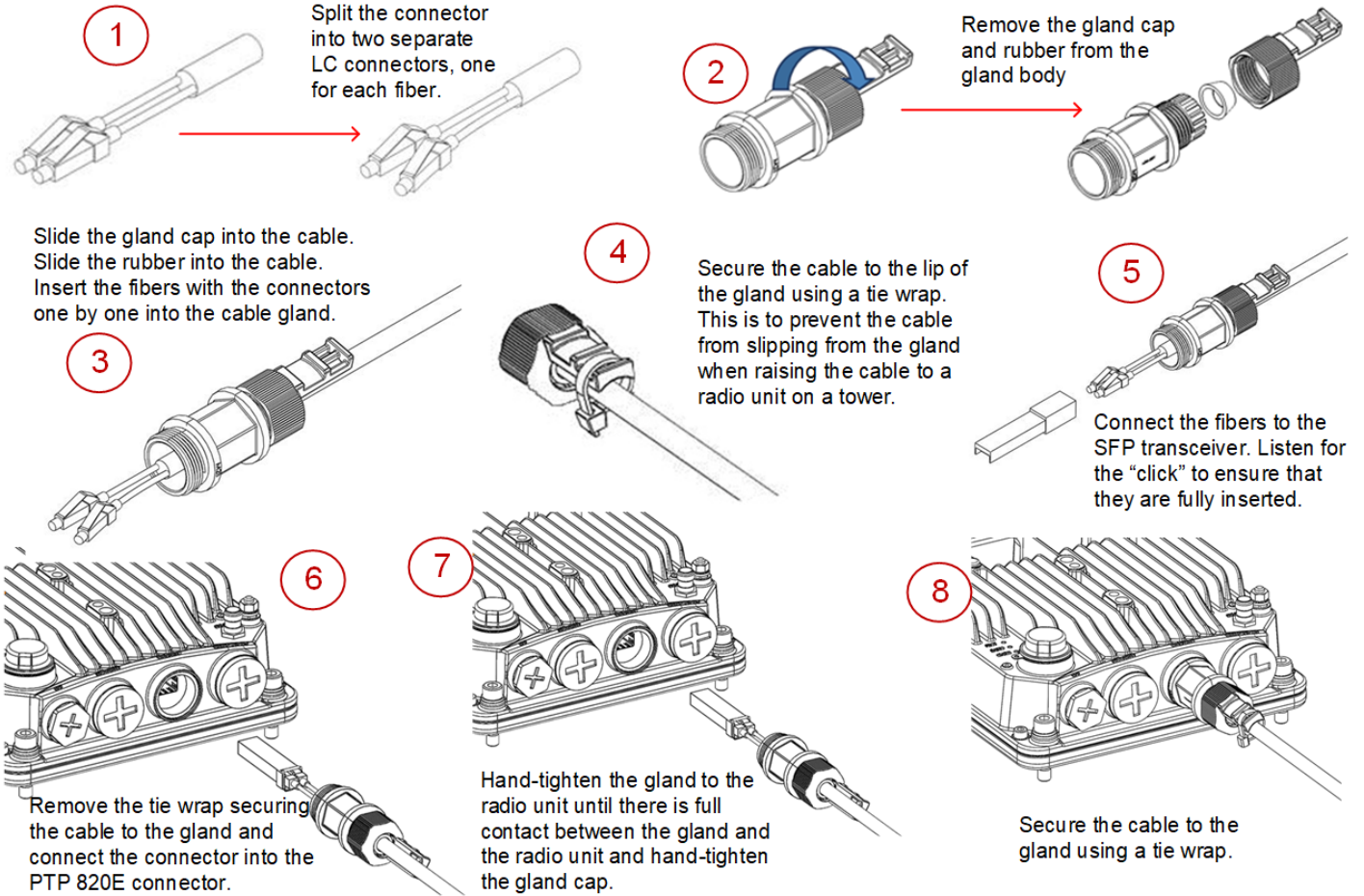For vertical polarization, locate the twist with the letter "V" at 3 o'clock and fasten the two screws.

Mount the PTP 820E on the antenna using the four M8 captive screws and washers that are supplied, assembled, in the PTP 820E, and tighten the screws. When tightening the captive screws, use 20 Nm torque. In order to avoid misalignment, screws should be tightened progressively.
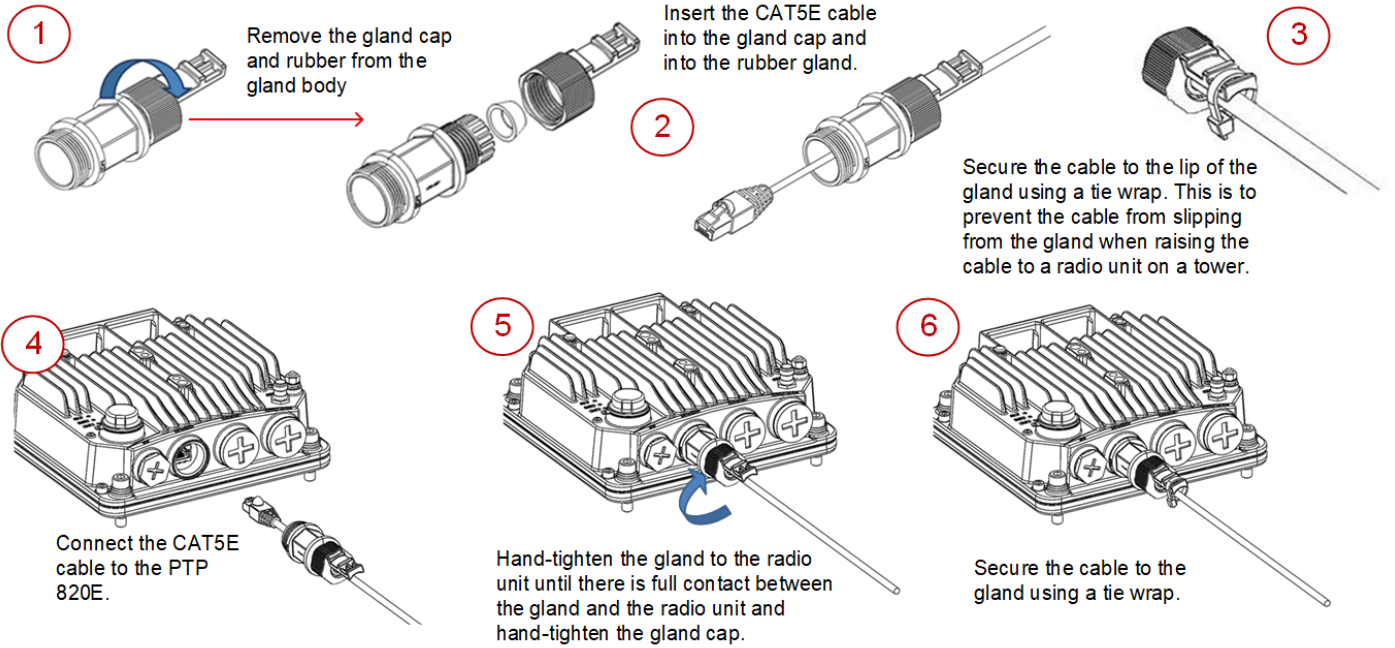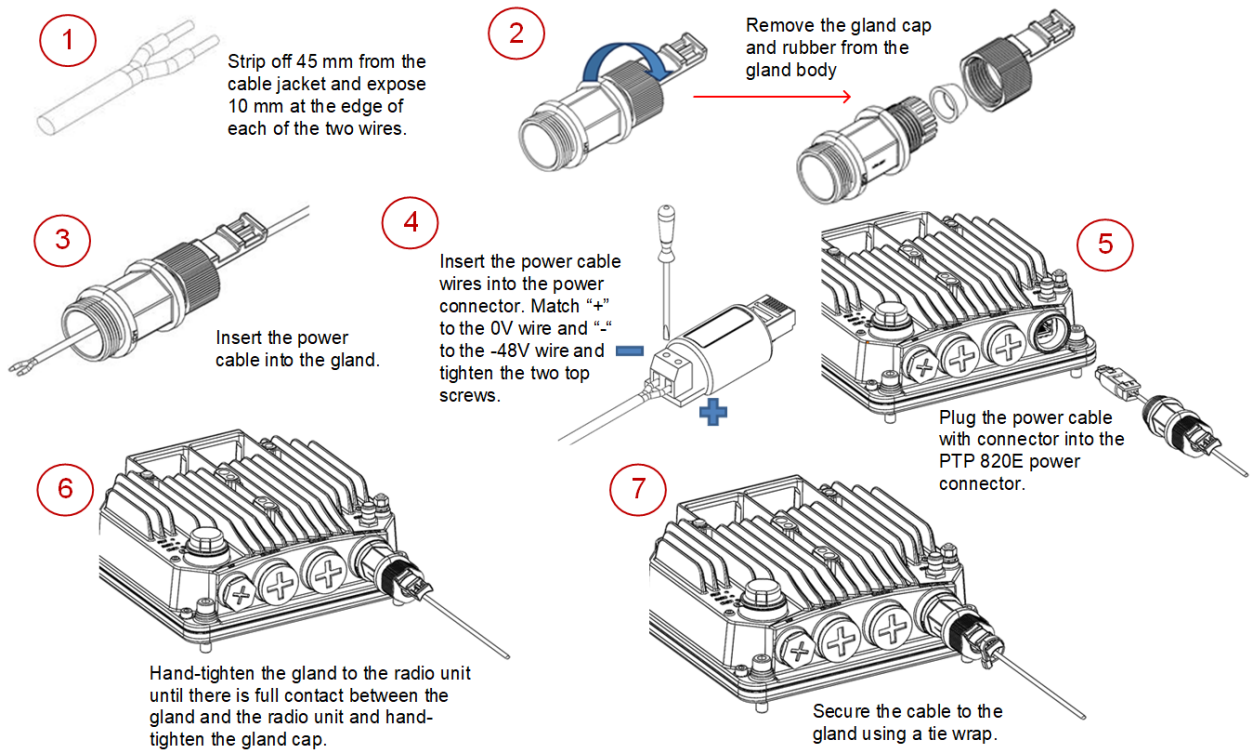
Cabling

To connect an optical Ethernet cable and SFP:

1 Split the connector into two separate LC connectors, one for each fiber.

2 Remove the gland cap and rubber from the gland body

3 Slide the gland cap into the cable. Slide the rubber into the cable. Insert the fibers with the connectors one by one into the cable gland.

4 Secure the cable to the lip of the gland using a tie wrap. This is to prevent the cable from slipping from the gland when raising the cable to a radio unit on a tower.

5 Connect the fibers to the SFP transceiver. Listen for the "click" to ensure that they are fully inserted.

6 Remove the tie wrap securing the cable to the gland and connect the connector into the PTP 820E connector.

7 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.

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

To connect an electrical Ethernet cable:

1 Remove the gland cap and rubber from the gland body

Insert the CAT5E cable into the gland cap and into the rubber gland.

2

3

Secure the cable to the lip of the gland using a tie wrap. This is to prevent the cable from slipping from the gland when raising the cable to a radio unit on a tower.

4 Connect the CAT5E cable to the PTP 820E.

5 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.

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

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 and tighten the two top screws.

5 Plug the power cable with connector into the PTP 820E power connector.

6 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.

7 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 kit CAT5E_gnd_kit.

Installing and Connecting a PoE Injector
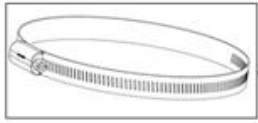
To mount a PoE Injector on the wall:

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.
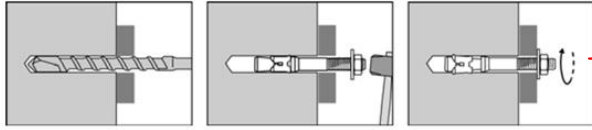
3 Insert the anchors with the bolts, place the washers on the bolts, and tighten the nuts.
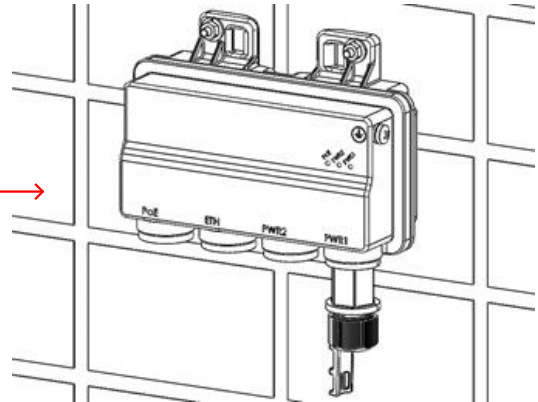
To mount a PoE Injector on a pole:

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.
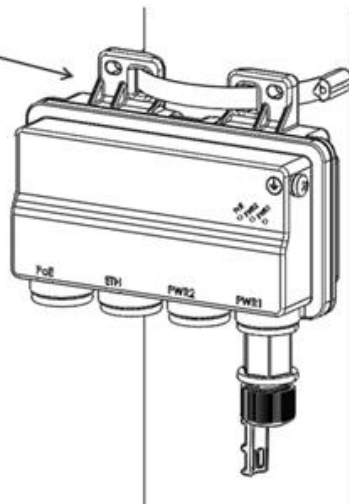
To mount a PoE Injector on a 19" rack:

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.
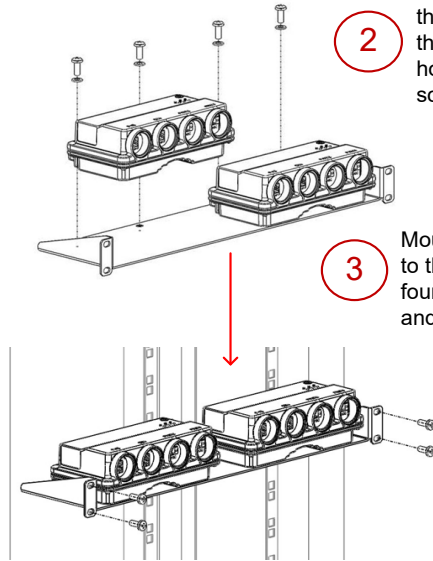
To mount a PoE Injector on an ETSI rack:

1 Mount the PoE Injector to an ETSI rack using a 19" rack adaptor and ETSI adapting ears.

2 Connect ETSI adapting ears to a 19" rack adaptor using four M6 screws.

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

4 Mount the 19" rack adaptor with the ETSI ears on the ETSI rack using four M6 screws and cage nuts.
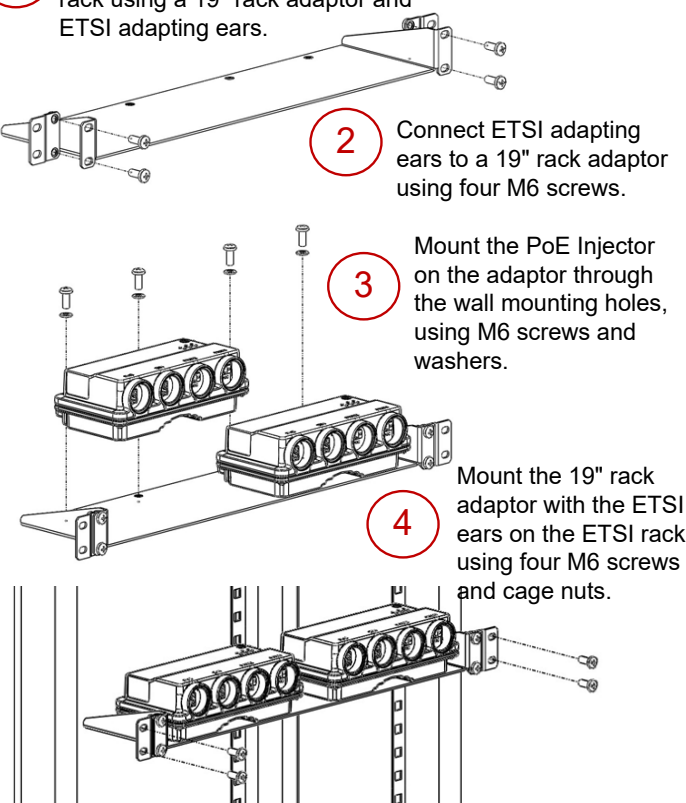

To ground a PoE Injector:

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 820E port and the Switch/Router the device is connected to should not exceed 100m/328ft. This length includes the connection between the PTP 820E and the PoE Injector ($X1 + X2 \leq 100m/328ft$ 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).
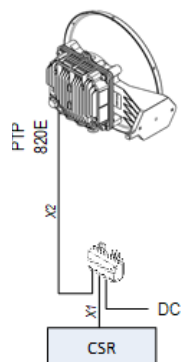
Grounding the PTP 820E

(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.
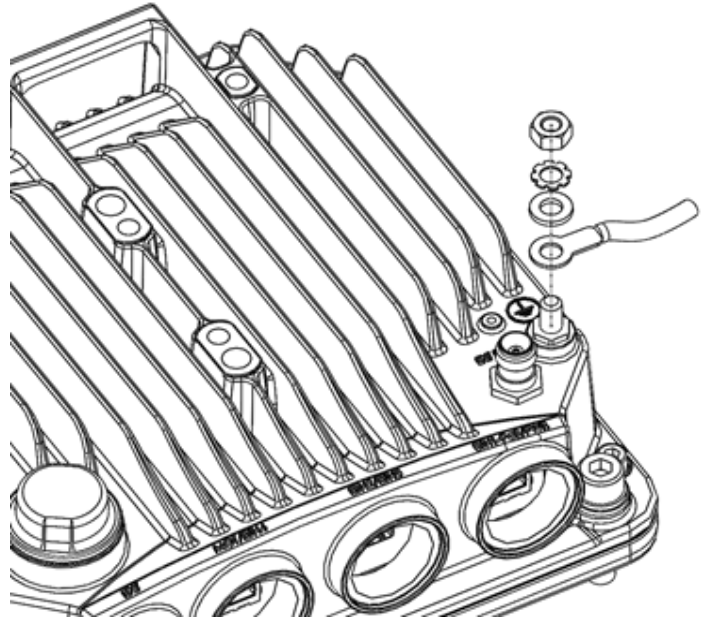
Notes:

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.

Connecting to the Unit:

1. Connect your laptops LAN port to the MGT port on the PTP 820E.
2. Configure an IP address on the laptop within the same subnet as the PTP 820E unit. The default PTP 820 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**.

Changing the Default IP Address

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

Select IPv4 or IPv6. The unit will use the selected protocol when initiating communications.

Description of unit (optional)

You can enter an IP address in IPv4 format (use the **IP address** field) or IPv6 format (use the **IPv6 Address** field).

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

Installing the Activation Key

New PTP 820E 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.

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 > Single Carrier > 1+0**. Page 1 of the 1+0 Quick Configuration wizard opens.

1

Link Setup (PIPE) 1 + 0

Select one Ethernet and one radio interface, then select the PIPE type.

Interface Selection (1 + 0)

Ethernet Interface   Ethernet: Slot 1, port 1   Create LAG
Radio Interface   Radio: Slot 2, port 1
PIPE Type   dot1q

<< Back   Next >>   Finish

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.

Select a radio interface for the link.

Select the Attached Interface type for the service that will connect the radio and Ethernet interfaces:

- **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.

2

Link Setup (PIPE) 1 + 0

Link Setup Progress   30%

Enter the radio interface parameters.

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

TX Frequency (MHz)   74000.000   (74000.000..76000.000)
RX Frequency (MHz)   85875.000   (81000.000..86000.000)
TX Level (dBm)   8
TX Mute   Off

<< Back   Next >>   Finish

Set the transmission and received radio frequency in MHz.

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

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

3

Link Setup (PIPE) 1 + 0

Link Setup Progress   50%

Select an MRMC script and profile.

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

Script ID   Script: 4702, Single-Carrier, BW:250 MHz, OBW:239.6 MHz, 179.679-1636.975 Mbps, ETSI, ACCP
Operational Mode   Adaptive
Maximum profile   Profile: 6, 128 QAM, 1460.154 Mbps
Minimum profile   Profile: 0, 2 QAM, 179.679 Mbps

<< Back   Next >>   Finish

Select the MRMC script you want to assign to the radio.

Select the ACM mode: **Fixed** or **Adaptive**.

- 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.

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.

4

Link Setup (PIPE) 1 + 0

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, 1 + 0

In Band Management   Yes
Management VLAN   1

☐ In Band includes Ethernet interface

<< Back   Next >>   Finish

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

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

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

5

Link Setup (PIPE) 1 + 0

Link Setup Progress   100%

Following are the parameters that you have selected, 1 + 0
Radio interface: Radio: Slot 2, Port 1
TX Frequency: 74000 MHz, RX Frequency: 85875 MHz
TX Level (dBm): 8 TX Mute: Off
MRMC Script ID: 4702, Operational Mode: Adaptive, Maximum profile: 6

Ethernet Interface: Ethernet: Slot 1, Port 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
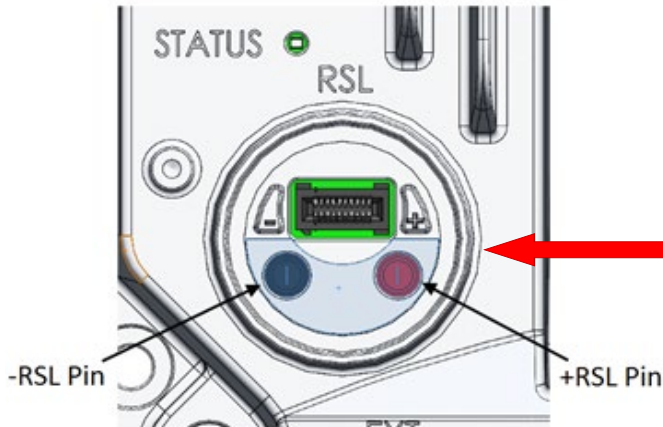
Verify that the Received Signal Level (RSL) is up to +/- 4 dB from the expected (calculated) level at both ends of the link.

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 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**).

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