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# ePMP™ 1000 Hotspot Connectorized Radio Installation Guide

System Release 1.0

- Safety and Installation Considerations
- Installing a Connectorized Radio
- Installing an Integrated Radio
- Antenna Installation
- Device LEDs
- Site Diagrams

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## About this guide

This guide is supplied for ePMP 1000 Hotspot radio equipment. It describes how to install the site equipment for ePMP 1000 Hotspot Series networks. Users of this guide must follow good practices for outdoor radio installations.

## RELATED DOCUMENTS

For full ePMP 1000 Hotspot installation planning instructions and a list of components, refer to the ePMP 1000 Hotspot *Series User Guide*.

## VERSION INFORMATION

Document number and version: epmp-1116\_000v001 (August 2015).

## WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE)

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

## SAFETY

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### Warning

To prevent loss of life or physical injury, observe the safety guidelines below. In no event shall Cambium Networks be liable for any injury or damage caused during the installation of the Cambium ePMP 1000 Hotspot equipment. Ensure that only qualified personnel install ePMP 1000 Hotspot equipment.

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### ***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 connectorized ePMP 1000 Hotspot module 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 the requirements of the National Electrical code NFPA 70-2005 and 780-2004 *Installation of Lightning Protection Systems*. 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.

### ***Powering down before servicing***

Before servicing ePMP 1000 Hotspot equipment, unplug the power supply from the power source.

Do not disconnect the RJ45 Ethernet cable connectors from the ePMP 1000 Hotspot device while the power supply is on. Always remove the input power from the power supply.

### ***External cables***

Safety may be compromised if outdoor rated cables are not used for connections that will be exposed to the outdoor environment. For outdoor copper Cat5e Ethernet interfaces, always use Cat5e cable that is shielded with copper-plated steel. Alternative types of cable are not supported by Cambium Networks.

### ***RF exposure near the antenna***

Radio frequency (RF) fields will be present close to the antenna when the transmitter is on. Always turn off the power to the Access Point or Station before undertaking maintenance activities in front of the antenna.

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### ***Minimum separation distances***

Ensure that personnel are not exposed to unsafe levels of RF energy. Never work in front of the antenna when the device is powered. Install the module so as to provide and maintain the minimum separation distances from all persons. For minimum separation distances, see the ePMP 1000 Hotspot *Series User Guide*.

### ***Grounding and lightning protection requirements***

Ensure that the installation meets the requirements defined in the ePMP 1000 Hotspot *Series User Guide*.

### ***Grounding cable installation methods***

To provide effective protection against lightning induced surges, observe these requirements:

- Grounding conductor runs must be 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 Access Points, Stations, and antennas***

Access Points, Stations, and external antennas are not designed to survive direct lightning strike. For this reason they must be installed in Zone B as defined in the ePMP 1000 Hotspot *Series User Guide*. Mounting in Zone A may put equipment, structures and life at risk.

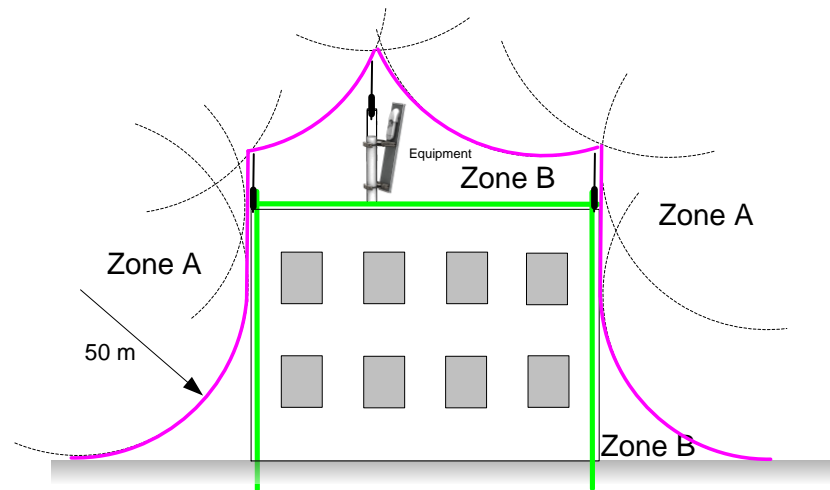
## LIGHTNING PROTECTION ZONES

Use the rolling sphere method (**Figure 1**) to determine where it is safe to mount equipment. An imaginary sphere, typically 50 meters in radius, is rolled over the structure. Where the sphere rests against the ground and a strike termination device (such as a finial or ground bar), all the space under the sphere is considered to be in the zone of protection (Zone B). Similarly, where the sphere rests on two finials, the space under the sphere is considered to be in the zone of protection.

**Figure 1** Rolling sphere method to determine the lightning protection zones

Assess locations on masts, towers and buildings to determine if the location is in Zone A or Zone B:

- **Zone A:** In this zone a direct lightning strike is possible. Do not mount equipment in this zone.
- **Zone B:** In this zone, direct EMD (lightning) effects are still possible, but mounting in this zone significantly reduces the possibility of a direct strike. Mount equipment in this zone.



### Warning

**Never mount equipment in Zone A. Mounting in Zone A may put equipment, structures and life at risk.**

## SITE GROUNDING SYSTEM

Confirm that the site has a correctly installed grounding system on a common ground ring with access points for grounding ePMP 1000 Hotspot equipment.

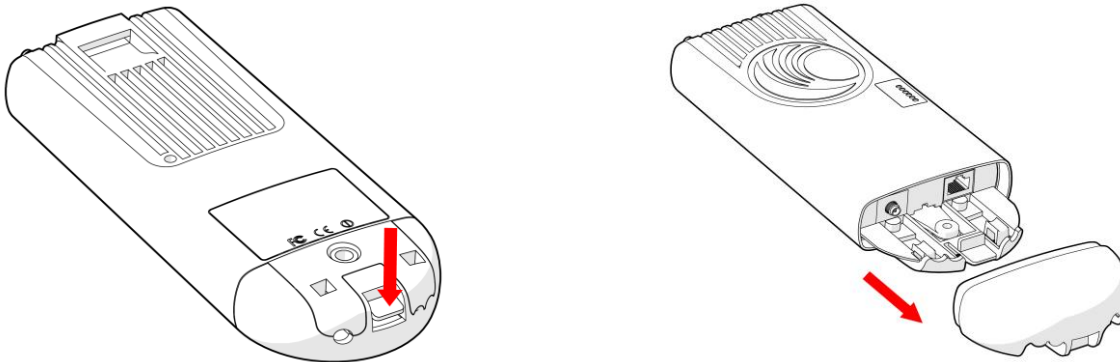
If the outdoor equipment is to be installed on the roof of a high building, confirm that the following additional requirements are met:

- A grounding conductor is installed around the roof perimeter to form the main roof perimeter lightning protection ring.
- Air terminals are installed along the length of the main roof perimeter lightning protection ring, typically every 6.1m (20ft).
- The main roof perimeter lightning protection ring contains at least two down conductors connected to the grounding electrode system. The down conductors should be physically separated from one another, as far as practical.

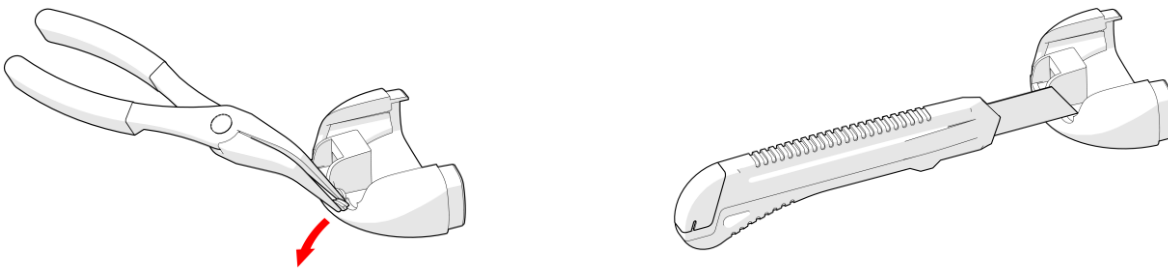
## Installing a Connectorized Radio

Cambium recommends to assemble the antenna and connectorized device prior to field deployment. To install the connectorized radio and cabling, proceed as follows:

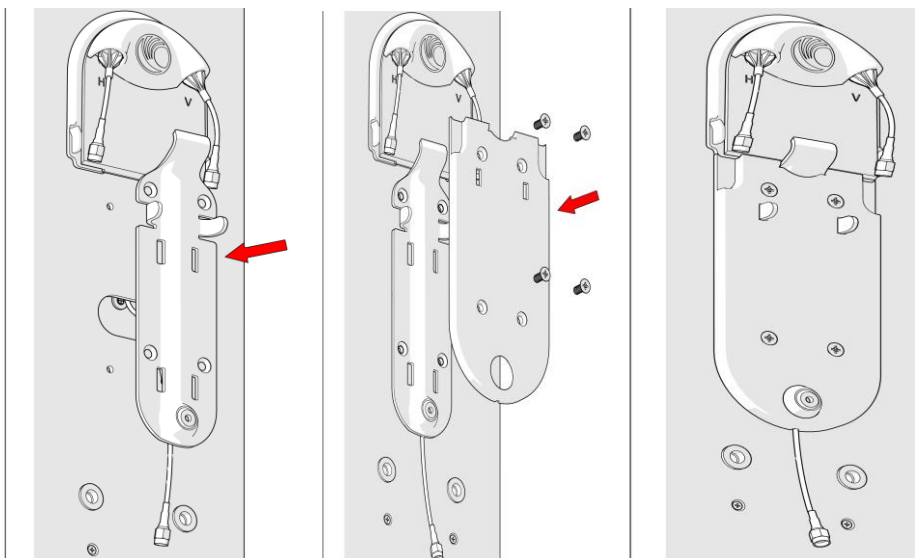
- 1 Depress the retaining clip, then remove the bottom cover of the connectorized device.



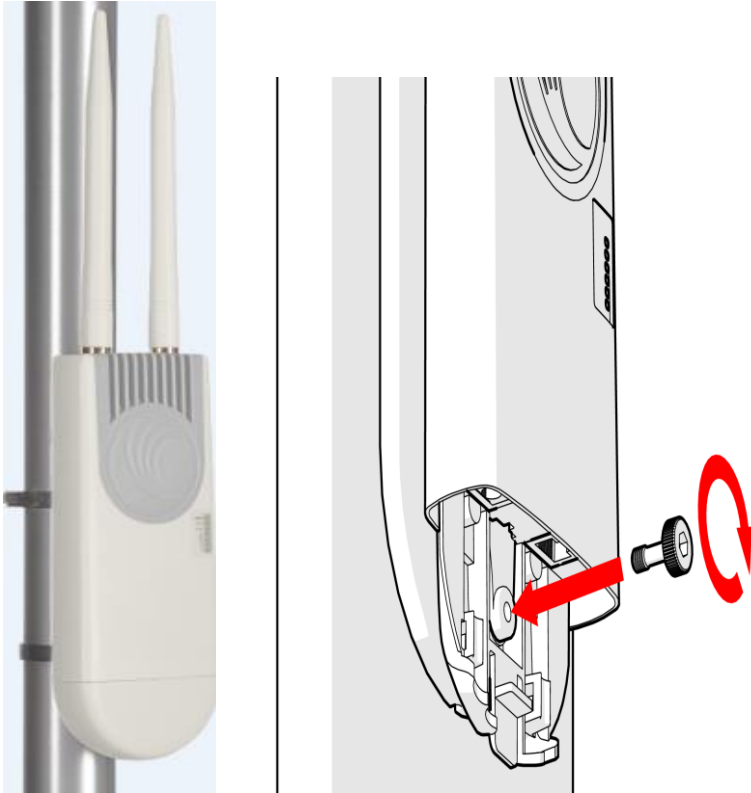
- 2 Remove the knockouts from the bottom shell cover for Ethernet and grounding cable routing. Remove any remaining plastic burrs which may damage cabling.



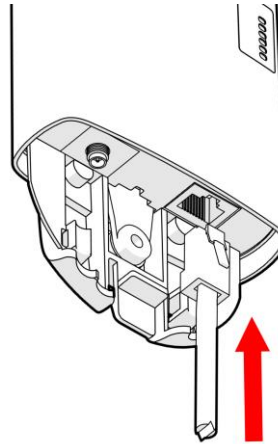
- 3 Reattach the radio mounting brackets to the omni antenna with a Philips screwdriver (4 screws).



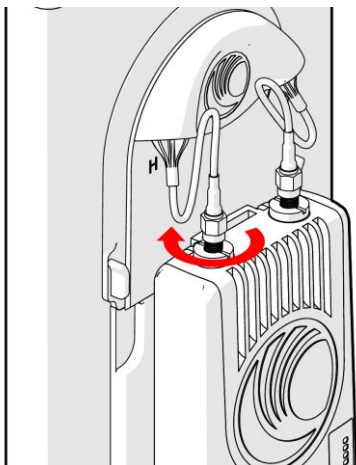
- 4** Attach the radio module to the omni antenna by hooking the top of the unit to the bracket then installing the retaining thumbscrew



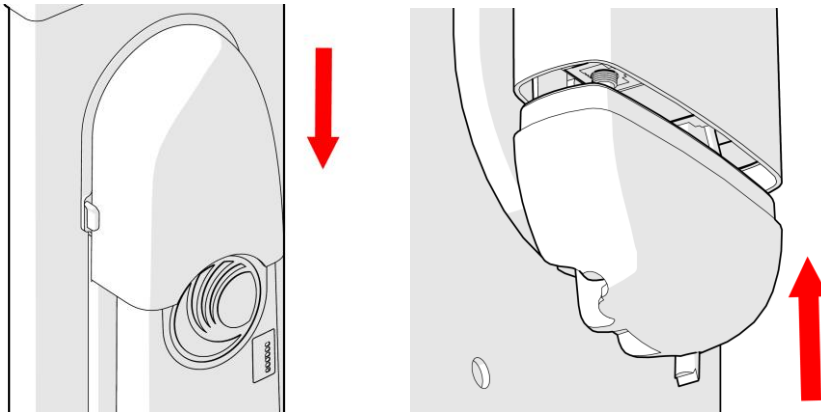
- Pack the Ethernet port with dielectric grease, then **5** insert one end of the Ethernet cable into the ETH port



- 6** Tighten the omni antenna cables, then use overlapping wraps of vinyl tape to seal.

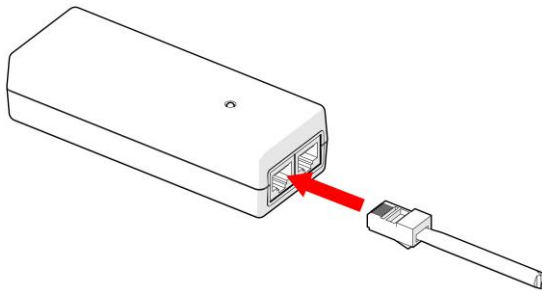


- 7 Reinstall the connectorized device antenna cabling cover and bottom shell cover (ensure that the bottom shell is latched – you may need to hold the tab/latch open when reinstalling the bottom cover).

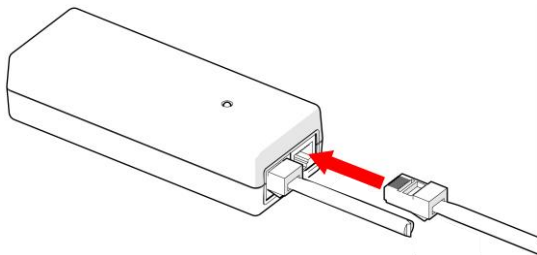


## POWERING ON THE CONNECTORIZED DEVICE

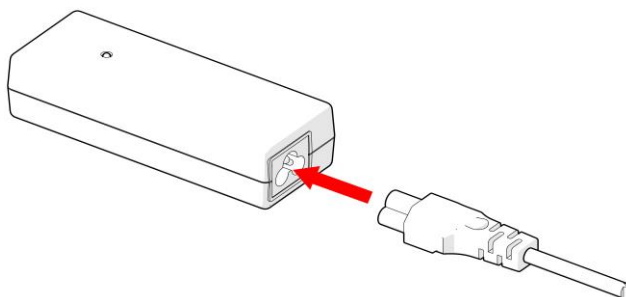
1. Connect the connectorized device Ethernet cable to the power supply port labeled "10/100Mbit Data+Power"



2. Connect an Ethernet cable from your management PC or network to the power supply port labeled "10/100Mbit Data"



3. Connect the power cord to the power supply, then plug the cable into an electrical outlet. Ensure that the power supply LED is lit green.



## Installing the Antenna

The antenna is screwed on to the connectors and must be turned all the way till the connector is flush with the device.



**Note**

The users must check the antenna band (2.4GHz or 5GHz) which is embossed on the antenna housing to make sure the right band of antenna is being connected to the AP.



**2.4G 5G**

## Device LED

### CONNECTORIZED MODULE LEDS

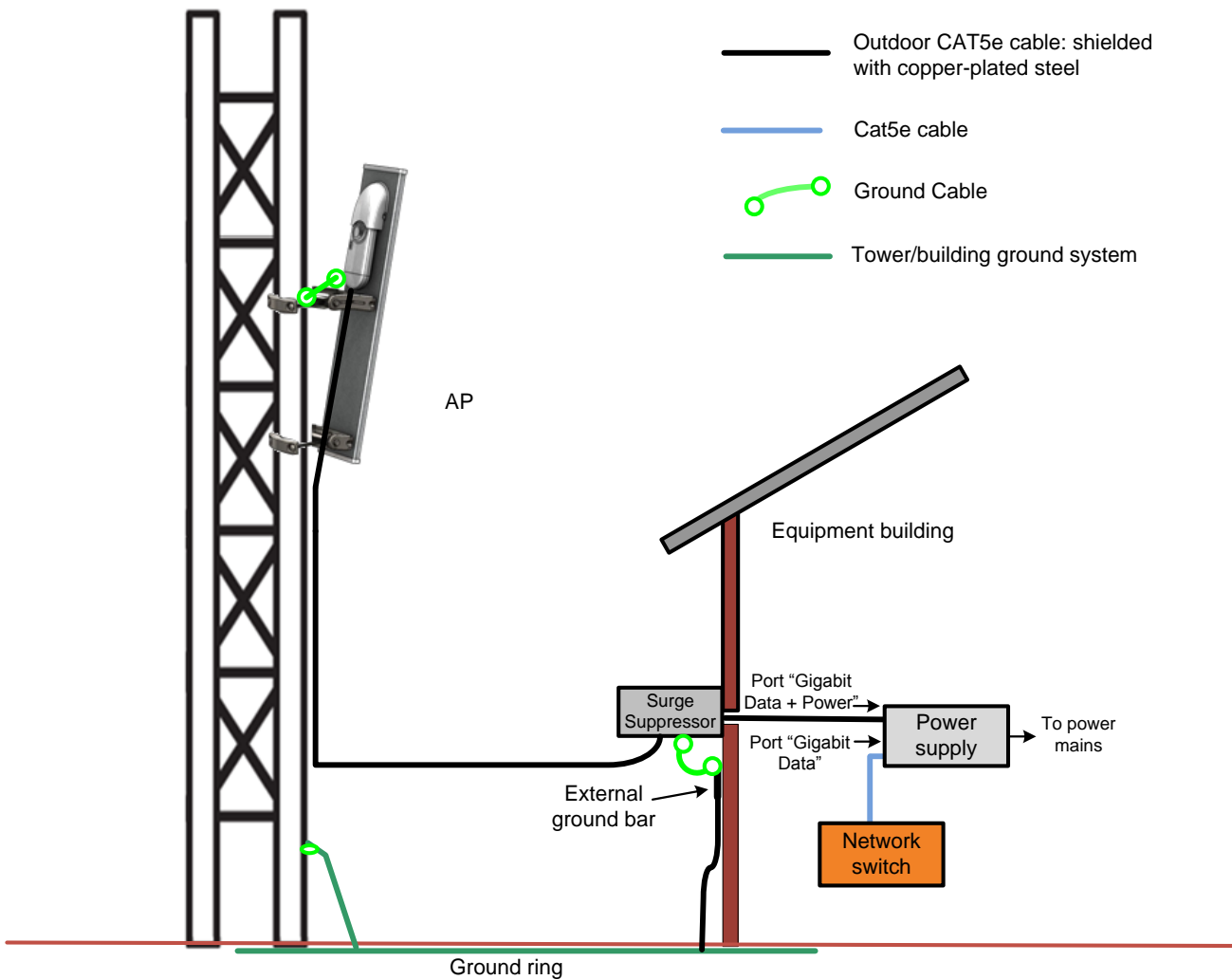
LED	Function
<b>POWER</b>	Green: Power is applied to the device Unlit: No power is applied to the device or improper power source

## Typical connectorized radio deployment

An ePMP 1000 Hotspot connectorized radio site typically consists of a high supporting structure such as a mast, tower or building for the radio, and an equipment building or moisture-proof enclosure for the indoor equipment (power supply, Cluster Management Module), as shown here in a typical mast or tower installation. If the radio/antenna is to be mounted on a metal tower or mast, then in addition to the general protection requirements (see section **Safety**), the following requirements must be observed:

- The equipment must be lower than the top of the tower or its lightning air terminal.

- The metal tower or mast must be correctly grounded.



**Note**

The Cambium 600SSH surge suppressor may be used for 10/100 Mbit Ethernet deployments. For 1000 Mbit (Gigabit) Ethernet deployments, the following surge suppressors must be used:

Manufacturer	Part Number	Description
L-COM	AL-CAT6JW	Outdoor 10/100/1000 Base-T CAT6 PoE Compatible Lightning Protector – RJ45 jacks
L-COM	AL-CAT6HPJW	Outdoor 10/100/1000 Base-T CAT6 Hi-Power Lightning Protector – RJ45 jacks