



HARDWARE INSTALLATION GUIDE

Enterprise Wi-Fi Access Point

System Release 6.3



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Chapter 1: About This User Guide

This chapter describes the following topics:

- [Overview of Cambium Network products](#)
- [Intended audience](#)
- [Purpose](#)
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- [Error! Reference source not found.](#)
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- [Training](#)
- [Power density exposure limit](#)

Overview of Cambium Network products

This User Guide describes the features supported by Cambium Network's Access Point (AP) and provides detailed instructions for setting Up and configuring Cambium Network's AP.

Intended audience

This guide is intended for use by the system designer, system installer and system administrator.

Purpose

Cambium Network's AP documents are intended to instruct and assist personnel in the operation, installation and maintenance of the Cambium's equipment and ancillary devices. It is recommended that all personnel engaged in such activities be properly trained.

Cambium disclaims all liability whatsoever, implied or expressed, for any risk of damage, loss or reduction in system performance arising directly or indirectly out of the failure of the customer, or anyone acting on the customer's behalf, to abide by the instructions, system parameters, or recommendations made in this document.

Related documents

[Table 1](#) provides details on Cambium Enterprise Wi-Fi product support information.

Table 1 Related documents

Enterprise Wi-Fi product details	https://www.cambiumnetworks.com/products/wifi/
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Enterprise Wi-Fi AP User Guide (This document)	https://support.cambiumnetworks.com/files
Enterprise Wi-Fi AP Release Notes	https://support.cambiumnetworks.com/files
Software Resources	https://support.cambiumnetworks.com/files
Community	http://community.cambiumnetworks.com/
Support	https://www.cambiumnetworks.com/support/contact-support/
Warranty	https://www.cambiumnetworks.com/support/warranty/
Feedback	For feedback, e-mail to support@cambiumnetworks.com

Hardware platforms

Table 2 Hardware platforms

Hardware	Description
XV3-8	8x8:8, 4x4:4 802.11a/b/g/n/ac wave 2/ax Tri-Radio indoor Access Point
XV2-2	2x2:2, 2x2:2 802.11a/b/g/n/ac wave 2/ax Dual-Radio indoor Access Point

Reporting problems, security advice and safety and regulatory information

This section includes the following topics:

- [Reporting problems](#)
- [Security advice](#)
- [Safety and regulatory information](#)

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: <http://www.cambiumnetworks.com/support>
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:
<https://www.cambiumnetworks.com/support/contact-support/>

Security advice

Cambium Network's systems and equipment provide security parameters that can be configured by the operator based on their particular operating environment. Cambium recommends setting and using these parameters following industry recognized security practices. Security aspects to be considered are protecting the confidentiality, integrity, and availability of information and assets. Assets include the ability to communicate, information about the nature of the communications, and information about the parties involved.

In certain instances, Cambium makes specific recommendations regarding security practices, however the implementation of these recommendations and final responsibility for the security of the system lies with the operator of the system.

Cambium Network's Enterprise AP equipment is shipped with default web management interface login credentials. It is highly recommended that the following default username and password should be modified prior to system installation.

- Username: admin
- Password: admin

Safety and regulatory information

This section describes important safety and regulatory guidelines that must be observed by personnel installing or operating Enterprise Access Point equipment.

Important safety information



Warning

To prevent loss of life or physical injury, observe the safety guidelines in this section.

Power lines

Exercise extreme care when working near power lines.

Working at heights

Exercise extreme care when working at heights.

Grounding and protective earth

Cambium Networks Enterprise Access Point (AP) devices must be properly grounded to protect against lightning. It is the responsibility of the user 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 be contracted to a professional installer.

Powering down before servicing

Always power down and unplug the equipment before servicing.

Primary disconnect device

The Enterprise AP power supply is the primary disconnect device.

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 AP device before undertaking maintenance activities in front of the antenna.

Important regulatory information

The XV3-8 Enterprise AP product is certified as an unlicensed device in frequency bands where it is not allowed to cause interference to licensed services (called primary users of the bands).

Radar avoidance

In countries where radar systems are the primary band users, the regulators have mandated special requirements to protect these systems from interference caused by unlicensed devices. Unlicensed devices must detect and avoid co-channel operation with radar systems.

The XV3-8 Enterprise AP detects and avoids functionality for countries and frequency bands requiring protection for radar systems. The XV3-8 Enterprise AP is qualified for ETSI/FCC DFS certification (see [Note](#)) for radar detection and avoidance as per the law.



Note

Country-specific limits apply, some bands require Dynamic Frequency Selection (DFS). DFS bands operation subject to regulatory approval. Check Software release notes for details.

Installers and users must meet all local regulatory requirements for radar detection. To meet these requirements, users must set the correct country code during commissioning of the XV3-8 Enterprise AP equipment. If this is not done, installers and users may be liable to civil and criminal penalties.

Contact the Cambium helpdesk if more guidance is required.

Human exposure to radio frequency energy

Relevant standards (USA and EC) applicable when working with RF equipment are:

- ANSI IEEE C95.1-1991, IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.
- Council recommendation of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz) (1999/519/EC) and respective national regulations.
- Directive 2004/40/EC of the European Parliament and of the Council of 29 April 2004 on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (electromagnetic fields) (18th individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC).
- US FCC limits for the general population. See the FCC website at <https://www.fcc.gov/>, and the policies, guidelines, and requirements in Part 1 of Title 47 of the Code of Federal Regulations, as well as the guidelines and suggestions for evaluating compliance in FCC OET Bulletin 65.
- Health Canada limits for the general population. See the Health Canada website at http://www.hc-sc.gc.ca/ewh-semt/pubs/radiation/radio_guide-lignes_direct/index-eng.php and Safety Code 6.
- EN 50383:2002 to 2010 Basic standard for the calculation and measurement of electromagnetic field strength and SAR related to human exposure from radio base stations and fixed terminal stations for wireless telecommunication systems (110 MHz - 40 GHz).
- BS EN 50385:2002 Product standard to demonstrate the compliances of radio base stations and fixed terminal stations for wireless telecommunication systems with the basic restrictions or the

reference levels related to human exposure to radio frequency electromagnetic fields (110 MHz - 40 GHz) - general public.

ICNIRP (International Commission on Non-Ionizing Radiation Protection) guidelines for the general public. See the ICNIRP website at <http://www.icnirp.de/> and Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields.

USA and Canada specific information

Federal Communication Commission interference statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



Attention

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For product available in the USA/Canada market, only channel 1-11 can be operated. Selection of other channels is not possible.

This device and its antennas(s) must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures.

This device is restricted for indoor use.

FCC radiation exposure statement

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body.

IC statement

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes (1) l'appareil ne doit pas produire de

brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

For product available in the USA/Canada market, only channel 1-11 can be operated. Selection of other channels is not possible.

Pour les produits disponibles aux États-Unis / Canada du marché, seul le canal 1 à 11 peuvent être exploités. Sélection d'autres canaux n'est pas possible.

This device and it's antennas(s) must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with IC multi-transmitter product procedures.

Cet appareil et son antenne (s) ne doit pas être co-localisés ou fonctionnement en association avec une autre antenne ou transmetteur.

The device for the band 5150-5250 MHz is only for indoor usage to reduce potential for harmful interference to co-channel mobile satellite systems.

les dispositifs fonctionnant dans la bande 5150-5250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux;

IC radiation exposure statement

This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body.

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

CE statement

This equipment complies with EU radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20 cm between the radiator and your body.

Specific expertise and training required for professional installers

To ensure that the XV3-8 Enterprise AP is installed and configured in compliance with the requirements of Industry Canada and the FCC, installers must have the radio engineering skills and training described in this section. This is particularly important when installing and configuring an XV3-8 Enterprise AP system for operation in the 5 GHz band (5150 - 5250 MHz - FCC only, 5250 - 5350 MHz, 5470 - 5725 MHz and 5725 - 5850 MHz).

Avoidance of weather radars

The installer must be familiar with the requirements in FCC KDB 443999. Essentially, the installer must be able to:

- Access the FCC database of weather radar location and channel frequencies.
- Use this information to correctly configure the product (using the UI) to avoid operation on channels that must be avoided according to the guidelines that are contained in the KDB and explained in detail in this user guide.
- In ETSI regions, the band 5600 MHz to 5650 MHz is reserved for the use of weather radars.

Ethernet networking skills

The installer must have the ability to configure IP addressing on a PC and to set up and control products using a web browser interface.

Pole or tower mount guidelines

If you need to install AP to a metal tower or pole, then in addition to the general protection requirements, follow the below requirements:

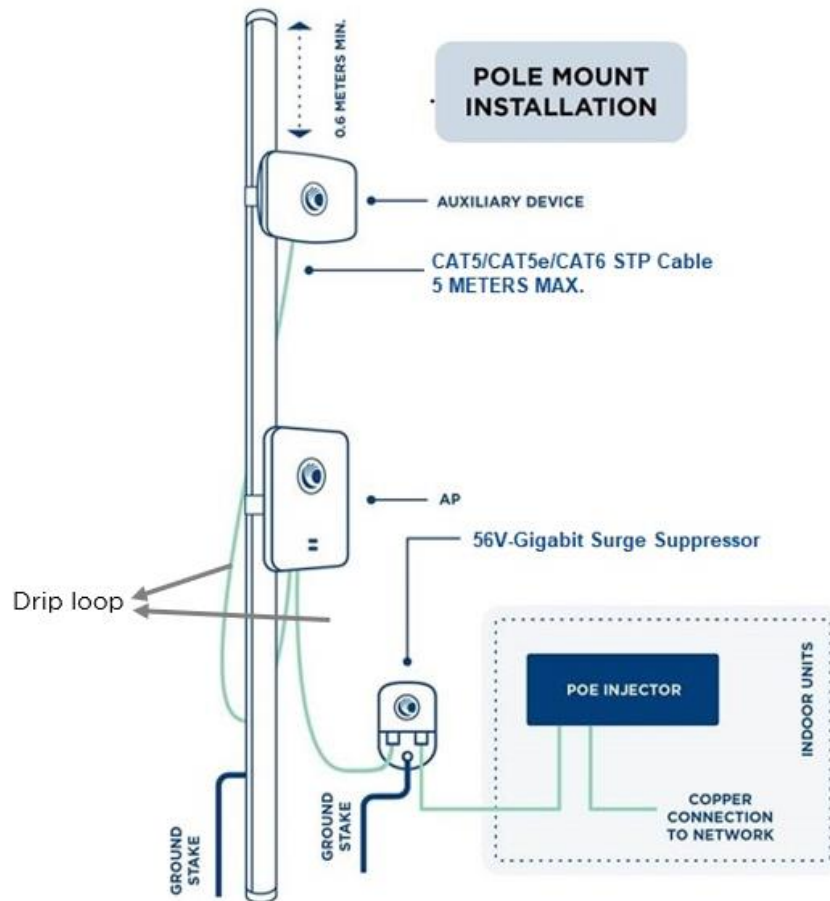
- Ensure that the position of the equipment is lower than the top of the tower or its lightning air terminal.
- Ensure that the metal tower or pole is correctly grounded.
- Install a grounding kit at the first point of contact (top), between the drop cable and the tower.
- Install a grounding kit at the bottom of the tower, near the vertical to horizontal transition point.



Note If grounding kit is installed, ensure the grounding kit is bonded to the tower or Tower Ground Bus Bar (TGB).

Connection examples of pole or tower installations are shown in below figure.

Figure 1 Grounding and lightning protection on pole or tower



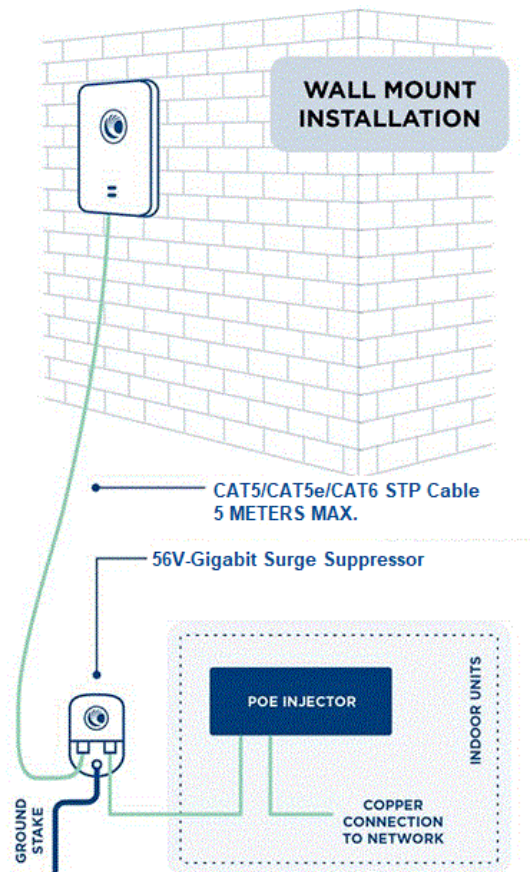
Wall mount guidelines

If you need to install AP on the wall of a building, then in addition to the general protection requirements, follow the below requirements also:

- Ensure that the position of the equipment is lower than the top of the building or its lightning air terminal.
- Ensure that the building is correctly grounded.

Connection examples of wall installations are shown in below figure.

Figure 2 Grounding and lightning protection on wall



Note

There should be a drip loop immediately at the Ethernet port entrance going to the AP.

Training

The installer needs to have basic competence in radio and IP network installation. The specific requirements applicable to the Cambium Networks Enterprise Wi-Fi AP must be gained by reading this User Guide and by performing sample setups at base workshop before live installments.

Power density exposure limit

This section includes the following topics:

- Calculation of power density and distance
- Calculated distances and power compliance margins

Install the radios for the platform family of wireless solutions so as to provide and maintain the minimum separation distances from all persons.

The applicable FCC power density exposure limit for RF energy in the 2.4 and 5 GHz frequency bands is 1 mW/cm².

The applicable ISEDC power density exposure limit for RF energy in unlicensed bands is $0.02619 \cdot (f^{0.6834})$, where f is the lowest frequency of the supported band. For licensed bands, the power density exposure limit is $0.6455 \cdot (f^{0.5})$, where f is the lowest frequency of the supported band.

Calculation of power density and distance

The following calculation is based on the ANSI IEEE C95.1-1991 method, as that it provides a worst-case analysis. Details of the assessment to EN50383:2002 can be provided, if required.

Peak power density in the far field of a radio frequency point source is calculated as follows:

$$S = \frac{P \cdot G}{4\pi d^2}$$

P - Maximum average transmit power capability of the radio, in W

G - total Tx gain as a factor, converted from dB

S - power density (W/m²)

d - Distance from point source, in cm (Centimeters)

Table 3 Antenna details

AP	Antenna	Gain (For 2.4 GHz in dBi)	Gain (For 5 GHz in dBi)
XV3-8	Omnidirectional	5.1	6.7
XV2-2	Omnidirectional	5.4	6.3

For details on minimum safe distance value, please refer Table 4.

Calculated distances and power compliance margins

Table 4 displays power density and minimum safe separation distance from point source for each frequency band and antenna combination for the USA and Canada. These are conservative distances that include compliance margins.

Cambium Networks Enterprise Wi-Fi AP adheres to all applicable EIRP limits for transmit power when operating in MIMO mode. Separation distances and compliance margins include compensation for both transmitters.

$$d = \sqrt{\frac{P \cdot G}{4\pi \cdot S}}$$

Explanation of terms used in the following tables:

P - maximum average transmits power of the radio (Watt)

G - total transmit gain as a factor, converted from dB

S - power density (W/m²)

d - minimum safe separation distance from point source (Centimeters)

Table 4 Power density and distance

Product	Regulatory Domain	Power density S (mW/cm)	Distance d (cm)
XV3-8	FCC	0.21/0.33	31
	IC	0.22/0.35	30
	CE	0.197/7.47 (2.4G/5G W/m ²)	20
XV2-2	FCC	0.45/0.505	25
	IC	0.31/0.35	30
	CE	0.1966/7.598 (2.4G/5G W/m ²)	20

Chapter 2: Packaging and Installation of Access Point

This chapter describes the following topics:

- [Unpacking](#)
- [Package contents](#)
- [Mounting the device](#)

Unpacking the Access Point

After you purchase a Cambium Networks Enterprise Wi-Fi AP, unpack the AP and check the package contents.

1. Open the AP package, and then carefully remove the contents.
2. Verify that all items listed in Package contents below are included in the package. Check each item for damage. If any item is damaged or missing, notify your authorized Cambium Networks Enterprise Wi-Fi AP sales representative.

Package contents

A complete Cambium Networks Enterprise Wi-Fi AP package contains all the items listed below:

1. Cambium Networks Enterprise Wi-Fi AP
2. Quick Start Guide (QSG)
 - a) Specifications
 - b) Safety Notice
 - c) Compliance
3. Hardware Accessories (Based on SKU/Model)
 - a) Mounting Kits

Mounting the device

This section includes the following topics:

- [Mounting XV3-8](#)
- [Mounting XV2-2](#)

Cambium Networks Enterprise Wi-Fi AP feature an attractive design with flexible mounting options that allows the APs to smoothly blend into any business environment. Cambium Networks Enterprise Wi-Fi AP are mounted in the following methods:

- Wall Mount
- Ceiling Mount
- T-bar Mount

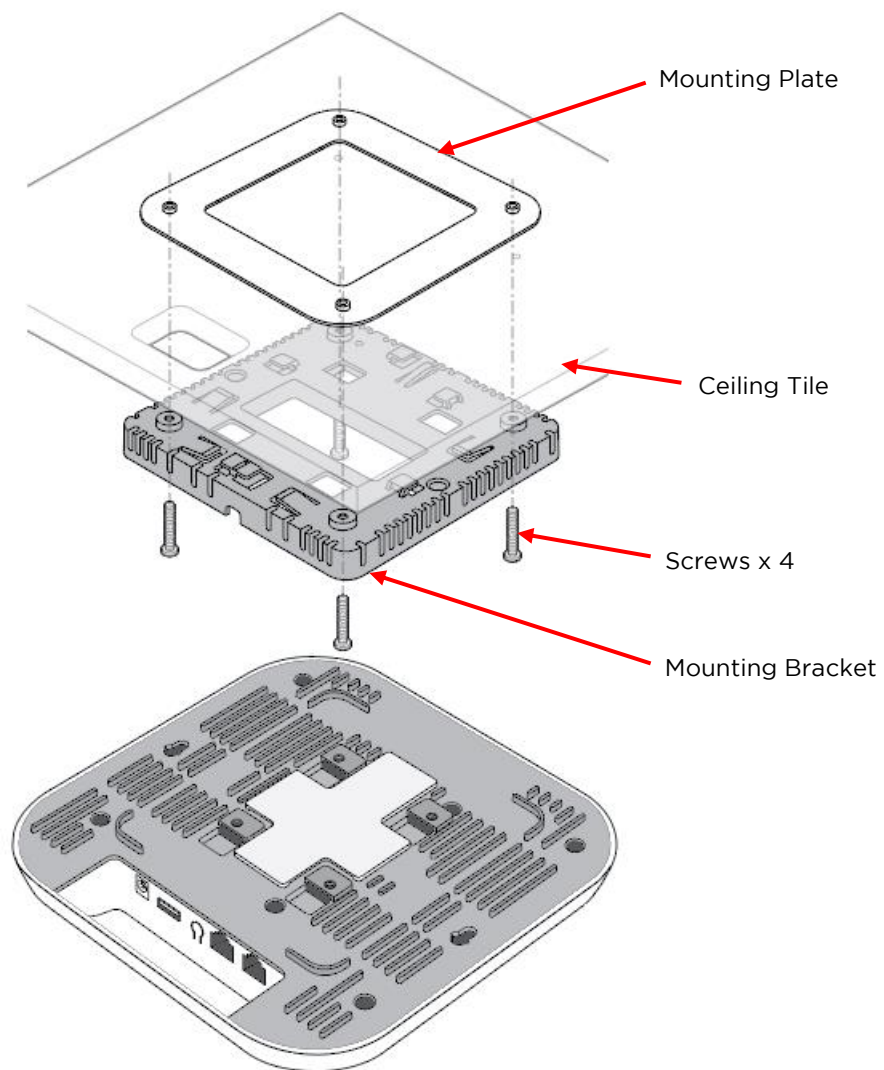
[Table 5](#) provides an overview of the type of mountings each Cambium Networks Enterprise Wi-Fi AP supports.

Table 5 Types of mounting the device

Access Point	Wall Mount	Ceiling Mount	T-bar Mount
XV3-8	✓	✓	✓
XV2-2	✓	✓	✓

Mounting XV3-8

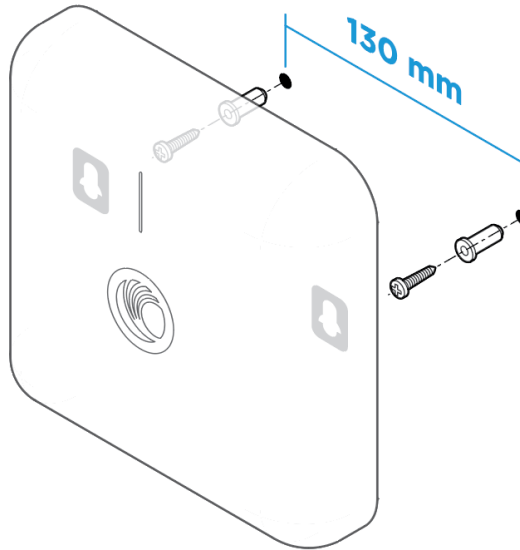
Ceiling Mount:



1. Determine where XV3-8 needs to be mounted and remove the ceiling tile.
2. Using the hole template, mark the hole locations.
3. Drill the holes for the 4 mounting screws using a 5mm (3/6") diameter drill bit.

4. Drill the RJ45 cable hole using a 15 mm (5/8") diameter bit.
5. Hold the mounting plate on the top side of the ceiling tile and screw it on the mounting bracket.
6. Run the RJ45 cable/cables through the 15mm hole and remount the ceiling tile.
7. Attach the RJ45 cable/cables to XV3-8.
8. Slide XV3-8 into the mounting bracket.

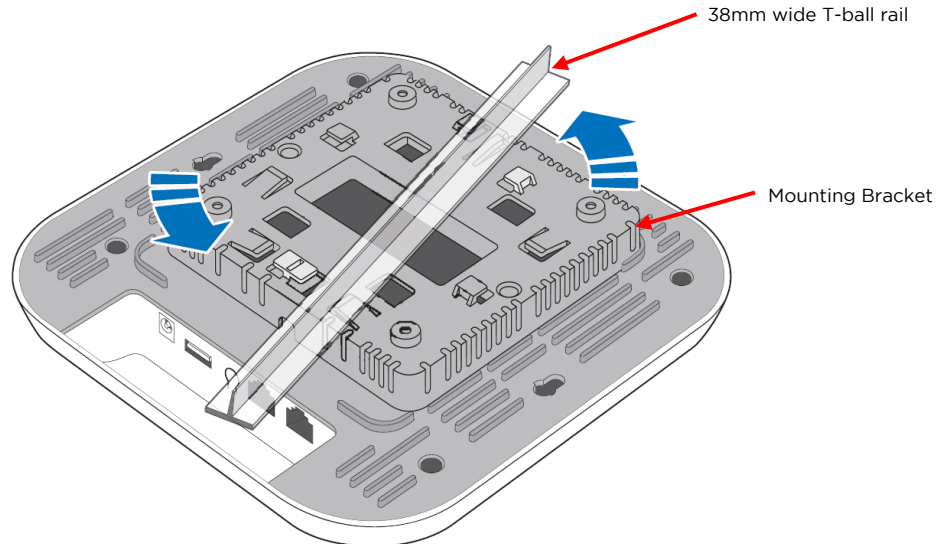
Wall Mounting:



The XV3-8 mounts to any wall by using two screws with corresponding wall anchors. The ceiling mount bracket can be used as a template to align the screws with the unit.

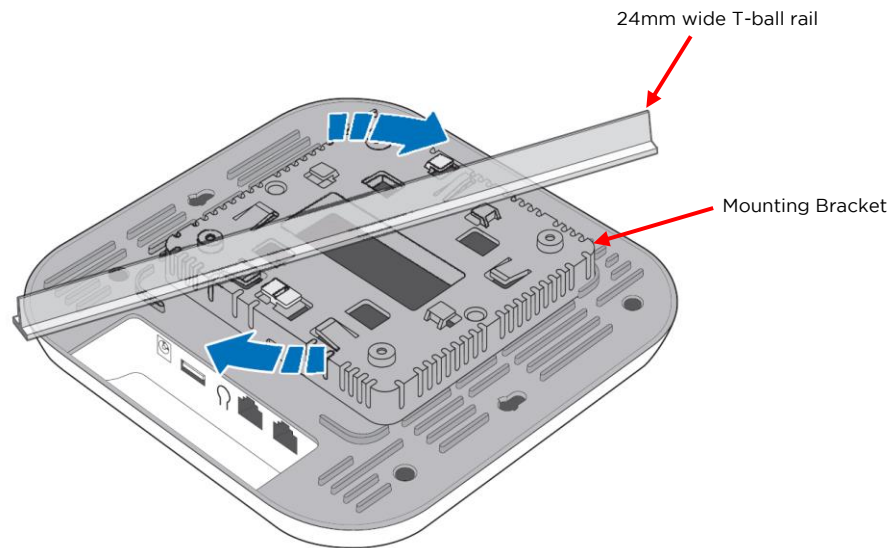
T-bar Mounting

38mm T-Bar:



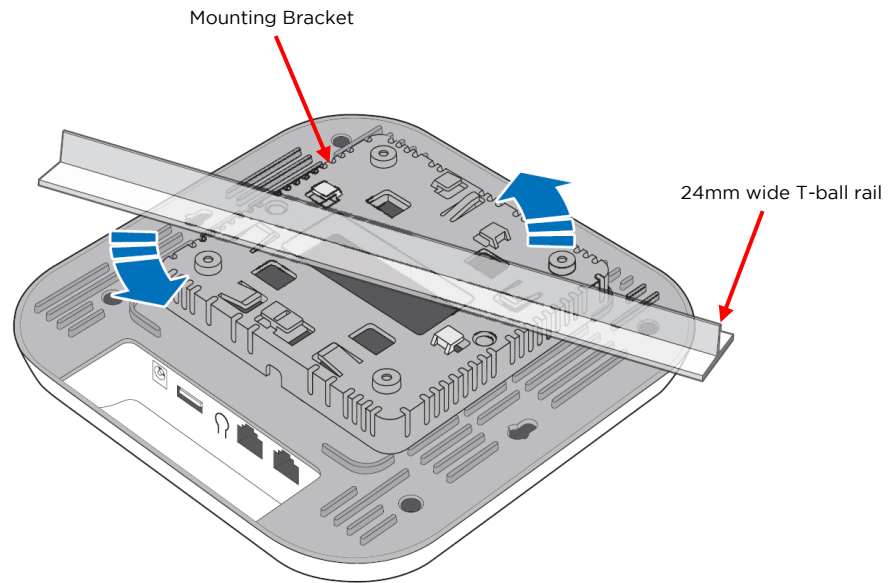
The XV3-8 can be secured to a 38mm ceiling T-bar rail by using the ceiling mount bracket (The “A” marking on the bracket is to be used for this width T-bar rail).

24mm T-Bar:



The XV3-8 can be mounted to a 24mm width T-bar rail using the clips built into the underside of the unit (The “B” marking on the bracket is to be used for this width T-bar rail).

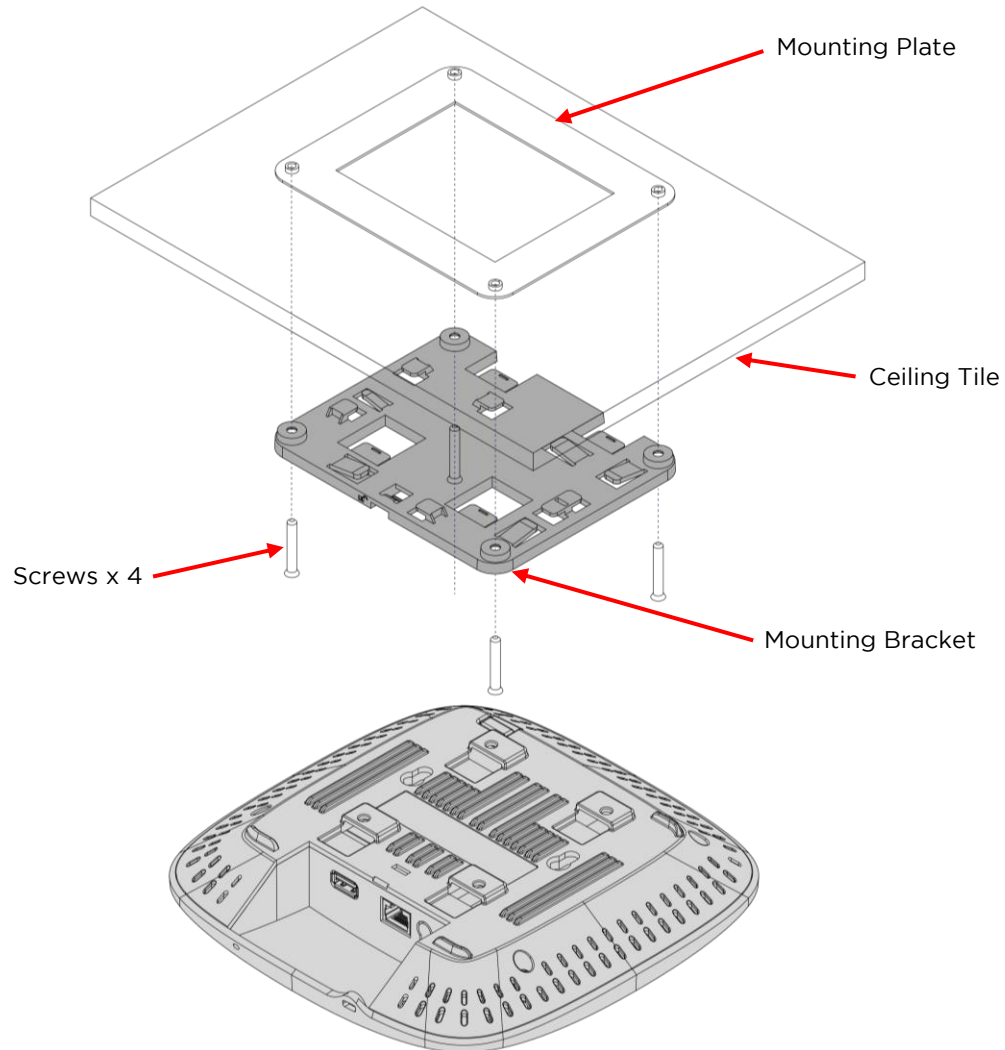
14mm T-Bar:



The XV3-8 can be mounted to a 14mm width T-bar rail using the clips built into the underside of the unit (The "C" marking on the bracket is to be used for this width T-bar rail).

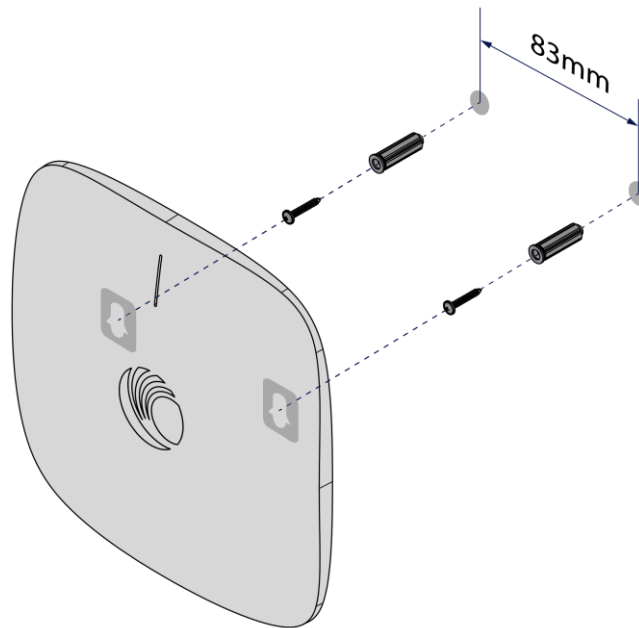
Mounting XV2-2

Ceiling Mount:



1. Determine where XV2-2 needs to be mounted and remove the ceiling tile.
2. Using the hole template, mark the hole locations.
3. Drill the holes for the 4 mounting screws using a 5mm (3/6") diameter drill bit.
4. Drill the RJ45 cable hole using a 15 mm (5/8") diameter bit.
5. Hold the mounting plate on the top side of the ceiling tile and screw it on the mounting bracket.
6. Run the RJ45 cable/cables through the 15mm hole and remount the ceiling tile.
7. Attach the RJ45 cable/cables to XV2-2.
8. Slide XV2-2 into the mounting bracket.

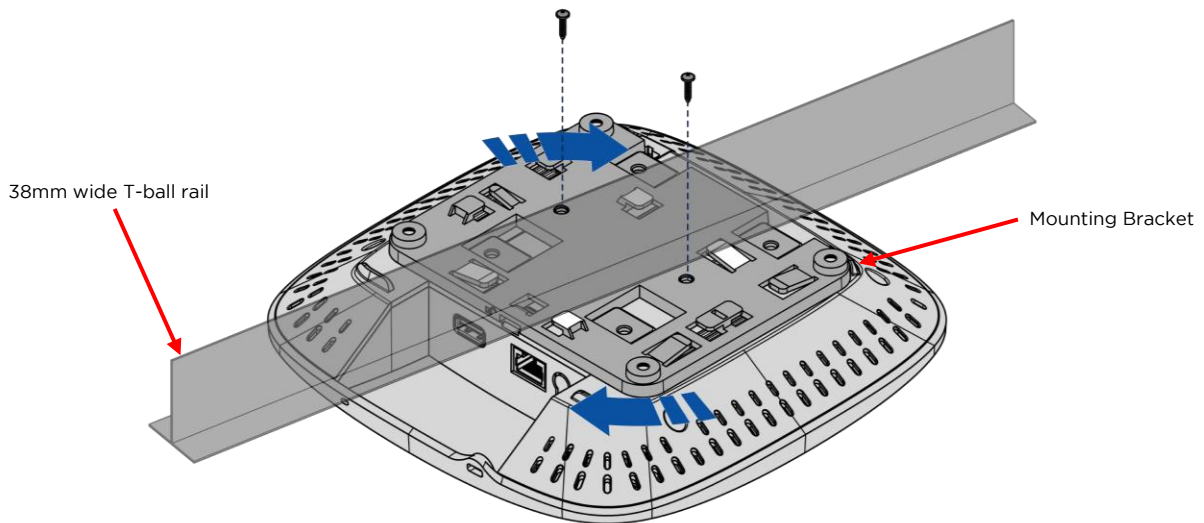
Wall Mounting:



The XV2-2 mounts to any wall by using two screws with corresponding wall anchors. The ceiling mount bracket can be used as a template to align the screws with the unit.

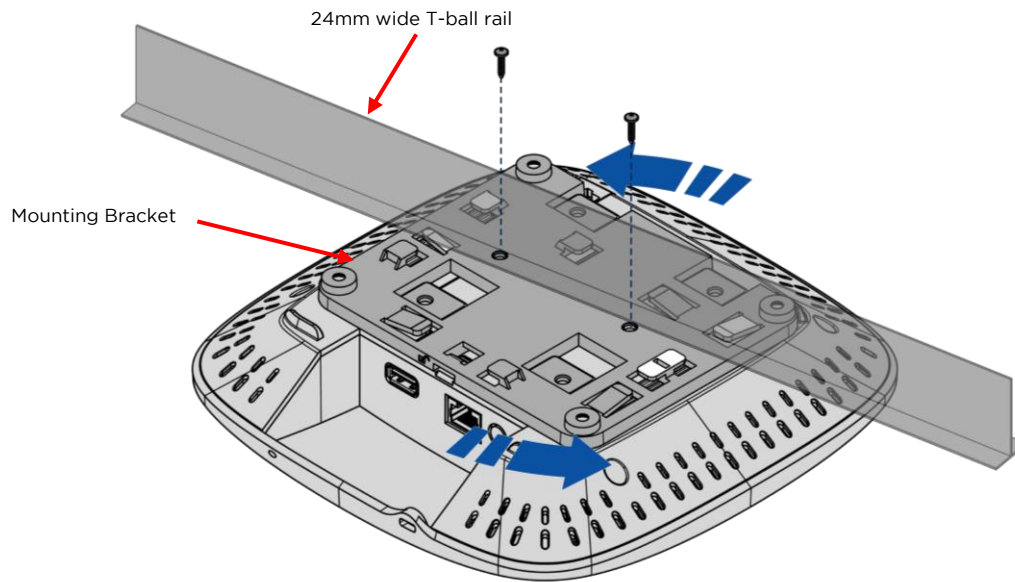
T-bar Mounting

38mm T-Bar:



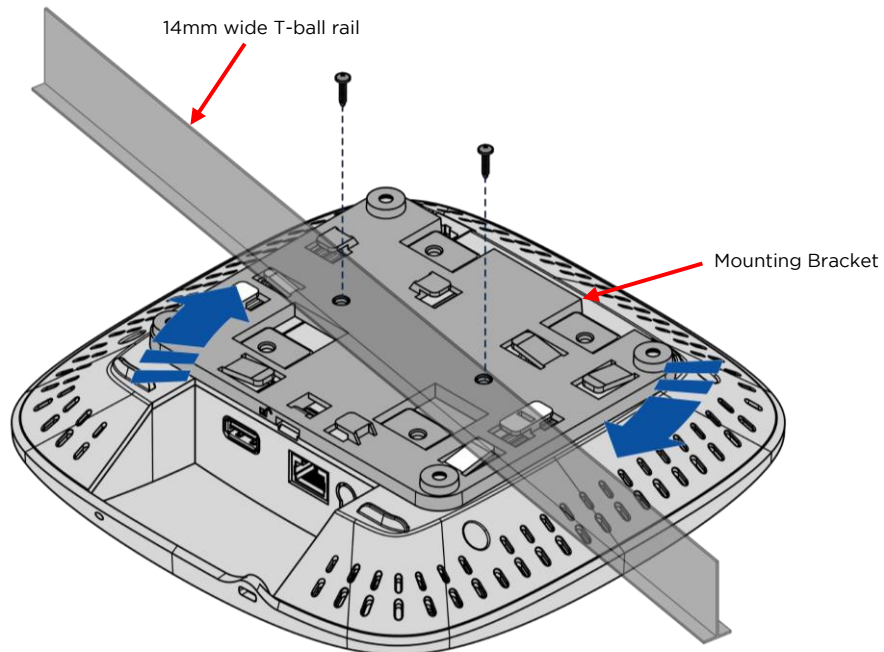
The XV2-2 can be secured to a 38mm ceiling T-bar rail by using the ceiling mount bracket (The “A” marking on the bracket is to be used for this width T-bar rail).

24mm T-Bar:



The XV2-2 can be mounted to a 24mm width T-bar rail using the clips built into the underside of the unit (The “B” marking on the bracket is to be used for this width T-bar rail).

14mm T-Bar:



The XV2-2 can be mounted to a 14mm width T-bar rail using the clips built into the underside of the unit (The “C” marking on the bracket is to be used for this width T-bar rail).