



CommScope ERA[®] UAP2 with Copper Interface Installation Guide Release

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Document Revision History

This is the third release of the UAP2 with Copper Interface Installation Guide. This release

- revises [Table 3: Maximum Power Output by Frequency](#) (page 12)
- added 2 new points in [Powering on a Copper UAP2](#) (page 33).

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Chapter 1

Document Overview

This installation guide describes the Copper UAP2 that interfaces with a Classic CAN or TEN.

This guide provides a product overview and installation instructions for installing the UAP2 copper model. UAP2 is for indoor installations only.

Supported UAP2 Models [Table 1: Supported UAP2 Models](#) (page 6) lists the Copper UAP2 variants that this installation guide supports.

TABLE 1: Supported UAP2 Models

Part Number	Model Name
7845389-0003	UAP 2 35L T/35HT C-P E
7845389-0009	UAP 2 9/18/21/26 C- PE
7845389-0013	UAP 2 7-8/9/18/21 C-PE
7845389-0016	UAP 2 18/21 C-PE
7845389-0025	UAP 2 17E/19 C-PE
7845389-0028	UAP 2 25T/37T C-PE
7845389-0029	UAP 2 34T/37T C-PE
7845389-0030	UAP 2 25T/34T/37T/ 37T C-PE
7845389-0031	UAP 2 17E/19/25T/ 37T C-PE
7845389-0032	UAP 2 7E/17E/19/37T C- PE
7845389-0033	UAP 2 80-85/25T/34T/37T C-PE
7845389-0034	UAP 2 80-85/17E/19/37T C-PE



Note:  For information on how to find the minimum software requirements for ERA hardware, refer to [Hardware to Software Mapping Information](#) (page 37).

Document Cautions and Notes

This document may contain any of the following notes, cautions, and warning icons.



Note:  This symbol without additional icons indicates a general note. Notes provide information about special circumstances.



Note:  This icon indicates a caution or warning. Cautions and warnings indicate operations or steps that could cause personal injury, induce a safety problem in a managed device, destroy or corrupt information, or interrupt or stop services.



Note:  This icon indicates a caution or warning that pertains to laser equipment.



Note:  This icon indicates a caution or warning that pertains to Radio Frequency (RF).



Note:  This icon indicates that the hardware is susceptible to Electro-Static Discharge (ESD) damage.



Note:  This icon indicates a caution or warning that pertains to an electrical hazard.



Note:  This icon indicates a caution or warning that pertains to a fire hazard.



Note:  This icon indicates a system configuration that can only be performed by a specific user role. The required user login credential will be identified.

Abbreviations Used in this Guide

Abbreviation	Description	Abbreviation	Description
AC	Alternating Current	ISDE	Innovation, Sciences et Développement économique Canada
AP	Access Point	ISED	Innovation, Science and Economic Development Canada
AUX	Auxiliary	kg	Kilogram
C	Celsius	LED	Light Emitting Diode
CAN	Central Area Node	MHz	Megahertz
CAP H	Carrier Access Point, High Power	mm	Millimeter
CAP L	Carrier Access Point, Low Power	MMF	Multi-Mode Fiber
CAP M	Carrier Access Point, Medium Power	OPT	Optical Transport
Cat	Category	PoE	Power over Ethernet
CAT	Copper Transport	PN	Part Number
CMS	CommScope Mobility Solutions	RAN	Regional-Area Network
dB	Decibel	RF	Radio Frequency
dBm	Decibel-milliwatts	RU	Rack Unit
DC	Direct Current	RX	Receive
EFTA	European Free Trade Association	SFP	Small Form-Factor Pluggable
EMC	Electromagnetic Compatibility	TEN	Transport Expansion Node
EMEA	Europe, Middle East, Africa	TX	Transmit
EU	European Union	UAP	Universal Access Point

Abbreviation	Description	Abbreviation	Description
F	Fahrenheit	Vac	Voltage in Alternating Current
FCC	Federal Communications Commission	Vdc	Voltage in Direct Current
Gb	Gigabit	W	Watts
GHz	Gigahertz	WIN	Wide-Area Integration Node
GUI	Graphical User Interface	WCS	Wireless Communications Switch
ION	Intelligent Optical Network		

Safely Working with ERA Hardware

The following sections provide important information that you should read and know before working with any ERA hardware. Observe all cautions and warnings listed in this section.

Health and Safety Precautions



Note:  A high leakage current ground (earth) connection to the Power Supply Unit (PSU) is essential before making any other connections to the PSU.



Note:  Laser radiation. Risk of eye injury in operation. Do not stare into the laser beam; do not view the laser beam directly or with optical instruments.



Note:  High frequency radiation in operation. Risk of health hazards associated with radiation from the antenna(s) connected to the unit. Implement prevention measures to avoid the possibility of close proximity to the antenna(s) while in operation.

Property Damage Warnings



Note:  Keep operating instructions within easy reach and make them available to all users.



Note:  Only license holders for the respective frequency range are allowed to operate this unit.



Note:  Read and obey all the warning labels attached to the unit. Keep all warning labels are kept in a legible condition. Replace missing or damaged labels.



Note:  Make sure the unit's settings are correct for the intended use (refer to the manufacturer product information) and regulatory requirements are met. Do not carry out any modifications or fit any spare parts, which are not sold or recommended by the manufacturer.

General Installation Safety Requirements



Note:  Wet conditions increase the potential for receiving an electrical shock when installing or using electrically powered equipment. To prevent electrical shock, never install or use electrical equipment in a wet location or during a lightning storm.



Note:  This system is a RF Transmitter and continuously emits RF energy. Maintain a minimum eight-inch (20 cm) clearance from the antenna while the system is operating. Whenever possible, power down the UAP2 before servicing the antenna.



Note:  Do not remove protective caps from any of the connectors until instructed to do so.



Note:  The UAP2 is to be used only with CommScope (NEC Class 2) or Limited Power Source ERA Subrack, or equivalent.

Guard Against Damage from Electro-Static Discharge



Note:  Electro-Static Discharge (ESD) can damage electronic components. To prevent ESD damage, always wear an ESD wrist strap when working with hardware components. Not all ERA hardware requires grounding. For those ERA hardware components for which grounding is required, connect the ground wire on the ESD wrist strap to an earth ground source before touching the component. Wear the wrist strap the entire time that you work with the ERA hardware.

Compliance

1. **Notice:** For installations, which have to comply with FCC RF exposure requirements, the antenna selection and installation must be completed in a way to ensure compliance with those FCC requirements. Depending on the RF frequency, rated output power, antenna gain, and the loss between the repeater and antenna, the minimum distance D to be maintained between the antenna location and human beings is calculated according to this formula:

$$D_{[cm]} = \sqrt{\frac{P_{[mW]}}{4 * \pi * PD_{[mW/cm^2]}}}$$

where

- P (mW) is the radiated power at the antenna, i.e. the max. rated repeater output power in addition to the antenna gain minus the loss between the repeater and the antenna.
- PD (mW/cm²) is the allowed Power Density limit acc. to 47 CFR 1.1310 (B) for general population / uncontrolled exposures which is
 - f (MHz) / 1500 for frequencies from 300MHz to 1500MHz

- 1 for frequencies from 1500MHz to 100,000MHz

RF exposure compliance may need to be addressed at the time of licensing, as required by the responsible FCC Bureau(s), including antenna co-location requirements of 1.1307(b)(3).

2. **Notice:** For installations which have to comply with European EN50385 exposure compliance requirements, the following Power Density limits/guidelines (mW/cm²) according to ICNIRP are valid:
 - 0.2 for frequencies from 10 MHz to 400 MHz
 - $F \text{ (MHz)} / 2000$ for frequencies from 400 MHz to 2 GHz
 - 1 for frequencies from 2 GHz to 300 GHz
3. **Notice:** Installation of this equipment is in full responsibility of the installer, who has also the responsibility, that cables and couplers are calculated into the maximum gain of the antennas, so that this value, which is filed in the FCC Grant and can be requested from the FCC data base, is not exceeded. The industrial boosters are shipped only as a naked booster without any installation devices or antennas as it needs for professional installation.
4. **Notice:** For installations which have to comply with FCC/ISED requirements:

English:

This device complies with FCC Part 15. 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.

This device complies with Health Canada's Safety Code. The installer of this device should ensure that RF radiation is not emitted in excess of the Health Canada's requirement. Information can be obtained at http://www.hc-sc.gc.ca/ewh-semt/pubs/radiation/radio_guide-lignes_direct-eng.php.

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

Antenna Statement for ISED:

This device has been designated to operate with the antennas having a maximum gain of 9 dBi. Antennas having a gain greater than 9 dBi are prohibited for use with this device without consent by ISED regulators. The required antenna impedance is 50 ohms.

The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 100 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. Users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

French:

Cet appareil est conforme avec Santé Canada Code de sécurité 6. Le programme d'installation de cet appareil doit s'assurer que les rayonnements RF n'est pas émis au-delà de l'exigence de Santé Canada. Les informations peuvent être obtenues: http://www.hc-sc.gc.ca/ewh-semt/pubs/radiation/radio_guide-lignes_direct-eng.php

Les changements ou modifications non expressément approuvés par la partie responsable de la conformité pourraient annuler l'autorité de l'utilisateur à utiliser cet équipement.

Antenne déclaration pour ISDE:

Ce dispositif a été désigné pour fonctionner avec les antennes ayant un gain maximal de 9 dBi. Antennes ayant un gain plus grand que 9 dBi sont interdites pour une utilisation avec cet appareil sans le consentement des organismes de réglementation d'ISDE. L'impédance d'antenne requise est 50 ohms.

L'antenne (s) utilisé pour cet émetteur doit être installé pour fournir une distance de séparation d'au moins 100 cm de toutes les personnes et ne doit pas être co-localisées ou opérant en conjonction avec une autre antenne ou émetteur. Les utilisateurs et les installateurs doivent être fournis avec des instructions d'installation de l'antenne et des conditions de fonctionnement de l'émetteur pour satisfaire la conformité aux expositions RF.

Canadian Representative	
ISED Company No:	3874A
Company Name:	Celltech Labs Inc.
Address:	32-364 Lougheed Road Kelowna, BC V1X 7R8
Contact Name:	Ben Hewson
Telephone No:	(250) 765-7650 x201
Email:	IC-Rep@celltechlabs.com

5. **Notice:** The unit complies with Overvoltage Category II. It also complies with the surge requirement according to EN 61000-4-5 (fine protection); however, installation of an additional medium (via local supply connection) and/or coarse protection (external surge protection) is recommended depending on the individual application in order to avoid damage caused by overcurrent.

For Canada and US, components used to reduce the Overvoltage Category shall comply with the requirements of IEC 61643-series. As an alternative, components used to reduce the Overvoltage Category may comply with ANSI/IEEE C62.11, CSA Certification Notice No. 516, CSA C22.2 No. 1, or UL 1449. Suitability of the component for the application shall be determined for the intended installation.

6. **Notice:** Corresponding local particularities and regulations must be observed. For national deviations, please refer to the respective documents included in the manual CD that is delivered with the unit.
7. **Note:** For a Class B digital device or peripheral:

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.

8. **Notice:** For a Class A digital device or peripheral.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

9. **Note:** This unit complies with European standard EN62368-1.

Equipment Symbols Used / Compliance

Please observe the meanings of the following symbols used in our equipment and the compliance warnings listed in [Table 2: Compliance Labels](#) (page 12).

TABLE 2: Compliance Labels

Symbol	Compliance	Meaning
-	FCC	For industrial (Part 20) signal booster: WARNING: This is NOT a CONSUMER device. It is designed for installation by FCC LICENSEES and QUALIFIED INSTALLERS. You MUST have an FCC LICENSE or express consent of an FCC Licensee to operate this device. Unauthorized use may result in significant forfeiture penalties, including penalties in excess of \$100,000 for each continuing violation.
-	ISED	WARNING: This is NOT a CONSUMER device. It is designed for installation by an installer approved by an ISED licensee. You MUST have an ISED LICENCE or the express consent of an ISED licensee to operate this device. AVERTISSEMENT: Ce produit N'EST PAS un appareil de CONSOMMATION. Il est conçu pour être installé par un installateur approuvé par un titulaire de licence d'ISDE. Pour utiliser cet appareil, vous DEVEZ détenir une LICENCE d'ISDE ou avoir obtenu le consentement exprès d'un titulaire de licence autorisé par ISDE.
CE	CE	To be sold exclusively to mobile operators or authorized installers - no harmonized frequency bands, operation requires license. Intended use: EU and EFTA countries. Indicates conformity with the RED directive 2014/53/EU and/or RoHS directive 2011/65/EU.
CE 0700	CE	Indicates conformity with the RED directive 2014/53/EU and RoHS directive 2011/65/EU certified by the notified body no. 0700.

Maximum Output Power Levels

[Table 3: Maximum Power Output by Frequency](#) (page 12) lists the frequencies and maximum power output for bands supported in the UAP2 variants.

TABLE 3: Maximum Power Output by Frequency

UAP2 Band	DL Frequency Range (MHz)	Power Output (dBm)
7E	729 - 756, 758 - 768	24
7 - 8	758 - 821	24
80 - 85	862 - 894	26
9	925 - 960	25
18	1805 - 1880	28

TABLE 3: Maximum Power Output by Frequency (continued)

UAP2 Band	DL Frequency Range (MHz)	Power Output (dBm)
19	1930 - 1995	29
17E	2110 - 2180	29
21	2110 - 2170	29
25T	2496 - 2690	28
26	2620 - 2690	28
34T	3450 - 3550	27
35L	3410 - 3640	27
35H	3580 - 3800	27
37T	3700 - 3980	27

Chapter 2

Copper UAP2 Overview

UAP2 is a low power AP (Access Point). It supports up to four independent radio modules that allow up to four 2x2 MIMO bands. The UAP2 contains four internal antennas that are associated with up to four radio modules.

On the downlink, the Copper UAP2 converts data arriving at the UAP2 to analog signals and sends them to the Antenna ports. On the uplink, received signals are digitized and serialized into data streams, which are sent back to the Classic CAN or TEN.

The Copper UAP2

- is actively cooled with an operating temperature range of: +0°C to +40°C (32°F to 104°F)
- is indoor rated
- is powered by the CAT2 through CAT6A cabling

The Copper UAP2 has two RJ45 ports. The red Primary and blue Secondary ports must both be connected to adjacent ports of a CAT2 card in a Classic CAN or TEN. The blue Secondary port also provides more than 320 MHz of transport bandwidth, if required.

UAP2 Accessories and Options

The Copper UAP2 accessories and options are described in the following sections:

- [Mounting Kits](#)

Mounting Kits

Wall and Ceiling mounting brackets are included with the UAP2. For Ceiling mounting, a 24" drop rail is also needed. In the NAR market, this drop rail can be ordered as CommScope part OC-BA50A. In other markets, the drop rail may not be available as a CommScope part number; look for compatible third-party options such as the Eaton BA50A.



Note: The Wall / Ceiling Mount adds an additional ~45 mm (1.77") of depth to the UAP2, totaling a depth of ~142 mm (5.59").

TABLE 4: Spare/Replacement Mounting Kits

Mounting/Power Kit	CommScope PN	See
Wall / Ceiling Mount (without drop rail for Ceiling Mount)	OC-10A0-003	Mounting a UAP2 on a Ceiling / Mounting a UAP2 on a Wall

Chapter 3

Plan And Prepare for a Copper UAP2 Installation

Do the following before beginning installation.

1. Review and know the information in [Maximum Number of UAP2s Supported in an ERA System](#).
2. [UAP2 Dimensions](#), which includes understanding and meeting requirements for mounting the UAP2.
3. Map out all cable runs; see [Rules for Using Cat6A Cables and Connectors](#).
4. Obtain any accessories required for this installation; see [UAP2 Accessories and Options](#).
5. [Unpack and Inspect the UAP2 and Accessories](#).
6. Review [Cat6A Specifications and Testing Requirements](#).



Note:



Cables must be CAT6A or better supporting 10Gbps Ethernet, maximum cable length is 100m.



Note:



The primary and secondary CAT6A cables should be color coded to match the red Primary and blue Secondary ports on the UAP2.

Maximum Number of UAP2s Supported in an ERA System

The ERA software assigns a default power consumption value of 160 W for UAP2s powered by the WCS subrack (Power over Cat 6A), which includes the power losses in 100 m of Cat 6A cable.

Power consumption values on individual spec sheets are at the unit itself, not accounting for voltage drop over CAT6A.

[Table 5: Number of UAP2s and CAP L2s Supported](#) (page 15) lists the number of UAP2s and Copper CAP L2s that the WCS subracks can power via Power over Cat 6A.

TABLE 5: Number of UAP2s and CAP L2s Supported

AP Type	1 x 120 Vac		2 x 120 Vac		1 x 220 Vac		2 x 220 Vac	
	# APs Powered	Maximum Watts	# APs Powered	Maximum Watts	# APs Powered	Maximum Watts	# APs Powered	Maximum Watts
UAP2	7	1200	8	2400	8	2000	8	4000
CAP L2	7	1200	8	2400	8	2000	8	4000

UAP2 Dimensions

Use the dimensions shown in the section applicable to this installation to determine the space required at the mounting site.

FIGURE 1: Dimensions of the UAP2 with Mounting Kit

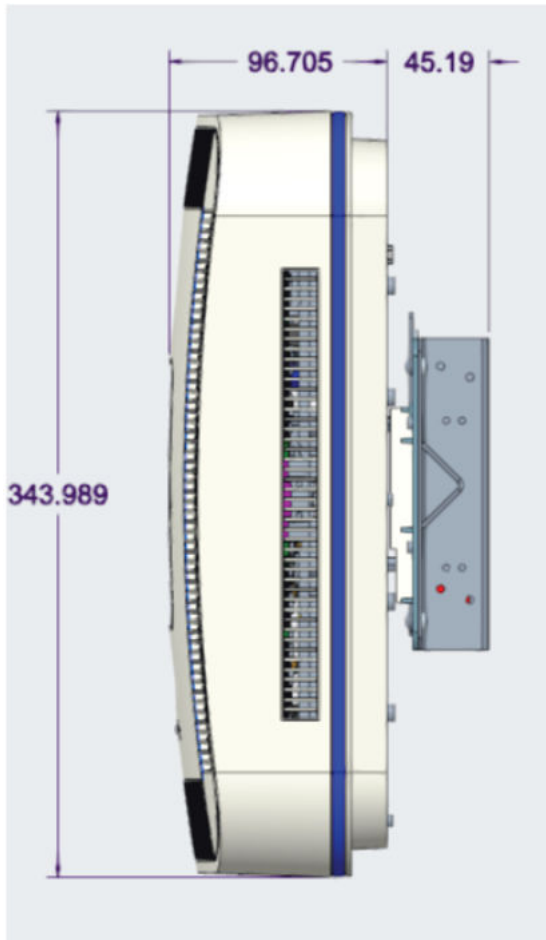


TABLE 6: UAP2 Dimensions & Weight

Height	344 mm (13.54")
Width	344 mm (13.54")
Depth	97 mm (3.82") + 45 mm (1.77") (Mounting Kit)
Weight	6 kg (13.2 lbs)

Unpack and Inspect the UAP2 and Accessories

1. Inspect the exterior of the shipping container(s) for evidence of rough handling that may have damaged the components in the container.

2. Unpack each container while carefully checking the contents for damage and verify with the packing slip.
3. If damage is found or parts are missing, file a claim with the commercial carrier and notify CommScope Technical Support (see [DAS and Small Cell Support](#)). Save the damaged cartons for inspection by the carrier.
4. Save all shipping containers for use if the equipment requires shipment at a future date.

Obtain the Required Materials

Obtain the following components, as required, for this installation.

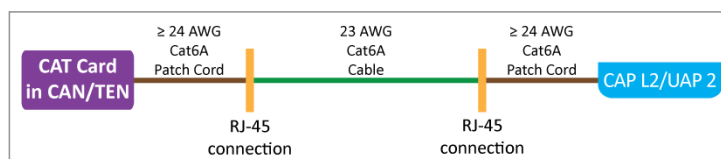
- appropriate mounting kit and any required fasteners
- Two runs of CAT6A cable and accessories in accordance with best practices

Rules for Using Cat6A Cables and Connectors

UAP2 uses Cat6A for data and power links to a CAT2 Card installed in a TEN or Classic CAN. The following rules must be observed for all UAP2 installations. For a UAP2, two Cat6A cables need to be connected per AP.

- Plenum rated cable must be used wherever it is required by local electrical codes.
- Shielded twisted pair is not required unless operating in a high RFI/EMI environment.
- An Era system requires a minimum Signal-to-Noise Ratio (SNR) of 25 dB, and Alien Crosstalk (AXT) must not degrade SNR on any cable by more than 0.5dB.
- Cat6A cable wire size requirements are as follows:
 - 23 AWG Cat6A cable (minimum EIA/TIA standards) must be used between RJ-45 connector points
 - 24 AWG is the minimum wire size allowed for a Cat6A Patch Cord.
- CommScope strongly recommends using factory terminated and tested Cat6A Patch Cord.
- There can never be more than two RJ-45 connections in a Cat6A cable run, as described below and as shown in [Figure 2: Maximum Number of RJ-45 Connections in Cable Runs](#) (page 17). Minimizing these connections improves the link margin.
 - Between an AP and a CAT Card, there can be
 - one Cat6A Patch Cord at the start of a Cat6A cable run
 - a second Cat6A Patch Cord at the end of a Cat6A cable run.

FIGURE 2: Maximum Number of RJ-45 Connections in Cable Runs



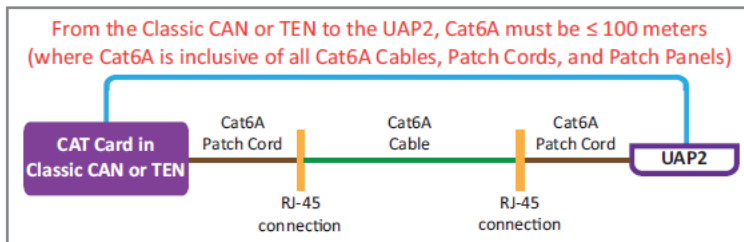
- Unshielded Cat6A (Category 6A U/UTP) twisted pair cable that meets ANSI/TIA-568-C.2, CENELEC EN 50173 series, and ISO/IEC 11801:2002 including its amendments 1 and 2, is suitable for use in an Era

system. The CommScope GigaSPEED X10D® 2091B ETL Verified Category 6A U/UTP Cable (760107201, 2091B BL 4/23 W1000) meets these requirements and is recommended.

There are many parameters that impact the SNR of the 10GBase-T signal received by the CAT2 Card from the AP, or received by the AP from the CAT2 Card. For example, excessive insertion loss degrades the signal level, which results in a degraded SNR. An increase in the noise level will also result in degraded SNR. The most common sources of noise are NEXT (near end crosstalk, interference from pairs within a cable that couple from the TX to RX), and AXT (alien crosstalk, interference from adjacent cables). Additionally, there can be interference from outside sources such as lighting, switching power supplies, radio transmitters in the UHF and VHF bands, and similar sources of RFI/EMI. To guarantee acceptable SNR level, all cable key parameters must be measured as discussed in the next section.

- The maximum Cat6A cable length between a UAP2 and a TEN or Classic CAN is 100 meters including all Cat6A cables, Cat6A Patch Cords, and Patch Panels (see [Figure 3: Maximum Cat6A Cable Lengths from CAT Card to UAP](#) (page 18)). No more than 5m of Cat6A Patch Cords should be used to connect a UAP2 and the CAT2 Card.

FIGURE 3: Maximum Cat6A Cable Lengths from CAT Card to UAP



Chapter 4

Mount the Copper UAP2



Note: The primary and secondary CAT6A cables should be color coded to match the red Primary and blue Secondary ports on the UAP2.

The UAP2 Copper supports the following mounting options:

- Ceiling, see [Mounting a UAP2 on a Ceiling](#)
- Wall, see [Mounting a UAP2 on a Wall](#)

General Mounting Cautions

The following cautions apply to all Copper UAP2 installations; there may be other mounting cautions applicable to a specific mounting option, which will be defined in the applicable mounting procedure.



Note: ⚠ Attach all UAP2s securely to a stationary object as described in this installation guide.



Note: ⚠ To maintain proper ventilation, keep at least 76 mm (3-inch) clearance around the UAP2.



Note: ⚠ The installation site must be able to bear the weight of the UAP2; see [Table 6: UAP2 Dimensions & Weight](#) (page 16).



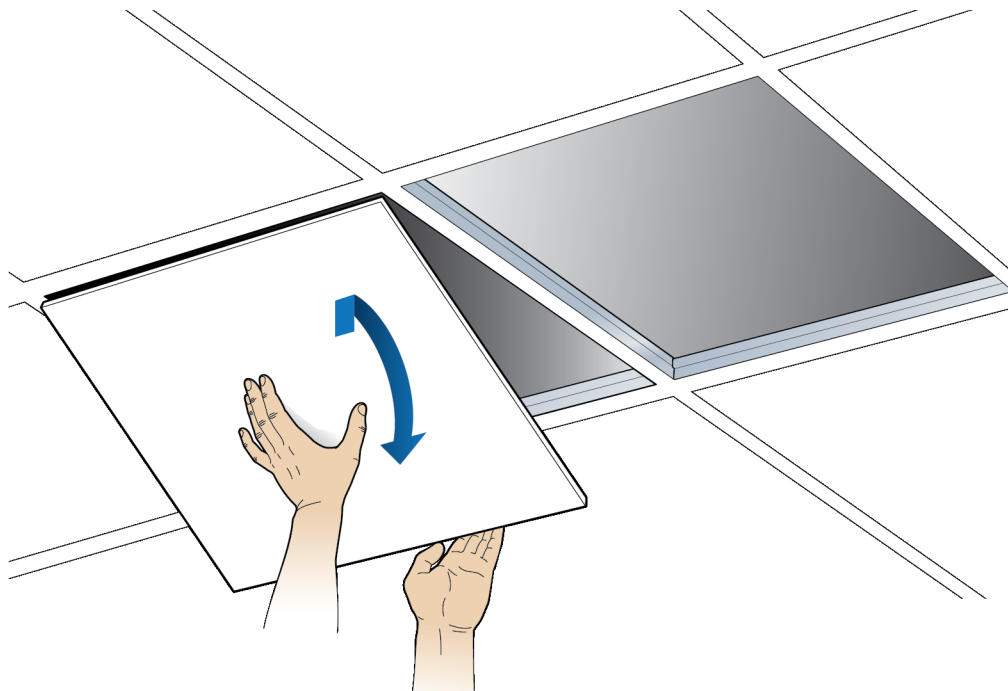
Note: ⚠ The minimum distance between two UAP2s with different frequency bands is 35 cm (13.8 inches)

Mounting a UAP2 on a Ceiling

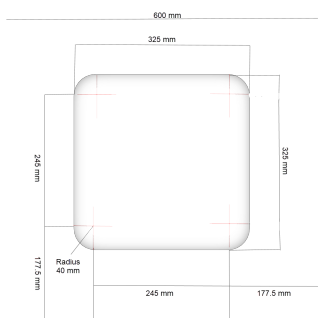


Note: The drop rail is NOT included with the UAP 2 and needs to be ordered separately. In the NAR market, this drop rail can be ordered as part OC-BA50A. In other markets the drop rail may not be available as a CommScope part number; look for compatible third-party-options such as the Eaton BA50A.

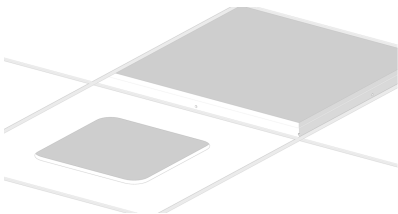
1. Follow the steps in [Unpack and Inspect the UAP2 and Accessories](#).
2. Refer to and observe all cautions listed in [General Mounting Cautions](#).
3. Refer to [UAP2 Dimensions](#) to determine the mounting location, which must be able to support the weight and dimensions of the UAP2.
4. Remove two adjacent ceiling tiles.



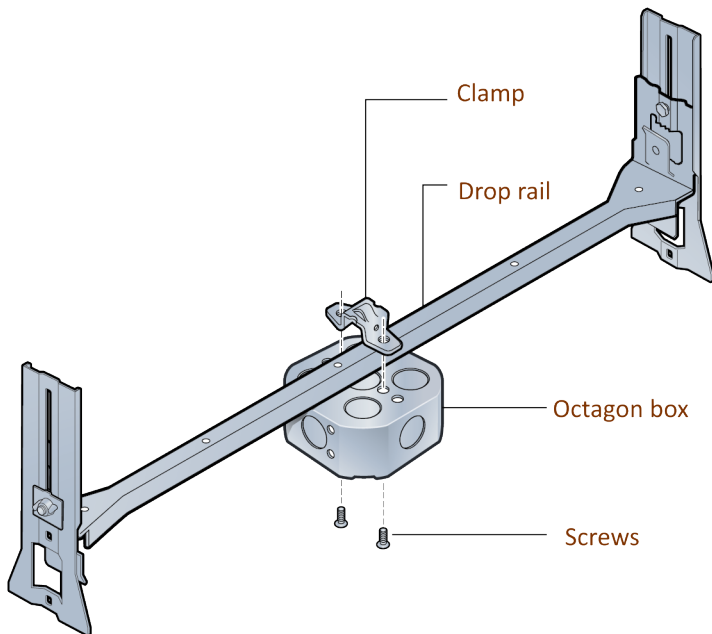
5. Mark and cut the opening according to the dimensions in the following drawing.



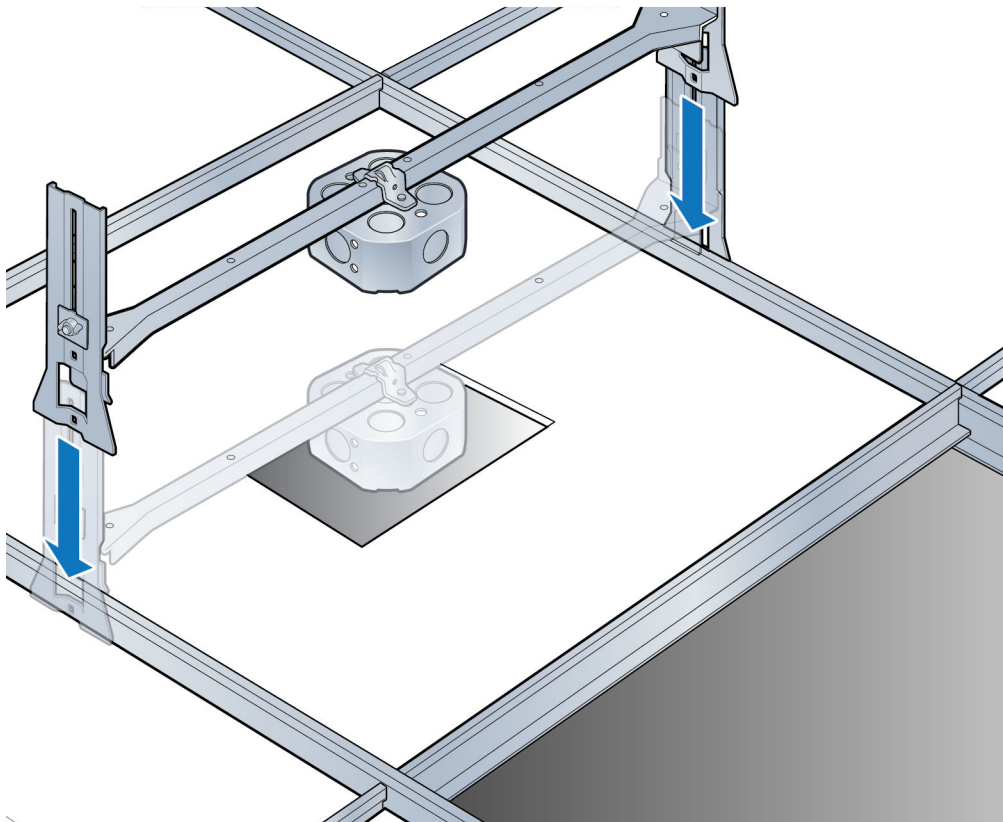
6. Replace the cutout tile in the ceiling. (Leaving the adjacent tile out.)



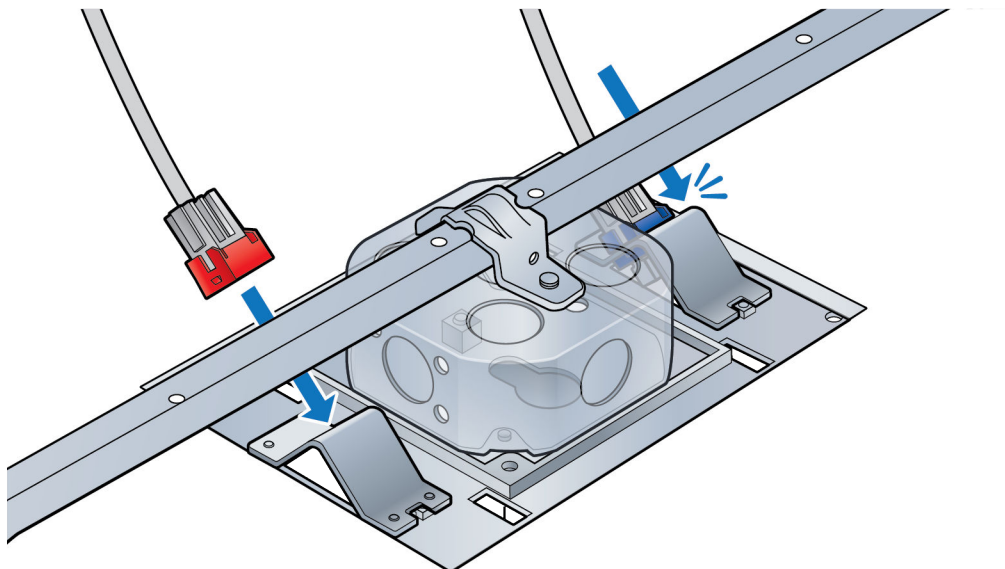
7. Attach the Octagon box to the drop rail using a clamp and screw.



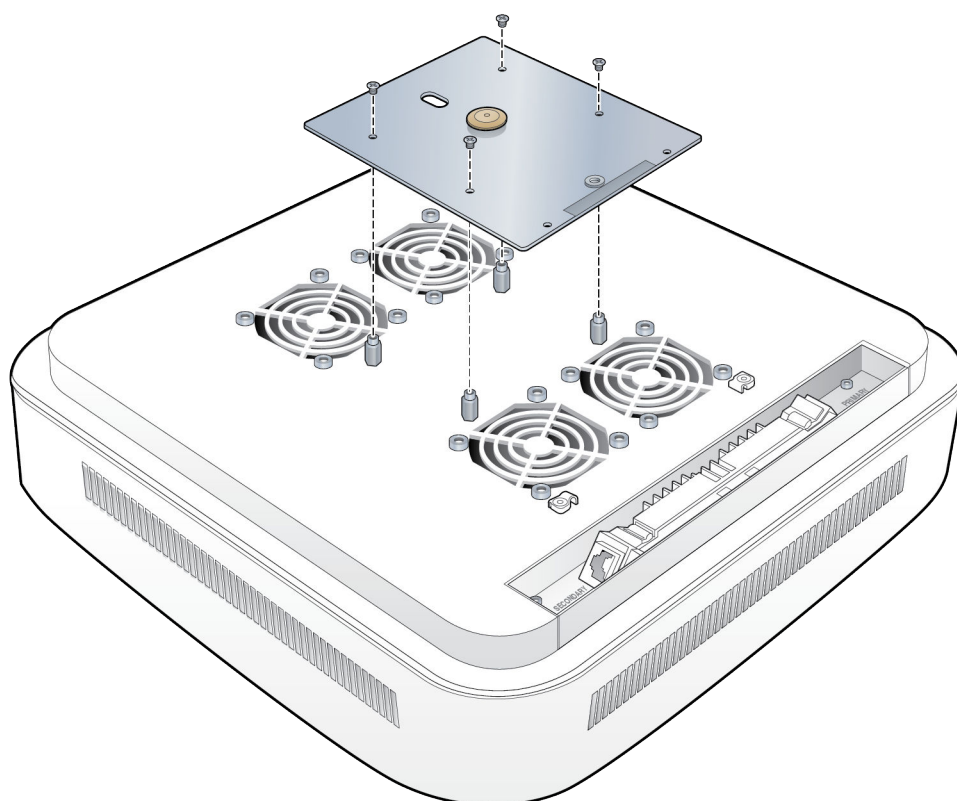
8. Install the drop rail/octagon box assembly over the modified tile.



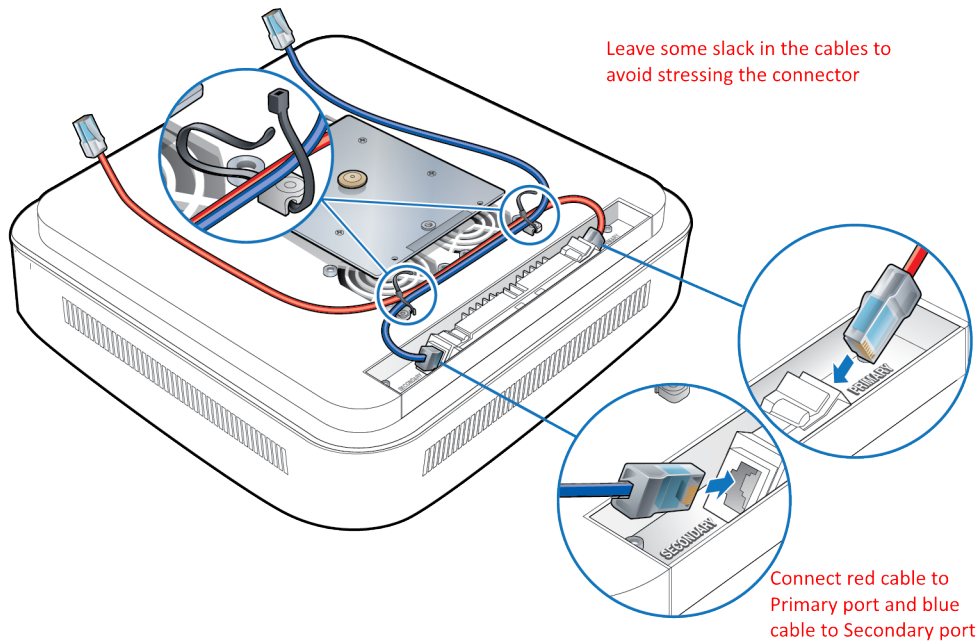
9. Attach the mounting plate onto the octagon box on the UAP2 side of the tile.
10. Insert the red and blue cable from the ceiling to the mounting plate as shown.



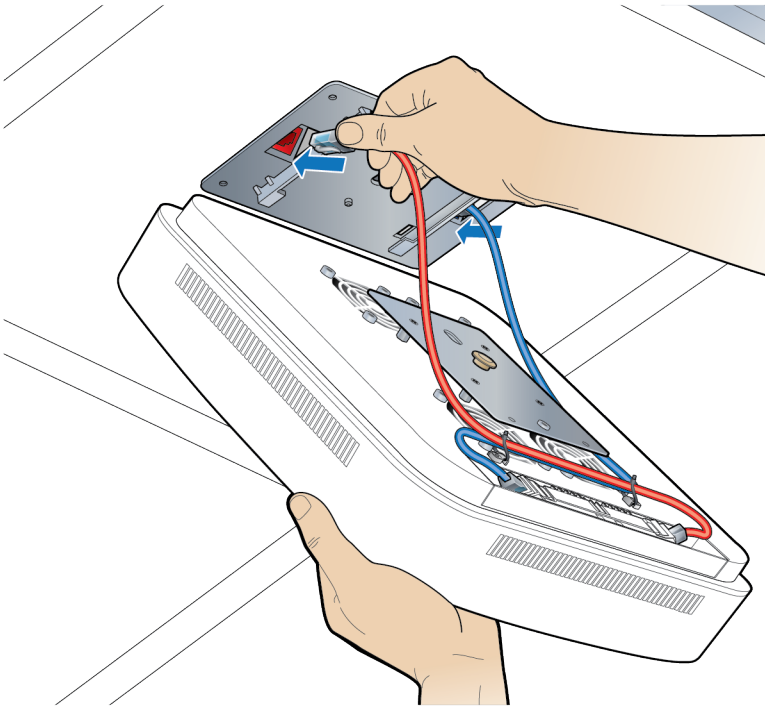
11. Attach AP plate to the UAP2.



12. Connect the red Primary and blue Secondary cables to the UAP2 corresponding ports, as shown below. Tie-wrap the cables in place.

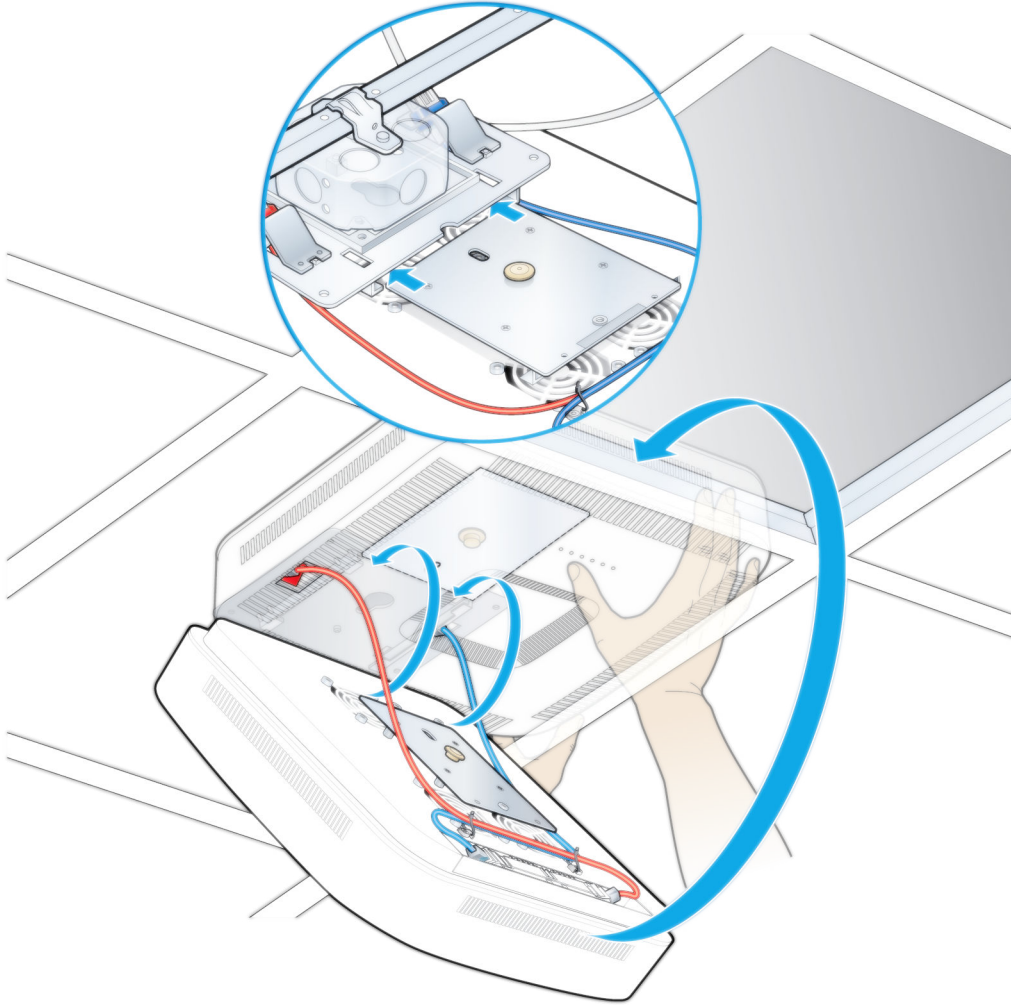


13. Connect the blue and red Ethernet cables from the UAP to the corresponding connectors on the mounting plate.

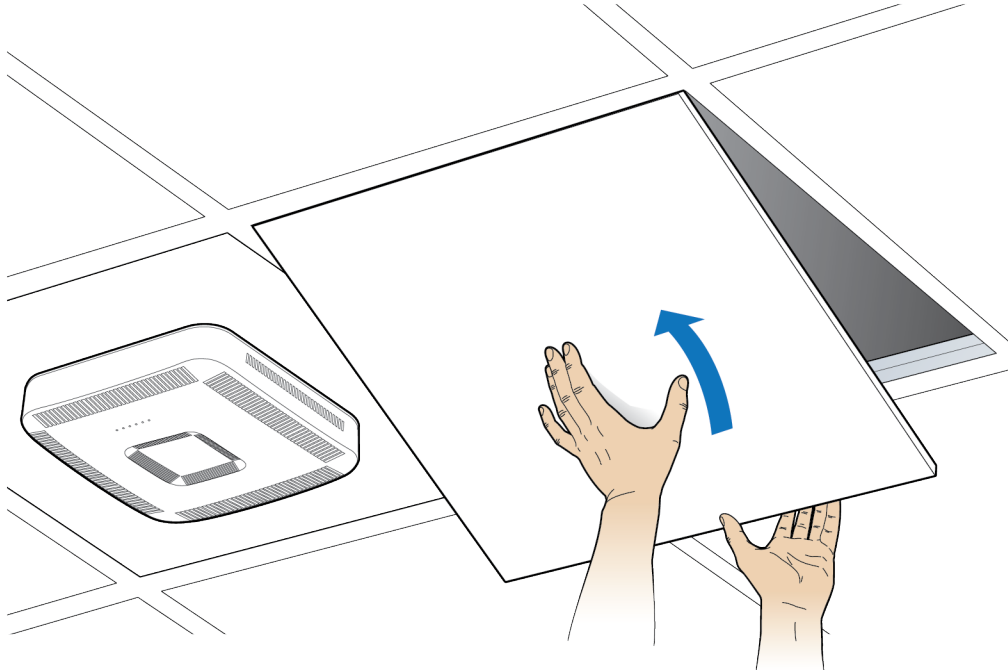


14. Attach the UAP2 to the mounting plate.
- Align the keyhole opening on the mounting plate with the button on the UAP2 mounting plate.
 - Insert the UAP2 into the mounting plate slot and slide until the UAP2 plate meets the tabs on the octagon box plate.

- c. Lift the UAP2 vertically and slide it into the locked position.

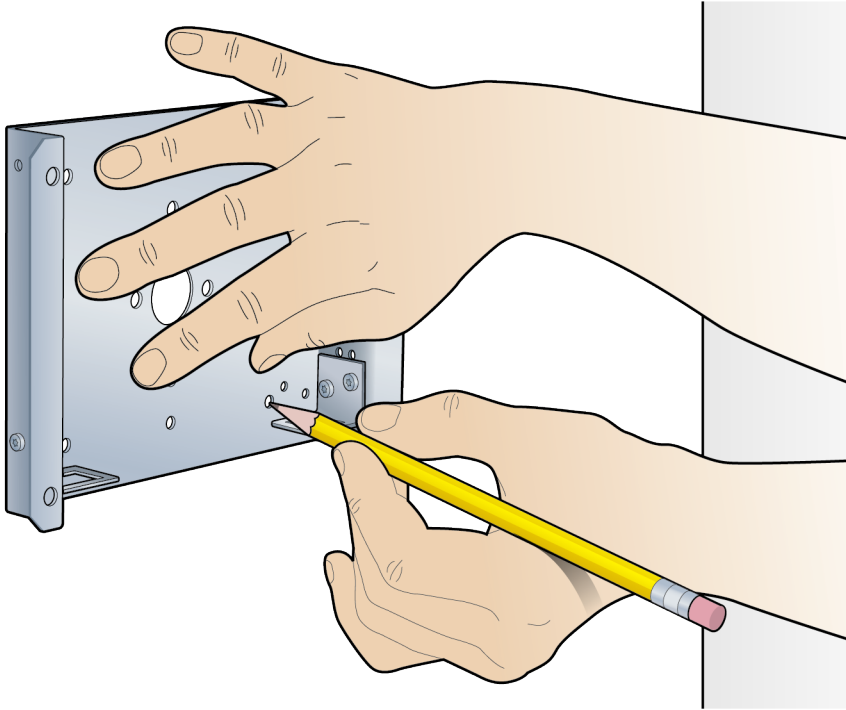


15. Replace the ceiling tile next to the UAP2.

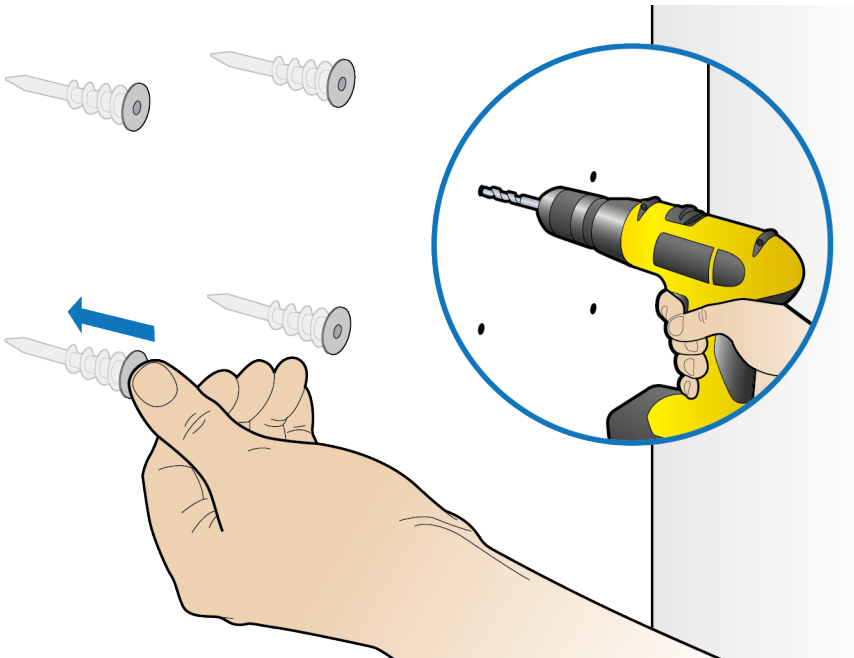


Mounting a UAP2 on a Wall

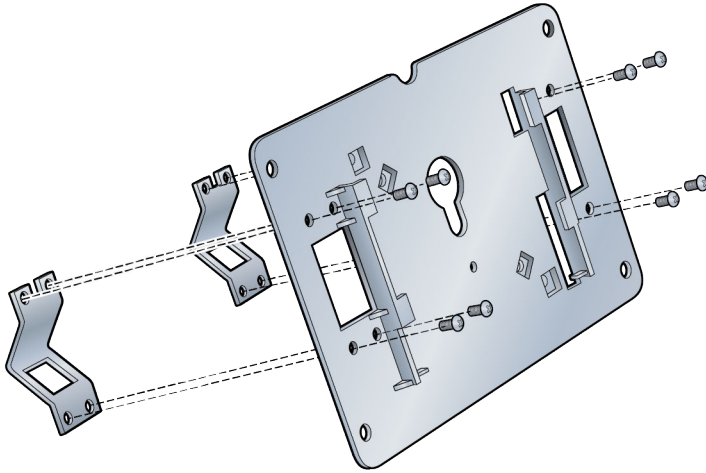
1. Follow the steps in [Unpack and Inspect the UAP2 and Accessories](#).
2. Refer to and observe all cautions listed in [General Mounting Cautions](#).
3. Refer to [UAP2 Dimensions](#) to determine the mounting location, which must be able to support the weight and dimensions of the UAP2.
4. On the wall, use the U-bracket as a template to mark the holes at the location where you will mount the UAP2.



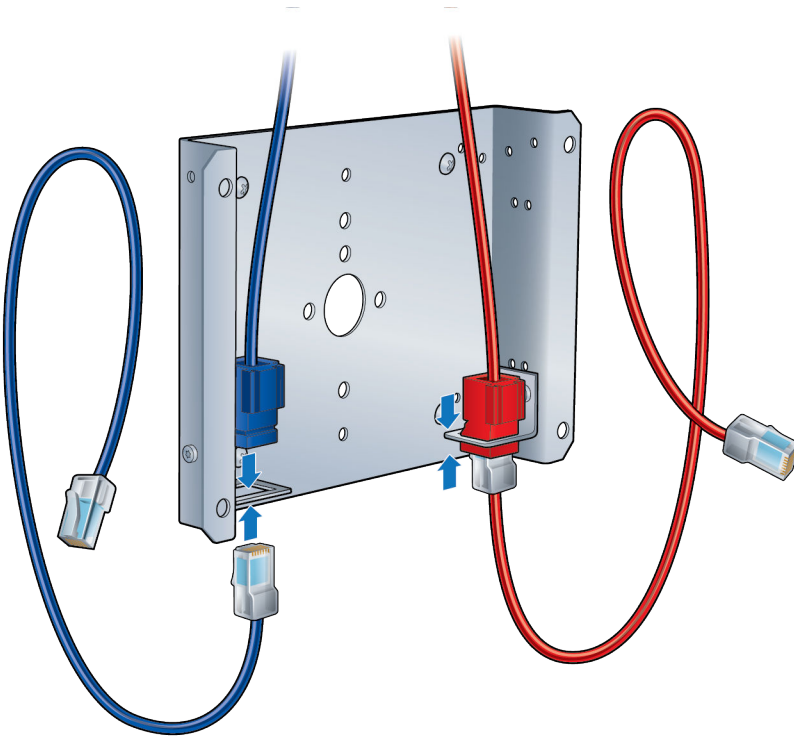
5. Attach the U-bracket to the wall with four anchor screws.



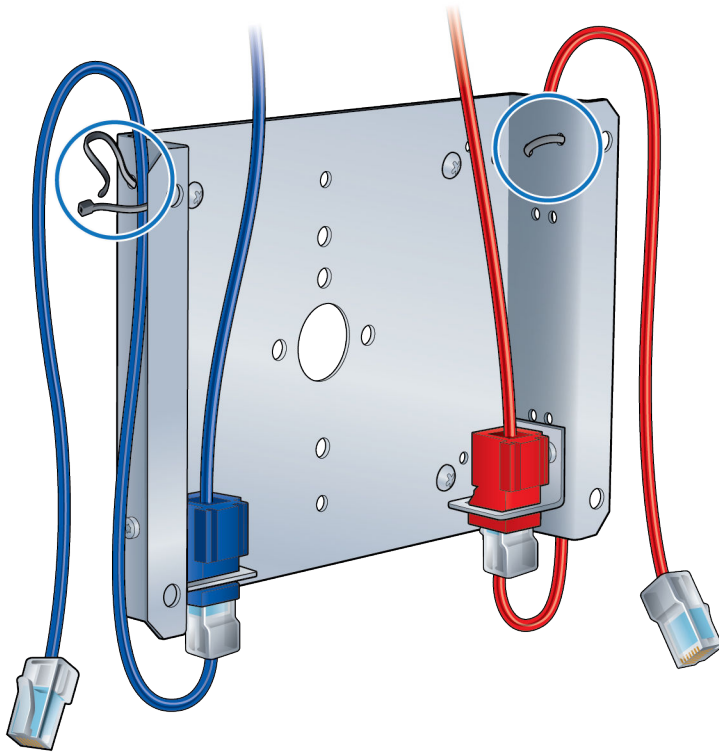
6. Remove the angle brackets from the wall plate.



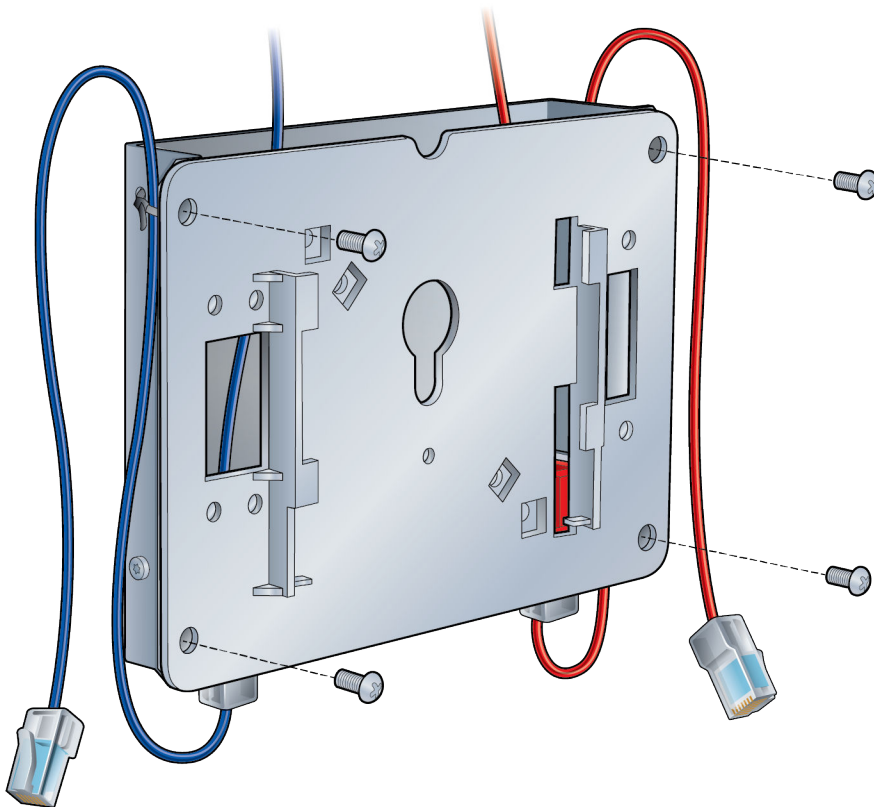
7. Feed the red and blue cables from the ceiling and snap them into the L-brackets on the U-bracket. Then attach them to the corresponding cables to the corresponding red and blue UAP2 cables provided in the kit.



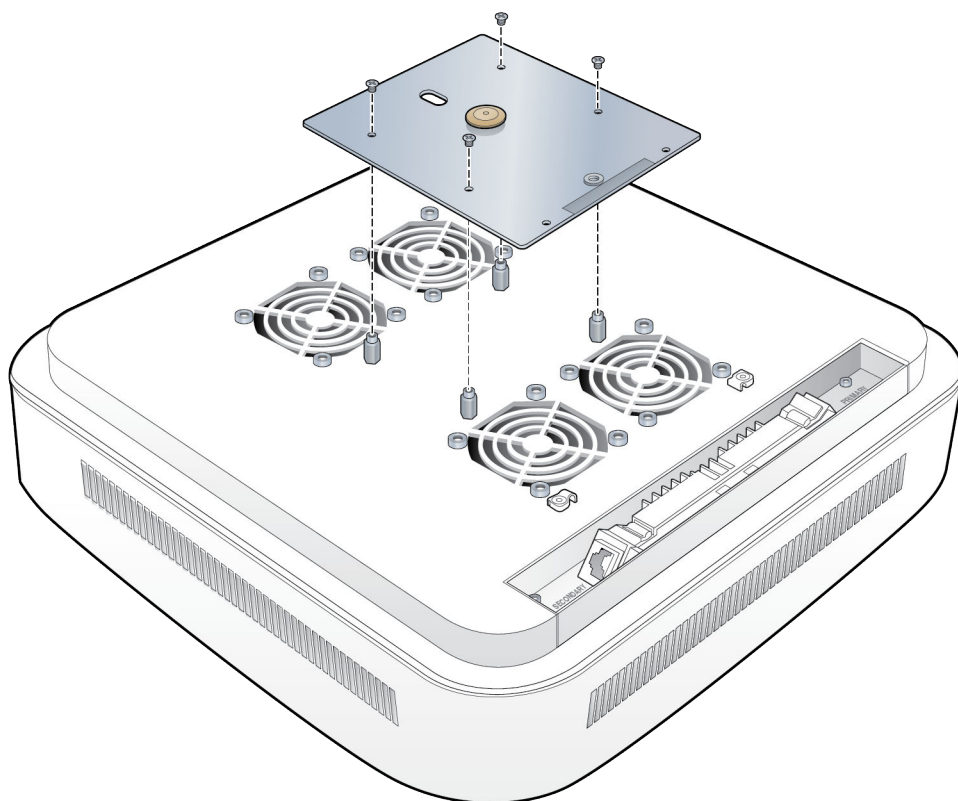
8. Feed the red and blue cables around the outside of the U-Bracket and tie-wrap the cables, as shown below.



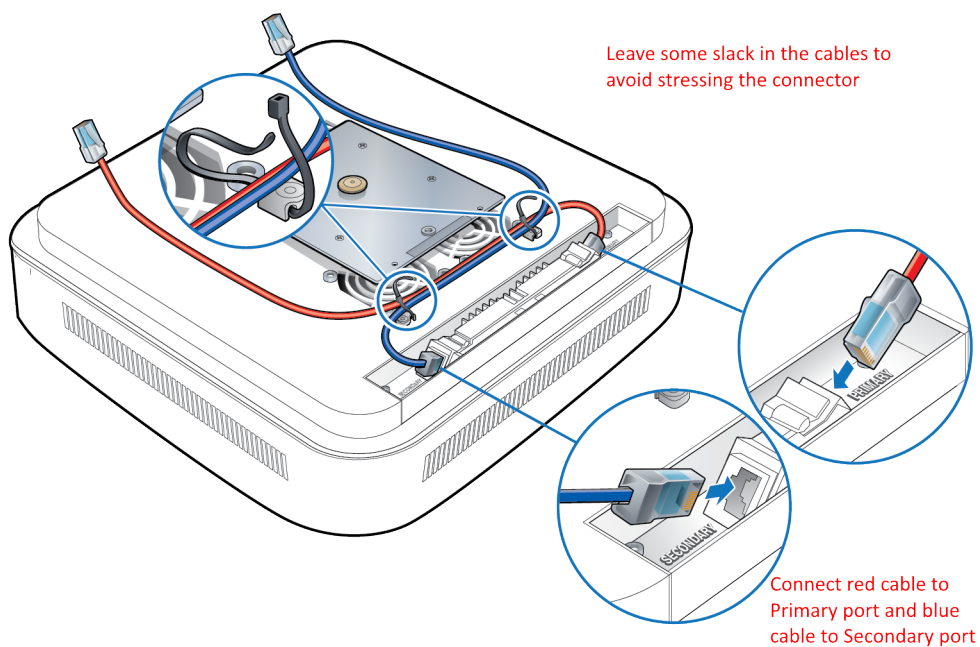
9. Attach the wall plate to U-bracket, using the four screws provided in the kit.



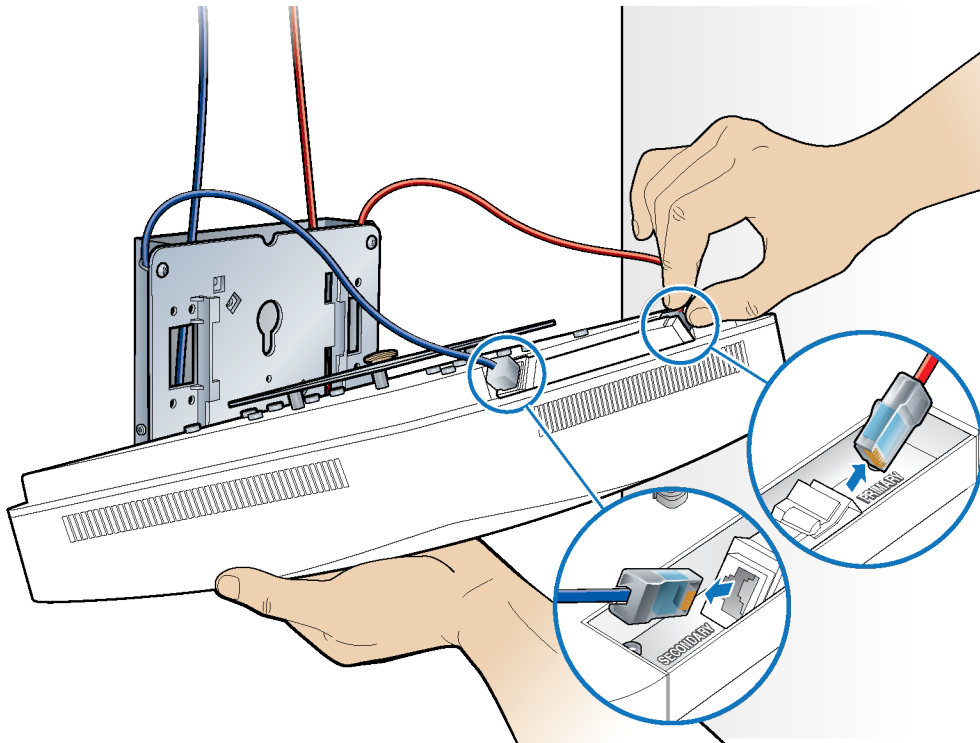
10. Attach the AP plate with the four screws provided in the kit.



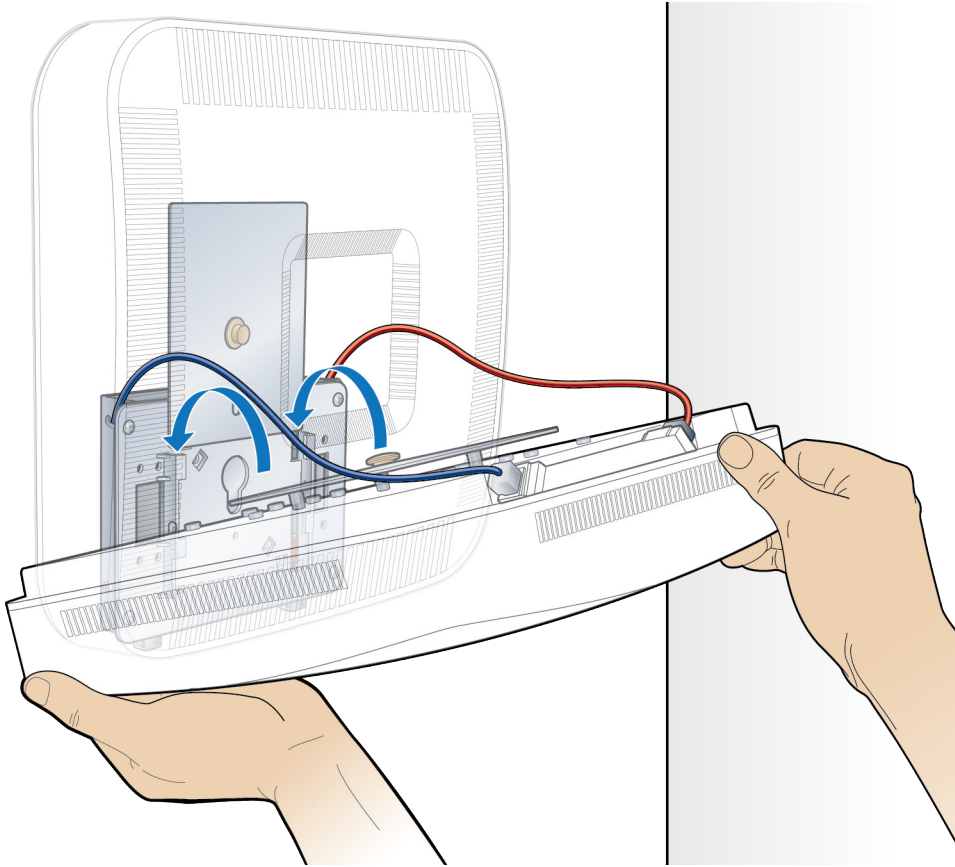
11. Connect the red Primary and blue Secondary Ethernet cables to the UAP2 corresponding ports, as shown below.



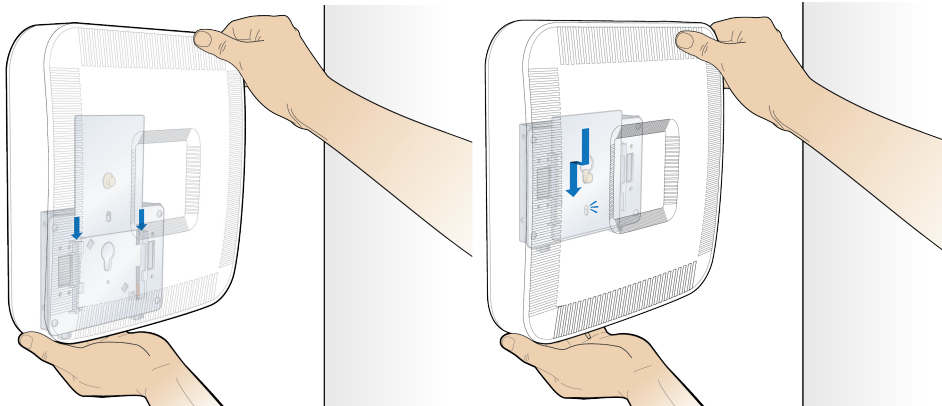
12. Lift the UAP2 near the wall plate and attach the red and blue cables to the corresponding red Primary and blue Secondary ports.



13. Attach the UAP2 to the mounting plate.
 - a. Align the keyhole opening on the mounting plate with the button on the UAP mounting plate.
 - b. Insert the UAP2 into the mounting plate slot and slide until the UAP2 plate meets the tabs on the octagon box plate.



14. Gently slide the UAP2 downward and lock it into place.



Chapter 5

Connect a Copper UAP2 to a Classic CAN OR TEN

When connecting UAP2 to a Classic CAN or TEN follow these guidelines:

- The UAP2 must connect to two consecutive ports on the same CAT2 card, i.e. Lx.y & Lx.z with z=y+1 (for example L1.1 and L1.2, or L1.2 and L1.3).
- The “y” CAT2 port (lower number) carries power, RF data, and ERA signaling information and must connect to the red Primary Port of the AP.
- The “z” CAT2 port (higher number) carries power and RF data only and must connect to the blue Secondary Port of the AP.

Chapter 6

Powering on a Copper UAP2

The UAP2 is powered on as soon as power is connected to it. Under normal operating conditions, the Power LED turns on briefly when the unit is first detected. It will then go out briefly, followed by an initialization period during which the Power LED flashes slowly while the UAP2 is configured. The Power LED remains a steady green (not flashing) once the unit reaches a fully operational state.

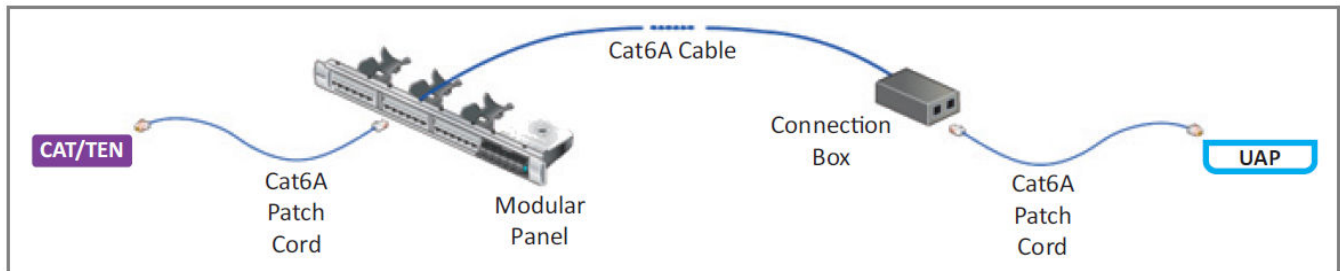
The Power LED behavior for a Copper UAP2 is as follows:

- Initial flash on and then off—UAP2 has power applied but no link is established to a CAN/TEN or to a Copper UAP2.
- Steady green—UAP2 is powered on and operational.
- Slow flashing green—UAP2 is powered on and initializing.
- Rapid flashing green—UAP2 Unit Identifier active via the **Flash LED** function in the ERA GUI.
- Slow-Flashing Red—The ERA GUI is reporting a critical alarm for the unit. The AP can be recovered without replacing hardware.
- Steady Red—The ERA GUI is reporting a critical alarm for the unit. The AP must be replaced.

CAT6A Specifications and Testing Requirements

Cat6A connections must be tested with a device that can measure the cable parameters against the thresholds defined in ANSI/TIA standards (such as the Fluke DTX-1800 and DSX-5000). [Figure 4: ERA End-to-End Channel](#) (page 34) shows the end-to-end channel from the TEN or Classic CAN to the UAP, which is inclusive of the Cat6A cable, the Cat6A Patch Cord, and the Panel and connection box. The end-to-end channel must meet the Cat6A U/UTP performance defined by the TIA/EIA 568 C.2 standard; see [Table 7: Cat6A U/UTP Performance Standards \(TIA/EIA 568 C.2\)](#) (page 34).

FIGURE 4: ERA End-to-End Channel



Note:  Some cables list their performance in “typical” performance values. However, sweep-testing is necessary to confirm actual performance. CommScope strongly recommends using Cat6A cable that has been tested to the listed frequency with test confirmation available for inspection.

TABLE 7: Cat6A U/UTP Performance Standards (TIA/EIA 568 C.2)

MHz	Insertion Loss (dB) Channel/Link	NEXT (dB) Channel/Link	PSum NEXT (dB) Channel/Link	ACRF (dB) Channel/Link	PSum ACRF (dB) Channel/Link	Return Loss (dB) Channel/Link
1	2.3/1.9	65.0/65.0	62.0/62.0	63.3/64.2	60.3/61.2	19.0/19.1
4	4.2/3.5	63.0/64.1	60.5/61.8	51.2/52.1	48.2/49.1	19.0/21.0
8	5.8/5.0	58.2/59.4	55.6/57.0	45.2/46.1	42.2/43.1	19.0/21.0
10	6.5/5.5	56.6/57.8	54.0/55.5	43.3/44.2	40.3/41.2	19.0/21.0
16	8.2/7.0	53.2/54.6	50.6/52.2	39.2/40.1	36.2/37.1	18.0/20.0
20	9.2/7.8	51.6/53.1	49.0/50.7	37.2/38.2	34.2/35.2	17.5/19.5
25	10.2/8.8	50.0/51.5	47.3/49.1	35.3/36.2	32.3/33.2	17.0/19.0
31.25	11.5/9.8	48.4/50.0	45.7/47.5	33.4/34.3	30.4/31.3	16.5/18.5

TABLE 7: Cat6A U/UTP Performance Standards (TIA/EIA 568 C.2) (continued)

MHz	Insertion Loss (dB) Channel/Link	NEXT (dB) Channel/Link	PSum NEXT (dB) Channel/Link	ACRF (dB) Channel/Link	PSum ACRF (dB) Channel/Link	Return Loss (dB) Channel/Link
62.5	16.4/14.1	43.4/45.1	40.6/42.7	27.3/28.3	24.3/25.3	14.0/16.0
100	20.9/18.0	39.9/41.8	37.1/39.3	23.3/24.2	20.3/21.2	12.0/14.0
200	30.1/26.1	34.8/36.9	31.9/34.3	17.2/18.2	14.2/15.2	9.0/11.0
250	33.9/29.5	33.1/35.3	30.2/32.7	15.3/16.2	12.3/13.2	8.0/10.0
300	37.4/32.7	31.7/34.0	28.8/31.4	13.7/14.6	10.7/11.6	7.2/9.2
400	43.7/38.5	28.7/29.9	25.8/27.1	11.2/12.1	8.2/9.1	6.0/8.0
500	49.3/43.8	26.1/26.7	23.2/23.8	9.3/10.2	6.3/7.2	6.0/8.0



Note: Propagation Delay is 555 nanoseconds for channel/498 nanoseconds for link tested at 10 MHz.



Note: Delay Skew is 50 nanoseconds for channel/44 nanoseconds for link tested at 10 MHz.



Note: For additional information, see also CommScope Product Specifications for the GigaSPEED X10D® 2091B ETL Verified Category 6A U/UTP Cable (760107201 | 2091B BL 4/23 W1000). (Click [here](#) to access the document online.)

Contacting CommScope

This chapter tells you how to contact CommScope for additional information or for assistance.

DAS and Small Cell Technical Support

The following sections tell you how to contact the DAS and Small Cell Technical Support team. Support is available 7 days a week, 24 hours a day.

Telephone Helplines

Use the following Helpline telephone numbers to get live support, 24 hours a day:

24x7	+1 888-297-6433 (Toll free for U.S. and Canada)
EMEA 8:00-17:00 (UTC +1)	+ 800 73732837 (Toll free for parts of EMEA and Australia)
	+ 49 909969333 (Toll charge incurred)
	Calls to an EMEA Helpline outside of the 8:00 to 17:00 time frame will be forwarded to the 24x7 Helpline.

Online Support

To go to the CommScope Wireless Support Request web site from which you can initiate a Technical Support ticket, do one of the following:

- Scan the QR Code below.



- If viewing this document online as a PDF, click on the following URL link: <http://www.commscope.com/wisupport>
- Enter the preceding URL into your web browser, and then press **ENTER** on your keyboard.

Waste Electrical and Electronic Equipment Recycling

Country specific information about collection and recycling arrangements per the Waste Electrical and Electronic Equipment (WEEE) Directive and implementing regulations is available on CommScope's website. To access information on the CommScope recycling program, do any of the following:

- Scan the QR Code below.



- If viewing this document online as a PDF, click on the following URL link: <http://www.commscope.com/corporate-responsibility-and-sustainability/environment/weee-customer-recycling/>
- Enter the preceding URL into your web browser, and then press **ENTER** on your keyboard.

Hardware to Software Mapping Information

1. To view or download the minimum software requirements for each of the DAS and Small Cell hardware modules. Alternatively, you can go to the following web address to access the portal: <http://www.commscope.com/resources/in-building-wireless/era>



- Scan the QR Code below.
2. Click on a document link to open it, or right click on the link and select the **Save target as...** option from the contextual menu.

DAS and Small Cell Technical Training

1. To access training on the online technical training site, please use the following web address or scan the



QR code to the right: <https://commscopeuniversity.com>

2. Once you have logged in, you can search for training by typing search words in the **Search** bar or by going to the **Catalog** page to view the available courses.
3. Instructor-led courses are conducted in North America and Europe. Before choosing a course, please verify the region.
4. For training related questions, please contact us: icn_training@commscope.com

Accessing ERA User Documentation

1. Access to the Customer Portal requires a user account. If you don't have an account:
 - a. Visit My Commscope at <https://www.mycommscope.com>.
 - b. Click New User Registration and follow the prompts.
 - c. After you've registered in My CommScope, click the Request Additional Access button and select the DAS and Small Cell Customer Portal from the list of applications.
2. Scan the QR Code below to go directly to the DAS and Small Cell Customer Portal.



Alternatively, visit MyCommScope and use the DAS and Small Cell Customer Portal Application.

3. In Tools and Documentation, search by product, document category or title.
4. Click on the title of any document to open it.

