



Wi-Fi7 Antennas Guide

Access Point Compatibility and Antenna Installation

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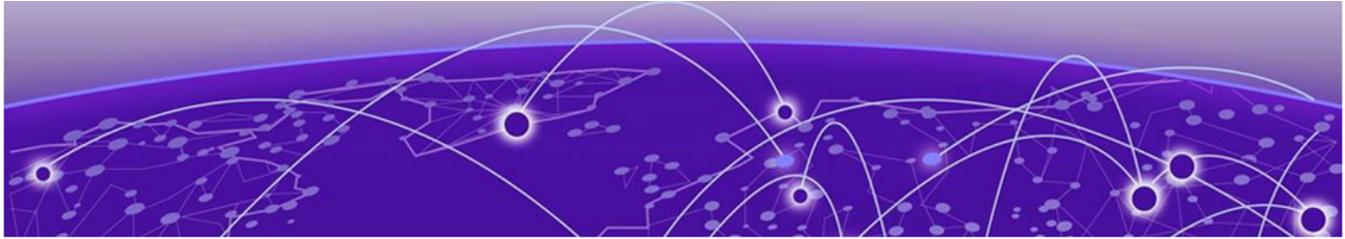
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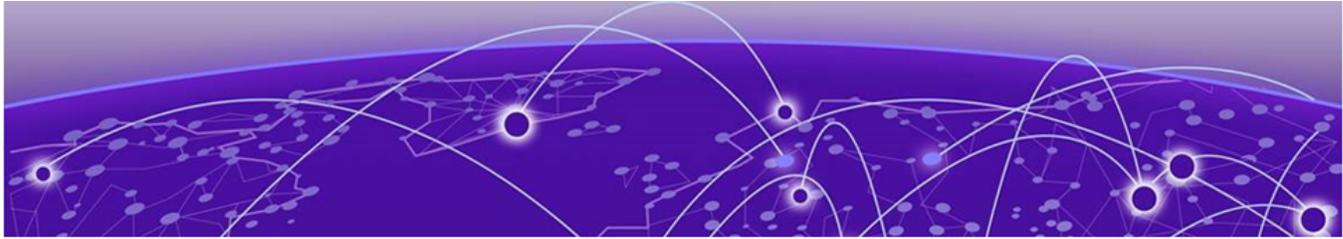
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Abstract

This Wi-Fi 7 Antenna Specifications Guide for Extreme Networks provides detailed technical information on antenna compatibility, installation procedures, and regulatory compliance for enterprise WLAN deployments across multiple access point models including AP4020X, AP4020FX, AP4060X, and AP5022FX. The guide covers tri-band (2.4GHz, 5GHz, 6GHz), dual-band, and high-band antenna models with varying gain levels (4-17 dBi), beamwidths (20-360 degrees), and feed configurations (2-8 feed) for indoor and outdoor installations. It explains antenna part number nomenclature, detailing how alphanumeric codes indicate environment suitability, bandwidth, feed type, gain in dBi, and connector types (RP-SMA or N-type). Comprehensive installation instructions are provided for thirteen specific antenna models including omni-directional dipole antennas (AI-TS06360, AIO-TS06360-N, AI-TP05360) and panel antennas (AI-TQ08055, AI-TH06120, AIO-HQ17020-N), with torque specifications ranging from 5 inch-pounds for RP-SMA connectors to 20 inch-pounds for N-type connectors and 45-50 inch-pounds for mounting hardware. The document emphasizes professional installer requirements including RF theory knowledge, link budget calculations incorporating conducted output power, cable losses, mechanical connection losses, and antenna gain to ensure FCC-compliant operation. Post-installation procedures include weatherproofing outdoor connections using 3M or Scotch weatherproofing kits and forming drip loops to prevent water ingress, with detailed diagrams showing proper sealing techniques for Type-N connectors and cable management practices. Installation best practices address RF obstruction considerations, signal penetration characteristics through various building materials (paper, concrete, drywall, metal), optimal antenna placement away from interference sources, and vertical mounting orientation with cables pointing toward the ground for maximum performance.



Preface

Read the following topics to learn about:

- The meanings of text formats used in this document.
- Where you can find additional information and help.
- How to reach us with questions and comments.

Text Conventions

Unless otherwise noted, information in this document applies to all supported environments for the products in question. Exceptions, like command keywords associated with a specific software version, are identified in the text.

When a feature, function, or operation pertains to a specific hardware product, the product name is used. When features, functions, and operations are the same across an entire product family, such as Extreme Networks switches, the product is referred to as *the switch*.

Table 1: Notes and warnings

Icon	Notice type	Alerts you to..
	Tip	Helpful tips and notices for using the product
	Note	Useful information or instructions
	Important	Important features or instructions
	Caution	Risk of personal injury, system damage, or loss of data
	Warning	Risk of severe personal injury

Table 2: Text

Convention	Description
screen displays	This typeface indicates command syntax, or represents information as it is displayed on the screen.
The words <i>enter</i> and <i>type</i>	When you see the word <i>enter</i> in this guide, you must type something, and then press the Return or Enter key. Do not press the Return or Enter key when an instruction simply says <i>type</i> .
Key names	Key names are written in boldface, for example Ctrl or Esc . If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example: Press Ctrl+Alt+Del
Words in italicized type	Italics emphasize a point or denote new terms at the place where they are defined in the text. Italics are also used when referring to publication titles.
NEW!	New information. In a PDF, this is searchable text.

Table 3: Command syntax

Convention	Description
bold text	Bold text indicates command names, keywords, and command options.
<i>italic text</i>	Italic text indicates variable content.
[]	Syntax components displayed within square brackets are optional. Default responses to system prompts are enclosed in square brackets.
{ x y z }	A choice of required parameters is enclosed in curly brackets separated by vertical bars. You must select one of the options.
x y	A vertical bar separates mutually exclusive elements.
< >	Nonprinting characters, such as passwords, are enclosed in angle brackets.
...	Repeat the previous element, for example, <i>member [member...]</i> .
\	In command examples, the backslash indicates a “soft” line break. When a backslash separates two lines of a command input, enter the entire command at the prompt without the backslash.

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- Content errors, or confusing or conflicting information.
- Improvements that would help you find relevant information.
- Broken links or usability issues.

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Provide as much detail as possible including the publication title, topic heading, and page number (if applicable), along with your comments and suggestions for improvement.

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Search the GTAC (Global Technical Assistance Center) knowledge base; manage support cases and service contracts; download software; and obtain product licensing, training, and certifications.

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Call GTAC

For immediate support: (800) 998 2408 (toll-free in U.S. and Canada) or 1 (408) 579 2800. For the support phone number in your country, visit www.extremenetworks.com/support/contact.

Before contacting Extreme Networks for technical support, have the following information ready:

- Your Extreme Networks service contract number, or serial numbers for all involved Extreme Networks products
- A description of the failure
- A description of any actions already taken to resolve the problem
- A description of your network environment (such as layout, cable type, other relevant environmental information)
- Network load at the time of trouble (if known)
- The device history (for example, if you have returned the device before, or if this is a recurring problem)
- Any related RMA (Return Material Authorization) numbers

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[Extreme Optics Compatibility](#)

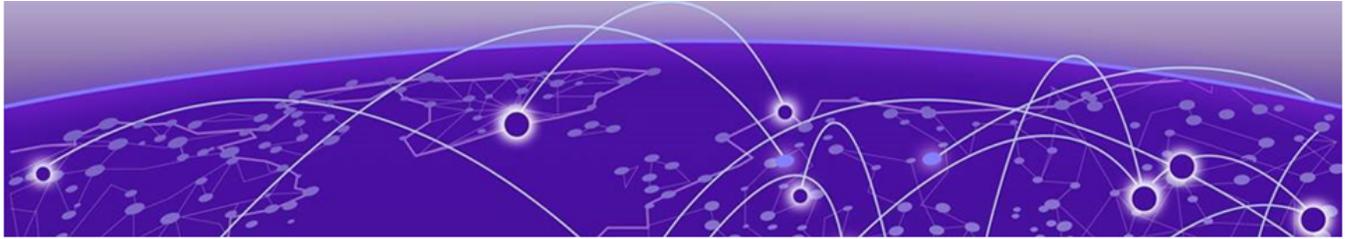
[Other Resources](#) such as articles, white papers, and case studies

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Overview

- [Antenna Accessories for Enterprise WLANs](#) on page 10
- [Considerations When Selecting An Antenna](#) on page 10
- [Antenna Part Numbers Explained](#) on page 11

This guide provides detailed information for AP-antenna compatibility and antenna installation for your Extreme Networks WiFi7 antennas. For technical specifications, see the [technical specifications for your WiFi 7 antenna](#).

Antenna Accessories for Enterprise WLANs

A complete selection of antennas and accessories is available to ensure optimal coverage and performance for wireless LANs. Regardless of the size or layout of your environment, from a small office or storefront to campus-wide, multiple-site, indoor and outdoor deployments, antennas, cables and accessories are available to fit your needs.

For more information on accessories, see [802.11ax and Cloud Access Points Accessories](#).

Considerations When Selecting An Antenna

It is important to consider a number of factors when choosing an antenna for your AP. To choose the right components, you'll need to know:

- **Frequency band:** Ensure the antenna supports the AP's operational bands.
- **Antenna gain:** Choose a gain that meets your needs while avoiding overshoot and interference.
- **Beam width and direction:** Do you need an Omni-directional antenna for 360-degree coverage? Or a directional antenna for a more focused, long-distance coverage?
- **Radiation patterns:** Consider an antenna's coverage pattern.
- **Installation environment:** Consider where you plan to deploy the antenna - indoor or outdoor? On a ceiling, wall, or pole? Make sure that you select an antenna that matches the environment.
- **Connectors and cable length:** Choose an antenna that is compatible with your AP and that it has a long enough cable.
- **Obstacles:** Geographic obstacles such as walls or the terrain can affect antenna performance.

Indoor and Outdoor Antennas

Indoor and outdoor antennas differ in two important ways:

- Outdoor antennas are weather sealed to protect them from the environment. Because of this extra protection, outdoor antennas are typically more expensive than those rated for indoor use. Outdoor antennas can be used for indoor applications, such as freezers and cooler where moisture is common. But indoor antennas should not be used in outdoor applications.
- Outdoor antennas typically have a Type N Male connector for connecting to a lightning arrestor. It is strongly advised that you use a lightning arrestor with an outdoor antenna.

Extended AP to Antenna Cable Lengths

Most indoor antennas are mounted directly to the AP's connectors. But you may want to position the AP a significant distance away from the antenna.

In these situations, various adapters and cable extensions are required. Keep the following points in mind:

- The connector on the AP
- The connector on the antenna
- The spectrum being implemented
- Signal loss due to multiple connectors and long cable lengths

Antenna Part Numbers Explained

Each Extreme Networks antenna is identified by an alphanumeric code called a part number or P/N. Each P/N is broken into 3 fields separated by a dash (-), with each number or letter identifying an important feature of the antenna.

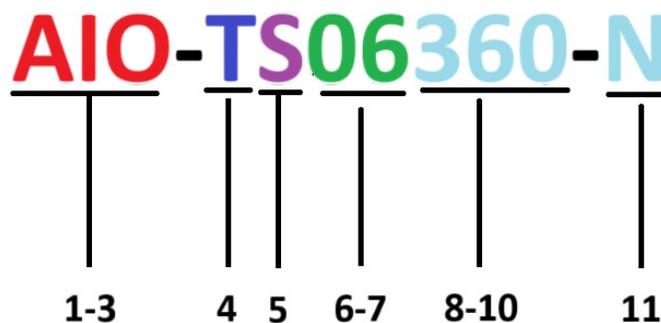


Figure 1: Example of 11 Character Antenna Part Number

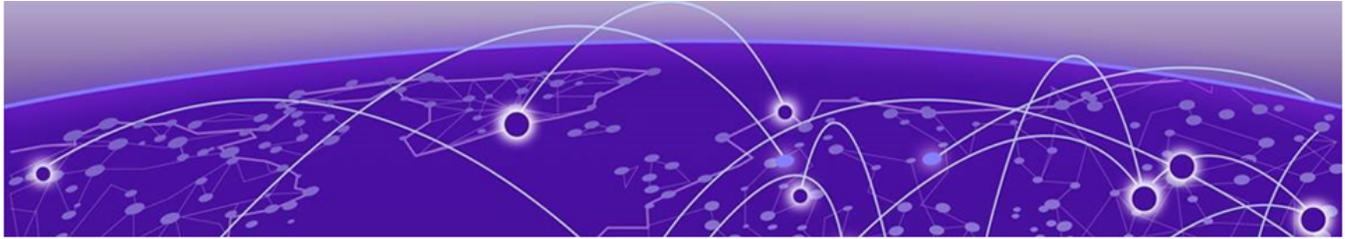
Use the following key to read or decode an antenna P/N.

Table 4: Key to Antenna Part Numbers

Field	Position	Meaning
Field 1	Position 1 -3	<p>The environment in which the antenna can be used:</p> <ul style="list-style-type: none"> • AI = indoor • AO = outdoor • AIO = indoor and outdoor <p>Note: Some AIO - indoor and outdoor - antennas have a RP-SMA connector, which has to be weatherized before you use them outdoors. Check the connector type before you deploy outdoors.</p>
Field 2	Position 4	<p>The bandwidth:</p> <ul style="list-style-type: none"> • 2 = 2.4GHz • 5 = 5.0GHz • 6 = 6.0GHz • D = Dual band, 2.4GHz or 5.0GHz • T = Tri-band, 2.4GHz, 5.0GHz and 6GHz • H = High band, 5 GHz and 6 GHz
	Position 5	<p>The feed:</p> <ul style="list-style-type: none"> • D = 2 feed • T = 3 feed • Q = 4 feed • P = 5 feed • H or X = 6 feed • E = 8 feed
	Position 6-7	<p>Gain in dBi:</p> <ul style="list-style-type: none"> • 04 = 4 dBi • 05 = 5 dBi • 06 = 6 dBi <p>Note: In some P/Ns, you may see 75, which denotes a dBi of 7.5.</p>
	Position 8-10	<p>3dBi beam width in degrees.</p> <ul style="list-style-type: none"> • 020 = 20 degree

Table 4: Key to Antenna Part Numbers (continued)

Field	Position	Meaning
		<ul style="list-style-type: none">• 055 = 55 degree• 060 = 60 degree
Field 3	Position 11	The connector type: <ul style="list-style-type: none">• N = N type connector• If empty = RP-SMA.



Antenna Compatibility

[Compatibility Matrix](#) on page 14

[Antenna Specifications Matrix](#) on page 16

Use the following information to map antennas to APs.

Compatibility Matrix

The following table lists available antennas and the AP that support the antennas. Click on the antenna part number to read the technical specifications.

Table 5: Antenna Compatibility Matrix

Antenna Part Number	APs	Notes
Indoor Antennas		
30702 (WS-AI-DQ05120)	AP4020X	Panel antenna
ML-2452-SEC6M4-036	AP4020X	Panel antenna
AI-TS06360	AP4020X AP4020FX	Omni antenna
AI-TQ08055	AP4020X AP4020FX AP4020FX AP5022FX	Panel antenna
AI-TQ06120	AP4020X AP4020FX	Panel antenna
AI-TH08055	AP4020FX	Panel antenna
AI-TH06120	AP4020X AP4020FX	Panel antenna
AI-TH14035	AP4020FX	Panel antenna
AIO-HQ17020	AP5022FX AP4020FX	Indoor use panel antenna. For outdoor use, the connectors must be weatherized.
AI-TP05360	AP5022FX	Omni antenna

Table 5: Antenna Compatibility Matrix (continued)

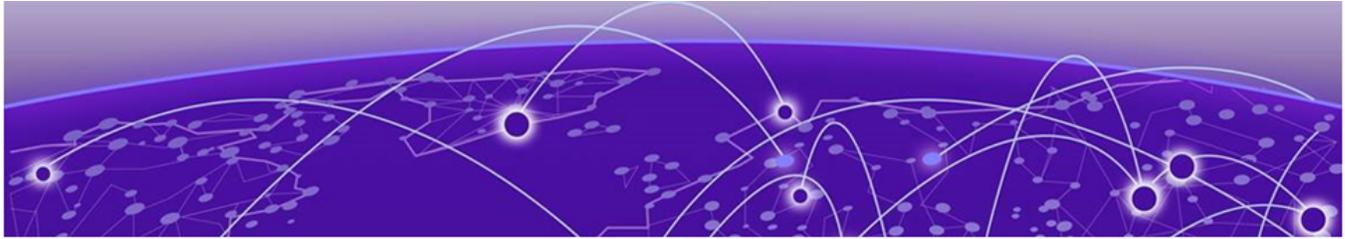
Antenna Part Number	APs	Notes
Indoor and Outdoor Antennas		
AIO-DQ15021-RPSMA	AP4020X	Panel antenna
AIO-DD05120-RPSMA	AP4020X	Panel antenna
AIO-DD75060-RPSMA	AP4020X	Panel antenna
AIO-TS06360-N	AP4060X	Omni antenna
AIO-TQ08055-N	AP4060X	Panel antenna
AIO-TQ14035-N	AP4060X	Panel antenna
AIO-TQ06120-N	AP4060X	Panel antenna
AIO-HQ17020-N	AP4060X	Panel antenna

Antenna Specifications Matrix

The following table displays a few of the key antenna specifications. For additional details, click on the antenna P/N to see the technical specifications document.

Table 6: Antenna Specifications

Antenna Type	Antenna P/N	Antenna Connector	Max Gain			Beam Width	
			2.4 GHz	5 GHz	6 GHz	Horizontal	Vertical
Panel	AI-TH06120	6, RP-SMA	6dBi	6dBi	6dBi	120°/120°	60°/50°
	AI-TH08055	6, RP-SMA	7dBi	6dBi	6dBi	65°/55°	65°/65°
	AI-TH14035	6, RP-SMA	12dBi	11.5dBi	11.5dBi	35°/40°	35°/40°
	AI-TQ06120	4, RP-SMA	6dBi	6dBi	6dBi	120°/120°	60°/50°
	AI-TQ08055	4, RP-SMA	7dBi	6dBi	6dBi	65°/55°	65°/55°
	AIO-TQ06120-N	4, N-type	6dBi	6dBi	6dBi	120°/120°	60°/50°
	AIO-TQ08055-N	4, N-type	7dBi	6dBi	6dBi	65°/55°	65°/55°
	AIO-TQ14035-N	4, N-type	12dBi	11.5dBi	11.5dBi	35°/40°	35°/40°
	AIO-HQ17020	4, RP-SMA	N/A	16.4dBi	17.0dBi	21°/20°	20°/16°
	AIO-HQ17020-N	4, N-type	N/A	16.4dBi	17.0dBi	21°/20°	20°/16°
	AIO-DQ15021-RPSMA	4, RP-SMA	11.1dBi	15dBi	N/A	47/20	48/18
	AIO-DD05120-RPSMA	2, RP-SMA	5dBi	5dBi	N/A	120°/120°	70°/70°
	AIO-DD75060-RPSMA	2, RP-SMA	7.5dBi	7.5dBi	N/A	70°/65°	65°/60°
	30702 (WS-AI-DQ05120)	4, RP-SMA	5.5dBi	5.5dBi	N/A	100°/80°	90°/65°
ML-2452-SEC6M4-036	4, RP-SMA	7dBi	7.3dBi	N/A	100°/80°	90°/65°	
Dipole	AIO-TS06360-N	1, N-type	5dBi	5.5dBi	5.5dBi	360°/360°	30°/25°
	AI-TS06360	1, RP-SMA	3dBi	5dBi	5dBi	65°/55°	65°/55°
Omni	AI-TP05360	5, RP-SMA	4.4dBi	5.2dBi	4.7dBi	21°/20°	20°/16°



Antenna Installation

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Use the information in the following sections to install your antennas.

Regulatory Compliance

Enterprise Access Points are approved by governmental regulatory agencies with the understanding that these devices are Professionally Installed. Under most regulations, this allows the Professional Installers the flexibility to configure the Access Points for each specific customers needs and insure a compliant installation. The antennas offered in our portfolio have different coverage patterns and antenna gains to meet the needs of different installation requirements and require careful planning. The Access Point transmitter power must be adjusted by the professional installer based on the

specific antenna and other installation components used in the installation to ensure compliant operation.

A professional installer must:

- Have a good understanding of RF theory
- Be able to calculate a link budget for a given transmitter configuration. For example, Conducted Output Power + Cabling Losses + Mechanical Connection Losses + Antenna Gain = Output Power (This output power should be equal or lower than the Maximum Power as listed on the FCC Grant for a transmitter)
- Be familiar with both the mechanical and software tools required to configure and adjust the transmitter being installed
- Understand basic FCC regulations for the site specific location and installation requirements of the various radio products being installed
- Understand basic antenna operational theory and standard industry antenna installation practices
- Be certified by local authorities to install electrical devices.



Warning

OPERATING A TRANSMITTER THAT IS CONFIGURED FOR INDOOR USE IN AN OUTDOOR ENVIRONMENT IS AGAINST FCC REGULATIONS AND SUBJECT TO FCC ENFORCEMENT ACTIONS AGAINST BOTH THE INSTALLER AND THE OPERATOR.

Installation Best Practices

Antennas transmit and receive radio signals which are susceptible to Radio Frequency (RF) obstructions and common sources of interference that can reduce the throughput and range of the device to which they are connected. Follow these guidelines to ensure the best possible antenna performance:

- Install the antenna vertically and mount it with the cables pointing toward the ground.
- Keep the antenna away from metal obstructions such as heating and air-conditioning ducts, large ceiling trusses, building superstructures, and major power cabling runs. If necessary, use a rigid conduit to lower the antenna away from these obstructions.
- The building construction material density determines the number of walls the signal can pass through and still maintain adequate signal strength.
- Consider the following before choosing the location for your antenna:
 - Signals penetrate paper and vinyl walls with little change to signal strength.
 - Signals penetrate only one or two solid and pre-cast concrete walls without degrading signal strength.
 - Signals penetrate three or four concrete and wood block walls without degrading signal strength.
 - Signals penetrate five or six drywall or wood wall without degrading signal strength.

- Signals will reflect off thick metal wall and will not penetrate it at all.
- Signals will reflect off a chain link fence or wire mesh spaced between 1 and 1.5 inches (2.5 and 3.8 cm).

The fence acts as a harmonic reflector that blocks the signal.

- Install the antenna away from microwave ovens and 2 GHz cordless phones.

These products can cause signal interference because they operate in the same frequency range as the device to which your antenna is connected.

Antenna Installation Workflow

Use the information in the following table to help you install your antenna.

Table 7: Installation Work flow

Steps	Action	Purpose
1.	Verify the box contents.	Ensure that you have all of the necessary parts. The box components vary by antenna but they generally include an antenna and mounting hardware.
2.	Install the antenna.	Assemble the antenna bracket. Connect the AP to antenna.
3.	Form a drip loop.	The drip loop prevents water from entering the AP by channeling water down and away from the connection points.
4.	Weatherproof the antenna connections.	RP-SMA connections should be weatherized if used outdoors.
5.	Confirm the antenna and AP function.	Ensure that your antenna and AP work as expected.

Install AI-TP05360

Before You Begin

Mount the AP in the desired location.

About This Task



The AI-TP05360 antenna is a tri-band antenna designed for indoor use. It measures 220 mm x 69.9 mm (8.66 inches x 2.75 inches) and weighs 1.7kg (3.75 lbs).

Procedure

1. Unpack the antenna from the shipping materials.
2. Thread the antennas onto the AP's external RP-SMA connectors.
See the [AP installation guide](#) for information on connecting the antenna to the correct ports.
3. Tighten the antennas onto the RP-SMA connectors to a torque of 5 inch-pounds.

Install AI-TS06360

Before You Begin

Mount the AP in the desired location.

About This Task



Figure 2: AI-TS06360 Antenna

The AI-TS06360 antenna is a tri-band antenna designed for indoor use. It measures 158 mm x 17.7 mm x 6 mm (6.22 inches x 0.69 inches x 0.23 inches) and weighs 14.76 g (0.032 lbs).

Procedure

1. Unpack the antenna from the shipping materials.
2. Thread the antennas onto the AP's external RP-SMA connectors.
See the [AP installation guide](#) for information on connecting the antenna to the correct ports.
3. Tighten the antennas onto the RP-SMA connectors to a torque of 5 inch-pounds.

Install AI-TQ08055

Before You Begin

Mount the AP in the desired location.

About This Task



Figure 3: AI-TQ08055

The AI-TQ08055 antenna is an indoor panel antenna that measures 250mm x 250mm x 25mm (9.84in x 9.84in. x 0.98in) and weighs 0.86 kg (1.9 lbs). It ships with a mounting bracket.

Procedure

1. Unpack the antenna from the shipping materials.
2. Assemble the mounting bracket. The pivot screws should be only finger-tight.
3. Mount the mounting bracket to the wall or pole.
Tighten the non-pivot fasteners to 45-inch lbs.
4. Assemble the antenna to the mounting bracket. Tighten the nuts to 45-inch lbs.
5. Attach the four cables to the AP for the specified frequencies. Tighten the RP-SMA connectors to 5 inch-pounds. See the [AP installation guide](#) for information on connecting the antenna to the correct ports.
6. Adjust the mounting bracket angles to point the panel antenna in the desired direction. Tighten the pivot screws to 50 -inch lbs.

Install AI-TQ06120

Before You Begin

Mount the AP in the desired location.



Figure 4: AI-TQ06120 Antenna

The AI-TQ06120 antenna is an indoor panel antenna that measures 250mm x 250mm x 25mm (9.84in x 9.84in. x 0.98in) and weighs 0.72 kg (1.59 lbs). It ships with a mounting bracket.

Procedure

1. Unpack the antenna from the shipping materials.
2. Assemble the mounting bracket. The pivot screws should be only finger-tight.
3. Mount the mounting bracket to the wall or pole. Tighten the mounting hardware to 45 inch-lbs.

Tighten the non-pivot mounting hardware to 45 inch-lbs and tighten the pole cable strap screw so they are tight and cannot be moved on the pole.

4. Mount the mounting bracket to the wall or pole.
5. Assemble the antenna to the mounting bracket.

Tighten the fasteners to 45-inch lbs.

6. Attach the 4 cables to the AP for the specified frequencies.

Tighten the RP-SMA connectors to 5-inch pounds. See the [AP installation guide](#) for information on connecting the antenna to the correct ports.

7. Adjust the mounting bracket angles so the panel antenna is pointing in the desired direction.

Tighten the pivot screws to 50 -inch lbs.

Install AI-TH14035

Before You Begin

Mount the AP in the desired location.

About This Task



Figure 5: AI-TH14035 Antenna

The AI-TH14035 antenna is an indoor panel antenna that measures 370mm x 370mm x 25mm (14.56in x 14.56in. x 0.98in) and weighs 2.34 kg (5.16 lbs). It ships with a mounting bracket.

Procedure

1. Unpack the antenna from the shipping materials.
2. Assemble the mounting bracket. The pivot screws should be only finger-tight.
3. Mount the mounting bracket to the wall or pole.
Tighten the non-pivot mounting hardware to 45 inch-lbs and tighten the pole cable strap screw so they are tight and cannot be moved on the pole.
4. Mount the mounting bracket to the wall or pole.
5. Assemble the antenna to the mounting bracket.
Tighten the fasteners to 45-inch lbs.
6. Attach the 4 cables to the AP for the specified frequencies.
Tighten the RP-SMA connectors to 5 inch-pounds. See the [AP installation guide](#) for information on connecting the antenna to the correct ports.
7. Adjust the mounting bracket angles so the panel antenna is pointing in the desired direction.
Tighten the pivot screws to 50 -inch lbs.

Install AI-TH08055

Before You Begin

Mount the AP in the desired location.

About This Task



Figure 6: AI-TH08055 Antenna

The AI-TH08055 antenna is an indoor panel antenna that measures 250mm x 250mm x 25mm (9.84in x 9.84in. x 0.98in) and weighs 1.0 kg (2.2 lbs). It ships with a mounting bracket.

Procedure

1. Unpack the antenna from the shipping materials.
2. Assemble the mounting bracket. The pivot screws should be only finger-tight.
3. Mount the mounting bracket to the wall or pole.
Tighten the non-pivot mounting hardware to 45 inch-lbs and tighten the pole cable strap screw so they are tight and cannot be moved on the pole.
4. Mount the mounting bracket to the wall or pole.
5. Assemble the antenna to the mounting bracket.
Tighten the fasteners to 45-inch lbs.
6. Attach the 6 cables to the AP for the specified frequencies.
Tighten the RP-SMA connectors to 5 inch-pounds. See the [AP installation guide](#) for information on connecting the antenna to the correct ports.
7. Adjust the mounting bracket angles so the panel antenna is pointing in the desired direction.
Tighten the pivot screws to 50 -inch lbs.

Install AI-TH06120

Before You Begin

Mount the AP in the desired location.

About This Task



Figure 7: AI-TH06120 Antenna

The AI-TH06120 antenna is a vertical panel antenna. It measures 250 mm x 250 mm x 25 mm (9.84 inches x 9.84 inches x .98 inches) and weighs 1.05 kg (2.31 lbs). It ships with a mounting bracket.

Procedure

1. Unpack the antenna from the shipping materials.
2. Assemble the mounting bracket. The pivot screws should be only finger-tight.
3. Mount the mounting bracket to the wall or pole.
Tighten the non-pivot mounting hardware to 45 inch-lbs and tighten the pole cable strap screw so they are tight and cannot be moved on the pole.
4. Assemble the antenna to the mounting bracket.
Tighten the nuts to 45 inch-lbs.
5. Attach the 6 cables to the AP for the specified frequencies.
Tighten the RP-SMA connectors to 5 inch-pounds. See the [AP installation guide](#) for information on connecting the antenna to the correct ports.
6. Adjust the mounting bracket angles so the panel antenna is pointing in the desired direction.
Tighten the pivot screws to 50 -inch lbs.

Install AIO-DQ15021-RPSMA

About This Task

The AIO-DQ15021-RPSMA is a panel antenna. It measures 373.3 x 411.4 mm (14.7 x 16.2 inches) and weighs 1.05 kg (2.31 lbs). It ships with a mounting bracket.

Procedure

1. Unpack the antenna from the shipping materials.
2. Assemble the mounting bracket. The pivot screws should be only finger-tight.

3. Mount the mounting bracket to the wall or pole.
Tighten the non-pivot mounting hardware to 45 inch-lbs and tighten the pole cable strap screw so they are tight and cannot be moved on the pole.
4. Assemble the antenna to the mounting bracket.
Tighten the nuts to 45 inch-lbs.
5. Attach the 4 cables to the AP for the specified frequencies.
Tighten the RP-SMA connectors to 5 inch-pounds. See the [AP installation guide](#) for information on connecting the antenna to the correct ports.
6. Adjust the mounting bracket angles so the panel antenna is pointing in the desired direction.
Tighten the pivot screws to 50 -inch lbs.

Install AIO-DD05120-RPSMA

About This Task

The AIO-DD05120-RPSMA is a panel antenna. It measures 200 x 200 x 33 mm (7.9" x 7.9" x 1.25") and weighs 25.91 grams (0.057 lbs). It ships with a mounting bracket.

Procedure

1. Unpack the antenna from the shipping materials.
2. Assemble the mounting bracket. The pivot screws should be only finger-tight.
3. Mount the mounting bracket to the wall or pole.
Tighten the non-pivot mounting hardware to 45 inch-lbs and tighten the pole cable strap screw so they are tight and cannot be moved on the pole.
4. Assemble the antenna to the mounting bracket.
Tighten the nuts to 45 inch-lbs.
5. Attach the 2 cables to the AP for the specified frequencies.
Tighten the RP-SMA connectors to 5 inch-pounds. See the [AP installation guide](#) for information on connecting the antenna to the correct ports.
6. Adjust the mounting bracket angles so the panel antenna is pointing in the desired direction.
Tighten the pivot screws to 50 -inch lbs.

Install AIO-DD75060-RPSMA

About This Task

The AIO-DD75060-RPSMA is a panel antenna. It measures 200 x 200 x 33 mm (7.9 in. x 7.9 in. x 1.25 in.) and weighs 25.91 grams (0.057 lbs). It ships with a mounting bracket.

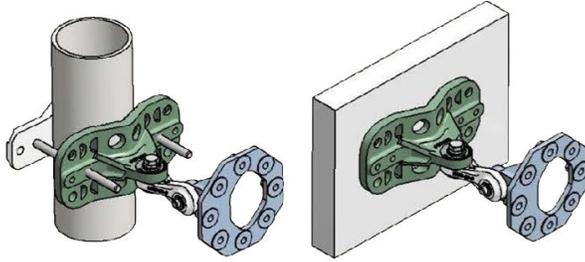


Figure 8: MNT-22 Mount

Procedure

1. Unpack the antenna from the shipping materials.
2. Assemble the mounting bracket. The pivot screws should be only finger-tight.
3. Mount the mounting bracket to the wall or pole.
Tighten the non-pivot mounting hardware to 45 inch-lbs and tighten the pole cable strap screw so they are tight and cannot be moved on the pole.
4. Assemble the antenna to the mounting bracket.
Tighten the nuts to 45 inch-lbs.
5. Attach the 2 cables to the AP for the specified frequencies.
Tighten the RP-SMA connectors to 5 inch-pounds. See the [AP installation guide](#) for information on connecting the antenna to the correct ports.
6. Adjust the mounting bracket angles so the panel antenna is pointing in the desired direction.
Tighten the pivot screws to 50 -inch lbs.

Install 30702 (WS-AI-DQ05120)

Before You Begin

Mount the AP in the desired location.

About This Task

The 30702 (WS-AI-DQ05120) is an indoor panel antenna. It measures 200 mm × 200 mm × 34 mm and weighs 1.00 lb (0.45 kg).

The 30702 only mounts to a wall.

Procedure

1. Unpack the antenna from the shipping materials.
2. Using the 30702 (WS-AI-DQ05120) antenna holes as a template, mark and drill four, 5 × 35 mm holes on a wall.
3. Insert four plastic wall insert plugs into the mounting holes.
4. Place a flat washer on every antenna mounting hole template, and insert the self tapping screw through the flat washer.
5. Insert the self tapping screws into the plastic wall insert plugs, and tighten the screws.

- Attach the 4 cables to the AP for the specified frequencies. Tighten the RP-SMA connectors to 5 inch-pounds. See the [AP installation guide](#) for information on connecting the antenna to the correct ports.

Install ML-2452-SEC6M4-036 on a Wall

Before You Begin

Mount the AP in the desired location.

About This Task

The ML-2452-SEC6M4-036 is a indoor panel antenna. It measures 200 mm × 200 mm × 34 mm and weighs 1.00 lb (0.45 kg).

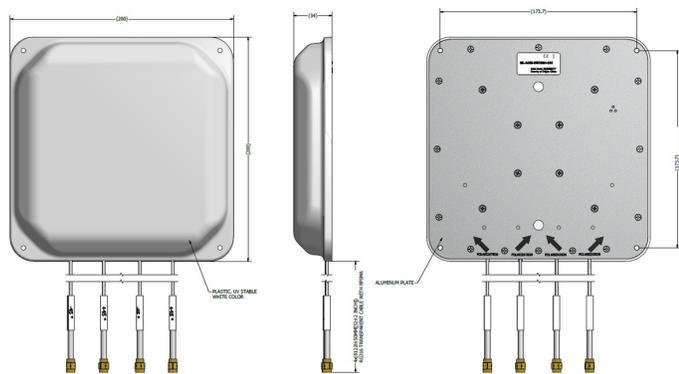


Figure 9: ML-2452-SEC6M4-036 Antenna

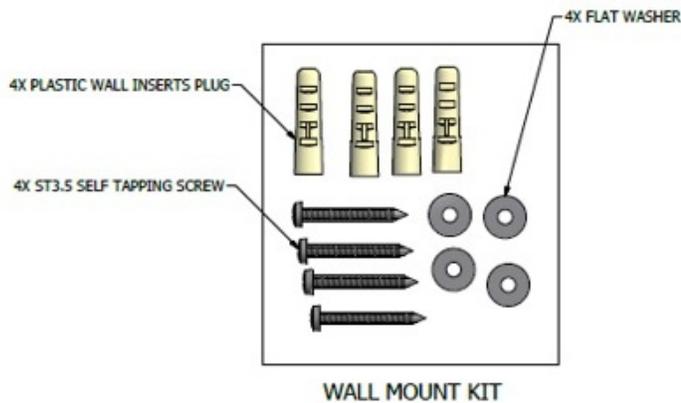


Figure 10: ML-2452-SEC6M4-036 Mount Kits

Procedure

- Unpack the antenna from the shipping materials.
- Using the ML-2452-SEC6M4-036 antenna holes as a template, mark and drill four, 5 × 35 mm holes on a wall.
- Insert four plastic wall insert plugs into the mounting holes.
- Place a flat washer on every antenna mounting hole template, and insert the self tapping screw through the flat washer.

5. Insert the self tapping screws into the plastic wall insert plugs, and tighten the screws.
6. Attach the 4 cables to the AP for the specified frequencies. Tighten the RP-SMA connectors to 5 inch-pounds. See the [AP installation guide](#) for information on connecting the antenna to the correct ports.

Install ML-2452-SEC6M4-036 on a Pole

About This Task

The ML-2452-SEC6M4-036 is a indoor panel antenna. It measures 200 mm × 200 mm × 34 mm and weighs 1.00 lb (0.45 kg).

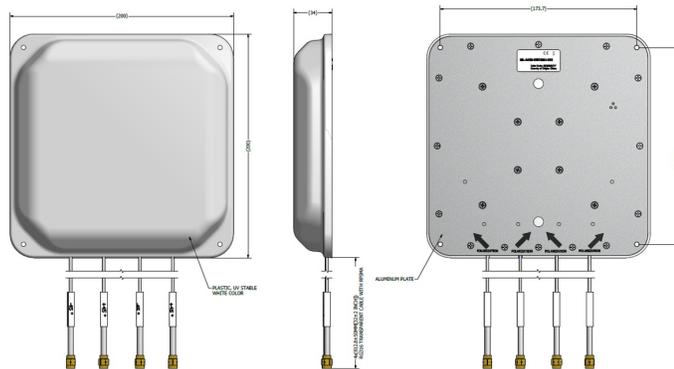


Figure 11: ML-2452-SEC6M4-036 Antenna

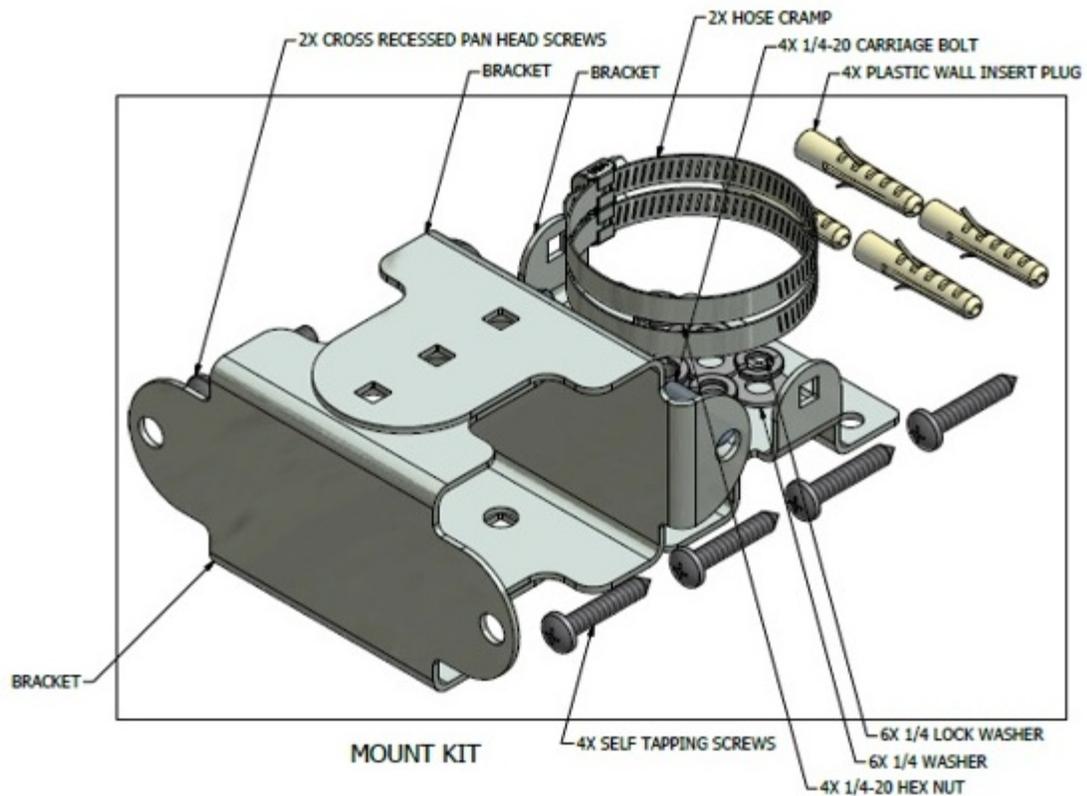


Figure 12: Pole Mount Kit

Procedure

1. Unpack the antenna from the shipping materials.
2. Assemble the pole mounting bracket sections to each other per the included instructions. The screws only need to be finger tight at this step.
3. Thread the hose clamps through the pole mounting section of the included bracket.
4. Use the hose clamps to attach the pole mounting section to the pole. Tighten the hose clamp screws to 15 - 20 inch lbs.
5. Using the two pan head screws attach the antenna to the bracket. Tighten those two screws to 25 inch-lbs.
6. Mount the AP in a location the cables can reach.
7. Attach the RP-SMA connectors from the cables to the appropriate connectors on the AP. Tighten the connectors to 5 inch-lbs. See the [AP installation guide](#) for information on connecting the antenna to the correct ports.
8. Adjust the antenna for the optimum Rx/Tx signals and then torque the bracket screws to 45 inch-lbs.
9. Attach the 4 cables to the AP for the specified frequencies. Tighten the RP-SMA connectors to 5 inch-lbs.

Install AIO-HQ17020

Before You Begin

Mount the AP in the desired location.

About This Task



AIO-HQ17020 is a dual polarized panel antenna. It measures 290mm x 185mm x 50 mm (11.41 inches x 7.28 inches x 1.96 inches). It ships with a mounting bracket.

Procedure

1. Unpack the antenna from the shipping materials.
2. Assemble the mounting bracket.
The pivot screws should be only finger-tight.
3. Mount the mounting bracket to the wall or pole.
Tighten the non-pivot mounting hardware to 45 inch-lbs and tighten the pole cable strap screw so they are tight and cannot be moved on the pole.
4. Assemble the antenna to the mounting bracket using 4 nuts.
Tighten the nuts to 45 inch-lbs.
5. Attach the 4 cables to the AP for the specified frequencies.
Tighten the RP-SMA connectors to 5 inch-pounds. See the [AP installation guide](#) for information on connecting the antenna to the correct ports.
6. The AIO-HQ17020 is considered an indoor antenna. If the antenna is deployed outdoor, [weatherize the RP-SMA connectors](#).
7. Adjust the mounting bracket angles so the panel antenna is pointing in the desired direction.
Tighten the pivot screws to 50 -inch lbs.

Install AIO-HQ17020-N

Before You Begin

Mount the AP in the desired location.

About This Task



AIO-HQ17020-N is a dual polarized panel antenna. It measures 290mm x 185mm x 50 mm (11.41 inches x 7.28 inches x 1.96 inches). It ships with a mounting bracket.

Procedure

1. Unpack the antenna from the shipping materials.
2. Assemble the mounting bracket.
The pivot screws should be only finger-tight.
3. Mount the mounting bracket to the wall or pole.
Tighten the non-pivot mounting hardware to 45 inch-lbs and tighten the pole cable strap screw so they are tight and cannot be moved on the pole.
4. Assemble the antenna to the mounting bracket using 4 nuts.
Tighten the nuts to 45 inch-lbs.
5. Attach the 4 cables to the AP for the specified frequencies.
Tighten the N connectors to 20 inch-pounds. See the [AP installation guide](#) for information on connecting the antenna to the correct ports.
6. Adjust the mounting bracket angles so the panel antenna is pointing in the desired direction.
Tighten the pivot screws to 50 -inch lbs.

Install AIO-TS06360-N

Before You Begin

Mount the AP in the desired location.

About This Task



Figure 13: AIO-TS06360-N

AIO-TS06360-N is an Omni-directional antenna. It measures 20 mm x 350 mm (0.78 inches x 13.77 inches) and weighs 0.14kg (0.309 lbs).

Procedure

1. Unpack the antenna from the shipping materials.
2. Attach the antenna to the appropriate "N" connectors.
Tighten the connectors to 20 inch-pounds. See the [AP installation guide](#) for information on connecting the antenna to the correct ports.

Install AIO-TQ08055-N

Before You Begin

Mount the AP in the desired location.

About This Task



Figure 14: AIO-TQ08055-N Antenna

AIO-TQ08055-N is a dual polarized panel antenna. It measures 250 mm x 250 mm x 25 mm (9.84 inches x 9.84 inches x .98 inches). It ships with a mounting bracket.

Procedure

1. Unpack the antenna from the shipping materials.
2. Assemble the mounting bracket.
The pivot screws should be only finger-tight.
3. Mount the mounting bracket to the wall or pole.
Tighten the non-pivot mounting hardware to 45 inch-lbs and tighten the pole cable strap screw so they are tight and cannot be moved on the pole.
4. Assemble the antenna to the mounting bracket using 4 nuts.
Tighten the nuts to 45 inch-lbs.
5. Attach the 4 cables to the AP for the specified frequencies.
Tighten the N connectors to 20 inch-pounds. See the [AP installation guide](#) for information on connecting the antenna to the correct ports.
6. Adjust the mounting bracket angles so the panel antenna is pointing in the desired direction.
Tighten the pivot screws to 50 -inch lbs.

Install AIO-TQ06120-N

Before You Begin

Mount the AP in the desired location.

About This Task



Figure 15: AIO-TQ06120-N Antenna

The AIO-TQ06120-N antenna is a vertical panel antenna. It measures 250 mm x 250 mm x 25 mm (9.84 inches x 9.84 inches x .98 inches) and weighs 0.8 kg (1.76 lbs). It ships with a mounting bracket.

Procedure

1. Unpack the antenna from the shipping materials.
2. Assemble the mounting bracket.
The pivot screws should be only finger-tight.

3. Mount the mounting bracket to the wall or pole.
Tighten the non-pivot mounting hardware to 45 inch-lbs and tighten the pole cable strap screw so they are tight and cannot be moved on the pole.
4. Assemble the antenna to the mounting bracket using 4 nuts.
Tighten the nuts to 45 inch-lbs.
5. Attach the 4 cables to the AP for the specified frequencies.
Tighten the RP-SMA connectors to 5 inch-pounds. See the [AP installation guide](#) for information on connecting the antenna to the correct ports.
6. Adjust the mounting bracket angles so the panel antenna is pointing in the desired direction.
Tighten the pivot screws to 50 -inch lbs.

Install AIO-TQ14035-N

Before You Begin

Mount the AP in the desired location.

About This Task



Figure 16: AIO-TQ14035-N Antenna

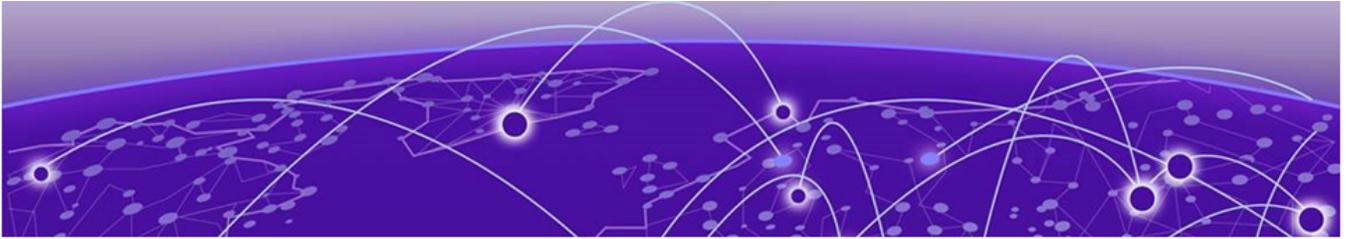
The AIO-TQ14035-N antenna is a dual polarized panel antenna. It measures 305 mm x 305 mm x 25 mm (12.00 inches x 12.00 inches x 0.98 inches) and weighs 2.3 kg (5.07 lbs). It ships with a mounting bracket.

Procedure

1. Unpack the antenna from the shipping materials.
2. Assemble the mounting bracket.
The pivot screws should be only finger-tight.
3. Mount the mounting bracket to the wall or pole.
Tighten the non-pivot mounting hardware to 45 inch-lbs and tighten the pole cable strap screw so they are tight and cannot be moved on the pole.
4. Assemble the antenna to the mounting bracket using 4 nuts.
Tighten the nuts to 45 inch-lbs.
5. Attach the 4 cables to the AP for the specified frequencies.
Tighten the N connectors to 20 inch-pounds. See the [AP installation guide](#) for information on connecting the antenna to the correct ports.

6. Adjust the mounting bracket angles so the panel antenna is pointing in the desired direction.

Tighten the pivot screws to 50 -inch lbs.



Post Installation

[Weatherproof the Antenna Connections](#) on page 37

[Drip Loop for Antenna Cables](#) on page 38

Use the information in the following sections to complete your installation.

Weatherproof the Antenna Connections

About This Task

The following guidelines apply to outdoor deployments.

Extreme Networks recommends that all RP-SMA connections between the AP and antennas are weatherproofed using the following weatherproof kits (not supplied):

- Wireless Weatherproofing Kits:
 - 3M (WK-100)
 - Scotch (WK-101)
 - Each weatherproofing kit includes $\frac{3}{4}$ -inch vinyl tape, 2-inch mastic tape, and 2-inch wide vinyl tape.

Follow the guidelines to ensure proper installation:

- The weatherproofing tape must be wound tightly over the connectors.
- Ensure that no areas around the edges are exposed.



Note

Installation instructions are provided with each weatherproofing kit.

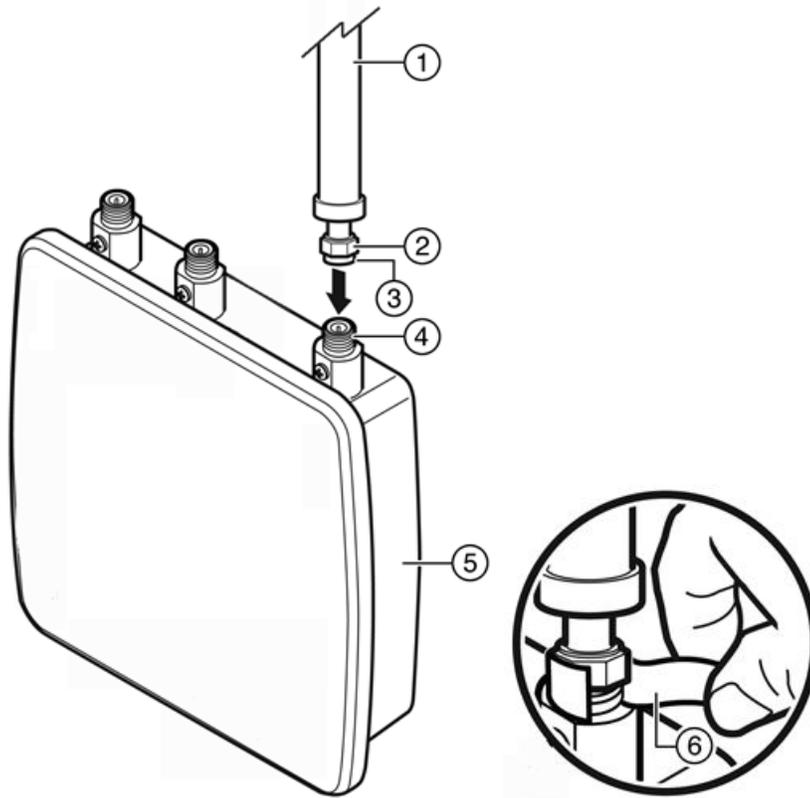


Figure 17: Weatherproofing the Antenna

1	Antenna	4	Type-N jack
2	Nut	5	AP
3	Standard polarity Type-N plug	6	Sealing tape (recommended, but not supplied)

Procedure

1. Secure the antenna in place by tightening the single nut.
2. Follow the manufacturer's instructions provided in the kit to seal the connection between the Type-N jack and the Type-N plug.

Drip Loop for Antenna Cables

When the cables have been connected to the AP and the connections have been weatherproofed, gather each cable below the AP, and form a drip loop as shown in the figure below. The drip loop prevents water from entering the AP by channeling water down and away from the connection points.

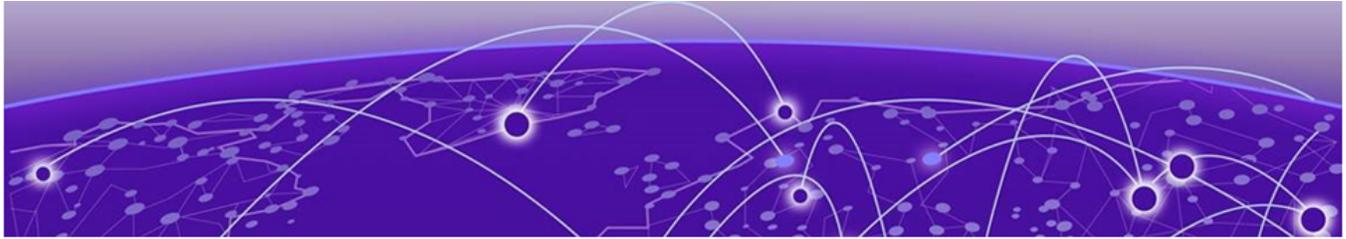


Note

Drip loops are required to ensure proper operation of the AP.



Figure 18: Drip Loop



Glossary

The following section lists common terms used in this guide. Use it to help clarify your understanding.

Cable loss (dB)

The signal strength loss introduced by the cable connected to the antenna expressed on the decibel logarithmic scale.

Dipole

A dipole antenna is a tubular antenna that can be either a pipe shape, a straight flexible rod or a paddle. This antenna has an omni-directional pattern when placed in a vertical position.

Dipole Array

Essentially a dipole, a dipole array is two or more dipoles that are placed one on top of the other, requiring a longer tube to hold them. The advantage of a dipole array is that it has higher gain.

Directional

Signal radiates in a specific direction, typically described as a beam of given width, expressed in degrees in the horizontal and vertical plane.

Elevation Beamwidth

Height of the antenna beam on the vertical plane expressed in degrees.

Frequency

The frequency band within which the antenna performs at the stated specifications.

Gain (dBi)

The relative amplification of the antenna with respect to an equivalent isotropic antenna, expressed on the decibel logarithmic scale.

Net gain (dBi)

The resulting amplification of the antenna paired with its cable.

Omni-Directional

Signal radiates from the antenna in all directions on the horizontal plane.

Panel Antenna

A panel antenna is a flat antenna mounted to a wall or other vertical surface and radiates RF energy (radio waves) directionally away from the wall. They usually have

gain greater than 5 dBi and are not suitable for omni-directional situations. Ideally suited for long hallways.

Polarization

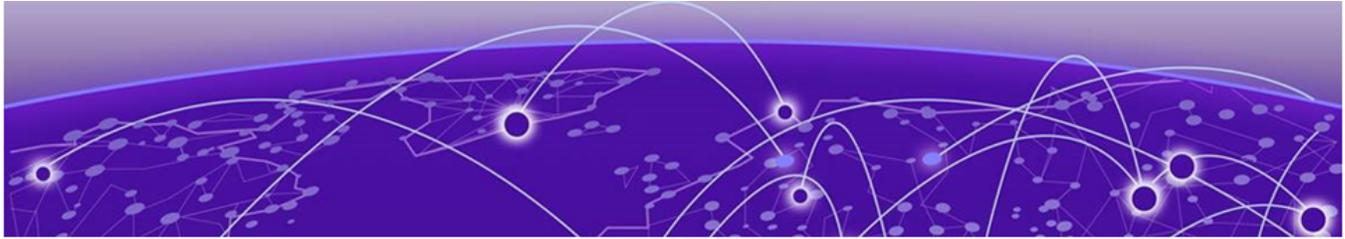
The orientation of the electrical field which the antenna is optimized to receive. If the transmitting and receiving antennas are both linear polarized, then turning one 90° so that they are cross polarized will reduce the range significantly.

Polarized Panel

A polarized panel antenna is a multi-port panel antenna with different linear polarization alignments on the different ports. Common polarization alignment orientations are Vertical/Horizontal and Vertical/ 45°-Slant. Polarized panel antennas are useful on outdoor Line-of-Sight links, and are also used in indoor deployments for improved coverage uniformity at the expense of slightly reduced range.

VSWR

Voltage Standing Wave Ratio (VSWR) is the ratio of maximum voltage to minimum voltage along the line. Expresses the degree of match between the transmission line and the terminating element (antenna). When VSWR is 1:1 the match is perfect, a VSWR of 1.5:1 corresponds to 96% power efficiency.



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