



# Cisco Aironet 2.4-GHz Diversity Omnidirectional Antenna (AIR-ANT24020V-R)

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This document outlines the specifications for the Cisco Aironet 2.4-GHz Diversity Omnidirectional Antenna (AIR-ANT24020V-R) and provides instructions for mounting it. The antenna operates in the 2.4-GHz frequency range and is designed for indoor use only. The antenna replaces the existing Cisco Aironet antenna model 5959.

The following information is provided in this document.

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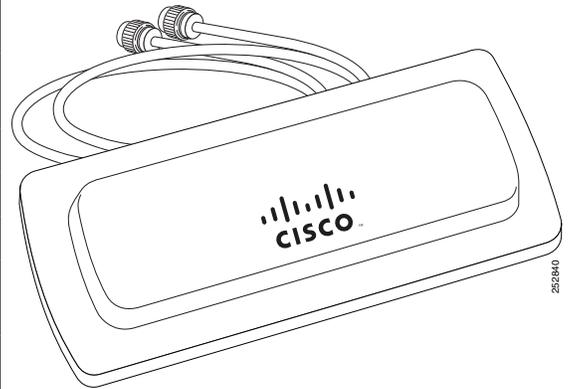
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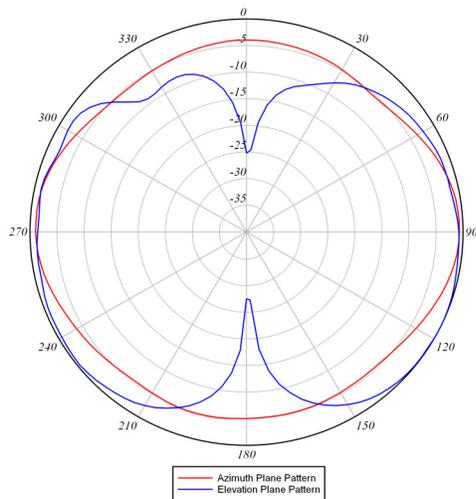
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# Technical Specifications

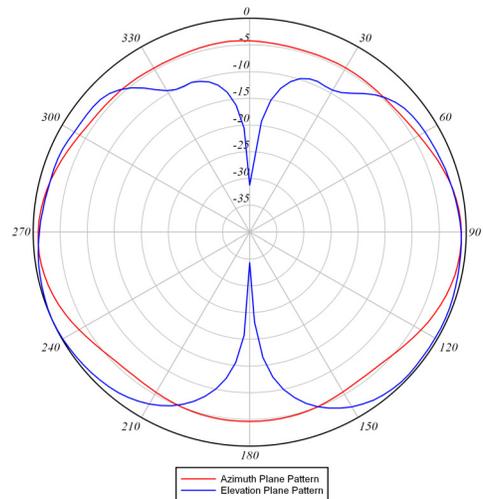
Antenna type	Diversity omnidirectional
Operating frequency range	2400–2500 MHz
VSWR	1.5:1
Peak gain	2.2 dBi
Polarization	Linear
Azimuth plane (3 dB beamwidth)	Ominidirectional
Elevation plane (3 dB beamwidth)	97°
Length	6.9 in (17.5 cm)
Width	3 in (7.6 cm)
Depth	<1 in (< 2.5 cm)
Cable	3 ft. (91.4 cm) plenum rated, UV stable
Connector	RP-TNC
Environment	Indoor
Temperature range	32° F to 131° F (0° C to 55° C)



**Radiation Patterns – Antenna #1**



**Radiation Patterns – Antenna #2**



# System Requirements

This antenna is designed for indoor with any 2.4-GHz Cisco Aironet radio device that uses a RP-TNC connector.

## Safety Precautions

Follow these safety instructions when installing your antenna.

- Plan your installation procedure carefully and completely before you begin.
- If you are installing an antenna for the first time, for your own safety as well as others, seek professional assistance. Consult your dealer, who can explain which mounting method to use for the location where you intend to install the antenna.
- Select your installation site with safety, as well as performance, in mind. Remember that electric power cables and telephone lines look alike. For your safety, assume that any line is an electric power line until determined otherwise.
- Call your local power company or building maintenance organization if you are unsure about cables close to your mounting location.
- When installing your antenna, **do not** use a metal ladder. **Do** dress properly: shoes with rubber soles and heels, rubber gloves, and a long sleeved shirt or jacket.
- If an accident or emergency occurs with the power lines, call for qualified emergency help immediately.

## Installation Notes

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

- 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 density of the materials used in a building's construction 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 walls constructed of drywall or wood without degrading signal strength.
  - Signals will likely reflect off a thick metal wall and may not penetrate it at all.
  - Signals will likely reflect off a chain link fence or wire mesh spaced between 1 and 1 1/2 in. (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.
- Install the antenna horizontally to maximize signal propagation.

## Choosing a Mounting Location

The antenna should be mounted clear of any obstructions to the sides of the radiating element. If possible, find a mounting place directly above your wireless device so that the lead-in cable can be as short as possible.

## Installing the Antenna

You can install the antenna on the following dropped ceiling systems:

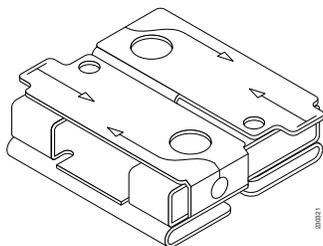
- Standard or recessed T-rail—15/16 in. (23.8 mm) or 9/16 in. (14.3 mm)
- Channel type T-rail—1/4 in (6.3 mm) or 1/2 in (12.7 mm)

The antenna ships with the necessary hardware to install it on a standard dropped ceiling already installed. To install the antenna on any other type of dropped ceiling listed above, you will need to use the mounting hardware contained in the supplied mounting hardware kit.

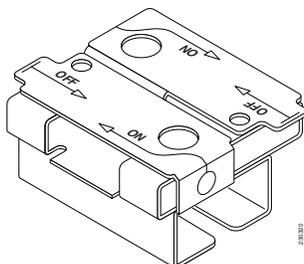
## Mounting Hardware Kit Contents

The antenna ships with a hardware mounting kit containing the following items:

- Two recessed ceiling T-rail spacers



- Two channel ceiling rail adapters



- Two 4x40 Phillips head machine screws

## Making Connections to the Access Point

The antenna has two antenna connectors, one for each antenna element. Refer to the user documentation for the access point to which you are connecting the antenna for specific connection instructions.

## Tools and Equipment Required

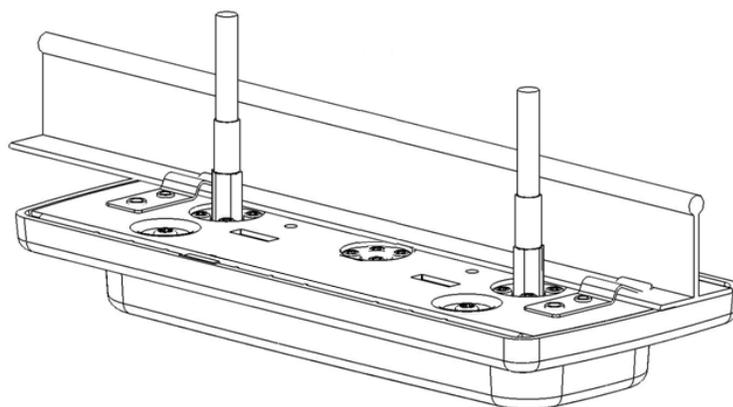
To install your antenna, you need the following tools and equipment, which are not supplied.

- A pencil
- A small standard screwdriver
- A cutting tool suitable for cutting and trimming dropped ceiling tiles
- Masking tape

## Installing the Antenna on a Standard Dropped Ceiling T-Rail

The antenna is shipped ready to install on a standard dropped ceiling T-rail. No adapters or spacers are necessary. [Figure 1](#) shows the antenna installed on a standard dropped ceiling T-rail.

**Figure 1**      **Antenna Installed on a Standard Dropped Ceiling T-Rail**



Follow these steps to install the antenna on a standard dropped ceiling T-rail.

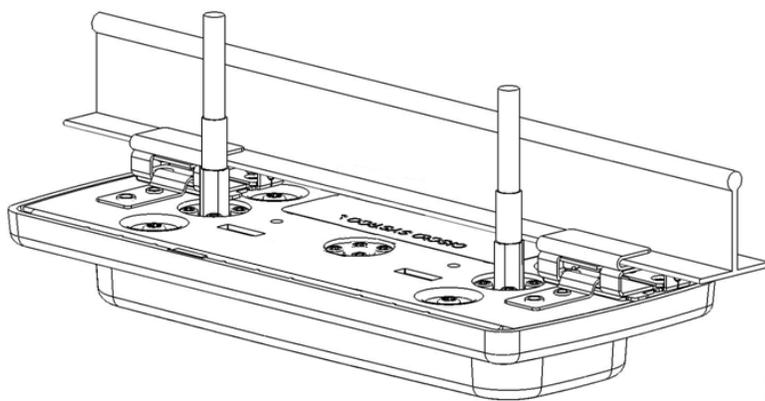
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- Step 1** Identify the location where you intend to install the antenna.
  - Step 2** Looking at the T-rail, raise ceiling tile on the left side of the T-rail.
  - Step 3** Position the clips on the antenna on the T-rail.
  - Step 4** Gently slide the antenna over the T-rail until it is secure.
  - Step 5** Connect the antenna cable to the access point or extender cables.
  - Step 6** Lower the ceiling tile onto the T-rail. The antenna cables will prevent you from lowering it completely.
  - Step 7** Mark the places on the ceiling tile where they are obstructed by the antenna cables.

- Step 8** Cut notches in the ceiling tile to eliminate the obstruction. You should then be able to lower the ceiling tile onto the T-rail.

## Installing the Antenna on a Recessed Dropped Ceiling T-Rail

To install the antenna on a recessed dropped ceiling requires using the two recessed ceiling spacers included in the mounting kit. These spacers attach to the recessed ceiling T-rail and must be disassembled before you can attach them. [Figure 2](#) shows the antenna installed on a recessed ceiling T-rail using the supplied recessed T-rail spacers.

**Figure 2** *Antenna Installed on a Recessed Dropped Ceiling T-Rail*



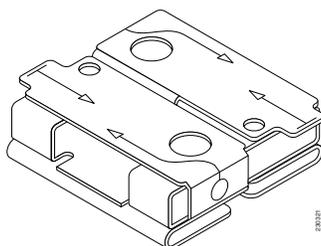
Follow these steps to install the antenna on a recessed dropped ceiling T-rail.

- Step 1** Identify the location where you intend to install the antenna.
- Step 2** Use a pencil to make an index mark at the locations on the T-rail where you will install the dropped ceiling spacers.

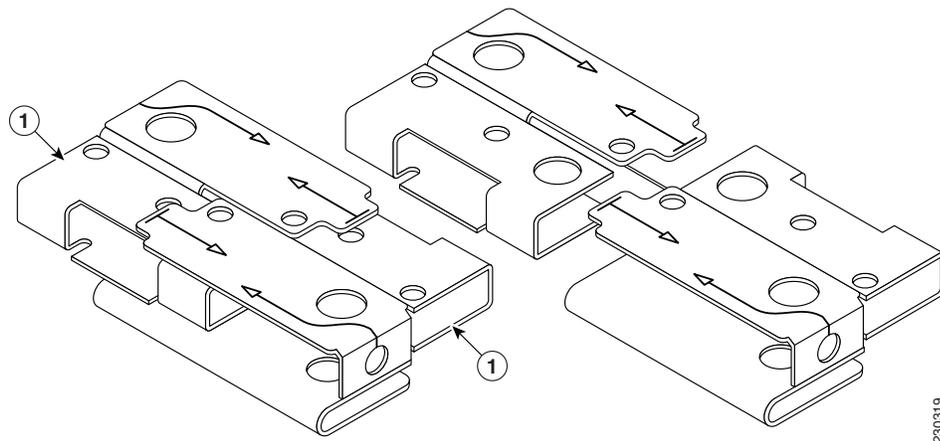


**Note** These marks indicate the center points of the spacers and must be 5 7/16 in. (13.81 cm) apart.

- Step 3** In the mounting kit, locate two recessed dropped ceiling spacers.



- Step 4** Disassemble the spacers by pushing on its tabs (1) using your thumb and forefinger.

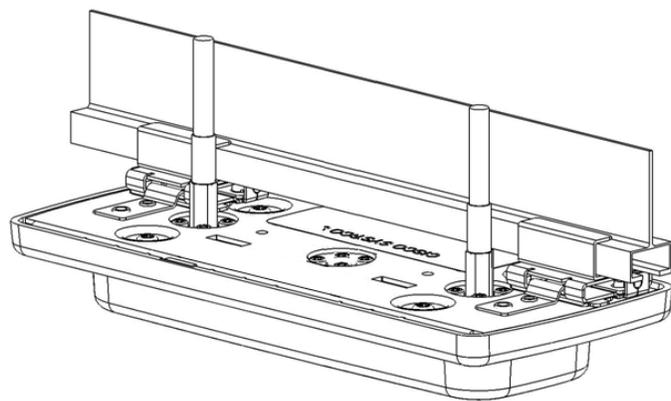


- Step 5** Raise the ceiling tile off the T-rail and position both pieces of the spacer on the T-rail (callout 1), one part on one side and the other on the opposite side. Make sure the ON arrows on the spacer parts point towards each other as shown above. The OFF arrows will point away from each other.
- Step 6** Position the spacers so that each one is centered over the index marks you made in Step 2.
- Step 7** Use a small standard screwdriver to tighten the two set screws on the spacers and secure the spacers to the T-rail. Do not overtighten the set screws.
- Step 8** Connect the antenna cable to the access point or extender cables.
- Step 9** Lower the ceiling tile onto the T-rail. Depending on the width of the T-rail, you may have to squeeze the tile to make it fit onto the T-rail.

## Installing the Antenna on a Channel Ceiling T-Rail

To install the antenna on a recessed dropped ceiling requires using the two channel ceiling adapters included in the mounting kit. These adapters attach to the channel ceiling T-rail and must be disassembled before you can attach them. [Figure 3](#) shows the antenna installed on a channel ceiling T-rail using the supplied channel T-rail spacers.

**Figure 3** Antenna Installed on a Channel Ceiling T-Rail



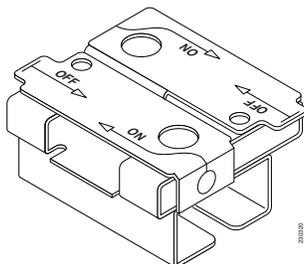
Follow these steps to install the antenna on a channel ceiling T-rail.

- Step 1** Identify the location where you intend to install the antenna.
- Step 2** Use a pencil to make an index mark at the locations on the T-rail where you will install the channel T-rail adapters.

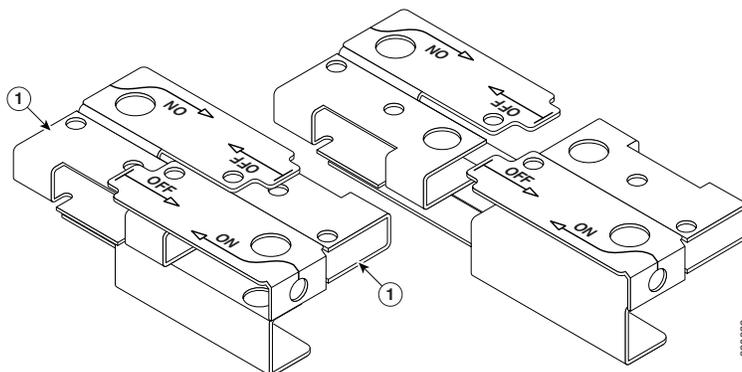


**Note** These marks indicate the center points of the adapters and must be 5 7/16 in. (13.81 cm) apart.

- Step 3** In the mounting kit, locate two recessed channel ceiling adapters.



- Step 4** Disassemble each adapter by pushing on its tabs using your thumb and forefinger.



- Step 5** Raise the ceiling tile off the channel T-rail and position both pieces of the adapter on the T-rail (callout 1), one part on one side and the other on the opposite side. Make sure the ON arrows on the adapter parts are pointing towards each other as shown above. The OFF arrows will point away from each other.
- Step 6** Position the adapters so that each one is centered over the index marks you made in Step 2.
- Step 7** Use a small standard screwdriver to tighten the two set screws on the adapters and secure them to the channel T-rail. Do not overtighten the set screws.
- Step 8** Connect the antenna cable to the access point or extender cables.
- Step 9** Lower the ceiling tile onto the T-rail.

## Suggested Cable

Cisco recommends a high-quality, low-loss cable for use with the antenna.

**Note**

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Coaxial cable loses efficiency as the frequency increases, resulting in signal loss. The cable should be kept as short as possible because cable length also determines the amount of signal loss (the longer the run, the greater the loss).

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## Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

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