



Cisco Catalyst 9136 Series Access Point Hardware Installation Guide

First Published: 2022-02-15

Last Modified: 2023-07-04

Americas Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
<http://www.cisco.com>
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 527-0883

THE SPECIFICATIONS AND INFORMATION REGARDING THE PRODUCTS IN THIS MANUAL ARE SUBJECT TO CHANGE WITHOUT NOTICE. ALL STATEMENTS, INFORMATION, AND RECOMMENDATIONS IN THIS MANUAL ARE BELIEVED TO BE ACCURATE BUT ARE PRESENTED WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. USERS MUST TAKE FULL RESPONSIBILITY FOR THEIR APPLICATION OF ANY PRODUCTS.

THE SOFTWARE LICENSE AND LIMITED WARRANTY FOR THE ACCOMPANYING PRODUCT ARE SET FORTH IN THE INFORMATION PACKET THAT SHIPPED WITH THE PRODUCT AND ARE INCORPORATED HEREIN BY THIS REFERENCE. IF YOU ARE UNABLE TO LOCATE THE SOFTWARE LICENSE OR LIMITED WARRANTY, CONTACT YOUR CISCO REPRESENTATIVE FOR A COPY.

The following information is for FCC compliance of Class A devices: 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 users will be required to correct the interference at their own expense.

The following information is for FCC compliance of Class B devices: 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 the equipment causes interference to radio or television reception, which can be determined by turning the equipment off and on, users are encouraged to try to correct the interference by using one or more of the following measures:

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

Modifications to this product not authorized by Cisco could void the FCC approval and negate your authority to operate the product.

The Cisco implementation of TCP header compression is an adaptation of a program developed by the University of California, Berkeley (UCB) as part of UCB's public domain version of the UNIX operating system. All rights reserved. Copyright © 1981, Regents of the University of California.

NOTWITHSTANDING ANY OTHER WARRANTY HEREIN, ALL DOCUMENT FILES AND SOFTWARE OF THESE SUPPLIERS ARE PROVIDED "AS IS" WITH ALL FAULTS. CISCO AND THE ABOVE-NAMED SUPPLIERS DISCLAIM ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING, WITHOUT LIMITATION, THOSE OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT OR ARISING FROM A COURSE OF DEALING, USAGE, OR TRADE PRACTICE.

IN NO EVENT SHALL CISCO OR ITS SUPPLIERS BE LIABLE FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES, INCLUDING, WITHOUT LIMITATION, LOST PROFITS OR LOSS OR DAMAGE TO DATA ARISING OUT OF THE USE OR INABILITY TO USE THIS MANUAL, EVEN IF CISCO OR ITS SUPPLIERS HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

Any Internet Protocol (IP) addresses and phone numbers used in this document are not intended to be actual addresses and phone numbers. Any examples, command display output, network topology diagrams, and other figures included in the document are shown for illustrative purposes only. Any use of actual IP addresses or phone numbers in illustrative content is unintentional and coincidental.

All printed copies and duplicate soft copies of this document are considered uncontrolled. See the current online version for the latest version.

Cisco has more than 200 offices worldwide. Addresses and phone numbers are listed on the Cisco website at www.cisco.com/go/offices.

Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to this URL: <https://www.cisco.com/c/en/us/about/legal/trademarks.html>. Third-party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1721R)

© 2022–2023 Cisco Systems, Inc. All rights reserved.



CONTENTS

PREFACE

Preface **vii**

- [About this Guide **vii**](#)
- [Conventions **vii**](#)
- [Related Documentation **viii**](#)
- [Communications, Services, and Additional Information **viii**](#)
- [Cisco Bug Search Tool **viii**](#)
- [Documentation Feedback **viii**](#)

CHAPTER 1

About Cisco Catalyst 9136 Series Access Points **1**

- [Introduction to Cisco Catalyst 9136 Series Access Points **1**](#)
- [Cisco Catalyst 9136 Series Access Points Features **1**](#)
- [AP Model Numbers and Regulatory Domains **3**](#)
- [Antennas and Radios **3**](#)
 - [Internal Antennas **4**](#)
 - [Operating Frequency and Maximum Output Power **4**](#)

CHAPTER 2

Hardware Features **5**

- [Access Point Views, Ports, and Connectors **5**](#)
 - [Connectors and Ports on the AP **5**](#)
 - [C9136I \(Internal Antenna\) Radiation Patterns **7**](#)

CHAPTER 3

Unpacking Your Access Point **13**

- [Package Contents **13**](#)
- [Unpacking the Access Point **13**](#)
- [Cisco Orderable Accessories **13**](#)

CHAPTER 4**Installation Overview 15**

- Performing a Preinstallation Configuration (Optional) 15
- Preinstallation Checks and Installation Guidelines 17
- Mounting the Access Point 18
- Powering the Access Point 19
- Redundant Power over Ethernet 20

CHAPTER 5**Configuring and Deploying the Access Point 21**

- The Controller Discovery Process 21
- Deploying the Access Point on the Wireless Network 22
- Checking the Access Point LEDs 22

CHAPTER 6**Troubleshooting 25**

- Using the Mode Button 25
- Troubleshooting the Access Point to Cisco Controller Join Process 26
- Important Information for Controller-Based Deployments 27
- Configuring DHCP Option 43 27

CHAPTER 7**Safety Guidelines and Warnings 29**

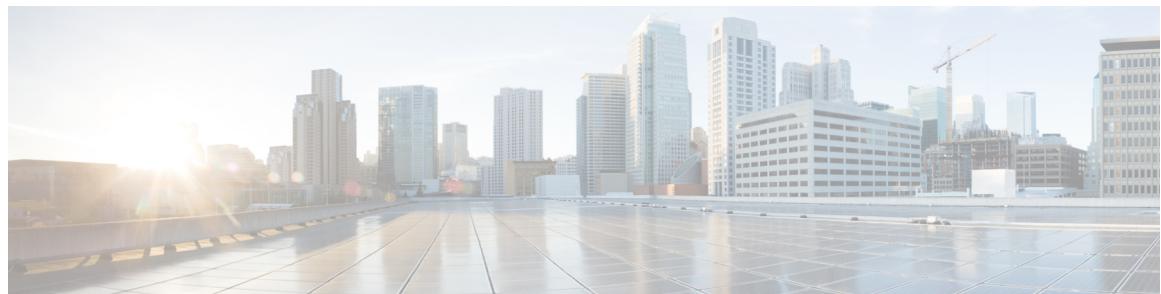
- Safety Instructions 29

CHAPTER 8**Declarations of Conformity and Regulatory Information 31**

- Manufacturers Federal Communication Commission Declaration of Conformity Statement 31
- VCCI Statement for Japan 32
 - Guidelines for Operating Cisco Catalyst Access Points in Japan 33
- Canadian Compliance Statement 34
- United Kingdom Compliance Statement 37
- European Community, Switzerland, Norway, Iceland, and Liechtenstein Compliance 37
- Administrative Rules for Cisco Catalyst Access Points in Taiwan 37
- Operation of Cisco Catalyst Access Points in Brazil 38
- Declaration of Conformity for RF Exposure 39
 - Generic Discussion on RF Exposure 39

This Device Meets International Guidelines for Exposure to Radio Waves	39
This Device Meets FCC Guidelines for Exposure to Radio Waves	39
This Device Meets the Industry Canada Guidelines for Exposure to Radio Waves	40
Additional Information on RF Exposure	41
Declaration of Conformity Statements	42

APPENDIX A**Transmit Power and Receive Sensitivity Values** 43



Preface

This preface describes this guide and provides information about the conventions used in this guide, and related documentation.

It includes the following sections:

- [About this Guide, on page vii](#)
- [Conventions, on page vii](#)
- [Related Documentation, on page viii](#)
- [Communications, Services, and Additional Information, on page viii](#)

About this Guide

This guide provides instructions on how to install your Cisco Catalyst 9136 Series Access Points and provides links to resources that can help you configure it. This guide also provides mounting instructions and troubleshooting information.

Note that the Cisco Catalyst 9136 Series Access Points is referred to as access point or AP in this document.

Conventions

This document uses the following conventions for notes, cautions, and safety warnings. Notes and cautions contain important information that you should know.



Note Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the manual.



Caution Means *reader be careful*. Cautions contain information about something you might do that could result in equipment damage or loss of data.



Warning Safety warnings appear throughout this guide in procedures that, if performed incorrectly, can cause physical injuries. A warning symbol precedes each warning statement.

Related Documentation

All user documentation for the Cisco Catalyst 9136 Series Access Points is available at:

<https://www.cisco.com/c/en/us/support/wireless/catalyst-9136-series-access-points/series.html>

For detailed information and guidelines about configuring and deploying your access point in a wireless network, see the following documentation:

[Cisco 9800 Wireless Controller Configuration Guide](#)

Communications, Services, and Additional Information

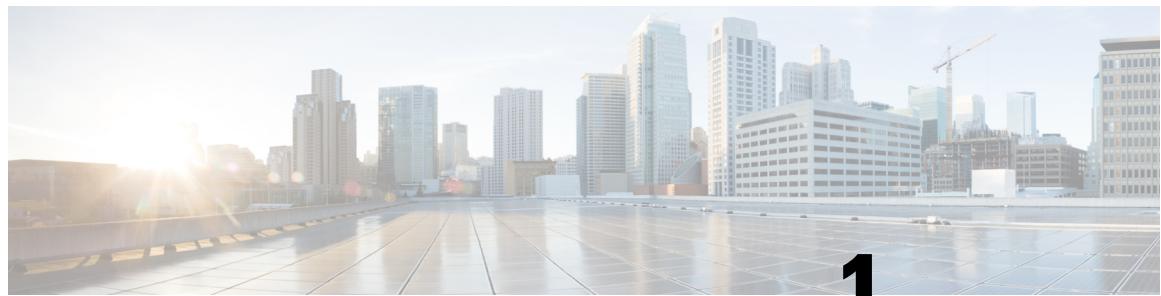
- To receive timely, relevant information from Cisco, sign up at [Cisco Profile Manager](#).
- To get the business impact you’re looking for with the technologies that matter, visit [Cisco Services](#).
- To submit a service request, visit [Cisco Support](#).
- To discover and browse secure, validated enterprise-class apps, products, solutions, and services, visit [Cisco DevNet](#).
- To obtain general networking, training, and certification titles, visit [Cisco Press](#).
- To find warranty information for a specific product or product family, access [Cisco Warranty Finder](#).

Cisco Bug Search Tool

[Cisco Bug Search Tool](#) (BST) is a gateway to the Cisco bug-tracking system, which maintains a comprehensive list of defects and vulnerabilities in Cisco products and software. The BST provides you with detailed defect information about your products and software.

Documentation Feedback

To provide feedback about Cisco technical documentation, use the feedback form available in the right pane of every online document.



CHAPTER 1

About Cisco Catalyst 9136 Series Access Points

- [Introduction to Cisco Catalyst 9136 Series Access Points, on page 1](#)
- [Cisco Catalyst 9136 Series Access Points Features, on page 1](#)
- [AP Model Numbers and Regulatory Domains, on page 3](#)
- [Antennas and Radios, on page 3](#)

Introduction to Cisco Catalyst 9136 Series Access Points

The Cisco Catalyst 9136 series wireless access point is a tri-band (2.4 GHz, 5 GHz, 6 GHz), enterprise 802.11ax (Wi-Fi 6) AP. The AP has one model with integrated antennas and is designed to use the 2.4-GHz, 5-GHz, and 6-GHz bands. This AP supports a greater overall Cisco High Density Experience (HDX), which provides a more predictable performance for advanced applications such as 4K or 8K videos, high-density and high-definition collaboration applications, all-wireless offices, and Internet of Things (IoT). The AP supports full interoperability with leading 802.11ax and 802.11ac clients, along with mixed deployment with other APs and controllers. These APs provide integrated security, resiliency, and operational flexibility as well as increased network intelligence.

A full listing of the AP's features and specifications is provided in the Cisco Catalyst 9136I Series Access Point Data Sheet, at:

<https://www.cisco.com/c/en/us/products/collateral/wireless/catalyst-9100ax-access-points/nb-06-cat9136-access-point-ds-cte-en.html>

Cisco Catalyst 9136 Series Access Points Features

The C9136I AP is an enterprise-grade wireless access point designed to work with a Cisco wireless controller. The AP includes the following hardware and supporting features:

- Five radios:
 - A 4x4:4 6-GHz radio
 - A 8x8:8 5-GHz radio
 - A 4x4:4 2.4-GHz radio
 - A tri-band scanning radio
 - A 2.4-GHz IoT (802.15.4) radio



Note The Bluetooth Low Energy (BLE) uses the Omni IoT radio.

- Integrated internal antennas that are omni directional in azimuth for 2.4-GHz, 5-GHz, and 6-GHz bands.
- Scanning radio utilizes two 2.4-GHz, 5-GHz, and 6-GHz antennas.
- Multiuser Multiple-Input Multiple-Output (MU-MIMO) technology for uplink and downlink.
- Orthogonal Frequency Division Multiple Access-based (OFDMA-based) scheduling for both uplink and downlink.
- Multigigabit Ethernet (mGig)
- The following hardware external interfaces:
 - 2x100/1000/2500/5000 Multigigabit Ethernet (RJ-45)



Note We recommend that you use the wired0 port in a single uplink port setup, and use the wired1 port only in a LAG setup. If wired1 is used as a single uplink port, then the AP will boot and get an IP address; however, it will not forward CAPWAP packets to discover a controller.

- RS-232 Console Interface through RJ-45
- Recovery push button (enables partial or full system configuration recovery)
- USB 2.0 port
- One multicolor LED
- Integrated Bluetooth Low Energy (BLE) radio to enable IoT use cases such as location tracking and wayfinding.
- Intelligent Capture probes the network, and provides Cisco DNA Center with deep analysis.
- Spatial Reuse (also known as Basic Service Set [BSS] coloring) that allows APs and their clients to differentiate between multiple BSS, thus permitting simultaneous transmissions.
- Power savings mode called Target Wake Time (TWT), which allows a client to stay asleep and wake up only at prescheduled (target) times to exchange data with the AP. This provides significant energy savings for battery-operated devices.
- Cisco Digital Network Architecture Center (DNA Center) support to enable Cisco DNA Spaces, Apple FastLane, and Cisco Identity Services Engine.
- Optimized AP Roaming to ensure that client devices associate with the AP in the coverage range that offers the fastest data rate available.
- Cisco CleanAir technology enhanced with 160-MHz channel support. CleanAir delivers proactive, high-speed spectrum intelligence across 20, 40, 80, and 160-MHz-wide channels to combat performance problems arising from wireless interference.

The AP supports lightweight deployments (using Cisco Wireless Controllers). The AP also supports the following operating modes:

- **Local mode:** This is the default mode for the AP. In this mode, the AP serves clients. The AP creates two CAPWAP tunnels to the controller, one for management and the other for data traffic. This is known as central switching because the data traffic is switched (bridged) from the AP to the controller where it is then routed.
- **FlexConnect mode:** In FlexConnect mode the data traffic is switched locally and is not sent to the controller. In this mode, the AP behaves like an autonomous AP, but is managed by the controller. Here, the AP can continue to function even if connection to the controller is lost.
- **Site Survey or Monitor mode:** In this mode, specified Cisco APs exclude themselves from handling data traffic between clients and the infrastructure. These APs act as dedicated sensors for location-based services (LBS), rogue AP detection, and intrusion detection system (IDS). When APs are in monitor mode, they actively monitor the airwaves and typically, do not serve clients.
- **Sniffer mode:** In this mode, the AP starts sniffing the air on a given channel. It captures and forwards all the packets from the clients on that channel to a remote machine that runs AiroPeek NX or Wireshark (packet analyzers for IEEE 802.11 wireless LANs). This includes information on time stamp, signal strength, packet size, and so on.


Note

In the sniffer mode, the server to which the data is sent should be on the same VLAN as the wireless controller management VLAN. Otherwise, an error is displayed.

AP Model Numbers and Regulatory Domains

AP Type	Model Number	Details
Access Point for indoor environments, with internal antennas	C9136I-x	Tri-band, controller-based 802.11ax

Verify whether the AP model you have is approved for use in your country. To verify approval and to identify the regulatory domain that corresponds to a particular country, see <https://www.cisco.com/c/dam/assets/prod/wireless/wireless-compliance-tool/index.html>. Not all regulatory domains have been approved. As and when they are approved, this compliance list is updated.


Note

The *x* in the model numbers represents the regulatory domain.

Antennas and Radios

The C9136I series access point configuration is:

- C9136I-x

Internal Antennas

The Cisco Catalyst 9136 AP (C9136I-x) has the following list of internal antennas:

- Four internal dual-band antennas with a dedicated 2.4-GHz radio and a 5-GHz radio
- Four internal single-band antennas with a dedicated 5-GHz radio
- Four internal single-band antennas with a dedicated 6-GHz radio
- One internal single-band antenna with a dedicated 2.4-GHz IoT radio
- One dual-band antenna with a dedicated 2.4-GHz radio and a 5-GHz Aux radio
- Two tri-band antennas with a dedicated 2.4-GHz, 5-GHz, and 6-GHz Aux radio

Operating Frequency and Maximum Output Power

Table 1: Cisco Catalyst 9136I AP Values for European Union (CE) Region

Radio	Frequency Bands	Maximum Total EIRP Level (dBm)
Wi-Fi	2400–2483.5 MHz	20
	5150–5350 MHz	23
	5470–5725 MHz	30
	5725–5850 MHz	23
	5945–6425 MHz	23
Bluetooth Low Energy (BLE)	2400–2483.5 MHz	20

Table 2: Cisco Catalyst 9136I AP Values for United Kingdom Region

Radio	Frequency Bands	Maximum Total EIRP Level (dBm)
Wi-Fi	2400–2483.5 MHz	20
	5150–5350 MHz	23
	5470–5725 MHz	30
	5725–5850 MHz	23
	5925–6425 MHz	24
Bluetooth Low Energy (BLE)	2400–2483.5 MHz	20



CHAPTER 2

Hardware Features

This chapter describes the hardware features of Cisco Catalyst 9136 Series Access Points and contains the following sections:

- [Access Point Views, Ports, and Connectors, on page 5](#)
- [C9136I \(Internal Antenna\) Radiation Patterns, on page 7](#)

Access Point Views, Ports, and Connectors

The AP has multiple options that you can use to power the AP. For information about connectors and ports for the AP models, see [Connectors and Ports on the AP, on page 5](#).

Environment Sensors

The AP has inbuilt environment sensors that work with Cisco DNA Spaces. There are two visible vents at the top of the AP. The sensors measure the following environment parameters:

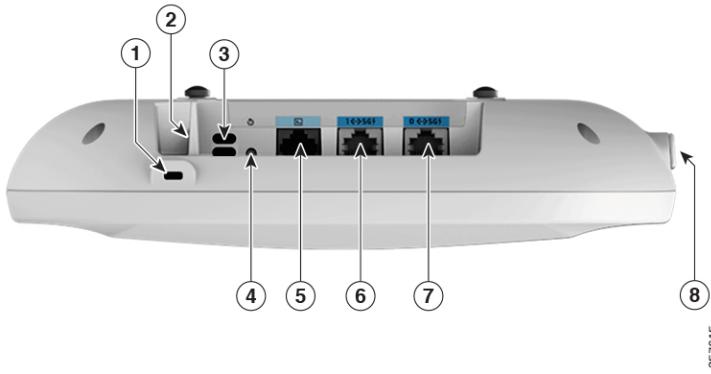
- Ambient air temperature
- Air quality (Total Volatile Organic Compounds [TVOC])
- Humidity

Connectors and Ports on the AP

The following figures show the available ports on the AP:

C9136I Face View*Figure 1: C9136I Face View*

1	Status LED
2	Location of the ports and connectors on the head of the AP.
3	USB 2.0 port

C9136I Top View*Figure 2: C9136I Top View with Connectors and Ports*

1	Kensington lock slot	5	RJ-45 console port
2	Security hasp for padlocking AP to the mounting bracket	6	5-GbE port 1
3	Environment Sensor vents	7	5-GbE port 0

4	Mode button For information about how to use the Mode button, see Using the Mode Button, on page 25	8	USB 2.0 port
---	--	---	--------------

**Note**

We recommend that you use the wired0 port in a single uplink port setup, and use the wired1 port only in a LAG setup. If wired1 is used as a single uplink port, then the AP will boot and get an IP address; however, it will not forward CAPWAP packets to discover a controller.

C9136I (Internal Antenna) Radiation Patterns

The following illustrations show the C9136I model with internal antenna radiation patterns:

Figure 3: C9136I - Dual-Band Antenna Radiation Pattern (2.4-GHz Azimuth)

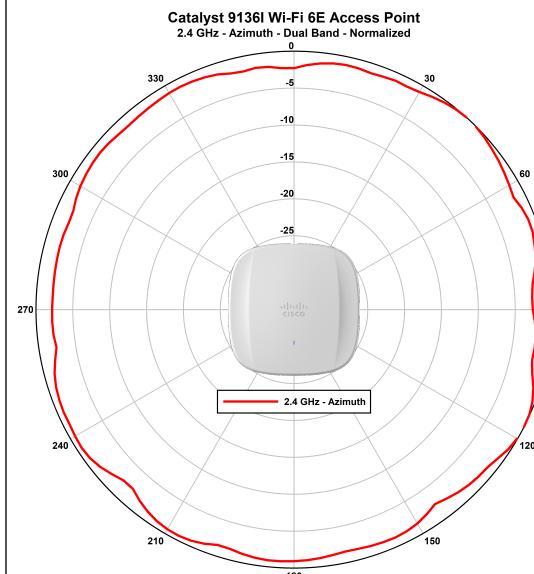
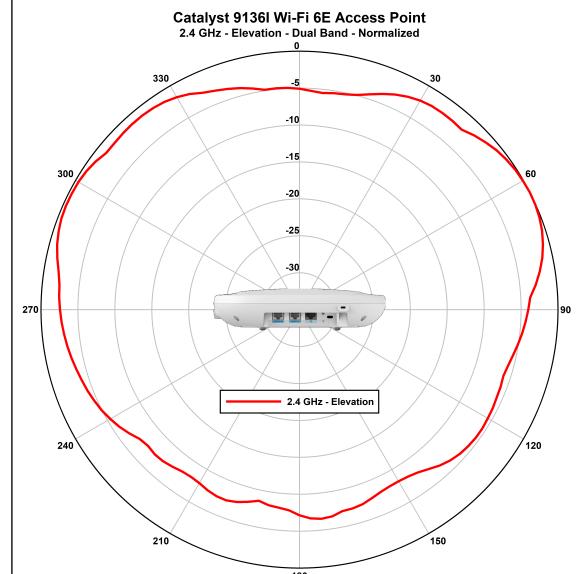
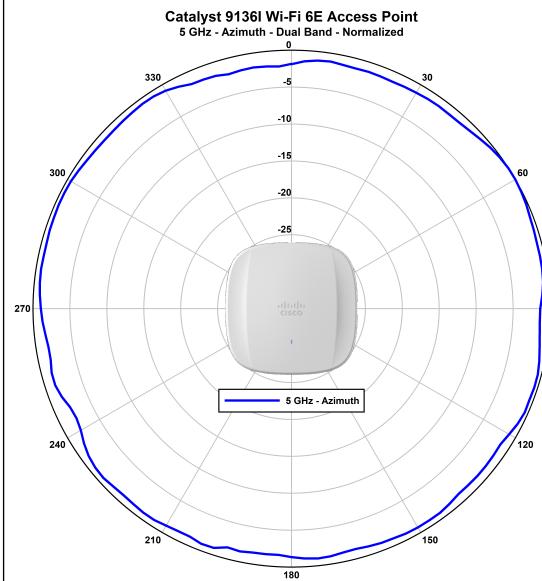
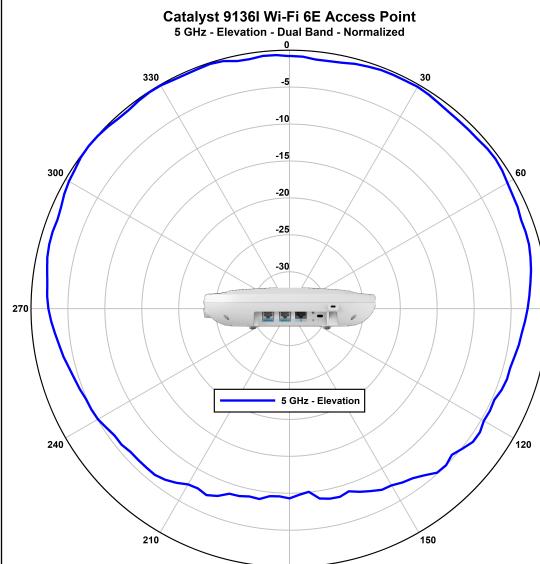
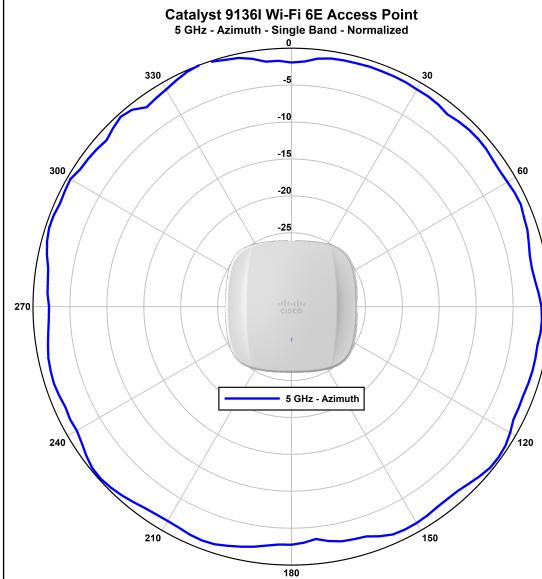


Figure 4: C9136I - Dual-Band Antenna Radiation Pattern (2.4-GHz Elevation)



C9136I (Internal Antenna) Radiation Patterns

Figure 5: C9136I - Dual-Band Antenna Radiation Pattern (5-GHz Azimuth)**Figure 6: C9136I - Dual-Band Antenna Radiation Pattern (5-GHz Elevation)****Figure 7: C9136I - Single-Band Antenna Radiation Pattern (5-GHz Azimuth)****Figure 8: C9136I - Single-Band Antenna Radiation Pattern (5-GHz Elevation)**