Cisco Aironet Access Point Module for 802.11ac

Cisco Aironet® Access Point Module for 802.11ac

- Flexible add-on third radio module for the Cisco Aironet 3600i or Cisco Aironet 3600e Series Access Points
- Self-contained 5-GHz radio
- Sleek design with internal antennas

Next-Generation Wi-Fi Connectivity

- IEEE 802.11ac Draft 5 Very High Throughput (VHT)
- Maximum date rate of 1.3 Gbps, with 802.11ac Wave 1 draft specification:
  - Channel widths expanded to 80 MHz
  - Enhanced 256 Quadrature Amplitude Modulation (QAM)
  - Three spatial streams
- Explicit Compressed Beamforming (ECBF) support will improve battery life and optimize the up and downlink performance for mobile devices that supporting this feature

Investment Protection with Modular Architecture Design

- Field upgrade existing 3600 Series access points
- 802.11ac Module appears as a second 5-GHz radio - in slot 2 of a 3600 Series
- Draws its power directly from the 3600 Series access point

Troubleshooting Forensics for Faster Interference Resolution and Proactive Action

- Historic interference information for back-in-time analysis and faster problem solving
- 24/7 monitoring with remote access reduces travel and speeds resolution
- Cisco® Spectrum Expert Connect provides real-time, raw spectrum data to help with difficult-to-diagnose interference problems
- The Air Quality Index in Cisco CleanAir® technology provides a snapshot of network performance and the impact of interference
- Classify over 20 different types of interference, including non-Wi-Fi interference within 5 to 30 seconds
- Automatic remedial action and less manual intervention

Secure Interoperability

- Controller-based deployment only

Taking advantage of the flexible, modular design of the Cisco Aironet® 3600 Series Access Point, the Cisco® 802.11ac Module delivers the industry's first enterprise-class implementation of next-generation Wi-Fi connectivity, as defined by the IEEE 802.11ac Wave 1 draft specification.

Delivering up to three times the maximum data rate of today's high-end, enterprise 802.11n access points, the Wi-Fi Alliance™ (WFA) Certified 802.11ac Module provides enterprise networks with more reliability and superior performance by supporting up to three spatial-stream and 80-MHz-wide channels for a maximum data rate of 1.3 Gbps.

- 802.11ac with 3 x 3 multiple-input multiple-output (MIMO) technology, with three spatial streams, which sustains 1.3-Gbps rates over a greater range for more capacity and reliability than competing access points
- With the Dynamic Channel usage 802.11ac can utilize an 80-MHz-wide channel and dynamically contract in real-time based on network characteristics
- The module provides MIMO-equalization-optimized uplink performance and reliability by minimizing the impact of signal fade
- 256 Quadrature Amplitude Modulation (QAM) providing a 30 percent more efficient use of the wireless spectrum
- Cisco CleanAir® technology, providing proactive, high-speed spectrum intelligence to combat performance problems due to wireless interference

- Explicit Compressed Beamforming (ECBF) technology option to improve performance in both directions (when the 802.11ac device also supports ECBF) including one-, two-, and three-spatial-stream devices on 802.11ac while improving battery life on mobile devices such as smartphones and tablets

The innovative modular design allows any existing Cisco Aironet 3600 Series Access Points to be field-upgraded and immediately expand the available bandwidth for new 802.11ac devices while supporting all your traditional wireless devices on 802.11a/b/g/n.

This flexibility allows companies to grow their network bandwidth dynamically as it is needed, whether for pervasive coverage or spot coverage based on the high-bandwidth demands of their user base - for example, areas of high user congregation such as libraries, cafeterias, auditoriums. Companies have full control for how, where, and when to expand their wireless network.

Scalability

The Cisco Aironet 3600 Series is a component of the Cisco Unified Wireless Network, which can scale to up to 18,000 access points with full Layer 3 mobility across central or remote locations on the enterprise campus, in branch offices, and at remote sites. The Cisco Unified Wireless Network is the industry's most flexible, resilient, and scalable architecture, delivering secure access to mobility services and applications and offering the lowest total cost of ownership and investment protection by integrating seamlessly with the existing wired network.

Product Specifications

Table 1 lists the product specifications for Cisco Aironet 3600 Series Access Points.

Table 1.   Product Specifications for Cisco Aironet 3600 Series Access Points

Item	Specification				
Part Numbers	**The Cisco Aironet 3600 Series 802.11ac Module** • AIR-RM3000AC-x-K9=: 802.11ac Module • AIR-RM3000MACxK910=: 802.11ac Module, 10 Pack **Cisco Wireless LAN Services** • AS-WLAN-CNSLT: Cisco Wireless LAN Network Planning and Design Service • AS-WLAN-CNSLT: Cisco Wireless LAN 802.11n Migration Service • AS-WLAN-CNSLT: Cisco Wireless LAN Performance and Security Assessment Service **Regulatory domains: X = Regulatory domain** Customers are responsible for verifying approval for use in their individual countries. To verify approval and to identify the regulatory domain that corresponds to a particular country, visit: http://www.cisco.com/go/aironet/compliance. Not all regulatory domains have been approved. As they are approved, the part numbers will be available on the Global Price List.				
	Cisco SMARTnet® Service for the Cisco Aironet Access Point 802.11ac Module Qty(10) CON-SNT-RM3000AC:SMARTnet 8x5xNBD 10 quantity eco-pack 802.11ac Module (5 GHz)				
	Individual SmartNet PIDs	**Individual 802.11ac Module PIDs**	**Eco Pack SmartNet PIDs**	**Eco Pack 802.11ac Module PIDs**	**Service Level**
	CON-SNT-AIRRM3CA	AIR-RM3000AC-A-K9=	CON-SNT-AIRRM3AA	AIR-RM3000ACAK910=	SNT
	CON-SNT-AIRRM3AC	AIR-RM3000AC-C-K9=	CON-SNT-AIRRM3A1	AIR-RM3000ACAK910=	SNT
	CON-SNT-AIRRM3EK	AIR-RM3000AC-E-K9=	CON-SNT-AIRRM3CE	AIR-RM3000ACAK910=	SNT
	CON-SNT-AIRRM3AK	AIR-RM3000AC-I-K9=	CON-SNT-AIRRM3A0	AIR-RM3000ACAK910=	SNT
	CON-SNT-AIRRM3KK	AIR-RM3000AC-K-K9=	CON-SNT-AIRRMCK9	AIR-RM3000ACAK910=	SNT
	CON-SNT-AIRRM3AN	AIR-RM3000AC-N-K9=	CON-SNT-AIRRMCNK	AIR-RM3000ACAK910=	SNT
	CON-SNT-AIRRM3QK	AIR-RM3000AC-Q-K9=	CON-SNT-AIRRM3CQ	AIR-RM3000ACAK910=	SNT
	CON-SNT-AIRRM3RK	AIR-RM3000AC-R-K9=	CON-SNT-AIRRM3AR	AIR-RM3000ACAK910=	SNT
	CON-SNT-AIRRM3AS	AIR-RM3000AC-S-K9=	CON-SNT-AIRRM3SK	AIR-RM3000ACAK910=	SNT

Item	Specification				
	CON-SNT-AIRRM3AT	AIR-RM3000AC-T-K9=	CON-SNT-AIRRM3A9	AIR-RM3000ACAK910=	SNT
	CON-SNT-AIRRM3ZK	AIR-RM3000AC-Z-K9=	CON-SNT-AIRRM3K9	AIR-RM3000ACAK910=	SNT
Software	Cisco Unified Wireless Network Software Release 7.5 or later				
Supported Wireless LAN Controllers	• Cisco 2500 Series Wireless Controllers, Cisco 2500 Series Virtual Wireless Controller, Cisco Wireless LAN Controller Module (WLCM) on Cisco Services-Ready Engine (SRE) for Cisco Integrated Services Router Generation 2 (ISR G2), Cisco Wireless Services Module 2 (WiSM2), Cisco 5500 Series Wireless Controller, Cisco Flex 7500 Series Cloud Controller, Cisco 8500 Series Wireless Controller				
802.11 Capabilities	• 3 x 3 multiple-input multiple-output (MIMO) with three spatial streams • Maximal ratio combining (MRC) • 802.11ac, 802.11n, and 802.11a/g beamforming • 20-, 40- and 80-MHz channels • PHY data rates up to 1.3 Gbps (80-MHz with three spatial streams) • Packet aggregation: A-MPDU (Tx/Rx), A-MSDU (Tx/Rx) • 802.11 dynamic frequency selection (DFS) • Cyclic shift diversity (CSD) support				

Data Rates Supported	802.11a: 6, 9, 12, 18, 24, 36, 48, and 54 Mbps			
	802.11n data rates (2.4 GHz and 5 GHz):			

MCS Index[1]	GI[2] = 800ns		GI = 400ns	
	20-MHz Rate (Mbps)	40-MHz Rate (Mbps)	20-MHz Rate (Mbps)	40-MHz Rate (Mbps)
0	6.5	13.5	7.2	15
1	13	27	14.4	30
2	19.5	40.5	21.7	45
3	26	54	28.9	60
4	39	81	43.3	90
5	52	108	57.8	120
6	58.5	121.5	65	135
7	65	135	72.2	150
8	13	27	14.4	30
9	26	54	28.9	60
10	39	81	43.3	90
11	52	108	57.8	120
12	78	162	86.7	180
13	104	216	115.6	240
14	117	243	130	270
15	130	270	144.4	300
16	19.5	40.5	21.7	45
17	39	81	43.3	90
18	58.5	121.5	65	135
19	78	162	86.7	180
20	117	243	130	270
21	156	324	173.3	360
22	175.5	364.5	195	405
23	195	405	216.7	450

[1] MCS Index: The Modulation and Coding Scheme (MCS) index determines the number of spatial streams, the modulation, the coding rate, and data rate values.
[2] GI: A guard interval (GI) between symbols helps receivers overcome the effects of multipath delays.

Item	Specification							
	802.11ac data rates (5 GHz):							
	MCS Index[3]	**Spatial Streams**	**GI[4] = 800ns**			**GI = 400ns**		
			20-MHz Rate (Mbps)	**40-MHz Rate (Mbps)**	**80-MHz Rate (Mbps)**	**20-MHz Rate (Mbps)**	**40-MHz Rate (Mbps)**	**80-MHz Rate (Mbps)**
	0	1	6.5	13.5	29.3	7.2	15	32.5
	1	1	13	27	58.5	14.4	30	65
	2	1	19.5	40.5	87.8	21.7	45	97.5
	3	1	26	54	117	28.9	60	130
	4	1	39	81	175.5	43.3	90	195
	5	1	52	108	234	57.8	120	260
	6	1	58.5	121.5	263.3	65	135	292.5
	7	1	65	135	292.5	72.2	150	325
	8	1	78	162	351	86.7	180	390
	9	1	NA	180	390	NA	200	433.3
	0	2	13	27	58.5	14.4	30	65
	1	2	26	54	117	28.9	60	130
	2	2	39	81	175.5	43.3	90	195
	3	2	52	108	234	57.8	120	260
	4	2	78	162	351	86.7	180	390
	5	2	104	216	468	115.6	240	520
	6	2	117	243	526.5	130	270	585
	7	2	130	270	585	144.4	300	650
	8	2	156	324	702	173.3	360	780
	9	2	78	780	780	NA	400	866.7
	0	3	19.5	40.5	87.8	21.7	45	97.5
	1	3	39	81	175.5	43.3	90	195
	2	3	58.5	121.5	263.3	65	135	292.5
	3	3	78	162	351	86.7	180	390
	4	3	117	243	526.5	130	270	585
	5	3	156	324	702	173.3	360	780
	6	3	175.5	364.5	NA	195	405	NA
	7	3	195	405	877.5	216.7	450	975
	8	3	234	486	1053	260	540	1170
	9	3	260	540	1170	288.9	600	1300

[3] MCS Index: The Modulation and Coding Scheme (MCS) index determines the number of spatial streams, the modulation, the coding rate, and data rate values.
[4] GI: A guard interval (GI) between symbols helps receivers overcome the effects of multipath delays.

Item	Specification	
Frequency Band and 20-MHz Operating Channels	**A (America - FCC)** • 5180 to 5320 MHz: 8 Channels • 5500 to 5700 MHz: 8 Channels (excludes 5600 to 5640 MHz) • 5745 to 5825 MHz: 5 Channels **C (China)** • 5745 to 5825 MHz: 5 Channels **E (ETSI)** • 5180 to 5320 MHz: 8 Channels • 5500 to 5700 MHz: 8 Channels (excludes 5600 to 5640 MHz) **I (Israel)** • 5180 to 5320 MHz: 8 Channels **K (Korea)** • 5180 to 5320 MHz: 8 Channels • 5500 to 5620 MHz: 7 Channels • 5745 to 5805 MHz: 4 Channels **N (India & Non FCC)** • 5180 to 5320 MHz: 8 Channels • 5745 to 5825 MHz: 5 Channels	**Q (Japan)** • 5180 to 5320 MHz: 8 Channels • 5500 to 5700 MHz: 11 Channels **R (Russia)** • 5180 to 5320 MHz: 8 Channels • 5660 to 5700 MHz: 3 Channels • 5745 to 5805 MHz: 4 Channels **S (Singapore)** • 5180 to 5320 MHz: 8 Channels • 5500 to 5700 MHz: 11 Channels • 5745 to 5825 MHz: 5 Channels **T (Taiwan)** • 5280 to 5320 MHz: 3 Channels • 5500 to 5700 MHz: 8 Channels (excludes 5600 to 5640 MHz) • 5745 to 5825 MHz: 5 Channels **Z (New Zealand)** • 5180 to 5320 MHz: 8 Channels • 5500 to 5700 MHz: 8 Channels (excludes 5600 to 5640 MHz) • 5745 to 5825 MHz: 5 Channels
Note: Customers are responsible for verifying approval for use in their individual countries. To verify approval and to identify the regulatory domain that corresponds to a particular country, visit: http://www.cisco.com/go/aironet/compliance.		
Maximum Number of Nonoverlapping Channels	**5 GHz** 802.11a • 20 MHz BW: 24 Channels 802.11n • 20 MHz: 24 Channels • 40 MHz: 11 Channels 802.11ac • 20 MHz: 24 Channels • 40 MHz: 11 Channels • 80 MHz: 5 Channels	
Note: This varies by regulatory domain. Refer to the product documentation for specific details for each regulatory domain.		

Receive Sensitivity	**802.11a** -93 dBm @ 6 Mb/s -75 dBm @ 54 Mb/s	**802.11n (HT20)** -92 dBm @ MCS0 -71 dBm @ MCS7 -89 dBm @ MCS8 -70 dBm @ MCS15 -87 dBm @ MCS16 -70 dBm @ MCS23 **802.11n (HT40)** -89 dBm @ MCS0 -69 dBm @ MCS7 -85 dBm @ MCS8 -66 dBm @ MCS15 -88 dBm @ MCS16 -65 dBm @ MCS23	**802.11ac (VHT20)** -91 dBm @ Nss=1, MCS0 -67 dBm @ Nss=1, MCS8 -88 dBm @ Nss=2, MCS0 -64 dBm @ Nss=2, MCS8 -87 dBm @ Nss=3, MCS0 -63 dBm @ Nss=3, MCS8 **802.11ac (VHT40)** -89 dBm @ Nss=1, MCS0 -63 dBm @ Nss=1, MCS9 -85 dBm @ Nss=2, MCS0 -59 dBm @ Nss=2, MCS9 -84 dBm @ Nss=3, MCS0 -58 dBm @ Nss=3, MCS9 **802.11ac (VHT80)** -86 dBm @ Nss=1, MCS0 -60 dBm @ Nss=1, MCS9 -82 dBm @ Nss=2, MCS0 -56 dBm @ Nss=2, MCS9 -80 dBm @ Nss=3, MCS0 -55 dBm @ Nss=3, MCS9

Item	Specification		

Maximum Transmit Power	**5 GHz**
	• 802.11a
	  ◦ 22 dBm: 3 Antennas Enabled
	• 802.11n (HT20)
	  ◦ 22 dBm: 3 Antennas Enabled
	• 802.11n (HT40)
	  ◦ 22 dBm: 3 Antennas Enabled
	• 802.11ac (VHT20)
	  ◦ 22 dBm: 3 Antennas Enabled
	• 802.11ac (VHT40)
	  ◦ 22 dBm: 3 Antennas Enabled
	• 802.11ac (VHT80)
	• 22 dBm: 3 Antennas Enabled		

Note: The maximum power setting will vary by channel and according to individual country regulations. Refer to the product documentation for specific details.			
Available Transmit Power Settings	**5 GHz**		
	1 Antenna	**2 Antenna**	**3 Antenna**
	• 17 dBm • 14 dBm • 11 dBm • 8 dBm • 5 dBm	• 20 dBm • 17 dBm • 14 dBm • 11 dBm • 8 dBm	• 22 dBm • 19 dBm • 16 dBm • 13 dBm • 10 dBm
Note: The maximum power setting will vary by channel and according to individual country regulations. Refer to the product documentation for specific details.			
Integrated Antenna	• 5 GHz, Gain 5 dBi, internal omni, horizontal beamwidth 360°		
Dimensions (W x L x H)	• 8.46 x 2.5 x 1.97 in. (21.48 x 6.35 x 5 cm)		
Weight	• 1 lb (0.45 kg)		
Environmental	**Cisco Aironet 3600i with the 802.11ac module installed** • Nonoperating (storage) temperature: -22 to 158°F (-30 to 70°C) • Nonoperating (storage) Altitude Test -25˚C, 15,000 ft. • Operating temperature: 32 to 104°F (0 to 40°C) • Operating humidity: 10 to 90% percent (noncondensing) • Operating Altitude Test -40˚C, 9843 ft. **Cisco Aironet 3600e with the 802.11ac module installed** • Nonoperating (storage) temperature: -22 to 158°F (-30 to 70°C) • Nonoperating (storage) Altitude Test -25˚C, 15,000 ft. • Operating temperature: -4 to 118°F (-20 to 48°C) with module • Operating humidity: 10 to 90 percent (noncondensing) • Operating Altitude Test -40˚C, 9843 ft.		
Power Draw	• 3600i/3600e with the 802.11ac Module requires 18W		
Powering Options	3600 Series Access Point with the 802.11ac Module • Enhanced Power over Ethernet (PoE): up to 20 W configurable on an Ethernet port basis • 802.3at PoE+: 25.5W delivered to the access ppoint • Cisco 3600 Series Power Injectors (AIR-PWRINJ4=) • Cisco 3600 Series Local Power Supply (AIR-PWR-B=)		
Warranty	Limited Lifetime Hardware Warranty		

Item	Specification
Compliance Standards	- UL 60950-1 - CAN/CSA-C22.2 No. 60950-1 - UL 2043 - IEC 60950-1 - EN 60950-1 - EN 50155 - Radio approvals: - FCC Part 15.247, 15.407 - RSS-210 (Canada) - EN 300.328, EN 301.893 (Europe) - ARIB-STD 66 (Japan) - ARIB-STD T71 (Japan) - EMI and susceptibility (Class B) - FCC Part 15.107 and 15.109 - ICES-003 (Canada) - VCCI (Japan) - EN 301.489-1 and -17 (Europe) - EN 60601-1-2 EMC requirements for the Medical Directive 93/42/EEC - IEEE Standard: - IEEE 802.11a/b/g, IEEE 802.11n, IEEE 802.11h, IEEE 802.11d - IEEE 802.11ac Draft 5 - Security: 802.11i, Wi-Fi Protected Access 2 (WPA2), WPA 802.1X - Advanced Encryption Standard (AES) - EAP Type(s): - Extensible Authentication Protocol-Transport Layer Security (EAP-TLS) - EAP-Tunneled TLS (TTLS) or Microsoft Challenge Handshake Authentication Protocol Version 2 (MSCHAPv2) - Protected EAP (PEAP) v0 or EAP-MSCHAPv2 - Extensible Authentication Protocol-Flexible Authentication via Secure Tunneling (EAP-FAST) - PEAPv1 or EAP-Generic Token Card (GTC) - EAP-Subscriber Identity Module (SIM) - Multimedia: - Wi-Fi Multimedia (WMM™) - Other: - FCC Bulletin OET-65C - RSS-102

Limited Lifetime Hardware Warranty

The Cisco Aironet Access Point Module for 802.11ac comes with a Limited Lifetime Warranty that provides full warranty coverage of the hardware for as long as the original end user continues to own or use the product. The warranty includes 10-day advance hardware replacement and ensures that software media is defect-free for 90 days. For more details, visit: http://www.cisco.com/go/warranty.

Cisco Wireless LAN Services

Realize the full business value of your technology investments faster with intelligent, customized services from Cisco and our partners. Backed by deep networking expertise and a broad ecosystem of partners, Cisco Wireless LAN Services enable you to deploy a sound, scalable mobility network. This mobility network supports rich media collaboration while improving the operational efficiency gained from a converged wired and wireless network infrastructure based on the Cisco Unified Wireless Network. Together with partners, we offer expert plan, build, and run services to accelerate your transition to advanced mobility services while continuously optimizing the performance, reliability, and security of that architecture after it is deployed. For more details, visit: http://www.cisco.com/go/wirelesslanservices.

For More Information

For more information about the Cisco Aironet Access Point Module for 802.11ac, visit http://www.cisco.com/go/wireless or contact your local account representative.