Data Sheet

Cisco Aironet 1600 Series Access Point



Industrial Design

- Sleek design with internal antennas, ideal for office environments
- Extended operating temperature, ideal for factories, warehouses, and other indoor industrial environments
- · Versatile RF coverage with optional external antennas
- UL 2043 plenum-rated for above-ceiling installation options or suspended from drop ceilings

Easy Installation and Power Efficient

- 802.11n performance with existing PoE switches
- Sleek design blends into a variety of indoor environments

Easy-to-Install Multipurpose Mounting Bracket

- Designed for easy replacement of existing access points
- Locks for theft protection

Deployment Options

• Controller-based or standalone deployment options

Secure Connections

- Supports rogue access point detection and denial-of service attacks
- Management frame protection detects malicious users and alerts network administrators

Cisco ClientLink 2.0 Beamforming

- Faster mobile client connections
- Support for all client types without any client requirements or dependencies
- More efficient use of mobile device batteries

Cisco CleanAir Express* Spectrum Intelligence

- Identifies, classifies and provides automatic remedial actions for different types of interference
- · Locates and visualizes sources of interference

Cisco VideoStream Technology

- Efficient multicast-to-unicast conversion
- Video call admission control to prevent oversubscription
- Queue prioritization to help ensure best user experience for corporate videos



The new Cisco Aironet[®] 1600 Series Access Point is an enterprise-class, entry-level, 802.11n-based access point designed to address the wireless connectivity needs of small and medium-sized enterprise networks.

The Aironet 1600 Series delivers great performance at an attractive price for customers while providing advanced functionality such as <u>CleanAir Express</u> for better cover through spectrum intelligence and <u>Clientlink 2.0</u> for entry level networks that have a mixed client base. In addition to these features, the Aironet 1600 series includes 802.11n-based 3x3 multiple-input multiple-output (MIMO) technology with two spatial streams, making it ideal for small and medium-sized enterprises.

The Aironet 1600 Series also provides at least six times the throughput of existing 802.11a/g networks. As part of the Cisco® Aironet Wireless portfolio, the Cisco Aironet 1600 Series access point provides low total cost of ownership and investment protection by integrating seamlessly with the existing network. With an entry-level path to 802.11n migration, the Aironet 1600 Series can add capacity to the network for future growth for expanding applications and bandwidth.

Designed with rapidly evolving mobility needs in mind, the Cisco Aironet 1600 Series Access Point addresses the bring-your-own-device (BYOD) trend by providing advanced functionality at the right price point.

Available via future release.

RF Excellence

Building on the Cisco Aironet heritage of RF excellence, the Cisco Aironet 1600 Series delivers secure and reliable wireless connections. Enterprise-class chipsets and optimized radios deliver a robust mobility experience with:

- 802.11n with 3x3 multiple-input multiple-output (MIMO) technology with two spatial streams, which sustains 300-Mbps rates over a greater range for more capacity and reliability than competing access points
- Radio resource management (RRM): Automated self-healing optimizes the unpredictability of RF to reduce dead spots and help ensure high-availability client connections
- CleanAir Express: Effectively detects RF interference and provides basic spectrum analysis capability while simplifying ongoing operations
- Cisco ClientLink 2.0 technology: Improves downlink performance to all mobile devices including 802.11n while improving battery life on mobile devices such as smartphones and tablets
- Cisco BandSelect technology: Improves 5-GHz client connections in mixed-client environments
 Cisco VideoStream technology: Uses multicast to improve rich-media applications
- Building on the Cisco All of these features help ensure the best possible end-user experience on the wireless network. Cisco also offers the industry's broadest selection of <u>802.11n antennas</u> delivering optimal coverage for a variety of deployment scenarios

Scalability

The Cisco Aironet 1600 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

Cisco Network Assistant

For quick and easy setup of your access points, <u>Cisco Network Assistant</u> provides a centralized network view with a user-friendly GUI that simplifies configuration, management and troubleshooting. Using Cisco Network Assistant you can easily discover and initialize your network of stand-alone access points.

Cisco Network Assistant is available free, and can be downloaded here: http://www.cisco.com/go/cna.

Product Specifications

Table 1 lists the product specifications for Cisco Aironet 1600 Series Access Points.

 Table 1.
 Product Specifications for Cisco Aironet 1600 Series Access Points

Item	Specification
Part Numbers	The Cisco Aironet 1600i Access Point: Indoor environments, with internal antennas
	AIR-CAP1602I-x-K9 Dual-band controller-based 802.11a/g/n
	AIR-CAP1602I-xK910 Eco-pack (dual-band controller-based 802.11a/g/n) 10 quantity access points
	AIR-SAP1602I-x-K9 Dual-band stand-alone 802.11a/g/n
	AIR-SAP1602I-xK9-5 Eco-pack (dual-band stand-alone 802.11a/g/n) 5 quantity access points
	The Cisco Aironet 1600e Access Point: Indoor, challenging environments, with external antennas
	AIR-CAP1602E-x-K9 Dual-band controller-based 802.11a/g/n
	• AIR-CAP1602E-xK910 Eco-pack (dual-band 802.11a/g/n) 10 quantity access points

Item	Specification						
	AIR-SAP1602E-x-K9 Dual-band stand-alone 802.11a/g/n						
	AIR-SAP1602E-xK9-5 Eco-pack (dual-band stand-alone 802.11a/g/n) 5 quantity access points						
	Cisco SMARTnet® Service for the Cisco Aironet 1600 Series Access Point with internal and external antennas						
	CON-SNT-C1602lx - SMARTnet 8x5xNBD 1600i access point (dual-band 802.11 a/g/n, Controller-based), (e.g SNT-C1602lE for AP1600 internal antenna for E Domain, Controller based)						
		SNT-C1602Ex - SMARTnet 8x5xNBD 1600e access point (dual-band 802.11 a/g/n, Controller-based), CON-SNT-C1602EA for AP1600 external antenna for A Domain, Controller based)					
		lx - SMARTnet 8x5xNBD 1600i access point (dual-band 802.11 a/g/n, Stand-alone), 1602IE for AP1600 internal antenna for E Domain, stand-alone)					
		REx - SMARTnet 8x5xNBD 1600e access point (dual-band 802.11 a/g/n, Stand-alone), S1602EA for AP1600 external antenna for A Domain, Stand-alone)					
	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)					
				I countries. To verify appi ttp://www.cisco.com/go/ai			
	Not all regulatory domains have been approved. As they are approved, the part numbers will be available on the Glo Price List.						
Software		ess Network Software (av e Release (available in C	,				
802.11n	 3 x 3 multiple-input multiple-output (MIMO) with two spatial streams Maximal ratio combining (MRC) 20- and 40-MHz channels PHY data rates up to 300 Mbps Packet aggregation: A-MPDU (Tx/Rx), A-MSDU (Tx/Rx) 802.11 dynamic frequency selection (DFS) (Bin 5) Cyclic shift diversity (CSD) support 						
Data Rates Supported	802.11a: 6, 9, 12, 18, 24, 36, 48, and 54 Mbps						
Julia Hallos Gappolitoa	802.11g: 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, and 54 Mbps						
	802.11n data rates (2.4 GHz ¹ and 5 GHz):						
	MCS Index ²	GI ³ = 800ns	I	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		

 $^{^{1}\,\}text{2.4 GHz}$ 2 GHz does not support 40 MHz.

 $^{^{2}}$ MCS Index: The Modulation and Coding Scheme (MCS) index determines the number of spatial streams, the modulation, the coding rate, and data rate values.

³ GI: A Guard Interval (GI) between symbols helps receivers overcome the effects of multipath delays.

Item	Specification						
	12	78	162		86.7	180	
	13	104	216		115.6	240	
	14	117	243		130	270	
						-	
	15	130	270		144.4	300	
Frequency Band and 20-MHz Operating Channels				N Regulatory Domain: • 2.412 to 2.462 GHz; 11 channels			
	• 5.180 to 5.320 GHz			; 8 channels			
	• 5.500 to 5.700 GHz; 8 channels (excludes 5.600 to 5.640 GHz)		• 5.745 to 5.825 GHz; 5 channels Q Regulatory Domain:				
	• 5.745 to 5.825 GHz	; 5 channels	_	•	: ; 13 channels		
	C Regulatory Domain:				; 8 channels		
	• 2.412 to 2.472 GHz	; 13 channels			; 11 channels		
	• 5.745 to 5.825 GHz	; 5 channels	R Regulator	ry Domain:			
	E Regulatory Domain:		• 2.412 to	2.472 GHz	; 13 channels		
	• 2.412 to 2.472 GHz		• 5.180 to	5.320 GHz	; 8 channels		
	• 5.180 to 5.320 GHz	•	• 5.660 to	5.700 GHz	; 3 channels		
	 5.500 to 5.700 GHz (excludes 5.600 to 5 	,	• 5.745 to	5.805 GHz	; 4 channels		
	I Regulatory Domain:		S Regulatory Domain:				
	• 2.412 to 2.472 GHz	; 13 channels	• 2.412 to 2.472 GHz; 13 channels				
	• 5.180 to 5.320 GHz		• 5.180 to 5.320 GHz; 8 channels				
	K Regulatory Domain:	• 5.500 to 5.700 GHz; 11 channels					
	• 2.412 to 2.472 GHz	; 13 channels	• 5.745 to 5.825 GHz; 5 channels				
	• 5.180 to 5.320 GHz	T Regulatory Domain: ■ 2.412 to 2.462 GHz; 11 channels					
	• 5.500 to 5.620 GHz	 5.280 to 5.320 GHz; 3 channels 					
	• 5.745 to 5.805 GHz	5.500 to 5.700 GHz; 8 channels (excludes 5.600 to 5.640 GHz)					
		• 5.745 to 5.825 GHz; 5 channels					
		Z Regulatory Domain:					
		• 2.412 to 2.462 GHz; 11 channels					
		• 5.180 to 5.320 GHz; 8 channels					
		• 5.500 to 5.700 GHz; 8 channels (excludes 5.600 to 5.640 GHz)					
		• 5.745 to 5.825 GHz; 5 channels					
Note: This varies by reg	ulatory domain. Refer to t	he product documentation	on for specific	details for e	each regulatory domain.		
Maximum Number of	2.4 GHz		5 GHz				
Nonoverlapping Channels	• 802.11b/g:		• 802.11a:				
- January	。 20 MHz: 3		。 20 MHz: 24				
	• 802.11n:		• 802.11n:				
	。 20 MHz: 3		• 20 MHz: 24				
			。 40 MHz: 11				
, ,	ulatory domain. Refer to t				each regulatory domain.		
Receive Sensitivity	2.4 GHz	2.4 GHz		5 GHz			
	802.11b 802.11g			802.11a			
	-101 dBm @ 1 Mb/s -93 dBm @ 6 Mb/						
-99 dBm @ 2 Mb/s							
	-92 dBm @ 5.5 Mb/s -92 dBm @ 12 M -89 dBm @ 11 Mb/s -90 dBm @ 18 M -87 dBm @ 24 M						
		-85 dBm @ 36 M					
	-80 dBm @ 48 M						
		-79 dBm @ 54 M		-78 dBm @ 54 Mb/s			
	<u> </u>	. 5 SE O O I MID/O					

Item	Specification						
	2.4 GHz			5 GHz		5 GHz	
	802.11n (HT20)			802.11n (HT20)		802.11n ((HT40)
	-93 dBm @ MCS0			-92 dBm @ MCS0		-88 dBm @ MCS0	
	-91 dBm @ MCS1			-89 dBm @ MCS1		-87 dBm @ MCS1	
	-89 dBm @ MCS2			-88 dBm @ MCS2		-85 dBm	@ MCS2
	-86 dBm @ MCS3			-85 dBm @ MCS3		-82 dBm	@ MCS3
	-83 dBm @ MCS4			-82 dBm @ MCS4		-79 dBm	@ MCS4
	-78 dBm @ MCS5			-77 dBm @ MCS5		-74 dBm	@ MCS5
	-77 dBm @ MCS6			-76 dBm @ MCS6		-73 dBm	@ MCS6
	-76 dBm @ MCS7			-75 dBm @ MCS7		-72 dBm	@ MCS7
	-93 dBm @ MCS8			-91 dBm @ MCS8		-88 dBm	@ MCS8
	-90 dBm @ MCS9			-88 dBm @ MCS9		-86 dBm	@ MCS9
	-88 dBm @ MCS10)		-87 dBm @ MCS10		-84 dBm	@ MCS10
	-85 dBm @ MCS11			-84 dBm @ MCS11		-81 dBm	@ MCS11
	-81 dBm @ MCS12	2		-81 dBm @ MCS12		-78 dBm @ MCS12	
	-77 dBm @ MCS13	3		-76 dBm @ MCS13		-73 dBm @ MCS13	
	-76 dBm @ MCS14			-75 dBm @ MCS14		-72 dBm	@ MCS14
	-74 dBm @ MCS15	5		-73 dBm @ MCS15		-70 dBm @ MCS15	
Maximum Total	2.4 GHz			5 GHz			
Transmit Power	• 802.11b			• 802.11a			
	 22 dBm (3 ar 	ntennas enabled)		 22 dBm (3 antennas enabled) 			
	• 802.11g			802.11n non-HT duplicate mode			
	 22 dBm (3 ar 	ntennas enabled)		 22 dBm (3 antennas enabled) 			
	• 802.11n (HT20) • 22 dBm (3 antennas enabled)			• 802.11n (HT20)			
				 22 dBm (3 antennas en 		abled)	
				• 802.11n (HT40)			
				 22 dBm (3 antennas enabled) 			
Note: The maximum por specific details.	wer setting will vary b	y channel and accord	ling to individual cou	ntry regulations. Refe	er to the pro	duct docu	umentation for
Available Total	2.4 GHz			5 GHz			
Transmit Power Settings	Enabled antennas:			Enabled antennas:			
_	1	2	3	1	2		3
	17 dBm	20 dBm	22 dBm	17 dBm	20 dBm		22 dBm
	14 dBm	17 dBm	19 dBm	14 dBm	17 dBm		19 dBm
	11 dBm	14 dBm	16 dBm	11 dBm	14 dBm		16 dBm
	8 dBm	11 dBm	13 dBm	8 dBm	11 dBm		13 dBm
	5 dBm	8 dBm	10 dBm	5 dBm	8 dBm		10 dBm
	2 dBm	5 dBm	7 dBm	2 dBm	5 dBm		7 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	 2.4 GHz, gain 4.0 dBi, horizontal beamwidth 360° 5 GHz, gain 4.0 dBi, horizontal beamwidth 360° 						
External Antenna	19						
(Sold Separately)	 Certified for use with antenna gains up to 6 dBi (2.4 GHz and 5 GHz) Cisco offers the industry's broadest selection of 802.11n antennas delivering optimal coverage for a variety of deployment scenarios 						
Interfaces	 10/100/1000BASE-T autosensing (RJ-45) Management console port (RJ-45) 						
Indicators	Status LED indicates boot loader status, association status, operating status, boot loader warnings, boot loader errors						
Dimensions (W x L x H)	• Access point (without mounting bracket): 8.7 x 8.7 x 1.84 in. (22.1 x 22.1 x 4.7 cm)						
Weight	• 1.9 lbs. (0.86 kg)						
•	1. (•					

Item	Specification
Environmental	Cisco Aironet 1600i
	Nonoperating (storage) temperature: -22 to 158年 (-3 0 to 70℃)
	• Nonoperating (storage) Altitude Test -25°C, 15,000 ft .
	Operating temperature: 32 to 104年 (0 to 40℃)
	Operating humidity: 10 to 90% percent (noncondensing)
	• Operating Altitude Test -40°C, 9843 ft.
	Cisco Aironet 1600e
	Nonoperating (storage) temperature: -22 to 158年 (-3 0 to 70℃)
	• Nonoperating (storage) Altitude Test - 25°C, 15,000 ft.
	Operating temperature: -4 to 122 € (-20 to 50 ℃)
	Operating humidity: 10 to 90 percent (noncondensing)
	● Operating Altitude Test -40℃, 9843 ft
O M	
System Memory	• 256 MB DRAM
	• 32 MB flash
Input Power	• AP1600: 44 to 57 VDC
Requirements	 Power Supply and Power Injector: 100 to 240 VAC; 50 to 60 Hz
Powering Options	802.3af Ethernet Switch
	Cisco AP1600 Power Injectors (AIR-PWRINJ4=, AIR-PWRINJ5=)
	Cisco AP1600 Local Power Supply (AIR-PWR-B=)
Power Draw	• AP1600: 12.95 W
I OWEI DIAW	Note: When deployed using PoE, the power drawn from the power sourcing equipment will be higher by some amount
	dependent on the length of the interconnecting cable. This additional power may be as high as 2.45W, bringing the total
	system power draw (access point + cabling) to 15.4W.
Warranty	Limited Lifetime Hardware Warranty
Compliance	Standards
Compilation	• Safety:
	• UL 60950-1
	• CAN/CSA-C22.2 No. 60950-1
	• UL 2043
	∘ IEC 60950-1
	• EN 60950-1
	• Radio approvals:
	• FCC Part 15.247, 15.407
	• RSS-210 (Canada)
	• EN 300.328, EN 301.893 (Europe)
	• ARIB-STD 33 (Japan)
	• ARIB-STD 66 (Japan)
	• ARIB-STD T71 (Japan)
	AS/NZS 4268.2003 (Australia and New Zealand)
	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
	• Security:
	802.11i, Wi-Fi Protected Access 2 (WPA2), WPA
	• 802.1X
	Advanced Encryption Standards (AES), Temporal Key Integrity Protocol (TKIP)
	 Advanced Encryption Standards (AES), Temporal Key Integrity Protocol (TKIP) EAP Type(s):
	• EAP Type(s):

Item	Specification
	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 1600 Series Access Point 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 that enables 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 1600 Series, visit http://www.cisco.com/go/wireless or contact your local account representative.



Americas Headquarters Cisco Systems, Inc. San Jose, CA Asia Pacific Headquarters Cisco Systems (USA) Pte. Ltd. Singapore Europe Headquarters Cisco Systems International BV Amsterdam, The Netherlands

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