Cisco 819 Integrated Services Routers with 3G and Wi-Fi Accessories

Enabling Machine-to-Machine Applications

The Cisco® 819 Integrated Services Router Family, designed in compact hardened and non-hardened form factors, is the smallest Cisco IOS® Software router with support for integrated third-generation (3G) wireless WAN (mobile broadband backhaul) and WLAN capabilities. The Cisco 819 ISR gateway provides a rapidly deployable, highly available, reliable, and secure solution designed specifically for machine-to-machine (M2M) applications. Markets that benefit from these applications include industrial automation, transportation, financial, health care, utility, and retail. Fully integrated with Cisco IOS Software, the Cisco 819 family delivers, enterprise-class features, including highly secure data, voice, and video communications to stationary and mobile network nodes across wired and wireless links. Figure 1 shows a Cisco 819 Integrated Services Router.

Figure 1.   Cisco 819 Integrated Services Router

The Cisco 819 ISR is available in both non-hardened (Cisco 819G) and hardened (Cisco 819HG) versions. Both models include support for 3G up to 3.7G wireless WAN (WWAN) speeds. Support for 3G offers cost-effective, rapidly deployable, reliable, and secure primary or backup connectivity. With support for industrial-grade components, the hardened Cisco 819HG extends the footprint and provides deployment flexibility. The Cisco 819HG is an ideal solution for stationary and mobile environments where space, heat dissipation, exposure to extreme temperatures, harsher environments, and low power consumption are critical factors.

For mobile applications, Cisco Mobile IP delivers transparent roaming across multiple wireless networks capable of covering wide geographic areas. Additionally, the Cisco 819 ISR supports enterprise class built-in Wireless LAN (WLAN) capability. The Cisco 819HGW platforms concurrently support both 3G for wireless WAN backhaul and

Cisco dual radio WLAN on the same platform as shown in Figure 2. The 802.11a/b/g/n 2X3 MIMO built-in Cisco 3500 Access Point (AP) in the Cisco 819, comes with Cisco's CleanAir technology, to create a self-healing, self-optimizing WLAN. Moreover, with the advantage of dual radio, the integrated AP can serve both as an access point and as a client to a wireless mesh network. This provides another source for WAN diversity along with Gigabit Ethernet, serial, and cellular. The AP ClientLink feature improves reliability and coverage for legacy devices and dynamic frequency selection (DFS allows detecting and avoiding interference with radar signals to comply with regulatory domains. Figure 2 shows the 819 ISR with integrated 3G and 802.11 a/b/g/n AP. More information on the Cisco 3500 Access Point is available at http://www.cisco.com/en/US/prod/collateral/wireless/ps5678/ps10981/data_sheet_c78-594630.html

Figure 2.   Non-hardened Cisco 819GW Integrated Services Router with 3G and Wi-Fi

A critical component of the Cisco M2M architecture, the Cisco 819 ISR serves as the single, horizontal platform which enhances the Cisco implementation of "any device, anywhere, any place" across multiple industries, including banking, retail, healthcare, manufacturing, government. It also provides the ability to extend Cisco product-based networks to small branch offices with a relatively low incremental investment, as well as to enable managed services offerings based on Cisco architecture.

Table 1.   Antenna Specifications

Product	Description
Diversity (dual antennae)	• All 3G SKUs support diversity
Antenna 3G-ANTM1919D	Description • Multiband swivel-mount dipole antenna • Faceplate mount (two unist included with all Cisco 819 ISRs) Electrical Specifications • Frequency range: 806 to 960 MHz and 1710 to 2170 MHz • Gain: 0 decibels relative to isotropic (dBi) (806 to 960 MHz) and 0 dBi (1710 to 2170 MHz) • Maximum power: 25W • Connector: TNC male • Voltage standing wave ratio (VSWR): <2.5:1 • Nominal impedance: 50 ohms Mechanical Specifications • Antenna dimensions: 7.63 x 0.94 x 0.63 in. (19.37 x 2.34 x 1.59 cm) • Temperature rating: −22 to 158°F (−30 to 70°C)

Product	Description
Antenna 3G-ANTM1916-CM	Description • Multiband omnidirectional antenna • Ceiling mount Electrical Specifications • Frequency range: 806 to 960 MHz and 1710 to 2170 MHz • Gain: 1.5 dBi (806 to 960 MHz) and 2.5 dBi (1710 to 2170 MHz) • Maximum power: 50W • Connector: TNC male • VSWR: <1.8:1 (806 to 960 MHz) and <1.6:1 (1710 to 2170 MHz) • Nominal impedance: 50 ohms • Polarization: Vertical • Intermodulation • <–140 decibels relative to carrier (dBc) typical (800 to 960 MHz IM3 at 2 x 20W) • <–140 dBc (1710 to 1880 MHz IM3 at 2 x 20W) • <–150 dBc (1920 to 2170 MHz IM7 at 2 x 20W) Mechanical Specifications • Radome material: White ABS • Base material: Aluminum • Cable: 086FEP conformable • Dimensions (outside diameter [OD] x H): 7.09 x 2.44 in. (18.00 x 6.20 cm) • Weight: 0.62 lb (0.28 kg) • Usable with the following cable extensions: 3G-CAB-ULL-20 and 3G-CAB-ULL-50
Antenna extension 3G-AE015-R	Description • Single-unit antenna extension base (15-ft [457.2-cm] cable included) Electrical Specifications • Frequency range: 0.8 to 5.85 GHz • Attenuation: <3 dB at or below 2.5 GHz • Base connector: TNC female • Pigtail connector: TNC male Mechanical Specifications • Base material: UL 94 V0PC and ABS plastic • Dimensions: 2.8 x 2.4 x 1.8 in. (7.1 x 6.1 x 4.6 cm) • Weight: 6 oz (0.17 kg) • Cable: 15 ft (457.2 cm) non-plenum rated Pro-Flex Plus 195
Antenna extension 3G-AE010-R	Description • Single-unit antenna extension base (10-ft [304.8-cm] cable included) Electrical Specifications • Frequency range: 0.8 to 5.85 GHz • Attenuation: <3 decibels (dB) at or below 2.5 GHz • Base connector: TNC female • Pigtail connector: TNC male Mechanical Specifications • Base material: UL 94 V0PC and ABS plastic • Dimensions: 2.8 x 2.4 x 1.8 in. (7.1 x 6.1 x 4.6 cm) • Weight: 6 oz (0.17 kg) • Cable: 10 ft (304.8 cm) non-plenum rated Pro-Flex Plus 195

Product	Description
Outdoor antenna 3G-ANTM-OUT-LP	Description • Multiband outdoor low-profile antenna with 15-ft (457-cm) cable • Panel mount (horizontal surface Electrical Specifications • Frequency range: 806 to 960 MHz and 1710 to 2170 MHz • Gain: –1.5 dBi (806 to 960 MHz) and –1.5 dBi (1710 to 2170 MHz), which includes antenna gain and cable loss • Maximum RF power tolerated: 20W • Connector: TNC male, right angle • Cable: LMR-195, 15 ft (457m) • VSWR: <2.5:1 (806 to 960 MHz) and < 2.5:1 (1710 to 2170 MHz) • Nominal impedance: 50 ohms • Polarization: Vertical • Radiation pattern (–3-dB beam width) • Horizontal: Omnidirectional • Vertical: 64 deg (806 to 960 MHz) and 90 deg (1710 to 2170 MHz) Mechanical Specifications • Radome material: Black MakroBlend plastic • Base material: Aluminum • Radome dimensions (OD x H): 5.65 x 2.06 in. (14.35 x 5.23 cm) • Radome weight: 0.375 lb (0.17 kg) • Cable dimensions (L x diameter [D]): 15 ft x 0.195 in. (4.57m x 4.95 mm) • Mounting panel thickness: 0.1 to 0.5 in. (2.54 to 12.7 mm) • Note: All mounting hardware is included. Environmental Specifications • Mechanical impact rating: [IK08] 5 joules per IEC-62262 • Operating and storage temperature: –40 to 185℉ (–40 to 85℃) • Wind rating: 150 mph installed • Water rating: IP65 installed

Product	Description
Outdoor antenna 3G-ANTM-OUT-COMBO	Includes • Mast- or wall-mount antenna • 3G-ACC-OUT-LA (lightning arrestor) Description • Multiband outdoor omnidirectional antenna • Mast or wall mount • 3G-ACC-OUT-LA lightning arrestor • Note: Can be used with the following cable extensions: 3G-CAB-ULL-20, 3G-CAB-ULL-50, 3G-CAB-LMR240-25, 3G-CAB-LMR240-50, and 3G-CAB-LMR240-75 Electrical Specifications • Frequency range: 806 to 960 MHz and 1710 to 2170 MHz • Gain : +2 dBi (806 to 960 MHz) and +4 dBi (1710 to 2170 MHz) • Maximum RF power tolerated: 20W • Connector: TNC male • VSWR: <2.5:1 (806 to 960 MHz) and <2.5:1 (1710 to 2170 MHz) • Nominal impedance: 50 ohms • Polarization: Vertical • Radiation pattern (–3-dB beam width) • Horizontal: Omnidirectional • Vertical: 40 deg (806 to 960 MHz) and 40 deg (1710 to 2170 MHz) Mechanical Specifications • Radome material: Off-white pultruded fiberglass, UV-protected • Cap material: Off-white MakroBlend plastic • Radome dimensions (OD x H): 1.25 x 16 in. (3.175 x 40.64 cm) • Radome weight: 0.375 lb (0.17 kg) • Mounting hardware • Bracket and clamps (for mast mounting) • Bracket (for wall mounting) • Screws not included (for wall mounting) Environmental Specifications • Operating and storage temperature: –40 to 185℉ (–40 to 85℃) • Wind rating: 100 mph (operational) and 125 mph (survival) • Water rating: IP65 installed

Product	Description
Outdoor antenna lightning arrestor 3G-ACC-OUT-LA	Description • 3G lightning arrestor for outdoor antennas • Type: Inline quarter-wave arrestor with integrated high-pass filter • Bulkhead mounted and grounded with optional ground lug • Can be used with 3G-ANTM-OUT-COMBO outdoor omni antenna with lightning arrestor • Can be used with the following cable extensions: 3G-CAB-ULL-20, 3G-CAB-ULL-50, 3G-CAB-LMR240-25, 3G-CAB-LMR240-50, and 3G-CAB-LMR240-75 • Indoor (preferred) or outdoor (optional) installation • No maintenance required Electrical Specifications • Frequency range: 800 to 2200 MHz • Maximum insertion loss: 0.2 dB • Maximum RF power tolerated: 20W • Connector: TNC male (protected side) and TNC female (antenna-facing) • VSWR: <1.22:1 (806 to 2200 MHz) • Return Loss: >26 dB • Nominal impedance: 50 ohms • Surge protection: 10 KA single and 5 KA multiple strikes (8/20-microsec test pulse) Mechanical Specifications • Material: Corrosion-resistant brass • Dimensions (OD x L) (approximate): 1.25 x 2.5 in. (3.175 x 6.35 cm) • Mounting hardware • Ground lug (optional grounding method) • Nut for bulkhead mounting and grounding (preferred grounding method) Environmental Specifications • Operating and storage temperature: –40 to 185°F (–40 to 85°C) • Water rating: IP67 installed
WLAN Antennas	
AIR-ANTM2050D-R (Default)	The AIR-ANTM2050D-R antenna operates in the 2.4- and 5-GHz bands, and is designed for use with spatial-diversity access point (AP) systems. The AIR-ANTM2050D-R antenna is compatible with Cisco 802.11a/b/g radio products using a reverse-polarity threaded Neill-Concelman (RP-TNC) connector. The antenna is designed for indoor office deployments. Faceplate Dipole (IP 41) 2.4–2.5 GHz and 4.9–5.9 GHz IP 41 Peak Gain (2.4) 1.4 Peak Gain (5 GHZ): 4.5
AIR-ANT2430V-R	This AIR-ANT2430V-R 3-dBi is an omni directional antenna that operates in the 2.4-GHz frequency range and is designed for use in an indoor office environment. The antenna assembly consists of three radiating elements, each fed with its own coaxial cable. **Ceiling (IP 41)** **2.4 GHz** **Peak Gain (2.4): 3**
AIR-ANT5140V-R	The AIR-ANT(AIR-ANT5140V-R) 4-dBi is an omnidirectional antenna and operates in the 5-GHz frequency range and is designed for use only in an indoor office environment. The antenna assembly consists of three radiating elements, each fed with its own coaxial cable. Ceiling(IP 41) 5 GHz Peak Gain(5 GHz): 4
AIR-ANT2440NV-R	The Cisco Aironet AIR-ANT2440NV-R is a 2.4-GHz MIMO wall-Mounted omnidirectional Antenna and operates in the 2.4 GHz frequency range and is designed for indoor or outdoor use. Multi-mount (Wall/Ceiling/Mast) (IP 54) 2.4 GHz Peak Gain (2.4): 4

Product	Description
AIR-ANT5140NV-R	Cisco Aironet 5-GHz MIMO Wall-Mounted omnidirectional Antenna (AIR-ANT5140NV-R) operates in the 5-GHz frequency range and is designed for indoor or outdoor use. Multi-mount (Wall/Ceiling/Mast) (IP 54) 5 GHz Peak Gain(5 GHZ): 4

Ordering Information

For Cisco 819 ordering information, please visit the Cisco Ordering Home Page and refer to Table 6.

For More Information

For more information about the Cisco 819 products, visit http://www.cisco.com/go/m2m or contact your local Cisco account representative.

For more information regarding Cisco 800 Series Integrated Services Routers and options, contact your Cisco representative or go to http://www.cisco.com/go/isr.

Cisco and Partner Services for the Borderless Network Architecture

Enable the Cisco Borderless Network Architecture and the business solutions that run on it with intelligent, personalized services from Cisco and our partners. Backed by deep networking expertise and a broad ecosystem of partners, these services can help you plan, build, and run a network that enables you to expand geographically, embrace new business models, and promote business innovation. Whether you are looking to transition to a Cisco Borderless Network Architecture, solve specific business problems, or improve operational efficiency, we have a service that can help you get the most from your IT environment. For more information, please visit http://www.cisco.com/go/services.

Warranty Coverage and Technical Service Options

The Cisco 819 Integrated Services Router comes with the Cisco 1-year limited hardware warranty. Adding a contract for a technical service offering such as Cisco SMARTnet® Service provides benefits not available with warranty, including access to OS updates, Cisco.com online resources, and Cisco Technical Assistance Center (TAC) support services. Table 7 shows the available technical services.

For information about Cisco warranties, visit http://www.cisco.com/go/warranty.

For information about Cisco Technical Services, visit http://www.cisco.com/go/ts.

Table 2.   Cisco Technical Services for Cisco 819 Integrated Services Routers

Technical Services
Cisco SMARTnet Service ● Global access to the Cisco TAC 24 hours a day ● Unrestricted access to the extensive Cisco.com resources, communities, and tools ● Next-business-day, 8 x 5 x 4, 24 x 7 x 4, and 24 x 7 x 2 advance hardware replacement[1] and onsite parts replacement and installation available ● Ongoing operating system software updates within the licensed feature set[2] ● Proactive diagnostics and real-time alerts on Smart Call Home-enabled devices

Technical Services
Cisco Smart Foundation Service
• Next-business-day advance hardware replacement as available
• Business-hours access to SMB Cisco TAC (access levels vary by region)
• Access to Cisco.com SMB knowledge base
• Online technical resources through Smart Foundation Portal
• Operating system software bug fixes and patches

[1]Advance hardware replacement is available in various service-level combinations. For example, 8 x 5 x Next business day (NBD) indicates that shipment will be initiated during the standard 8-hour business day, 5 days a week (the generally accepted business days within the relevant region), with NBD delivery. Where NBD is not available, same-day shipment is provided. Restrictions apply; please review the appropriate service descriptions for details.

[2]Cisco operating system updates include maintenance releases, minor updates, and major updates within the licensed feature set.

Printed in USA

C78-721036-00   11/12