Cisco 880G and 890G Series 4G LTE 2.0 Integrated Services Routers

The Cisco® 880G and 890G Series 4G LTE 2.0 Integrated Services Routers with Cisco IOS® Software offer support for integrated fourth-generation (4G LTE) wireless WAN (mobile broadband backhaul) and cutting-edge capabilities. The Cisco 880G and 890G Series ISRs provide a rapidly deployable, highly available, reliable, and secure solution designed to combine Internet access, comprehensive security, and wireless services in a single device that is easy to deploy and manage for primary or backup connectivity (Figure 1). Customers that would benefit from these routers include small businesses, remote small or medium-sized or power branches, financial services firms, healthcare organizations, pop-up stores, point-of-sale systems, and retail businesses. Fully integrated with Cisco IOS Software, the Cisco 880G and 890G routers deliver enterprise-class features, including highly secure data, voice, and video communications to stationary and mobile network nodes across wired and wireless links. The best-in-class Cisco 880G and 890G Series architecture is specifically designed to deliver high performance with concurrent services, business continuity, and investment protection. The Cisco 880G and 890G 4G LTE 2.0 series are the industry leader to bring enterprise grade wireline like functionality such as Quality of Service (QoS) for cellular, Multi-Virtual Route Forwarding (Multi-VRF), advanced VPN, and Unified Communications solutions over LTE.

Figure 1.   Cisco C899G-LTE Integrated Services Router

The Cisco® 880G and 890G Series LTE 2.0 routers also provide the ability to extend Cisco product-based networks to remote power branch offices with a relatively low incremental investment, as well as to enable managed services offerings based on end-to-end Cisco system architecture.

Product Overview

The Cisco 880G and 890G Series 4G LTE 2.0 ISRs are fixed-configuration routers that provide collaborative business solutions for secure voice and data communications to enterprise small branch offices, with support for the latest Third-Generation Partnership Project (3GPP) Release 9 standards for 4G LTE. They provide persistent, reliable LTE connectivity with fallback and transparent handoff to earlier technologies. The routers are designed to deliver secure broadband, Metro Ethernet or any xDSL variants, wireless WAN (WWAN) connectivity, and business continuity. They also come with powerful management tools, such as the web-based Cisco Configuration Professional configuration management tool, which simplifies setup and deployment.

- Cisco 4G LTE 2.0: Multimode LTE 2.0 for carriers that operate LTE 800-MHz (band 20), 900-MHz (band 8), 1800-MHz (band 3), 2100-MHz (band 1), or 2600-MHz (band 7) networks; the multimode 880G and 890G Series 4G LTE 2.0 routers are backward-compatible with Universal Mobile Telecommunications Service (UMTS) and High-Speed Packet Access Plus (HSPA+): 850 MHz (band 5) , 900 MHz (band 8), 1900 MHz (band 2), and 2100 MHz (band 1)

- C899G-LTE-NA-K9: Multimode Cisco LTE 2.0 for carriers that operate LTE 700 MHz (band 17), 1900 MHz (band 2 PCS), 850 MHz (band 5) or 1700/2100 MHz (band 4 AWS) networks; backward-compatible with

UMTS and HSPA+: 850 MHz (band 5), 900 MHz (band 8), 1900 MHz (band 2 PCS), and 1700/2100 MHz (band 4 AWS).

- C899G-LTE-VZ-K9 and C899G-LTE-ST-K9: Multimode Cisco LTE 2.0 for carriers that operate LTE 700 MHz (band 13), 1700/2100 MHz (band 4 AWS), or 1900 MHz (band 25 extended PCS) networks; backward-compatible with EVDO Rev A/CDMA 1x BC0, BC1, BC10.

The Cisco 880G and 890G Series 4G LTE 2.0 ISRs provide a broad range of enterprise-class features, including:

- Security services, such as firewall, intrusion prevention, VPN, and Cisco ISR Web Security with Cisco ScanSafe, which require no additional hardware or client software, This enables branch offices, manufacturing sites, hospitals, banks, and mobile fleets, for example, to intelligently redirect web traffic to the cloud to enforce granular security and acceptable use policies over user web traffic. With this solution, you can deploy market-leading web security quickly and easily to protect branch-office users from web-based threats, such as viruses, while saving bandwidth, money, and resources.

- Cisco WAN optimization system, consisting of Cisco Wide Area Application Services (WAAS) Express routers and Wide-Area Application Engines (WAEs) that work together to optimize TCP traffic in your network. When client and server applications attempt to communicate with each other, the network intercepts the traffic and acts on behalf of the client application and the destination server.

- Additional WAN options, such as Gigabit Ethernet WAN interfaces and an 8-port 10/100/1000 Gigabit Ethernet managed switch for LAN connectivity. The Cisco 880G and 890G Series ISRs provide quality-of-service (QoS) features for optimizing voice and video applications.

- Cisco Configuration Professional, a web-based configuration tool that simplifies setup and deployment. Centralized management capabilities give network managers visibility into and control over the network configurations at remote sites.

- WWAN services, offering enhanced data rates and improved latency (30 ms or less)—an ideal way to supplement traditional wireline services. The 4G LTE WWAN data services offered today have average data rates well in excess of ISDN speeds, with theoretical limits of 100 Mbps on the downlink and 50 Mbps on the uplink. The actual data speed depends on the service provider's network. With 4G LTE data rates, the Cisco 4G LTE 2.0 WWAN offers a primary WAN link solution capable of running comprehensive branch-office services, including voice and video services. The 4G LTE WWAN data services can also be used as a cost-effective alternative in areas where broadband services are either not available or very expensive. Cisco is building on these performance milestones and adding support for wireless to our wide variety of WAN interface alternatives.

Business Benefits and Application Examples

Businesses are looking for ways to reduce costs, increase revenue, and improve business continuity. The 4G LTE wireless connectivity, which is 10 to 15 times faster and has 5 times lower latency than 3G links, allows a small enterprise branch office or remote office to set up comprehensive media services in a matter of hours, without worrying about availability of broadband services or the need to lay down the lines. Wireless carriers offer flexible, usage-based data plans that can be customized to meet the needs and price points of the business customer. As WAN backup alternatives, 3G and 4G LTE wireless offer greater WAN diversity and resiliency because they are independent of the local terrestrial infrastructure. The Cisco 880G and 890G help businesses stay productive during service provider downtime or a network failure with Cisco Intelligent WAN (IWAN) diversity.

Ability to Host Networks in Motion

The Cisco 880G and 890G use standards-based mobile IP features in Cisco IOS Software to host networks in motion. Transitions to different wireless networks are transparent to the users and devices (such as laptops, smart devices, and surveillance cameras), and applications maintain continuous connectivity without the user's manual intervention as WAN links change. In addition to allowing a single node or device to stay connected, the Cisco 880G and 890G allow an entire mobile network or subnet to stay connected.

Retail VPN

Retail stores migrating from dialup connections for point-of-sale transactions can use the 4G LTE WWAN option on the Cisco 880G or 890G for low-cost broadband access, with the security required to comply with payment card industry (PCI) and other data security requirements. Multiple devices and applications can then be added to the store network to take advantage of the increased bandwidth and to enable secure mobility and enhance productivity.

Managed Services

Service providers and value-added resellers (VARs) can use the Cisco 880G or 890G as a platform to offer differentiated business-class security services for small and medium-sized business (SMB) customers. Superior management capabilities, such as Simple Network Management Protocol (SNMP) support for 3G MIB with 4G MIB extension and Cisco Configuration Professional, make remote management and provisioning easier.

- **Multiple-PDN:** This feature allows configuration of multiple active (Access Point Name) APN so that Internet traffic can be kept separate from the corporate traffic.
- **4G LTE multiple-bearer QoS for cellular:** The Cisco 880G and 890G 4G LTE 2.0 supports 4G LTE multiple-bearer QoS. Detailed information on the bearer is part of show CLI, SNMP-MIBs etc. The QoS feature is service provider (SP) dependent, and requires SP to launch this service.
- **Multi-VRF for cellular:** 4G LTE 2.0 now support Multi-VRF for cellular network. Multi-VRF is a Cisco proprietary implementation over and above the 3GPP spec and requires Cisco ASR5K Packet Gateway (P-GW) as the head-end at the service provider's network. The Multi-VRF feature is service provider (SP) dependent, and requires SP to launch this service.
- **Enterprise grade Unified Communication solutions over LTE:** The Cisco 880G and 890G 4G LTE 2.0 supports voice and video and can be integrated with Cisco Unified Communications cloud or premises-based infrastructure.

Primary Features and Benefits

Table 1.   Features and Benefits of the Cisco 880G and 890G Series 4G LTE 2.0 ISRs

Feature	Benefits
Smallest Cisco ISR in Nonhardened Form Factors	
Lightweight, compact size with low power consumption	• Can be deployed in many different environments where space, heat dissipation, and low power consumption are critical factors.
Increased performance to run concurrent services	• Performance allows customers to take advantage of broadband network speeds while running secure, concurrent data, voice, video, and wireless services.
Enhanced security	• An integrated stateful and application inspection firewall provides network perimeter security and high-speed IP Security (IPsec); Triple Data Encryption Standard (3DES) and Advanced Encryption Standard (AES) encryption offer data privacy over the Internet. • Intrusion prevention enforces security policies in a larger enterprise or service provider network. • Content filtering offers category-based URL classification and blocking, thus helping increase productivity and providing better use of company resources. • ScanSafe web security and filtering solution requires no additional hardware or client software. Enables remote locations to intelligently redirect web traffic to the cloud to enforce granular security and acceptable use policies over user web traffic.
Multiple WAN and LAN Connections	
4-port 10/100-Mbps or 8-port 10/100/1000-Mbps managed switch	• Allows connectivity for multiple Ethernet devices in a small office or other remote location with the ability to designate a port as the network edge. • VLANs allow for secure segmentation of network resources. • Multiple LAN and WAN devices can be connected to standard Fast Ethernet or Gigabit Ethernet.
WAN diversity	• Multiple WAN links are supported: Gigabit Ethernet (copper or SFP option), any xDSL variants, and 4G LTE provide for business continuity and WAN diversity.
Transparent Roaming Between Wireless Networks	
Dual subscriber-identity-module (SIM) support	• Dual SIM provides for high reliability and cellular multihoming support for LTE and HSPA-based networks using common firmware and technology within the same region.
Cisco IOS Mobile IP features	• Mobile IP offers transparent roaming for mobile networks, establishing a transparent Internet connection regardless of location or movement. This enables mission-critical applications to stay connected even when roaming between networks. • Assigned IP addresses to the home network are maintained in private or public networks.
Cisco IOS Mobile network features	• Allows an entire subnet or mobile network to maintain connectivity to the home network while roaming.
Multiple wireless WAN technologies	• Users can use the best wireless (4G LTE, 3.7G, 3.5G, or 3G) technology or network available.
Advanced IP Services in Standards-Based Cisco IOS Software	
Advanced security features	• Authorization and authentication determines which individuals and devices have access to the network. • Firewall protection provides perimeter security when using public networks. • 3DES and AES encryption provide for highly secure VPNs when transmitting and receiving data over public networks. • Intrusion detection monitors potential malicious activity within the network.
QoS features	• Provides traffic precedence to delay-sensitive or prioritized applications. • Facilitates low-latency routing of delay-sensitive applications such as streaming video.
IP Multicast	• Allows efficient broadcast of data or video for increased situational awareness, multiuser communications, or surveillance applications.

Feature	Benefits
Management and manageability	• Network managers can remotely manage and monitor networks with SNMP, Telnet, or HTTP, and locally through a console port. • Support for extensive 3G- and 4G LTE-based MIBs allows for centralized management of remote devices and gives network managers visibility into and control over the network configurations at the remote site. • Network managers can reset to a predesignated golden image as well as configure an ISR through Cisco IOS Software or through an external reset button. • Network managers can upgrade 3G, 3.5G, 3.7G, and 4G LTE firmware and router configurations remotely and confirm enhancement verification. • Tight integration with Cisco IOS Software allows you to self-monitor the functions of the 3G, 3.5G, 3.7G, and 4G LTE modems and automatically recover from a failure. • Cisco Configuration Professional provides a web-based tool that simplifies setup and deployment. • Intuitive network management tools such as Cisco Prime™ and HP OpenView are supported.
Cisco WAN Optimization	• Cisco WAAS Express routers and Wide-Area Application Engines work together to optimize TCP network traffic. When client and server applications attempt to communicate with each other, the network intercepts the traffic and acts on behalf of the client application and the destination server. • WAAS Express is supported on the Gigabit Ethernet WAN interface and up to 2 Mbps.

Product Specifications

Tables 2 and 3 summarize the routers in the Cisco 880G and 890G Series, respectively.

For common platform-specific details with extensive and rich Cisco IOS Software features set on both the Cisco 880 and 890 Series ISRs, go to:

http://www.cisco.com/c/en/us/products/collateral/routers/887-integrated-services-router-isr/data_sheet_c78_459542.html

Table 2. Cisco 880G Series 4G LTE 2.0 ISRs

Model	WAN Interface	LAN Interface	802.11a/g/n Option	Embedded Cisco 4G LTE 2.0	Integrated ISDN Dial Backup
C881G-4G	10/100-Mbps Fast Ethernet	4-port 10/100-Mbps managed switch With 2-port Power over Ethernet (PoE) option	No	Yes (Sierra Wireless MC7304 with Qualcomm MDM9215 for all – GA Global/Australia)	No
C887VAG-4G	Multimode VDSL2/ADSL2/2+ over basic telephone service				

http://www.cisco.com/c/en/us/products/collateral/routers/800-series-routers/data_sheet_c78-519930.html

Table 3. Cisco 890G Series 4G LTE 2.0 ISRs

Model	WAN Interface	LAN Interface	802.11a/g/n Option	Embedded Cisco 4G LTE 2.0	Integrated ISDN Dial Backup
C899G-LTE	1 port Gigabit Ethernet or 1 port SFP 1 port Gigabit Ethernet	8-port 10/100/1000-Mbps managed switch With 4-port Power over Ethernet (PoE) option	No	Yes (Sierra Wireless C899G-LTE –NA MC7354 and –VZ –ST MC7350 with Qualcomm MDM9615)	No
C896VAG-LTE	1 port Gigabit Ethernet or 1 port SFP VDSL/ADSL2+ Annex B				
C897VAG-LTE C897VAMG-LTE (Annex M)	1 port Gigabit Ethernet or 1 port SFP VDSL/ADSL2+ Annex A/M			Yes (Sierra Wireless MC7304 with Qualcomm MDM9215 for all – GA Global/Australia)	
C898EAG-LTE	1 port Gigabit Ethernet or 1 port SFP 4 pair Ethernet in the first mile (EFM)				

For the Cisco 880G and 890G 4G LTE 2.0 Hardware and Software Installation Guide, go to:

http://www.cisco.com/c/en/us/td/docs/routers/access/800/hardware/installation/guide/800HIG/prodoverview.html

http://www.cisco.com/c/en/us/td/docs/routers/access/interfaces/software/feature/guide/EHWIC-4G-LTESW.html

Table 4. LTE Bands Supported

Region	C88xG-4G-GA-K9 and C89xG-LTE-GA-K9	C899G-LTE-NA-K9	C899G-LTE-VZ-K9	C899G-LTE-ST-K9
LTE bands	LTE bands 1, 3, 7, 8, 20 800 MHz (band 20), 900 MHz (band 8), 1800 MHz (band 3), 2100 MHz (band 1), and 2600 MHz (band 7)	LTE band 2 PCS 1900, band 4 AWS (1700/2100), band 5 (850), and band 17 (700)	LTE band 4 AWS (1700/2100), and band 13 (700)	LTE band 25 extended PCS 1900
Theoretical Download/upload speeds	100 and 50 Mbps	100 and 50 Mbps	100 and 50 Mbps	100 and 50 Mbps
Australia	✓	X	X	X
Europe	✓	X	X	X
Middle East	✓	X	X	X
Latin America and Asia Pacific	✓ (Dependent on specific operators supporting the above LTE bands)	✓ (Dependent on specific operators supporting the above LTE bands)	X	X
United States	X	✓ ATT	✓ Verizon	✓ Sprint
Canada	X	✓	X	X

Note: LTE CAT 3 download/upload speeds depend on specific carrier channel bandwidth and carrier LTE network provisioning.

Table 5. Cisco 4G LTE 2.0 Specifications for the Cisco 880G and 890G Series 4G LTE 2.0 ISRs

Item	Specification
4G LTE modem form factor	• Embedded (included with the router) • Upgrade FW Image Switching provisioning from flash (FW-MC7304-LTE-AU or FW-MC7304-LTE-GB) • Upgrade FW Image Switching provisioning from flash (FW-MC7354-LTE-AT or FW-MC7354-LTE-CA)
Important 4G LTE features	• Automatic switch failover between primary and backup link • Multichannel-interface-processor (MIP) profile configuration • CDMA data retry • 3G MIB with 3G MIB extension and traps • Remotely initiated data callback using voice • Remotely initiated data callback using Short Message Service (SMS) • Remote firmware upgrade over 4G LTE • Virtual diagnostic monitoring • Mobile Equipment Personalization (MEP) lock and unlock capabilities • SIM lock and unlock capabilities
Dual SIM support	• High reliability, and cellular multihoming support for dual mini (2FF) SIM card socket; compliant with ISO-7816-2 (SIM mechanical)

Item	Specification
SMS and Global Positioning System (GPS)	• GPS antenna: SMA connector (separate active GPS with SMA antenna option) • Send and receive SMS (maximum 160 characters) • Standalone GPS, needs line of sight • Configure multiple profile
MIBs	• Enhanced 3G MIB with 4G MIB extension (4G parameters are covered with 3G MIB and 3G MIB extension) • ENTITY MIB • IF MIB • 3G WWAN MIB persistence
4G LTE network management and diagnostics	• In-band and out-of-band management using Telnet (Cisco IOS Software command-line interface [CLI]) and SNMP, including MIB II and other extensions • Industry-standard 4G LTE diagnostics and monitoring tools (Qualcomm CDMA Air Interface Tester [CAIT] and Spirent Universal Diagnostic Monitor [UDM])
Modem information	• **Modem form factor:** Embedded Peripheral Component Interconnect (PCI) minicard • **C88xG-4G-GA-K9 and C89xG-LTE-GA-K9:** Sierra Wireless MC7304 with Qualcomm MDM9215 • **C899G-LTE-NA-K9:** Sierra Wireless MC7354 with Qualcomm MDM9615 • **C899G-LTE-VZ-K9 and C899G-LTE-ST-K9 :** Sierra Wireless MC7350 with Qualcomm MDM9615
Programming interfaces	• Cisco IOS Software CLI
Wireless technologies supported (performance and throughput)	**C88xG-4G-GA-K9 and C89xG-LTE-GA-K9** Cisco LTE 2.0 800 MHz (band 20), 900 MHz (band 8), 1800 MHz (band 3), 2100 MHz (band 1), and 2600 MHz (band 7) Backward compatibility: • UMTS and HSPA+: 850, 900, 1900, and 2100 MHz • Quad-band EDGE, GPRS, and GSM: 800, 900, 1800, and 1900 MHz • HSPA+ speed DL up to CAT20 (42.2 Mbps) and UL up to CAT6 (5.76 Mbps) • DC-HSPA+ speed DL with CAT24 (42.2 Mbps) and UL up to CAT6 (5.76 Mbps) **C899G-LTE-NA-K9** Cisco LTE 2.0 1900 MHz (band 2 PCS), 1700/2100 MHz (band 4 AWS), 850 MHz (band 5), and 700 MHz (band 17) Backward compatibility: • UMTS and HSPA+: 850 (band 5), 900 (band 8), 1700/2100 (band 4 AWS), 1900 (band 2), and 2100 (band 1) MHz • Quad-band EDGE, GPRS, and GSM: 800, 900, 1800 and 1900 MHz • HSPA+ speed DL up to CAT20 (42.2 Mbps) and UL up to CAT6 (5.76 Mbps) • DC-HSPA+ speed DL with CAT24 (42.2 Mbps) and UL up to CAT6 (5.76 Mbps) **C899G-LTE-VZ-K9 and C899G-LTE-ST-K9** Cisco LTE 2.0 700 MHz (band 13), 1700/2100 MHz (band 4 AWS), and 1900 MHz (band 25 extended PCS) Backward compatibility: EVDO Rev A/CDMA 1x BC0, BC1, BC10
Included antenna	• Two multiband swivel-mount dipole antennae (4G- LTE-ANTM-D) and one extender (4G-AE010-R) are included with all Cisco 880G and 890G Series 4G LTE 2.0 routers.
LED indicators for 4G	• Received signal strength indication bar (RSSI) (green) • WWAN (green) • SIM status (green/yellow) • 3G and 4G LTE service (green) • GPS (green/yellow)
Carrier support	• For an updated list of carriers that offer services on the Cisco 880G and 890G 4G LTE 2.0 Series, please visit http://www.cisco.com/c/en/us/products/routers/networking_solutions_products_genericcontent0900aecd80601f7e.html#~north-america

Table 6. Cisco IOS Software Features: Advanced IP Services Features Set (default) on the Cisco 880G and 890G Series 4G LTE 2.0 ISRs

Feature	Description
Cisco IOS Software requirement	• Cisco IOS Software feature set: Universal Cisco IOS Software image (Advanced IP Services with Full Security License) • **C88xG-4G-GA-K9 and C89xG-LTE-GA-K9:** Mainline Cisco IOS Software Release 15.4(3)M1 with modem firmware 5.5.26.x or later IOS release with respective modem firmware. T train Cisco IOS Software Release 15.5(1)T with modem firmware 5.5.58.x or later IOS release with respective modem firmware for Advanced LTE features support • **C899G-LTE-NA-K9, C899G-LTE-VZ-K9, C899G-LTE-ST-K9:** Mainline Cisco IOS Software Release 15.5(1)T1 with modem firmware 5.5.58.x or later IOS release with respective modem firmware

Table 7. System Specifications for the Cisco 880G and 890G Series 4G LTE 2.0 ISRs

Feature	Specification
Memory	
Default and maximum DRAM	1 GB
Default and maximum flash memory	1 GB
Interface Support	
Console or auxiliary port	• RJ-45: Single dual-purpose port, which provides direct connection to a console or external modem for management or backup access point
Mini-USB port (reserved)	• Mini-USB port to support remote 4G LTE diagnostics and monitoring tools (Qualcomm CAIT and Spirent UDM)
WAN interfaces	• Wireless WAN with 4G LTE, 3.7G, 3.5G, and 3G speeds
LAN interfaces	• Four 10/100 Fast Ethernet ports on the Cisco 880G and eight 10/100/1000 Gigabit Ethernet ports on the Cisco 890G
LEDs	• WWAN (green/amber) • SIM status (green/amber) • Received signal strength indication (RSSI) bar (green) • 3G/4G LTE service (green/amber) • GPS (green/amber) • Speed and link for Gigabit Ethernet WAN port (green) • Speed and link for all Fast Ethernet LAN ports (green)
Physical Characteristics	
Physical dimensions (H x W x D)	Cisco C880G-4G • 1.9 x 12.8 x 10.4 in. (48 x 325 x 264 mm) (includes rubber feet and antenna TNC/SMA connectors) • 1.75 x 12.8 x 10.4 in. (44 x 325 x 264 mm) (without rubber feet and antenna TNC/SMA connectors) Cisco C890G-LTE • 1.9 x 12.8 x 10.4 in. (48 x 325 x 264 mm) (includes rubber feet and antenna TNC/SMA connectors) • 1.75 x 12.8 x 10.4 in. (44 x 325 x 264mm) (without rubber feet and antenna TNC/SMA connectors)
Weight	Cisco C880G-4G • 5.6 lb (2.54 kg) Cisco C890G-LTE • 5.7 lb (2.59 kg)
Standard safety certifications	• UL 60950-1, 2nd edition • CAN/CSA C22.2 No. 60950-1, 2nd edition • EN 60950-1, 2nd edition • CB to IEC 60950-1, 2nd edition with all group differences and national deviations

Feature	Specification
EMC emissions	EN55022/CISPR22, CFR 47 Part 15, ICES003, VCCI-V-3, AS/NZS CISPR22, CNS13438, EN300-386, EN61000-3-2, EN61000-3-3, and EN61000-6-1
EMC immunity	EN55024/CISPR24, (EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-11), and EN300-386
Radio immunity	EN301 489-1, EN 301 489-7, and EN301 489-24
Cellular radio	EN 301 908-1, EN 301 908-2, EN 301 511, 47 CFR Part 22, 47 CFR Part 24, and EN 301 908-13

Table 8.   Antenna Specifications

Item	Specification
Included antenna	Two multiband 4G LTE swivel-mount dipole antennae (4G-LTE-ANTM-D) and one extender (4G-AE010-R) are included.
Diversity (dual antennae) MIMO	**C88xG-4G-GA-K9, C89xG-LTE-GA-K9and C899G-LTE-xx-K9:** Diversity supported MIMO (2X2)
Antenna 4G-ANTM-OM-CM	**Description:** • Multiband indoor omnidirectional antenna • Ceiling mount **Electrical specifications:** • **Frequency range:** 698 to 960 MHz, 1575 MHz, and 1710 to 2690 MHz • **Gain:** 1 and 1.5 decibels relative to isotropic (dBi) (700 to 960 MHz), 1.7 and 3.2 dBi (1700 to 2200 MHz), 3 and 4 dBi (2500 to 2700 MHz) • **Maximum power:** 50W • **Connector:** TNC male • **Voltage standing wave ratio (VSWR):** 2.0:1 and 3.01:1 or less for GPS • **Nominal impedance:** 50 ohms • **Polarization:** Linear vertical **Mechanical specifications:** • **Radome material:** White ABS • **Dimensions (outside dimensions x height):** 5.64 in. x 2.0 in. (143.3 X 50.8 mm) • **Weight:** 6.0 oz (0.17 kg) • **Temperature rating:** –40° to 185°F (–40° to 85°C) • **Can be used with the following cable extensions:** 3G-CAB-ULL-20 and 3G-CAB-ULL-50
Antenna 4G- LTE-ANTM-D	**Description:** • Cisco 4G LTE and 3G omnidirectional dipole antenna • Articulating joint; can be rotated 360 degrees and is capable of maneuvering into three stop positions: 0 degrees, 45 degrees, and 90 degrees • Plug threaded TNC connector: Directly mount the antenna on any Cisco 4G LTE or Cisco 3G wireless ISR enhanced high-speed WAN interface card (EHWIC) with a TNC connector; the threads on the connector must comply with the ANSI 7/16-28 UNEF 2B thread specification • Multiband swivel-mount dipole antenna • Faceplate mount (dual units included with all Cisco 4G LTE WWAN) **Electrical specifications:** • **Operating frequency ranges:** 698 to 806 MHz, 824 to 894 MHz, 925 to 960 MHz, 1710 to 1885 MHz, 1920 to 1980 MHz, 2110 to 2170 MHz, and 2500 to 2690 MHz • **Maximum peak gain:** 2 dBi • **Maximum input power:** 3W • **Connector:** TNC plug • **VSWR:** < 2.5:1 or less • **Characteristic impedance:** 50 ohms **Mechanical specifications:** • **Antenna dimensions (L x W x D):** 9 x 1.2 x 7/16 in. (229 x 30.5 x 11 mm) • **Temperature rating:** –22° to 158°F (–30° to 70°C) • **Antenna base and random color:** Cisco Raven Black

Item	Specification
Antenna extension 4G-AE015-R	**Description:** • Single-unit antenna extension base (15 ft [457.2 cm]) **Electrical specifications:** • **Frequency range:** 6 GHz • **Attenuation:** Less than 3 dB at or below 2.5 GHz • **Base connector:** TNC socket • **Pigtail connector:** TNC plug **Mechanical specifications:** • **Base material:** Cisco gray UL94 V0 PC/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) nonplenum rated Pro-Flex Plus 195
Antenna extension 4G-AE010-R	**Description:** • Single-unit antenna extension base (one 10-ft [304.8 cm] cable included) **Electrical specifications:** • **Frequency range:** 6 GHz • **Attenuation:** Less than 3 dB at or below 2.5 GHz • **Base connector:** TNC socket • **Pigtail connector:** TNC plug **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) nonplenum rated Pro-Flex Plus 195
ANT-4G-OMNI-OUT-N	**Description: Cisco outdoor omnidirectional antenna for 2G, 3G, and 4G LTE cellular:** • UV-stable radome • Mast-mounting bracket • Applicable for both 2G and 3G solutions • Domestic LTE 700 band and global LTE 2600 band • Domestic cellular and global GSM • WiMAX 2300 and 2500 **Electrical specifications:** • **Frequency ranges:** 698 to 960 MHz, 1710 to 2170 MHz, and 2300 to 2700 MHz • **Nominal gain (dBi):** 698 to 960 MHz = 1.5 dBi, and 1710 to 2700 MHz = 3.5 dBi • **3 dB beam width (E plane):** 698 to 960 MHz = 81 degrees, 1710 to 2170 MHz = 75 degrees, and 2300 to 2700 MHz = 100 degrees • **3 dB beam width (H plane):** 360 degrees, omnidirectional • **Polarization:** Vertical and linear • **Normal impedance:** 50 ohms • **VSWR:** < 2.5:1 (698 to 960 MHz) and < 2.0:1 (1710 to 2690 MHz) • **Radiation pattern:** Omnidirectional **Mechanical specifications:** • **Mount style:** Mast mount, upright position only • **Environment:** Outdoor • **Connector:** N-type socket • **Antenna length (height):** 9.8 x 1 in. (24.9 x 2.45 cm) • **Weight:** 1.5 lb (0.68 kg) • **Dimensions (H x outside dimensions):** 9.8 x 1 in. (248 x 24.5 mm) • **Operating temperature range:** –22° to 158°F (–30° to 70°C) • **Storage temperature:** –40° to 185°F (–40° to 85°C) • **Maximum power:** 20W • **Radome:** Polycarbonate, UV, white • **Material substance compliance:** Reduction of Hazardous Substances (ROHS) compliant

Item	Specification
ANT-4G-SR-OUT-TNC	**Description: Cisco integrated 4G LTE low-profile outdoor saucer antenna:** • Applicable for both 3G and 4G LTE solutions • Domestic LTE 700 band and global LTE 2600 band • Domestic cellular and global GSM • Weatherproof UV stable radome • Performance optimized • Excellent flame rating **Electrical specifications:** • **Frequency ranges:** 698 to 960 MHz and 1710 to 2700 MHz • **Peak gain with 1-ft (30.5-cm) cable:** 1.5 dBi (698 to 960 MHz) and 3.7 dBi (1710 to 2700 MHz) • **Peak gain with 15-ft (457.2-cm) cable:** 0.8 dBi (698 to 960 MHz) and 0.2 dBi (1710 to 2700 MHz) • **Average efficiency with 1-ft (30.5-cm) cable:** 90% (698 to 960 MHz) and 82% (1710 to 2700 MHz) • **Average efficiency with 15-ft (457.2-cm) cable:** 60% (698 to 960 MHz) and 40% (1710 to 2700 MHz) • **Polarization:** Linear and vertical • **Nominal impedance:** 50 ohms • **VSWR (maximum):** 2.0:1 (698 to 960 MHz) and 2.0:1 (1710 to 2700 MHz) • **H-plane (3-dB beam width):** Omnidirectional **Mechanical specifications:** • **Power:** 3W • **Cable:** 15-ft (457.2 cm) LMR 195 • **RF connector:** Type N (f); TNC (plug) available • **Mount style:** Ceiling mount • **Radome:** PC/ABS, UV stable, black • **Material substance compliance:** RoHS compliant • **Operational temperature:** –22° to 158°F (–30° to 70°C) • **Storage temperature:** –40° to 185°F (–40° to 85°C) • **Environment:** Indoor • **Dimensions (H x outside dimensions):** 3.4 x 7.9 in. (87 x 200 mm)
ANT-4G-PNL-OUT-N	**Description: Cisco multiband panel outdoor 4G LTE antenna:** • Supports 3G and 4G LTE solutions • Supports bands • Wall or mast mount • Indoor and outdoor • Dual type-N socket connector **Electrical specifications:** • **Frequency ranges:** 698 to 960 MHz and 1710 to 2700 MHz • **VSWR:** 2.0:1 maximum • **Gain:** 5.5 to 10.5 dBi (698 to 960 MHz) and 6.5 to 9.0 dBi (1710 to 2700 MHz) • **3-dB beam width (vertical plane):** 55 to 70 degrees = 698 to 960 MHz, 53 to 98 degrees = 1710 to 2200 MHz, 60 to 70 degrees = 2200 to 2500 MHz, and 55 to 70 degrees = 2500 to 2700 MHz • **3-dB beam width (horizontal plane):** 55 to 70 degrees = 698 to 960 MHz and 50 to 90 degrees = 1710 to 2200 MHz • **F/B ratio:** > 15 dB, typical 20 dB = 698 to 960 MHz, and > 17 dB, typical 23 dB = 1700 to 2700 MHz • **Isolation:** > 30 dB • **Polarization:** Slant +/– 45 degrees • **Nominal impedance:** 50 ohms • **Radiation pattern:** Directional **Mechanical specifications:** • **Mount style:** Wall or mast mount • **Environment:** Outdoor • **Connector:** Dual type-N socket (direct connect or dual 12 in. [30 cm]) • **Antenna length (height):** 11.6 in. (29.5 cm) • **Temperature range (operating):** –22° to 158°F (–30° to 70°C) • **Storage temperature:** –40° to 185°F (–40° to 85°C) • **Wind rating:** 99 mi (160 km) per hr • **IP rating:** IP 54

Item	Specification
	• **Radome:** Polycarbonate, UV resistant, white • **Material substance compliance:** ROHS compliant

CGR-LA-NM-NF*
CGR-LA-NF-NF*
	Description: Cisco Lightning Arrestor
	• Broadband operation
	• DC continuity for outdoor powering
	• Reversed installation
	Permanently installed gas capsule
	Feature description:
	• **Arrestor type:** Gas discharge tube
	• **Main path connectors:** Port 1: protected, N plug (male); Port 2: unprotected, N jack (female, bulkhead side)
	• **Impedance:** 50 ohms
	• **Frequency range:** 0 MHz to 5800 MHz
	• **Return loss:** Greater than or equal to 20 dB
	• **Insertion loss:** Less than or equal to 0.2 dB
	• **RF continuous wave (CW) power:** Less than or equal to 60W
	• **Surge current handling capability:** 10 single, multiple kA (test pulse 8/20 ms)
	• **Residual pulse energy:** 250 microsecond typically (test pulse 4 kV 1.2/50 microsecond; 2kA 8/20 microsecond), main path (protected side)
	• **Operating temperature range:** -40° to 185°F (-40° to 85°C)
	• **Waterproof rating:** IP 67 (according to IEC 60529, data refer to the coupled state)
	• **Mounting and grounding:** MH24 (bulkhead)
	• **Material**
	  ◦ **Housing:** Brass
	  ◦ **Port 1 center contact:** Gold-plated brass
	Port 2 center contract copper beryllium alloy

* –N antenna works with –N cables and –N lightning arrestor.

Ordering Information

For Cisco ISR 880G and 890G Series 4G LTE 2.0 ISR ordering information, please visit the Cisco Ordering Home Page and refer to Tables 9 and 10.

Table 9.   Cisco 890G and 880G 4G Series LTE 2.0 ISRs Ordering Information

Product	Description
Cisco 89xG 4G LTE 2.0 Integrated Services Router	
C899G-LTE-GA-K9	Cisco LTE 2.0 Secure IOS Gigabit Router SFP with Sierra Wireless MC7304/Qualcomm MDM9215 for Australia and Europe, LTE 800/900/1800/ 2100/2600 MHz, 850/900/1900/2100 MHz UMTS/HSPA+ bands
C899G-LTE-NA-K9	Cisco LTE 2.0 Secure IOS Gigabit Router SFP Multi-Mode 4G LTE M2M ISR with Sierra Wireless MC7354/Qualcomm MDM9615 for North America, LTE 700/850/1900 (1700/2100 AWS), 850/900/1900 (1700/2100) MHz UMTS/HSPA+ bands
C899G-LTE-VZ-K9	Cisco LTE 2.0 Secure IOS Gigabit Router SFP Multi-Mode 4G LTE M2M ISR with Sierra Wireless MC7350/Qualcomm MDM9615 for Verizon, LTE 700 and (1700/2100 AWS), EVDO Rev A/CDMA 1x BC0, BC1, BC10
C899G-LTE-ST-K9	Cisco LTE 2.0 Secure IOS Gigabit Router SFP Multi-Mode 4G LTE M2M ISR with Sierra Wireless MC7350/Qualcomm MDM9615 for Sprint, LTE 1900 extended PCS, EVDO Rev A/CDMA 1x BC0, BC1, BC10
C896VAG-LTE-GA-K9	Cisco LTE 2.0 Secure IOS Gigabit Router SFP VDSL/ADSL2+ Annex B with Sierra Wireless MC7304/Qualcomm MDM9215 for Australia and Europe, LTE 800/900/1800/ 2100/2600 MHz, 850/900/1900/2100 MHz UMTS/HSPA+ bands
C897VAG-LTE-GA-K9 **C897VAMG-LTE-GA-K9**	Cisco LTE 2.0 Secure IOS Gigabit Router SFP VDSL/ADSL2+ Annex A or M with Sierra Wireless MC7304/Qualcomm MDM9215 for Australia and Europe, LTE 800/900/1800/ 2100/2600 MHz, 850/900/1900/2100 MHz UMTS/HSPA+
C898EAG-LTE-GA-K9	Cisco LTE 2.0 Secure IOS Gigabit Router SFP G.SHDSL (EFM/ATM) with Sierra Wireless MC7304/Qualcomm MDM9215 for Australia and Europe, LTE 800/900/1800/ 2100/2600 MHz, 850/900/1900/2100 MHz UMTS/HSPA+ bands

Product	Description
Cisco 88xG 4G LTE 2.0 Integrated Services Router	
C881G-4G-GA-K9	Cisco LTE 2.0 Secure IOS Fast Ethernet Router with Sierra Wireless MC7304/Qualcomm MDM9215 for Australia and Europe, LTE 800/900/1800/ 2100/2600 MHz, 850/900/1900/2100 MHz UMTS/HSPA+ bands
C887VAG-4G-GA-K9	Cisco LTE 2.0 Secure IOS Router VDSL/ADSL2+ Annex A with Sierra Wireless MC7304/Qualcomm MDM9215 for Australia and Europe, LTE 800/900/1800/ 2100/2600 MHz, 850/900/1900/2100 MHz UMTS/HSPA+ bands

Table 10.   Antenna, Cable, and Lightning Arrestor Ordering Information

Description	Part Number
Multiband Swivel Mount Dipole Antenna, Faceplate Mount (dual included)	4G-LTE-ANTM-D 4G-LTE-ANTM-D= (Spare)
Multiband Omnidirectional Antenna, Ceiling Mount	4G-ANTM-OM-CM 4G-ANTM-OM-CM= (Spare)
Single Unit Antenna Extension Base (one 10-ft [304.8-cm] cable included)	4G-AE010-R 4G-AE010-R= (Spare)
Single Unit Antenna Extension Base (15-ft [457.2-cm] cable)	4G-AE015-R 4G-AE015-R= (Spare)
50-ft (15-m) Ultra Low Loss LMR 400 Cable with TNC Connector	4G-CAB-ULL-50 4G-CAB-ULL-50= (Spare)
20-ft (6-m) Ultra Low Loss LMR 400 Cable with TNC Connector	4G-CAB-ULL-20 4G-CAB-ULL-20= (Spare)
25-ft (7.5-m) Low Loss LMR 240 Cable with TNC Connector	4G-CAB-LMR240-25 4G-CAB-LMR240-25= (Spare)
50-ft (15-m) Low Loss LMR 240 Cable with TNC Connector	4G-CAB-LMR240-50 4G-CAB-LMR240-50= (Spare)
75-ft (23-m) Low Loss LMR 240 Cable with TNC Connector	4G-CAB-LMR240-75 4G-CAB-LMR240-75= (Spare)
Standalone active SMA GPS antenna with 17-ft (5-m) extender	GPS-ACT-ANTM-SMA GPS-ACT-ANTM-SMA= (Spare)
Multiband Omnidirectional Stick Outdoor 4G Antenna	ANT-4G-OMNI-OUT-N
Multiband Low-Profile Saucer Outdoor 4G Antenna	ANT-4G-SR-OUT-TNC
Multiband Panel Outdoor 4G Antenna	ANT-4G-PNL-OUT-N
50-ft (15-m) Ultra Low Loss LMR 400 Cable TNC-N Connector	CAB-L400-50-TNC-N
20-ft (6-m) Ultra Low Loss LMR 400 Cable with TNC-N Connector	CAB-L400-20-TNC-N
20-ft (6-m) Ultra Low Loss LMR 400 Cable with N Connectors	CAB-L400-20-N-N
Lightning Arrestor Kit: female to female	CGR-LA-NF-NF
Lightning Arrestor Kit: male to female	CGR-LA-NM-NF

* –N antenna works with –N cables and –N lightning arrestor.

For More Information

For more information about the Cisco 880G and 890G Series, visit http://www.cisco.com/go/800 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.

For–N antenna and cable installation guidance, visit
http://www.cisco.com/en/US/docs/routers/connectedgrid/antennas/installing/Overview.html

Cisco and Partner Services for the Enterprise Networks Architecture

Enable the Cisco Enterprise Networks 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 Enterprise Networks 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 890G and 880G Series 4G LTE 2.0 Integrated Services Routers come 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 the warranty, including access to OS updates, Cisco.com online resources, and Cisco Technical Assistance Center (TAC) support services. Table 11 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 11.   Cisco Technical Services for Cisco 890G and 880G Series 4G LTE 2.0 ISRs

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, 8x5x4, 24x7x4, and 24x7x2 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
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.

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