

Cisco 809 Industrial Integrated Services Routers

The Cisco® 809 Industrial Integrated Services Router is a compact ruggedized router designed for deployment in harsh industrial environments. The 809 is Cisco's smallest multimode 3G and 4G LTE wireless router, making it an ideal solution for distribution automation and remote asset management across multiple industrial verticals. The 809 has an integrated 9.6-60 VDC power input and is designed to withstand hostile environments, including shock, vibration, dust, and humidity, and supports a wide temperature range (-40°C to +60°C and type-tested at +85°C for 16 hours). The IR809 brings together enterprise-grade wireline-like services, such as quality of service (QoS), Cisco advanced VPN technologies (i.e. Dynamic Multipoint VPN - DMVPN -, Flexible VPN - FlexVPN), and Multi-VRF for cellular, highly secure data, voice, and video communications and Cisco IOx, an open, extensible environment for hosting applications at the network edge.

Figure 1. Cisco 809 Industrial Integrated Services Router with 4G LTE



Product Overview

The Cisco 809 Industrial Integrated Services Routers support the latest 3rd Generation Partnership Project (3GPP) Release 9 Category 3 LTE standards. They provide persistent, reliable LTE connectivity transparent handoffs between LTE and 3G networks.

The following models are available:

- **IR809G-LTE-NA-K9:** Multimode Cisco LTE 2.0 for carriers operating in LTE 700 MHz (band 17), 1900 MHz (band 2 PCS), or 1700/2100 MHz (band 4 AWS) frequencies; 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).
- **IR809G-LTE-VZ-K9:** Multimode Cisco LTE 2.0 for carriers operating in LTE 700 MHz (band 13), 1700/2100 MHz (band 4 AWS), or 1900 MHz (band 25 extended PCS) frequencies; backward-compatible with EVDO Rev A/CDMA 1x BC0, BC1, BC10.

- **IR809G-LTE-GA-K9:** Multimode Cisco LTE 2.0 for carriers operating in LTE 800 MHz (band 20), 900 MHz (band 8), 1800 MHz (band 3), 2100 MHz (band 1), or 2600 MHz (band 7) frequencies; backward-compatible with UMTS and HSPA+: 850 MHz (band 5), 900 MHz (band 8), 1900 MHz (band 2), and 2100 MHz (band 1).

The Cisco 809 Industrial Integrated Services Routers offer a broad range of features for industrial and enterprise Internet of Things (IoT):

- **Accelerometer and gyroscope¹:** Monitor speed and angular momentum for automotive applications and detect tampering.
- **GPS:** Enables real-time location tracking of remote assets and geo-fence when used with IOT Field Network Director.
- **Zero-touch provisioning:** This provisioning uses network management tools, such as the IoT Field Network Director, and simplifying deployment of a secure network head-end using a Cisco Industrial Operations Kit.
- **Security services:** Services included area firewall, VPN, which requires no additional hardware or client software. This security service can, for example, intelligently redirect web traffic to the cloud to enforce granular security and acceptable use policies over user web traffic. With this solution, businesses can deploy the market-leading web security solution quickly and easily to protect assets from web-based threats, such as viruses, while saving bandwidth, money, and resources.
- **4G LTE wireless WAN (WWAN) data services:** With enhanced data rates and improved latency (30 milliseconds or less), WWAN services provide an ideal way to supplement traditional wire-line services. These 4G LTE WWAN data services have average data rates with theoretical limits of 100 Mbps on the downlink and 50 Mbps on the uplink. Actual data speed depends on the service provider's network. With 4G LTE data rates, the 809s offer a primary WAN link capable of running multiple services, including voice and video. The 4G LTE WWAN data services can also be used as a cost-effective alternative in areas where broadband wireline services are either not available or very expensive.
- **Multiple-PDN (Packet Data Network):** This feature allows the router to connect to different access point names (APNs) enabling traffic segregation. For example, public internet traffic can be kept separate from corporate traffic.
- **4G LTE multiple-bearer QoS for cellular:** The 809s support 4G LTE multiple bearers, enabling differentiated treatment of traffic based on QoS policies. The QoS feature depends on the service provider's ability to classify and enforce QoS policies and hence requires the providers to launch this service in their networks.
- **Multi-VRF.** The 809s support multi-VRF feature that allows customer to segment and isolate traffic based on their applications requirements.

¹ Hardware-ready. Software supported in a future release.

Business Benefits and Application Examples

Industrial customers are looking for real-time monitoring and control of industrial assets to drive higher operational efficiency.

Utilities

Utilities are looking to have the ability to monitor thousands of miles of electrical or water infrastructure often located in harsh environments through 3G and 4G cellular networks to provide remote assets monitoring, and reliable and secure supervisory control and data acquisition (SCADA) traffic backhauling. Devices that enable this connectivity need to be able to be remotely monitored and configured, and need to support legacy serial interfaces to interconnect with legacy monitoring devices.

Oil and Gas

Oil and gas companies have the need to monitor pipeline infrastructure across wide geographic areas and remote locations using 3G and 4G cellular networks to collect data from remote terminal units and securely transport SCADA traffic to a Network Operations Center.

Transportation

Highways and transportation agencies require reliable always-on communication between speed cameras, monitoring cameras, ticket terminals, etc. Wireless devices to support such a continuous communication need to support 3G and 4G networks to assure good wide coverage, support continuous operation in very harsh environment, and be very compact for deployment in roadside cabinets, as well as support serial interfaces to existing legacy devices.

Primary Features and Benefits

Table 1 lists the features and benefits of Cisco 809 Industrial Integrated Services Routers.

Table 1. Features and Benefits

Features	Benefits
IoT Enablement	
Compact Ruggedized Form Factor	Designed for hostile outdoor remote assets monitoring and M2M communications and integrated 9.6-60 VDC power supply.
Raw socket transport and SCADA	Raw socket can be used to transport SCADA data from remote terminal units (RTUs). This method is an alternative to the Block Serial Tunnel (BSTUN) protocol. The 809 provides DNP3 serial to DNP3/IP translation and IEC 60870 T101 to IEC 60870 T104 protocol translation to serve as a SCADA gateway to do the following: <ul style="list-style-type: none"> • Receive data from RTUs (T101 or DNP3 serial) and relay configuration commands from the Control Center (T104 or DNP3 IP) SCADA applications. • Receive configuration commands from the Control Center and relay RTU data to the Control Center. • Terminate incoming T104 or DNP3 IP requests from the Control Center when an RTU is offline.
Cisco IOx Application Support	Provides an open, extensible environment for hosting OS and applications at the network edge.
IoT Field Network Director	Available as an optional Industrial Operations Kit. This is a software platform that manages a multiservice network and security infrastructure for IoT applications such as transportation, smart grid, services, distribution automation, and substation automation.
Multiple mounting options	<ul style="list-style-type: none"> • Supports a variety of mounting options - floor mount and wall mount - and offers DC power options allowing for deployment flexibility.
Lightweight, compact size with low power consumption	<ul style="list-style-type: none"> • Can be deployed in many different environments where space, heat dissipation, and low power consumption are critical factors.
Increased performance to run concurrent services	<ul style="list-style-type: none"> • Performance allows customers to take advantage of broadband network speeds while running highly secure, concurrent data, voice, video, wireless and IoT services.




Features	Benefits
Enhanced security	<ul style="list-style-type: none"> • An integrated stateful and application inspection firewall provides network perimeter security and hardware assisted high-speed IP Security (IPSec); Triple Data Encryption Standard (3DES) and next-generation encryption protocols such as Advanced Encryption Standard (AES) encryption and Secure Hash Algorithm (SHA) 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, and thus providing increased productivity and better use of company resources. • Cisco Cloud 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	
Two Gigabit Ethernet interfaces	<ul style="list-style-type: none"> • Allows for multiple Ethernet device connectivity in a small office or other remote location with the ability to designate a port as the network edge. • VLANs for Layer-3 IP sub-interfaces. • Inter-VLAN routing capabilities.
Two serial interfaces	<ul style="list-style-type: none"> • Two serial interfaces (one RS232 port and one RS232/RS485 port) to provide two serial connections to local RTU for SCADA transport and RTU management.
Transparent Roaming between Wireless Networks	
Dual subscriber-identity-module (SIM) support	<ul style="list-style-type: none"> • Dual SIM feature provides reliability and multihoming capabilities over LTE and HSPA-based networks.
Cisco IOS® Mobile IP features	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Allows an entire subnet or mobile network to maintain connectivity to the home network while roaming.
Multiple wireless WAN technologies	<ul style="list-style-type: none"> • Users can use the best wireless (4G LTE, 3.7G, 3.5G, 3G or 2G) technology or network available.
Advanced IP Services in Standards-Based Cisco IOS Software	
Advanced security features	<ul style="list-style-type: none"> • Authorization and authentication determine 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. • The next-generation protocol suites enable users to monitor potential malicious activity on the network.
QoS features	<ul style="list-style-type: none"> • Provides traffic precedence to delay-sensitive or prioritized applications. • Facilitates low-latency routing of delay-sensitive industrial applications.
IP Multicast	<ul style="list-style-type: none"> • Allows efficient broadcast of data or video for increased situational awareness, multiuser communications, or surveillance applications.
Management and manageability	<ul style="list-style-type: none"> • Network managers can remotely manage and monitor networks with SNMP, Telnet, or HTTP/HTTPS/SSH, 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 configuration at the remote site. • Network managers can reset to a predesignated golden image, as well as configure an 809 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. • The tight integration with Cisco IOS Software enables router to self-monitor the LTE WAN link and automatically recover from a radio link failure.

Product Specifications

Table 2: 4G LTE specifications for the Cisco 809 Industrial Integrated Services Routers.

Table 2. 4G LTE Specifications

Region Theaters	IR809G-LTE-GA-K9	IR809G-LTE-NA-K9	IR809G-LTE-VZ-K9
Bands	LTE bands 1, 3, 7, 8, 20 800 (band 20), 900 (band 8), 1800 (band 3), 2100 (band 1), and 2600 (band 7) MHz	LTE band 2 PCS 1900, band 4 AWS (1700/2100), band 17 (700), band 13 (700), band 25 extended PCS 1900	LTE band 13 (700), band 4 AWS (1700/2100) and band 25 extended PCS (1900)
Theoretical Download/upload speeds*	100 and 50 Mbps	100 and 50 Mbps	100 and 50 Mbps
Australia	✓	X	X
Europe	✓	X	X
Middle East	✓	X	X
LATAM and APAC	✓ (Dependent on specific operators supporting the previous LTE bands)	✓ (Dependent on specific operators supporting the previous LTE bands)	X
United States	X	✓ ATT (FW Image Provisioning Switching)	✓ Verizon
Canada	X	✓	X

Item	Specification
4G LTE modem form factor	<ul style="list-style-type: none"> • Embedded (included with the router) • Upgrade -GA FW Image Switching provisioning from flash (FW-MC7304-LTE-AU or FW-MC7304-LTE-GB) • Upgrade -NA FW Image Switching provisioning from flash (FW-MC7354-LTE-AT or FW-MC7354-LTE-CA)
Important 4G LTE features	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • High reliability, and cellular multihoming support for dual SIM card socket; compliant with ISO-7816-2 (SIM mechanical)
SMS and Global Positioning System (GPS) 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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

Item	Specification
4G LTE network management and diagnostics	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Modem form factor: Embedded Peripheral Component Interconnect (PCI) mini card. IR809G-LTE-GA-K9: Sierra Wireless MC7304 with Qualcomm MDM9215. IR809G-LTE-NA-AK9: Sierra Wireless MC7354 with Qualcomm MDM9615 IR809G-LTE-VZ-AK9: Sierra Wireless MC7350 with Qualcomm MDM9615.
Programming interfaces	<ul style="list-style-type: none"> Cisco IOS Software CLI
Wireless technologies supported (performance and throughput)	<p>IR809G-LTE-GA-K9</p> <p>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).</p> <p>Backward compatibility:</p> <ul style="list-style-type: none"> 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) <p>IR809G-LTE-NA-K9</p> <p>Cisco LTE 2.0 1900 MHz (band 2 PCS), 1700/2100 MHz (band 4 AWS), 700 MHz (band 17) Backward compatibility:</p> <ul style="list-style-type: none"> 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) <p>IR809G-LTE-VZ-K9</p> <p>Cisco LTE 2.0 700 MHz (band 13), 1700/2100 MHz (band 4 AWS), 1900 MHz (band 25 extended PCS)</p> <p>Backward compatibility:</p> <ul style="list-style-type: none"> EVDO Rev A/CDMA 1x BC0, BC1, BC10
LED indicators for 4G	<ul style="list-style-type: none"> Received-signal-strength indication (RSSI) (green) WWAN (green) SIM status (green/yellow) GPS (green/yellow) SYS (green/yellow) VPN (green)
Carrier support	<ul style="list-style-type: none"> For an updated list of carriers that offer services on the Cisco IR809, visit http://www.cisco.com/go/ir809.

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

Table 3 lists the software features supported on Cisco 809 Industrial Integrated Services Routers.

Table 3. Cisco IOS Software Features on 809

Feature	Description
Cisco IOS Software requirements	<ul style="list-style-type: none"> Cisco IOS Software feature set: Universal Cisco IOS Software image Cisco IOS Software Release - 15.5(3)M, or later, and modem firmware - 5.5.58, or later

Feature	Description
IP and IP services features	<ul style="list-style-type: none"> • Routing Information Protocol Versions 1 and 2 (RIPv1 and RIPv2) • Generic routing encapsulation (GRE) and multipoint GRE (MGRE) • Cisco Express Forwarding • Standard 802.1d Spanning Tree Protocol (STP) • Layer 2 Tunneling Protocol (L2TP) • Layer 2 Tunneling Protocol Version 3 (L2TPv3) • Network Address Translation • Dynamic Host Configuration Protocol (DHCP) server, relay, and client • Dynamic DNS (DDNS) • DNS Proxy • DNS Spoofing • Access control lists (ACLs) • IPv4 and IPv6 Multicast • Open Shortest Path First (OSPF) • Border Gateway Protocol (BGP) • Performance Routing (PfR) • Enhanced Interior Gateway Routing Protocol (EIGRP) • Virtual Route Forwarding (VRF) Lite • Next Hop Resolution Protocol (NHRP) • Bidirectional Forwarding Detection (BFD) • Web Cache Communication Protocol (WCCP)
Security features	<p>Secure Connectivity:</p> <ul style="list-style-type: none"> • Secure Sockets Layer (SSL) VPN for secure remote access • Hardware-accelerated DES, 3DES, AES 128, AES 192, and AES 256 • Public-key-infrastructure (PKI) support • 20 IPsec tunnels • Cisco Easy VPN Client and Server • Network Address Translation (NAT) transparency • Dynamic Multipoint VPN (DMVPN) • Tunnel-less Group Encrypted Transport VPN • Flex VPN • IPsec stateful failover • VRF-aware IPsec • IPsec over IPv6 • Adaptive control technology • Session Initiation Protocol (SIP) application layer gateway <p>Cisco IOS Firewall:</p> <ul style="list-style-type: none"> • Zone-based policy firewall • VRF-aware stateful inspection routing firewall • Stateful inspection transparent firewall • Advanced application inspection and control • Secure HTTP (HTTPS), FTP, and Telnet Authentication Proxy • Dynamic and static port security • Firewall stateful failover • VRF-aware firewall <p>Content Filtering:</p> <ul style="list-style-type: none"> • Subscription-based content filtering with Trend Micro • Support for Websense and SmartFilter • Cisco IOS Software blacklists and whitelists <p>Integrated Threat Control:</p> <ul style="list-style-type: none"> • Control plane policing • Flexible packet matching • Network foundation protection

Datasheet

Feature	Description
QoS features	<ul style="list-style-type: none"> • Low latency queuing (LLQ) • Weighted fair queuing (WFQ) • Class-based WFQ (CBWFQ) • Class-based traffic shaping (CBTS) • Class-based traffic policing (CBTP) • Policy-based routing (PBR) • Class-based QoS MIB • Class of service (CoS)-to-differentiated services code point (DSCP) mapping • Class-based weighted random early detection (CBWRED) • Network-based application recognition (NBAR) • Link fragmentation and interleaving (LFI) • Resource Reservation Protocol (RSVP) • Real-Time Transport Protocol (RTP) header compression (cRTP) • Differentiated services (DiffServ) • QoS preclassify and prefragmentation • Hierarchical QoS (HQoS)
Management features	<ul style="list-style-type: none"> • IoT Field Network Director and Industrial Operations Kit • Cisco Configuration Professional • Cisco Configuration Express • Cisco Configuration Engine support • Cisco AutoInstall • IP service-level agreement (IP SLA) • Cisco IOS Embedded Event Manager (EEM) • Cisco Security Manager • Telnet, SNMPv3, Secure Shell (SSH) Protocol, CLI, and HTTP management • RADIUS and TACACS+ • Out-of-band management with external modem through virtual auxiliary port
High-availability features	<ul style="list-style-type: none"> • Virtual Router Redundancy Protocol (VRRP) (RFC 2338) • Hot Standby Router Protocol (HSRP) • Multigroup HSRP (MHSRP) • Dial backup with external modem through virtual auxiliary port • Dual SIM support for cellular failover
IPv6 features	<ul style="list-style-type: none"> • IPv6 addressing architecture • IPv6 name resolution • IPv6 statistics • IPv6 translation: transport packets between IPv6-only and IPv4-only endpoints (NAT-PT) • Internet Control Message Protocol Version 6 (ICMPv6) • IPv6 DHCP services • IPv6 routing • IPv6 tunneling • IPv6 IPsec

Table 4 lists the system specifications, and Table 5 lists antenna specifications for the 809.

Table 4. System Specifications

Feature	Specification
Memory	
Default and maximum DRAM	2 GB
Default and maximum flash memory	8 GB eMMC (4GB usable)
IP rating	IP30

Datasheet

Feature	Specification
Interface Support	
Console	<ul style="list-style-type: none"> Mini type-B USB; also supports remote 4G LTE diagnostics and monitoring tools
WAN interfaces	<ul style="list-style-type: none"> Wireless WAN with multimode 4G LTE, 3.7G, 3.5G, 3G and 2G speeds
LAN interfaces	<ul style="list-style-type: none"> Two 10/100/1000 Base-T Gigabit Ethernet ports
LEDs	<ul style="list-style-type: none"> System OK (green/amber) WWAN (green) Speed and link for Gigabit Ethernet WAN port (green) Speed and link for all Fast Ethernet LAN ports (green)
Serial interface	<ul style="list-style-type: none"> 1 RS-232 and 1 RS-232/RS-485 Supports asynchronous mode with speed up to 115.2K
Serial protocol support	<ul style="list-style-type: none"> SCADA, DNP3, T101-104, Raw Socket TCP and UDP, SLIP
Physical Characteristics	
Physical dimensions (H x W x D)	1.15 x 5.05 x 6.27 in (29.21 x 128 x 159.2 mm)
Weight	1 lb 11 oz. (0.77 kg)
Mounting options	Panel/Door mount
Mean time between failure (MTBF - Ground Benign)	440, 370 hours
Maximum platform power consumption	29W
Environmental operating range	-40° to 140°F (-40° to 60°C) in a sealed NEMA cabinet with no airflow -40° to 158°F (-40° to 70°C) in a vented cabinet with 40 lfm of air -40° to 167°F (-40° to 75°C) in a forced air enclosure with 200 lfm of air Type tested at +85°C for 16 hours
Operating altitude	50°C up to 5000 ft (above 5000 ft derate maximum operating temperature 1.50°C per 1000 ft) Maximum altitude: 10,000 ft
Standard safety certifications	<ul style="list-style-type: none"> 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 EN50155 and IEC61850-3 NUP T2 shock testing, non-NEBS 3396 IEEE 1613
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
Power specifications	Min/max voltage: 9.6-60V DC input Max, Min current: 2A (9.6VDC), 0.4A (60VDC)

Table 5. Antenna Specifications

Item	Specification
ANT-3-4G2G1-0	<p>Description: Cisco transportation omnidirectional 3-element antenna for 2G, 3G, 4G cellular and GPS</p> <ul style="list-style-type: none"> MIMO 2 x cellular elements, 1 x GPS active antenna. Vehicular roof stud/nut mounting, qualified to vehicular shock and vibrate standards. IP67 waterproof with proper installation on the roof on an 8x8" flat mounting surface. Covers 2G, 3G, 4G cellular bands in 698-2700 MHz frequency range. LTE MIMO support with low correlation coefficient.

Item	Specification
	<ul style="list-style-type: none"> • Low noise active GPS antenna. • Specifications below are given with 1ft diameter ground plane under antenna. <p>Cellular Electrical Specifications: (specs apply to both elements)</p> <ul style="list-style-type: none"> • Frequency ranges: 698 to 960 MHz, 1710 to 2700 MHz • Typical gain (dBi): 698 to 960 MHz = 2.6 dBi, and 1710 to 2700 MHz = 4.6 dBi • Efficiency: 60% • Polarization: Linear, Vertical • Port Impedance: 50 ohms • VSWR: < 2.1:1 (698 to 960 MHz) and < 2.0:1 (1710 to 2700 MHz) • Radiation pattern: Omnidirectional • Integrated RF cables: 2ft, LMR-195 type, TNC(male) <p>GPS Electrical Specifications:</p> <ul style="list-style-type: none"> • Frequency range: 1575.42 MHz +/- 1 MHz (GPS L1) • Amplifier gain: 27dB +/- 3dB • Noise Figure: 4dB max • Port Impedance: 50 ohms • Output VSWR: < 2.0:1 • Radiation pattern: RHCP • DC Voltage: 2.7 - 12 VDC • DC Current: < 20mA over -40 to +85C temperature range • Integrated RF cable: 17ft, LMR-100 type, SMA(m) <p>Mechanical and Environmental Specifications:</p> <ul style="list-style-type: none"> • Mount style: Vehicular roof or similar, stud and nut mount. • Environment: Outdoor, vehicular roof, transportation ruggedized and qualified to subset of SAE1455 and MILSTD 810G • Connectors: 2 x TNC(m) cellular, 1 x SMA(m) GPS • Antenna Dimensions: 7.1 in diameter x 2.4 in height (18.0 x 6.5 cm), excluding RF cables • Weight: 1.48 lb. (0.67kg) • Operating temperature range: -40° to +70°C • Storage temperature: -40° to 85°C • Maximum power: 10W • Radome: Polycarbonate, UV, Black • Material substance compliance: ROHS compliant
ANT-4G-OMNI-OUT-N	<p>Description: Cisco outdoor omnidirectional antenna for 2G, 3G, and 4G LTE cellular</p> <ul style="list-style-type: none"> • 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 <p>Electrical Specifications:</p> <ul style="list-style-type: none"> • 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 <p>Mechanical Specifications:</p> <ul style="list-style-type: none"> • 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. (24.8 x 24.5 mm)

Item	Specification
	<ul style="list-style-type: none"> • 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: ROHS compliant
<p>ANT-4G-PNL-OUT-N</p>	<p>Description - Cisco multiband panel outdoor 4G LTE antenna:</p> <ul style="list-style-type: none"> • Supports 3G and 4G LTE solutions • Supports bands • Wall mount and mast mount • Indoor and outdoor • Dual type-N socket connector <p>Electrical specifications:</p> <ul style="list-style-type: none"> • 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 <p>Mechanical specifications:</p> <ul style="list-style-type: none"> • Mount style: wall or mast mount • Environment: outdoor • Connector: dual type N female (direct connect or dual 12 in (30 cm)) • Antenna length (height): 11.6" (2.95 cm) • Temperature Range (Operating): -22 to 158-degrees F (-30 to 70-degrees C) • Storage temperature: -40 to +85° C • Wind rating: 160 Km/H • IP rating: IP 54 • Radome: polycarbonate, UV resistant, white • Material substance compliance: ROHS compliant
<p>ANT-4G-DP-IN-TNC</p>	<p>Description: Cisco indoor swivel-mount dipole antenna</p> <ul style="list-style-type: none"> • Low-profile blade style sheath • Applicable for both 3G and 4G solutions • Domestic LTE 700 and global LTE 2600 bands • Domestic cellular and global GSM • Conformance to RoHS • Complete cellular and 3G/4G data communications in a single antenna <p>Electrical Specifications:</p> <ul style="list-style-type: none"> • Operating frequency ranges: 698 to 806 MHz, 824 to 894 MHz, 880 to 960 MHz, 1710 to 1880 MHz, 1850 to 1990 MHz, 1920 to 2170MHz, 2100 to 2500 MHz and 2500 to 2690 MHz • Peak gain: 0.5 dBi (698 to 960 MHz) and 2.2 dBi (1710 to 2700 MHz) • Average efficiency: 55% (698 to 960 MHz) 73% (1710 to 2700 MHz) • Maximum input power: 3 watts • Voltage standing wave ratio (VSWR): < 2.5:1 • Characteristic impedance: 50 ohms • Polarization: linear <p>Mechanical Specifications:</p> <ul style="list-style-type: none"> • Type: dipole • Antenna dimensions (L x W x D): 229 mm x 30.5 mm x 15 mm • Mount style: direct mount

Item	Specification
	<ul style="list-style-type: none"> • Environment: indoor • RF Connector: TNC (m) • Antenna weight: 49 g • Temperature rating: -31 to 158 degrees F (-35 to +70 degrees C) • Material substance compliance: RoHS compliant
4G-ANTM-OM-CM	<p>Description:</p> <ul style="list-style-type: none"> • Multiband indoor omnidirectional antenna • Ceiling mount <p>Electrical Specifications:</p> <ul style="list-style-type: none"> • 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 • VSWR: 2.0:1 and 3.01:1 or less for GPS • Nominal impedance: 50 ohms • Polarization: linear vertical <p>Mechanical Specifications:</p> <ul style="list-style-type: none"> • 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. (170.1 g) • 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
GPS-ACT-ANTM-SMA	<p>Description: Cisco 4G Indoor/Outdoor Active GPS Antenna</p> <p>Maximum input power: 1 W Connector: SMA male VSWR: 2:1 or less Characteristic impedance: 50 Ohm Antenna base and radome color: Black Antenna dimensions: 1.7 (L) x 1.4 (W) x 0.55 (H) in. (44 x 36 x 14mm) Operating temperature: -40° to 185°F (-40° to 85°C) Operating frequency ranges: 1574.42-1576.42 MHz Polarization: RHCP Maximum peak gain (at Boresight): 4 dBic Shocks: 50G Drop test: 10x3 axis/1 meter drop 6 axis Cable Length: 17 ft (5.18 meters) Mount Bracket: Metal Anchor: 1 inch. The anchor drill size is 3/16. Screws: 3 stainless-steel screws that are self-drilling pan head #2 Phillips.</p>
Antenna extension 4G-AE015-R	<p>Description:</p> <ul style="list-style-type: none"> • Single-unit antenna extension base (15 ft [457.2 cm]) <p>Electrical Specifications:</p> <ul style="list-style-type: none"> • Frequency range: 6 GHz • Attenuation: less than 3 dB at or below 2.5 GHz • Base connector: TNC socket • Pigtail connector: TNC plug <p>Mechanical Specifications:</p> <ul style="list-style-type: none"> • 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) non-plenum rated Pro-Flex Plus 195

Item	Specification
Antenna extension 4G-AE010-R	<p>Description:</p> <ul style="list-style-type: none"> Single-unit antenna extension base (10 ft. [304.8 cm], one cable included) <p>Electrical Specifications:</p> <ul style="list-style-type: none"> Frequency range: 6 GHz Attenuation: less than 3 dB at or below 2.5 GHz Base connector: TNC socket Pigtail connector: TNC plug <p>Mechanical Specifications:</p> <ul style="list-style-type: none"> 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

* -N antenna works with -N cables and -N lightning arrestor

Ordering Information

For more information about ordering Cisco 809 Industrial Integrated Services Routers, visit the [Cisco Ordering home](#) page and refer to Tables 6 and 7.

Table 6. Ordering Information

Product	Description
Cisco IR809G 4G LTE Integrated Services Routers	
IR809G-LTE-GA-K9	Compact Cisco IR809 Ruggedized Secure Multi-Mode 4G LTE M2M ISR with Qualcomm MDM9215 for Australia and Europe, LTE 800/900/1800/2100/2600 MHz, 850/900/1900/2100 MHz UMTS/HSPA+ bands
IR809G-LTE-NA-K9	Compact Cisco IR809 Ruggedized Secure Multi-Mode 4G LTE M2M ISR with Qualcomm MDM9615 for North America, LTE 700 MHz (band 17), 1900 MHz (band 2 PCS), 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)
IR809G-LTE-VZ-K9	Compact Cisco IR809 Ruggedized Secure Multi-Mode 4G LTE M2M ISR with Qualcomm MDM9615 for Verizon in North America, 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
Power Supplies and Mounting Brackets	
PWR-IE50W-AC	AC power adapter with 110/220V AC and 88-300V DC input (Temperature: -40C to 60C)
IR809-DINRAIL ²	DIN rail kit for the IR809 (available in future)
IR809-VM-DINRAIL ³	Vertical-mount DIN rail kit for the IR809 (available in future)
IOS Software and Licenses	
SL-IR800-DATA-K9	Cisco 800 Series Industrial Routers Data License
SL-IR800-SNPE-K9	Cisco 800 Series Industrial Routers No Payload Encryption License
SL-IR800-SEC-K9	Cisco 800 Series Industrial Routers Security License
SL-IR800-IPB-K9	Cisco 800 Series Industrial Routers IP Base License
FW-MC7304-LTE-AU	Cisco Australia MC7304 modem image switching provisioning firmware
FW-MC7304-LTE-GB	Cisco Global MC7304 modem image switching provisioning firmware
FW-MC7354-LTE-AT	Cisco ATT MC7354 modem image switching provisioning firmware
FW-MC7354-LTE-CA	Cisco Canada MC7354 modem image switching provisioning firmware
FW-MC7350-LTE-VZ	Cisco Verizon MC7350 modem image switching provisioning firmware

² Meets IEEE 1613 and IEC 61850-3 standards

³ Not compliant with IEEE 1613 and IEC 61850-3 standards, but has passed the following tests

Datasheet

Op - Shock	2.39 m/s (94 in/sec) @2ms
Op - Vibration	3- 500 Hz.41 GRMS (2 hrs)
Non-Op - Shock	65G- 80G @8ms
Non-Op - Vibration	3- 500 Hz 1.12 GRMS (.5 hrs)

Table 7. Antenna Ordering Information

Note: None of the antennas are included by default along with the IR809.

Description	Part Number
Cisco transportation omnidirectional 3-element antenna for 2G, 3G, 4G cellular and GPS	ANT-3-4G2G1-O
	ANT-3-4G2G1-O= (Spare)
Multiband Omni-Directional Stick Outdoor 4G Antenna	ANT-4G-OMNI-OUT-N
	ANT-4G-OMNI-OUT-N= (Spare)
Multiband Panel Outdoor 4G Antenna	ANT-4G-PNL-OUT-N
	ANT-4G-PNL-OUT-N= (Spare)
Indoor swivel-mount dipole antenna	ANT-4G-DP-IN-TNC
	ANT-4G-DP-IN-TNC= (Spare)
Multi-Band Omnidirectional Antenna-Ceiling Mount	4G-ANTM-OM-CM
	4G-ANTM-OM-CM= (Spare)
Standalone active SMA GPS antenna with 17-ft (5 m)extender	GPS-ACT-ANTM-SMA
	GPS-ACT-ANTM-SMA= (Spare)
Single Unit Antenna Extension Base (10-ft, one cable included)	4G-AE010-R
	4G-AE010-R= (Spare)
Single Unit Antenna Extension Base (15-ft cable)	4G-AE015-R
	4G-AE015-R= (Spare)
50-ft (15m) Ultra Low Loss LMR 400 Cable with TNC Connector	4G-CAB-ULL-50
	4G-CAB-ULL-50= (Spare)
20-ft (6m) Ultra Low Loss LMR 400 Cable with TNC Connector	4G-CAB-ULL-20
	4G-CAB-ULL-20= (Spare)
50-ft (15 m) Ultra Low Loss LMR 400 Cable TNC-N Connector	CAB-L400-50-TNC-N
	CAB-L400-50-TNC-N= (Spare)
20-ft (6 m) Ultra Low Loss LMR 400 Cable with TNC-N Connector	CAB-L400-20-TNC-N
	CAB-L400-20-TNC-N= (Spare)
20-ft (6m) Ultra Low Loss LMR 400 Cable with N Connectors	CAB-L400-20-N-N
	CAB-L400-20-N-N= (Spare)
Lightning Arrestor Kit: female to female	CGR-LA-NF-NF
	CGR-LA-NF-NF= (Spare)
Lightning Arrestor Kit: male to female	CGR-LA-NM-NF
	CGR-LA-NM-NF= (Spare)

* -N antenna works with -N cables and -N lighting arrestor