Cisco IR829 Industrial Integrated Services Routers

Contents

Cisco® IR829 Industrial Integrated Services Routers are ruggedized integrated services routers designed for deployment in harsh industrial environments.

The IR829 Industrial Integrated Services Routers (IR829) have a compact form factor, multimode 4G LTE and 3G wireless WAN (dual active LTE and single LTE models), IEEE 802.11a/b/g/n WLAN, Ethernet (RJ45 and SFP), serial connections, integrated storage and compute capability for edge application hosting, and integrated 9–32 VDC power input. The IR829 also extends the connectivity to include Low Power Wide-Area (LPWA) access using Cisco Interface Module for LoRaWANTM. With it, you can rapidly deploy a wide variety of Internet of Things (IoT) solutions, including fleet management, mass transit, and remote asset monitoring. The 829 routers are designed to withstand hostile environments including shock, vibration, and humidity, as well as a wide temperature range (–40°C to +60°C and type-tested at +85°C for 16 hours). The IR829 brings together enterprise-grade wireline-like services such as Quality of Service (QoS), Cisco advanced VPN technologies (DMVPN and Flex VPN) and multi-VRF for WAN, highly secure data, voice, and video communications and Cisco IOx, an open, extensible environment for hosting applications at the network edge.

Figure 1.
Cisco IR829 Industrial Integrated Services Router with 4G LTE (Single LTE or Dual Active LTE) and Dual 802.11 a/b/g/n (2.4 GHz/5 GHz WiFi) Radios

Product overview

The IR829 supports the latest Third-Generation Partnership Project (3GPP), Release 9, Category 3 and Category 4 LTE standards. The routers provide persistent, reliable LTE connectivity transparent hand-offs between LTE and 3G networks.

The following models are available:

- **IR829M-2LTE-EA-*K9:** This router includes integrated dual active LTE, a dual Wi-Fi, an mSATA SSD storage option, PoE-enabled Ethernet ports, SFP, and serial. Customers gain dual active LTE connectivity for WAN redundancy and load balancing features, with each modem supporting multimode 4G/3G for carriers operating in FDD LTE 2100 MHz (band 1), 1900 MHz (band 2, band 25), 1800 MHz (band 3), 1700 MHz (band 4), 850 MHz (band 5, band 26), 2600 MHz (band 7), 700 MHz (band 12, band 13, band 29), 800 MHz (band 20), 1900 MHz (band 25), 850 MHz (band 26), 700 MHz (band 29), and TDD LTE 2500 MHz (band 41). This product is backward-compatible, with WCDMA 2100 MHz (band 1), 1900 MHz (band 2), 1800 MHz (band 3), 1700 MHz (band 4), 850 MHz (band 5), and 900 MHz (band 8). It comes with dual 802.11n a/g/n 2.4 GHz and 5 GHz Wi-Fi radios. A field-replaceable mSATA SSD can be inserted into the mSATA SSD storage slot to add storage to the IR829M model.
- **IR829M-LTE-EA-*K9:** This router includes integrated single LTE, a dual Wi-Fi, an mSATA SSD storage option, PoE-enabled Ethernet ports, SFP, and serial. It provides multimode 4G LTE / 3G for carriers operating in FDD LTE 2100 MHz (band 1), 1900 MHz (band 2, band 25), 1800 MHz (band 3), 1700 MHz (band 4), 850 MHz (band 5, band 26), 2600 MHz (band 7), 700 MHz (band 12, band 13, band 29), 800 MHz (band 20), 1900 MHz (band 25), 850 MHz (band 26), 700 MHz (band 29), and TDD LTE 2500 MHz (band 41). This model is backward-compatible, with WCDMA 2100 MHz (band 1), 1900 MHz (band 2), 1800 MHz (band 3), 1700 MHz (band 4), 850 MHz (band 5), and 900 MHz (band 8). It comes with dual 802.11n a/g/n 2.4 GHz and 5 GHz Wi-Fi radios. A field-replaceable mSATA SSD can be inserted into the mSATA SSD storage slot to add storage to the IR829M router.
- **IR829M-LTE-LA-*K9:** This router includes integrated single LTE, a dual Wi-Fi mSATA SSD storage option, PoE-enabled Ethernet ports, SFP, and serial. It provides multimode 4G/3G connectivity to cellular networks operating in FDD LTE 2100 MHz (band 1), 1800 MHz (band 3), 850 MHz (band 5), 2600 (band 7), 900 (band 8), 850 (band 18, band 19), 1500 (band 21), 700 (band 28) and TDD LTE 2600 (band 38), 1900 (band 39), 2300 (band 40), and 2500 (band 41). It is backward-compatible with WCDMA 2100 MHz (band 1), 850 MHz (band 5), 800 MHz (band 6, band 19), 900 MHz (band 8), 1700 MHz (band 9), and TD-SCDMA 1900 MHz (band 39). It comes with dual 802.11n a/g/n 2.4 GHz and 5 GHz Wi-Fi radios. A field-replaceable mSATA SSD can be inserted into the mSATA SSD storage slot to add storage to the IR829M.

- **IR829B-LTE-EA-*K9:** This router includes integrated single LTE, Dual Wi-Fi, Ethernet, SFP, and serial. It provides multimode 4G LTE / 3G for carriers operating in FDD LTE 2100 MHz (band 1), 1900 MHz (band 2, band 25), 1800 MHz (band 3), 1700 MHz (band 4), 850 MHz (band 5, band 26), 2600 MHz (band 7), 700 MHz (band 12, band 13, band 29), 800 MHz (band 20), 1900 MHz (band 25), 850 MHz (band 26), 700 MHz (band 29), and TDD LTE 2500 MHz (band 41). It is backward-compatible with WCDMA 2100 MHz (band 1), 1900 MHz (band 2), 1800 MHz (band 3), 1700 MHz (band 4), 850 MHz (band 5), and 900 MHz (band 8). It comes with dual 802.11n a/g/n 2.4 GHz and 5 GHz Wi-Fi radios. The IR829B does not have the option to insert mSATA SSD storage. It also doesn't have the option for PoE-enabled Ethernet ports.
- **IR829-2LTE-EA-*K9:** This router includes integrated dual active LTE, dual Wi-Fi, POE as an option, SFP, and serial. Dual active LTE connectivity for WAN redundancy and load balancing features with each modem supporting multimode 4G/3G for carriers operating in FDD LTE 2100 MHz (band 1), 1900 MHz (band 2, band 25), 1800 MHz (band 3), 1700 MHz (band 4), 850 MHz (band 5, band 26), 2600 MHz (band 7), 700 MHz (band 12, band 13, band 29), 800 MHz (band 20), 1900 MHz (band 25), 850 MHz (band 26), 700 MHz (band 29) and TDD LTE 2500 MHz (band 41); backward-compatible with WCDMA 2100 MHz (band 1), 1900 MHz (band 2), 1800 MHz (band 3), 1700 MHz (band 4), 850 MHz (band 5), 900 MHz (band 8). Dual 802.11n a/g/n 2.4GHz and 5GHz WiFi radios.
- **IR829GW-LTE-LA-*K9:** This router includes integrated single LTE, dual Wi-Fi, PoE as an option, SFP, and serial. Multimode 4G/3G connectivity to cellular networks operating in FDD LTE 2100 MHz (band 1), 1800 MHz (band 3), 850 MHz (band 5), 2600 (band 7), 900 (band 8), 850 (band18, band19), 1500 (band 21), 700 (band 28) and TDD LTE 2600 (band 38), 1900 (band 39), 2300 (band 40) and 2500 (band 41); backward-compatible with WCDMA 2100 MHz (band 1), 850 MHz (band 5), 800 MHz (band 6, band 19), 900 MHz (band 8), 1700 MHz (band 9) and TD-SCDMA 1900 MHz (band 39). Dual 802.11n a/g/n 2.4GHz and 5GHz WiFi radios.
- **IR829GW-LTE-NA-AK9:** This router includes integrated single LTE, dual Wi-Fi, PoE as an option, SFP, and serial. Multimode 4G/3G/2G connectivity to cellular networks operating in LTE 1900 MHz (band 2 PCS), 1700/2100 MHz (band 4 AWS), 850 MHz (band 5), 700 MHz (band 17) and 1900 MHz (band 25 extended PCS) 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). Dual 802.11n a/g/n 2.4GHz and 5GHz WiFi radios.
- **IR829GW-LTE-VZ-AK9:** This router includes multimode 4G/3G/2G connectivity to cellular networks operating in LTE 700 MHz (band 13), 1700/2100 MHz (band 4 AWS), or 1900 MHz (band 25 extended PCS) frequencies. It is backward-compatible with EVDO Rev A/CDMA 1x BC0, BC1, and BC10. Dual 802.11n a/g/n 2.4GHz and 5GHz WiFi radios.
- **IR829GW-LTE-GA-*K9:** This router includes integrated single LTE, dual Wi-Fi, PoE as an option, SFP, and serial. Multimode 4G/3G/2G connectivity to cellular networks 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). Dual 802.11n a/g/n 2.4GHz and 5GHz WiFi radios.

* - Wi-Fi regulatory domain. Please refer to Table 2 for the list of models and countries supported.

The Cisco IR829 Industrial Integrated Services Routers support Mobile IP delivering transparent roaming across multiple wireless networks capable of covering wide geographic areas; additionally, the IR829 supports enterprise- class built-in Wireless LAN (WLAN) capability with Autonomous and Unified mode options. The 802.11a/b/g/n 2X2 MIMO built in the IR829 creates a self-healing, self-optimizing WLAN. Moreover, with the advantage of dual radio, the integrated access point can serve as both an access point and a client to a wireless mesh network. This combined functionality provides another source for WAN diversity along with Gigabit Ethernet and cellular. The Cisco ClientLink feature of the access point improves reliability and coverage for legacy devices and Dynamic Frequency Selection (DFS) enables radar detection and avoidance to comply with regulatory domains. The IR829 concurrently supports both 4G LTE wireless WAN and Cisco dual-radio WLAN backhaul on the same platform.

The Cisco IR829 Industrial Integrated Services Routers offer a broad range of features for industrial and enterprise IoT:

	**Dual active LTE connectivity.** With two LTE modems, the IR829 enables concurrent connectivity to two cellular networks for high reliability, enhanced data throughputs, load balancing, and differentiated services. Applicable for IR829M-2LTE and IR829-2LTE
	**Integrated compute and storage** for edge application. The integrated SSD storage comes in two options - 50 GB and 100 GB - and is industrial-grade storage.
	**Auto SIM: SIM-based auto-carrier selection.** Automatically configure a modem carrier based on the inserted SIM.
	**Dual SIM: Dual SIMs on Single LTE IR829** provides the option to have two service providers. Only one operator is active at a time.
	**Accelerometer and gyroscope** to monitor speed and angular momentum for automotive applications and to detect tampering.
	**Ignition Power Management** to keep the router up even when the vehicle ignition is turned off.

	**GPS** to enable real-time location tracking of remote assets.
	**Network management** tools such as Cisco IoT Field Network Director, Cisco Prime, and APIC-EM simplify deployment of a secure network head-end using the Cisco Industrial Operations Kit.
	**Security services,** such as hardware cryptography, including Cisco's Next Generation Encryption (https://www.cisco.com/c/en/us/about/security-center/next-generation-cryptography.html) that guarantees high performance for IPsec VPN traffic and firewall. Requires no additional hardware or client software. With these security services, fleet vehicle management and mass transit systems, for example, can 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.
	**Additional WAN options,** such as Gigabit Ethernet/Fast Ethernet WAN interface with ruggedized SFP options and a 4-port 10/100/1000 Ethernet managed switch with an optional module for Power-over-Ethernet (PoE) LAN connectivity enable seamless connectivity to IP based devices such as cameras, sensors and Programmable Logic Controllers (PLCs).
	Provides an open, extensible environment for hosting OS and applications at the network edge rather than in the Cloud
	**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. The single LTE model of the IR829 supports peak data rates of 100 Mbps on the downlink and 50 Mbps on the uplink. The dual LTE model doubles the throughput by supporting peak data rates of 150 Mbps on the downlink and 50 Mbps on the uplink on each of the two cellular links. Actual data speed depends on the service provider network. With single and dual 4G LTE options, the IR829s offer a flexible, redundant cellular connectivity for mission critical 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.
	**Multiple-PDN (Packet Data Network)** feature allows the router to connect to different Access Point Names (APN) enabling traffic segregation. For example, public internet traffic can be kept separate from mission critical traffic emerging from the sensors and devices connected to the router.
	**4G LTE multiple-bearer QoS for cellular.** The IR829 supports 4G LTE multiple bearers enabling differentiated treatment of traffic based on the QoS policies. The QoS feature depends on a service provider's ability to classify and enforce QoS policies and hence requires providers to launch this service in their networks.
	**Multi-VRF.** The IR829s support multi-VRF feature that allows customer to configure and maintain more than one instance of a routing and forwarding table within the same Customer Edge (CE) device. For service providers, this feature enables them to support two or more Virtual Private Networks (VPNs), where the IP addresses can overlap several VPNs.

Business benefits and application examples

IoT gives the transportation industry an opportunity to connect people, improve safety, communicate more effectively, and change transportation centers into community hubs. The IR829 offers the automotive industry – including commercial fleets, emergency-response and public safety vehicles, rail, and roadways – standards-based, scalable, and highly secure solutions.

Fleet vehicles

The IR829 can withstand severe weather and environmental conditions, such as extreme temperatures, high vibrations, and shocks often encountered on buses and trains. The IR829s use standards-based Mobile IP features in Cisco IOS® Software to host networks in motion. Transitioning to different wireless networks is transparent to users and devices (such as laptops, smart devices, sensors and cameras), and applications maintain continuous connectivity without the manual intervention of users as WAN links change. In addition to allowing a single node or device to stay connected, the IR829 4G LTE routers allow an entire mobile network or subnet to stay connected. The dual-radio 2.4GHz and 5.0GHz WLAN on the IR829 can serve as both a client and an access-point. Our products also help transit operators effectively track vehicle fleets through built-in GPS systems.

Mass transit

Public-safety personnel can move critical video data and other sensitive information from incident commanders to field officers over a secure network, giving public safety agencies and their personnel access to real-time, multimedia data in the field. This access helps agencies increase cost efficiencies, provide better response time, and improve safety and security.

Asset management

Organizations can now remotely monitor and manage assets by connecting the asset with an IR829 over LTE WAN. The dual LTE capability of IR829 enables wireless WAN redundancy, improved coverage, and increased bandwidth for the asset. Integrating with Cisco's video surveillance solution provides remote surveillance of these assets. Centralized monitoring and control of assets using the IR829 helps organizations lower their cost of operations, identify issues remotely, and take meaningful actions.

Primary features and benefits

Table 1 lists the features and benefits of Cisco 829 Industrial Integrated Services Routers.

Table 1. Features and benefits

Features	Benefits
IoT Enablement	
Compact ruggedized form factor	Designed for mobile and hostile outdoor environments, such as fleet vehicle management, mass transit, and many other on-the-move IoT applications.

Features	Benefits
Raw socket transport and SCADA	Raw socket can be used to transport Supervisory Control And Data Acquisition (SCADA) data from Remote Terminal Units (RTUs). This method is an alternative to the Block Serial Tunnel (BSTUN) protocol. The IR829 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: • 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 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; expansion module slot to enable additional future communication technologies.
Cisco IOT Field Network Director	Available as the optional Cisco 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.
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 highly secure, concurrent data, voice, video, and wireless services.
Enhanced security	• 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) and Secure Hash Algorithm (SHA) offer data privacy over the Internet. • Intrusion prevention enforces security policies in a larger enterprise or service provider network.
Integrated WLAN access point	• Integrates the Cisco AP803 802.11 a/b/g/n access point with MIMO technology for mission-critical applications. By intelligently avoiding interference, the WLAN feature offers performance protection for 802.11n networks to help ensure reliable application delivery. • With dual radios, the Cisco access point can serve both as an access point and as a client to a wireless mesh network concurrently, providing another source for WAN diversity. • The Cisco ClientLink feature of the access point improves reliability and coverage for legacy devices. • Dynamic Frequency Selection (DFS) allows detecting and avoiding interference with radar signals to comply with regulatory domains.
Multiple WAN and LAN Connections	
Four Gigabit Ethernet PoE/PoE+ interfaces	• 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 switching capabilities. • Inter-VLAN routing capabilities. • 30W of PoE/PoE+ shared across the four Gigabit Ethernet interfaces. • Only available with IR829M, IR829GW (option), and IR829-2LTE (option) models.
Two serial interfaces	• Two asynchronous serial interfaces (one RS232 port and one RS232/RS485 port) that can be used with Raw Socket, Protocol Translation and IOx applications to provide two serial connections to local RTU for SCADA transport and RTU management.
WAN diversity	• Multiple WAN links are supported: Gigabit Ethernet or Fast Ethernet layer-3 SFP and 4G LTE provide for business continuity and WAN diversity.
Dual active LTE interfaces[1]	• Concurrent connectivity to two cellular networks for high reliability, load balancing and differentiated services.

Features	Benefits
LoRaWAN	• Extend the IR829 connectivity to include Low-Power Wide-Area (LPWA) access using Cisco Interface Module for LoRaWANTM. For more information, please visit https://www.cisco.com/c/en/us/products/routers/interface-module-lorawan.
Transparent Roaming Between Wireless Networks	
Dual Subscriber Identity Module (SIM) support2	• Dual SIM feature provides reliability and multihoming capabilities over LTE and HSPA-based networks. Note: Dual SIM active/backup mode is supported only on single LTE models of the IR829.
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 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. • IPsec over IPv4 and IPv6, IPsec stateful failover, VRF-aware IPsec, DMVPN, FlexVPN and PMIPv6.
Routing	• Enables advanced routing capabilities using E-IGRP, MP-BGP, IPv4 and IPv6 on all interfaces including cellular, IPv4/IPv6 Multicast, Generic Routing Encapsulation (GRE) and multipoint GRE (MGRE), NAT, DNS Proxy and Spoofing, IP SLA and QoS.
QoS features	• Provides traffic precedence to delay-sensitive or mission critical services. • Facilitates low-latency routing of delay-sensitive industrial applications. • Supported on all LAN and WAN interfaces including Cellular. • LTE QoS with support for up to 8 concurrent bearers on each cellular WAN interface for traffic classification and prioritization.
IP multicast	• Allows efficient broadcast of data or video for increased situational awareness, multiuser communications, or surveillance applications.
Management and manageability	• Network managers can remotely manage and monitor networks with SNMPv1/v2/v3, Telnet, or HTTP/HTTPS/SSHv2, 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 IR829 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.

[2] The two SIMs operate in active/backup mode on the single LTE models of the IR829 and active/active mode with each of the two SIMs assigned to a specific cellular radio on the dual LTE models.

Integrated WLAN access point: Flexible, high performance

The integrated WLAN access point in the IR829 routers offers a flexible, highly secure, and scalable platform that can be deployed as part of the Cisco Unified Wireless Network or as a standalone, autonomous solution. The WLAN access point provides high-performance device access through improved radio sensitivity and range with 802.11a/b/g/n multiple-input multiple-output (MIMO) technology, with two or three spatial streams, and up to 300 Mbps data rates. The WLAN access point in the IR829 can be deployed in the following configurations:

- Access point - Either in controller-based or standalone operation, it provides Wi-Fi connectivity concurrently to clients on both 2.4-GHz and 5-GHz radios.
- Mesh network - As dedicated backhaul or universal access, the 5-GHz radio is used for wireless network connections to adjacent mesh nodes.
- Bridging - It provides point-to-point, high-capacity data links, as well as point-to-multipoint bridging for campuses.
- Workgroup bridge - The access point enables LAN mobility, such as on a vehicle.
- Serial backhaul - It extends linear mesh with two co-located IR829 access points connected via the LAN port.

IP54 Kit for IR829

IP54 kit (IR829-IP54-KIT=) for IR829 is an additional kit (orderable separately) that when installed with IR829 makes the system rating to IP54. It provides further dust and water protection and discourages tampering. Further details can be accessed on the following link:

https://www.cisco.com/c/en/us/td/docs/routers/access/800/829/hardware/install/guide/829hwinst/IP54.html

Management

Cisco Prime - centrally managed network

Cisco Prime Infrastructure simplifies the management of wireless and wired networks. Cisco Prime Infrastructure can manage both the routing and Wi-Fi access point on the Cisco IR829. Central management and troubleshooting of the integrated Cisco wireless access point in the IR829 helps prevent costly maintenance service calls to outdoor locations. Cisco Prime® Infrastructure works in conjunction with the Cisco IR829 and Cisco wireless LAN controllers to configure and manage the wireless networks. With Cisco Prime Infrastructure, network administrators have a single solution for RF prediction, policy provisioning, network optimization, troubleshooting, security monitoring, and wireless LAN system management. Wireless network security is also part of a unified wired and wireless solution. Cisco wireless network security offers the highest level of network security, helping to ensure that data remains private and secure and that the network is protected from unauthorized access.

https://www.cisco.com/c/en/us/products/cloud-systems-management/prime-infrastructure/index.html

Field Network Director (FND)

The Cisco IoT Field Network Director (FND), is a software platform that manages multiservice networks of Cisco industrial integrated service routers, connected grid routers, and endpoints. It provides ease of deployment at scale with Zero-Touch Deployment (ZTD) of gateways and devices. The gateways and devices are enrolled and managed securely end-to-end. FND is optimized for operation in constrained bandwidth network. The platform provides ease of use with an intuitive web interface and GIS map visualization and monitoring with rich set of northbound APIs for third-party integration.

https://www.cisco.com/c/en/us/products/cloud-systems-management/iot-field-network-director/index.html

Kinetic Gateway Management Module (GMM)

Kinetic Gateway Management Module is a software to provision IoT gateways at scale with a highly secure, low-touch workflow. It can be used to view and control the gateways from a cloud-based dashboard. Kinetic GMM does not require any configuration code to be written thus saving manpower. The complete setup can be done through cloud-based dashboard. The platform provides real-time visibility into cellular connectivity and strength which can be used to manage dual sim connectivity better in mission critical applications.

https://www.cisco.com/c/dam/en/us/solutions/collateral/internet-of-things/kinetic-datasheet-gmm.pdf

Cisco Configurational Professional (CCP)

Cisco Configurational Professional is an on-device WebUI device management tool. The application provides simplified device management, monitoring, configuration and services through easy to use wizard. The application enhances productivity for network administrators and channel partners by enabling them to deploy routers with increased confidence and ease. The application has built-in configuration checks thus providing faster issue resolution through telemetry checks.

https://www.cisco.com/c/en/us/td/docs/routers/access/800/829/software/cisco_configuration_professional_express/v3_4/guides/quickstart/CiscoCPExpress_qsg.html

Product specifications

Table 2 outlines the 4G LTE specifications for the Cisco 829 Industrial Integrated Services Routers.

Table 2. 4G LTE specifications

Region Theaters	IR829GW-LTE-GA-*K9	IR829GW-LTE-NA-AK9	IR829GW-LTE-VZ-AK9	IR829M-2LTE-EA-*K9 IR829-2LTE-EA-*K9 IR829M-LTE-EA-*K9 IR829B-LTE-EA-*K9	IR829M-LTE-LA-*K9 IR829GW-LTE-LA-*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 5 (850), 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)	LTE bands 1-5, 7, 12, 13, 20, 25, 26, 29, 41	LTE bands 1, 3, 5, 7, 8, 18, 19, 21, 28, 38-41

Region Theaters	IR829GW-LTE-GA-*K9	IR829GW-LTE-NA-AK9	IR829GW-LTE-VZ-AK9	IR829M-2LTE-EA-*K9 IR829-2LTE-EA-*K9 IR829M-LTE-EA-*K9 IR829B-LTE-EA-*K9	IR829M-LTE-LA-*K9 IR829GW-LTE-LA-*K9
Theoretical Download and upload speeds*	100 and 50 Mbps	100 and 50 Mbps	100 and 50 Mbps	150 and 50 Mbps	150 and 50 Mbps
Australia	✓	X	X	X	✓ IR829M-LTE-LA-ZK9 IR829GW-LTE-LA-ZK9
Europe	✓	X	X	✓ IR829M-2LTE-EA-EK9 IR829-2LTE-EA-EK9 IR829M-LTE-EA-EK9 IR829B-LTE-EA-EK9	X
Middle East	✓	X	X	✓	X
LATAM and APAC	✓ (Dependent on specific operators supporting the above LTE bands) IR829GW-LTE-GA-EK9 – Europe IR829GW-LTE-GA-ZK9 – Brazil, Australia, New Zealand IR829GW-LTE-GA-CK9 – Malaysia IR829GW-LTE-GA-SK9 – Singapore	X	X	X	✓ IR829GW-LTE-LA-QK9 – Japan IR829GW-LTE-LA-ZK9 – Brazil IR829GW-LTE-LA-DK9 – India IR829GW-LTE-LA-KK9 – Korea IR829GW-LTE-LA-NK9 – Panama IR829GW-LTE-LA-SK9 – Hong Kong, Singapore IR829GW-LTE-LA-LK9 – Malaysia IR829GW-LTE-LA-HK9 – China IR829GW-LTE-LA-TK9 – Taiwan

Region Theaters	IR829GW-LTE-GA-*K9	IR829GW-LTE-NA-AK9	IR829GW-LTE-VZ-AK9	IR829M-2LTE-EA-*K9 IR829-2LTE-EA-*K9 IR829M-LTE-EA-*K9 IR829B-LTE-EA-*K9	IR829M-LTE-LA-*K9 IR829GW-LTE-LA-*K9
United States	X	✓ ATT	✓ Verizon	✓ ATT, Verizon, Sprint, T-Mobile IR829M-2LTE-EA-BK9 IR829-2LTE-EA-BK9 IR829M-LTE-EA-BK9 IR829B-LTE-EA-BK9	X
Canada	X	✓	X	✓ IR829M-2LTE-EA-AK9 IR829-2LTE-EA-AK9 IR829M-LTE-EA-AK9 IR829B-LTE-EA-AK9	X

* WiFi regulatory domain

Item	Specification
4G LTE modem form factor	• Embedded (included with the router) • Multiple firmware options available in the ordering tool to select a preferred cellular carrier **Note:** Please refer to table-2 for the details on carriers supported by each model.
Key 4G LTE features	• Single and dual LTE WAN support for WAN redundancy, high reliability and enhanced throughput • LTE QoS with support for up to 8 concurrent bearers on each cellular WAN interface for traffic classification and prioritization • Auto-SIM: Automatically configure a modem carrier based on the detected SIM • Multiple Packet Data Networks (PDNs) • Automatic switch/failover between primary and backup links • IPv4 and IPv6 support • Multichannel Interface Processor (MIP) profile configuration • Send and receive SMS (maximum 160 characters) • 4G/3G MIB with extension and traps • 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

Item	Specification
Dual SIM support 	• High reliability, and cellular multihoming support for dual SIM card socket; compliant with ISO-7816-2 (SIM mechanical) • The two SIMs operate in active/backup mode on the single LTE models of the IR829, and active/active mode with each of the two SIMs assigned to a specific cellular radio on the dual LTE models
Global Positioning System (GPS) 	• GPS antenna: SMA connector (separate active GPS with SMA antenna option) • Enables location-based services such as geo-fencing, asset tracking and management • 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])
Programming interfaces	• Cisco IOS Software Command Line Interface (CLI)
Wireless technologies supported (performance and throughput)	**IR829M-2LTE-EA-*K9, IR829-2LTE-EA-*K9, IR829M-LTE-EA-*K9 and IR829B-LTE-EA-8K9** Cisco dual LTE FDD 2100 MHz (band 1), 1900 MHz (band 2, band 25), 1800 MHz (band 3), 1700 MHz (band 4), 850 MHz (band 5, band 26), 2600 MHz (band 7), 700 MHz (band 12, band 13, band 29), 800 MHz (band 20), 1900 MHz (band 25),and 850 MHz (band 26), 700 MHz (band 29) and TDD LTE 2500 MHz (band 41) at Category 4 LTE speeds. Backward compatibility: UMTS and HSPA+: 2100 MHz (band 1), 1900 MHz (band 2), 1800 MHz (band 3), 1700 MHz (band 4), 850 MHz (band 5), 900 MHz (band 8) Peak downlink rate: 150 Mbps Peak uplink rate: 50 Mbps **IR829M-LTE-LA-*K9 and IR829GW-LTE-LA-*K9** (* Wi-Fi regulatory domain) Cisco LTE FDD 2100 MHz (band 1), 1800 MHz (band 3), 850 MHz (band 5), 2600 (band 7), 900 (band 8), 850 (band 18, band 19), 1500 (band 21), 700 (band 28), and TDD LTE 2600 (band 38), 1900 (band 39), 2300 (band 40), and 2500 (band 41) at Category 4 LTE speeds Backward compatibility: • UMTS and HSPA+: 2100 MHz (band 1), 850 MHz (band 5), 800 MHz (band 6, band 19), 900 MHz (band 8), 1700 MHz (band 9), and TD-SCDMA 1900 MHz (band 39) • Peak downlink rate: 150 Mbps • Peak uplink rate: 50 Mbps **IR829GW-LTE-GA-*K9** (* Wi-Fi regulatory domain) Cisco LTE 800 MHz (band 20), 900 MHz (band 8), 1800 MHz (band 3), 2100 MHz (band 1), and 2600 MHz (band 7) at Category 3 LTE speeds. Backward compatibility: • UMTS and HSPA+: 850, 900, 1900, and 2100 MHz • Quad-band EDGE, GPRS, and GSM: 800, 900, 1800, and 1900 MHz

Item	Specification
	• 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) **IR829GW-LTE-NA-AK9** Cisco LTE 1900 MHz (band 2 PCS), 1700/2100 MHz (band 4 AWS), 700 MHz (band 17) at Category 3 LTE speeds. 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) **IR829GW-LTE-VZ-AK9** Cisco LTE 700 MHz (band 13), 1700/2100 MHz (band 4 AWS), 1900 MHz (band 25 extended PCS) at Category 3 LTE speeds Backward compatibility: • EVDO Rev A/CDMA 1x BC0, BC1, BC10
LED indicators	• Refer to Table 5 for LED specifications

Note: * LTE data rates depend on the IR829 model, carrier channel bandwidth and carrier LTE network provisioning.

Table 3 lists the software features supported on the Cisco 829 Industrial Integrated Services Routers.

Table 3. Cisco IOS Software Features on the IR829

Feature	Description
Cisco IOS Software requirement	• Cisco IOS Software feature set: Universal Cisco IOS Software • Cisco IOS Software Release – 15.6(3)M2, or later, and modem firmware – 5.5.58, or later
IPv4 and IPv6 services features	• 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 • Layer 2 Tunneling Protocol (L2TP) • 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) • Enhanced Interior Gateway Routing Protocol (EIGRP) • Virtual Route Forwarding (VRF) Lite • Next Hop Resolution Protocol (NHRP) • Bidirectional Forwarding Detection (BFD)

Feature	Description
Switch features	• Auto Media Device In/Media Device Cross Over (MDI-MDX) • 16 802.1Q VLANs • MAC filtering • Storm control • Internet Group Management Protocol Version 3 (IGMPv3) snooping • 802.1X
Security features	**Secure connectivity:** • Hardware-accelerated DES, 3DES, AES 128, AES 192, and AES 256 • Public-Key-Infrastructure (PKI) support • 20 IPsec tunnels • Cisco Easy VPN Solution 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 **Cisco IOS Firewall:** • 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 **Integrated Threat Control:** • Control Plane Policing • Flexible Packet Matching • Network foundation protection
QoS features	• 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) • Resource Reservation Protocol (RSVP) • Real-Time Transport Protocol (RTP) header compression (cRTP) • Differentiated Services (DiffServ) • QoS preclassify and prefragmentation

Feature	Description
	• Hierarchical QoS (HQoS)
Management features	• Cisco IoT Field Network Director and Industrial Operations Kit • Cisco Application Policy Infrastructure Controller Enterprise Module (APICEM) • Cisco Universal Plug and Play (UPnP) • Cisco Configuration Professional Express • Cisco Configuration Engine support • Cisco AutoInstall • IP Service-Level Agreement (IP SLA) • Cisco IOS Embedded Event Manager (EEM) • Telnet, SNMPv3, Secure Shell (SSH) Protocol, CLI, and HTTP management • RADIUS and TACACS+ • Syslog, CGNA
High-availability features	• Virtual Router Redundancy Protocol (VRRP) (RFC 2338) • Hot Standby Router Protocol (HSRP) • Multigroup HSRP (MHSRP) • Dual SIMs that operate in active/backup mode on the single LTE models of the IR829, and active/active mode with each of the two SIMs assigned to a specific cellular radio on the dual LTE models
IPv6 features	• IPv6 addressing architecture • IPv6 Unicast and Multicast forwarding • IPv6 ACLs • IPv6 over Cellular • IPv6 routing • IPv6 Domain name resolution

Table 4 lists the system specifications, Table 6 lists the IR829's integrated WLAN access point specification, and Table 7 lists antenna specifications for Cisco 829 Industrial Integrated Services Routers.

Table 4. System specifications

Feature	Specification
Memory	
Default and maximum DRAM	2 GB
Default and maximum flash memory	8 GB eMMC (4GB usable)
SSD storage	100 GB (IR-SSD-MSATA-100G) and 50 GB (IR-SSD-MSATA-50G) option on IR829M
IP rating	IP40

Feature	Specification
Interface Support	
Console	• Mini type-B: also supports remote 4G LTE diagnostics and monitoring tools
WAN interfaces	• Wireless WAN with multimode 4G LTE, 3.7G, 3.5G, 3G and 2G speeds • SFP for copper and fiber options at 100 Mbps Fast Ethernet and 1000 Mbps Gigabit Ethernet speeds
802.11n Wi-Fi wireless interface	• 2x2 (2.4GHz) 802.11n MIMO and 2x2 (5GHz) 802.11n MIMO • Up to 300 Mbps data rate per radio • Autonomous and Universal modes
WLAN features	• 2 x 2 Multiple-Input Multiple-Output (MIMO) with two spatial streams • Maximal Ratio Combining (MRC) • Legacy beamforming • 20- and 40-MHz channels • PHY data rates up to 300 Mbps • Packet aggregation: A-MPDU (Tx/Rx), A-MSDU (Tx/Rx) • 802.11 Dynamic Frequency Selection (DFS) • Cyclic Shift Diversity (CSD) support
LAN interfaces	• Four 10/100/1000 Gigabit Ethernet ports with option for 30W of PoE/PoE+ • IEEE 802.1Q VLANs • Power over Ethernet (30W of PoE/PoE+ shared across the four Gigabit Ethernet interfaces)
Serial interface	• 1 RS-232 (DTE) and 1 RS-232/RS-485 (DCE) • Supports asynchronous modes
Serial protocol support	• Raw socket over TCP and UDP, SLIP, DNP3 and T101-104 translations, IOx
Physical Characteristics	
Physical dimensions (H x W x D)	1.73 x 11 x 7.7 in. (43.9 x 279 x 196 mm)
Weight	4.5 lbs. (2 kg)
Mounting options	Panel/door mount
Mean Time Between Failure (MTBF - ground begin)	322,390 hours (in a fixed environment with PoE module)
Maximum platform power consumption	40 Watts without PoE and 70 Watts with PoE
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
Operating altitude	Maximum altitude: 13.800 ft.

Feature	Specification
Mechanical and Environmental Standards	Industrial: EN61131-2 Railway: EN50155:2007 (Clause nr# 12.2.1, 12,2.3, 12.2.4, 12.2.5, 12.2.7, 12.2.8, 12.2.11) Marine: EN60945, DNV Marine Standard for Certification No 2.4 Automotive: SAEJ1455 2b[3], 2c, 3a[4], 3b Military: MIL-STD-810G • Method 514.6: Procedure 1 Category 4, Secured Cargo – Common • Method 514.6: Procedure 1 Category 20, Ground Vehicles • Method 516.6. Procedure 1, Functional Shock • Method 516.6. Procedure 5, Crash Hazard • Method 516.6. Procedure 6, Bench Handling
EMC-Emissions **CLASS A**	47 CFR Part 15 B EN 55032:2015 CISPR 32 Edition 2 CNS13438: 2006 EN 300 386 V1.6.1 EN61000-3-2: 2014 (AC Power Supply) EN61000-3-3: 2013 (AC Power Supply) ICES-003 Issue 6: 2016 KN 32: 2015 TCVN 7189: 2009 V-2/2015.04 V-3/2015.04
EMC-Immunity	CISPR24: 2010 + A1: 2015 EN 300 386 V1.6.1 EN 55024: 2010 + A1: 2015 EN 55035: 2017 KN35: 2015 TCVN 7317:2003 QCVN 18:2014
Radio-WiFi	FCC Part 15.407 FCC Part 15.247 RSS 247 FCC Part 2.1091 (MPE) RSS 102 (RF Exposure) EN 300 328 v2.1.1 EN 301 893 v2.1.1 EN 62311 (RF Exposure) AS/NZ 4268:2017 MIC Article -19, 19-3.2, 19-3 MIC Article 2, 9 NCC LP0002:2018 KCC Article 13:2013

Feature	Specification
	EN 300 328 v1.9.1 EN 301 893 v1.8.1 EN 301 489 – 1,17
Radio-Cellular	FCC 47 CFR Part 22,24,27 RSS 102, 132, 133 AS/NZ ACMA EMR, AS/CA S042.1, 4 MIC Article 2 Paragraph 1, Item 11-3,7,19 EN 301 908-1,2,13 EN 301 511 EN 301 489 -1, 52 v2.1.1 EN 301 489 – 1,3,7,24
GPS	EN 303 413 v1.1.1 EN 301 489 – 1,19
Railway	EN 50121-3-2:2016 EN 50121-4:2016 EN 50155:2007 (Clause nrs: 12.2.1, 12.2.3-12.2.5, 12.2.7-12.2.8, 12.2.11, 12.2.14)
ITE-Safety	UL/CSA 60950-1 EN 60950-1 IEC 60950-1 CB with all country deviations
Hazardous Locations	UL 121201 CSA 213 UL/CSA 60079-0, -15 IEC 60079-0, -15 IECEx Test Report EN 60079-0, -15 ATEX Certificate USL, CNL- Class 1, Division 2, Groups A,B,C & D Hazardous Locations USL - Class 1, Zone 2, AEx nA IIC T4 CNL - Class 1, Zone 2, Ex nA IIC T4 Gc
Power requirement	Nominal voltage: 12V, 24V DC Min/max voltage: 9-32V DC input Max/Min current: 7.8A, 2.2A

[3] for all instrument mounts except for windshield mount

[4] for 85° C maximum

Table 5. LED specifications

LED	Activity	Color(s)	Description
PWR	Power Status	Bicolor Green/Yellow	Off: no power Green Steady on: normal operation Green Blink: boot up phase or in ROM Monitor mode Yellow: Power OK but FPGA is not programmed Yellow Blink: the system has issues but has network connectivity or unconnected Ethernet ports are in administrative enable mode (ie., not

<table>
<tr><th>LED</th><th>Activity</th><th>Color(s)</th><th>Description</th></tr>
<tr><td></td><td></td><td></td><td>shutdown)</td></tr>
<tr><td>GE LAN</td><td>Link Status/POE Status GE[3:0]</td><td>Bicolor
Green/Yellow</td><td>Off: No link
Green Steady on: link Green Blink: TXD/RXD data
Yellow: PoE Fault, implies no link</td></tr>
<tr><td>GE WAN</td><td>Link Status</td><td>Green</td><td>Off: No link Steady Green: link
Blink: TXD/RXD data</td></tr>
<tr><td>POE</td><td>PoE Power Supply Status</td><td>Bicolor
Green/Yellow</td><td>Off: No -54V PoE power supply detected or no PoE board installed
Green Steady on: -54V PoE power supply good and all powered port operating normally
Yellow Steady on: -54V PoE power supply good but one or more PoE ports has a fault</td></tr>
<tr><td>WLAN</td><td>Link/Status [1:0]</td><td>Tricolor
Red/Green/Yellow</td><td>Off: Radio is down (no SSID configured)
Blinking Green: Bootloader, IOS Ethernet Init, IOS Start Up, IOS Start Up - after system init Green->Red->Yellow: Discovery/Join Process
Chirping Green: Joined to a controller
Green: One wireless client associated</td></tr>
<tr><td rowspan="11">3G/4G</td><td>Modem0 RSSI [2:0]</td><td rowspan="9">Green and Bicolor Green/Yellow</td><td colspan="4">RSSI is a 3 LED bar graph, LEDs are lit as follows:</td></tr>
<tr><td rowspan="8">Modem1 RSSI [2:0]</td><td>RSSI</td><td>RSSI[2]</td><td>RSSI[1]</td><td>RSSI[0]</td></tr>
<tr><td></td><td>Green</td><td>Green</td><td>Green/Yellow</td></tr>
<tr><td><110dBm</td><td>Off</td><td>Off</td><td>Off</td></tr>
<tr><td>-110~90dBm</td><td>Off</td><td>Off</td><td>Yellow</td></tr>
<tr><td>-90~75dBm</td><td>Off</td><td>Off</td><td>Green</td></tr>
<tr><td>-75~-60dBm</td><td>Off</td><td>Green</td><td>Green</td></tr>
<tr><td>>-60dBm</td><td>Green</td><td>Green</td><td>Green</td></tr>
<tr><td>Activity0</td><td>Green</td><td colspan="3" rowspan="2">Off: Module not powered
On: Module is powered on and connected but not transmitting or receiving
Slow Blink: Module is powered on and searching for connection
Fast Blink: Module is transmitting or receiving</td></tr>
<tr><td>Activity1</td><td>Green</td></tr>
<tr><td>GPS</td><td>Green</td><td colspan="3">Off: GPS not configured
On: GPS acquired
Slow Blink: GPS acquiring in Standalone GPS
Fast Blink: GPS acquiring in Assisted GPS
(Slow blink: In a cycle of 1 second, GPS LED will be ‘ON’ for 0.25 seconds and ‘OFF’ for 0.75 seconds
Fast blink: In a cyle of 0.5 seconds, GPS LED will be ‘ON’ for 0.25 seconds and ‘OFF’ for 0.25 seconds.)</td></tr>
<tr><td>USIM[1:0]</td><td>Green</td><td colspan="3">Off: No USIM
Green: USIM installed and active</td></tr>
</table>

LED	Activity	Color(s)	Description
VPN	VPN	Green	Off: no tunnel Steady Green: at least one tunnel is up
MST	Module Status[1:0]	Tricolor Red/Green/Yellow	BYOI module dependent

Table 6. Integrated WLAN Access point product specifications

Item	Specification				
802.11n and Related Capabilities	• 2x2 MIMO with 2 spatial streams (2.4 GHz) and 2x2 MIMO with 2 spatial streams (5 GHz) • 20-MHz (2.4 and 5 GHz) and 40-MHz (5 GHz only) channels • Packet aggregation: A-MPDU (Tx/Rx) • 802.11 dynamic frequency selection (DFS) • Cyclic shift diversity (CSD) support				
Data Rates Supported	802.11a: 6, 9, 12, 18, 24, 36, 48, and 54 Mbps				
	802.11b/g: 1, 2, 5.5, 6, 9, 11, 12, 18, 24, 36, 48, and 54 Mbps				
	802.11n data rates (2.4 and 5 GHz):				
	MCS Index[1]	**GI[2] = 800 ns**		**GI = 400 ns**	
		20-MHz Rate (Mbps)	**40-MHz Rate (Mbps)**	**20-MHz Rate (Mbps)**	**40-MHz Rate (Mbps)**
	0	6.5	13.5	7.2	15
	1	13	27	14.4	30
	2	19.5	40.5	21.7	45
	3	26	54	28.9	60
	4	39	81	43.3	90
	5	52	108	57.8	120
	6	58.5	121.5	65	135
	7	65	135	72.2	150
	8	13	27	14.4	30
	9	26	54	28.9	60
	10	39	81	43.3	90
	11	52	108	57.8	120
	12	78	162	86.7	180

[1] MCS index: The Modulation and Coding Scheme (MCS) index determines the number of spatial streams, the modulation, the coding rate, and data rate values.

[2] GI: A guard interval (GI) between symbols helps receivers overcome the effects of multipath delays.

Item	Specification				
	13	104	216	115.6	240
	14	117	243	130	270
	15	130	270	144.4	300
Frequency Range and 20-MHz Operating Channels	-A Domain: • 2.412 to 2.462 GHz; 11 channels • 5.280 to 5.320 GHz; 3 channels • 5.500 to 5.560 GHz; 4 channels • 5.680 to 5.700 GHz; 2 channels • 5.745 to 5.825 GHz; 5 channels -B Domain: • 2.412 to 2.462 GHz; 11 channels • 5.180 to 5.240 GHz; 4 channels • 5.260 to 5.320 GHz; 4 channels • 5.500 to 5.560 GHz; 4 channels • 5.680 to 5.720 GHz; 3 channels • 5.745 to 5.825 GHz; 5 channels -C Domain: • 2.412 to 2.472 GHz; 13 channels • 5.745 to 5.825 GHz; 5 channels -D Domain: • 2.412 to 2.462 GHz; 11 channels • 5.745 to 5.865 GHz; 7 channels -E Domain: • 2.412 to 2.472 GHz; 13 channels • 5.500 to 5.580 GHz; 5 channels • 5.660 to 5.700 GHz; 3 channels -F Domain: • 2.412 to 2.472 GHz; 13 channels • 5.745 to 5.805 GHz, 4 channels -H Domain: • 2.412 to 2.472 GHz; 13 channels • 5.745 to 5.825 GHz; 5 channels -I Domain: • 2.412 to 2.472 GHz; 13 channels -K Domain: • 2.412 to 2.462 GHz; 11 channels • 5.280 to 5.320 GHz; 3 channels • 5.500 to 5.620 GHz; 7 channels • 5.745 to 5.805 GHz; 4 channels -M Domain • 2.412–2.472 GHz; 13 channels • 5.500–5.580 GHz; 5 channels				

Item	Specification	
	• 5.660–5.700 GHz; 3 channels • 5.745–5.805 GHz; 4 channels –N Domain: • 2.412 to 2.462 GHz; 11 channels • 5.745 to 5.825 GHz; 5 channels –Q Domain: • 2.412 to 2.472 GHz; 13 channels • 5.500 to 5.700 GHz; 11 channels –R Domain: • 2.412 to 2.472 GHz; 13 channels • 5.260 to 5.320 GHz; 4 channels • 5.660 to 5.700 GHz; 3 channels • 5.745 to 5.825 GHz; 5 channels –S Domain: • 2.412 to 2.472 GHz; 13 channels • 5.500 to 5.700 GHz; 11 channels • 5.745 to 5.825 GHz; 5 channels –T Domain: • 2.412 to 2.462 GHz; 11 channels • 5.500 to 5.580 GHz; 5 channels • 5.660 to 5.700 GHz; 3 channels • 5.745 to 5.825 GHz; 5 channels –Z Domain: • 2.412 to 2.462 GHz; 11 channels • 5.500 to 5.580 GHz; 5 channels • 5.660 to 5.700 GHz; 3 channels • 5.745 to 5.825 GHz; 5 channels	
Note: These values vary by regulatory domain. Refer to the product documentation for specific details for each regulatory domain.		
Maximum Number of Non-overlapping Channels	**2.4 GHz** • 802.11b/g: ◦ 20 MHz: 3 • 802.11n: ◦ 20 MHz: 3	**5 GHz** • 802.11a: ◦ 20 MHz: 16 • 802.11n: ◦ 20 MHz: 16 ◦ 40 MHz: 8
Note: These values vary by regulatory domain. Refer to the product documentation for specific details for each regulatory domain.		
Receive Sensitivity	**802.11b (Complementary Code Keying [CCK])** –96 dBm @ 1 Mbps –93 dBm @ 2 Mbps –91 dBm @ 5.5 Mbps –89 dBm @ 11 Mbps	**802.11g (non-HT20)** –93 dBm @ 6 Mbps –90 dBm @ 9 Mbps –88 dBm @ 12 Mbps –85 dBm @ 18 Mbps –82 dBm @ 24 Mbps

Item	Specification	
		-82 dBm @ 36 Mbps -76 dBm @ 48 Mbps -73 dBm @ 54 Mbps
2.4 GHz	**802.11n (HT20)** -93 dBm @ MCS0 -88 dBm @ MCS1 -85 dBm @ MCS2 -82 dBm @ MCS3 -79 dBm @ MCS4 -76 dBm @ MCS5 -73 dBm @ MCS6 -72 dBm @ MCS7 -90 dBm @ MCS8 -85 dBm @ MCS9 -82 dBm @ MCS10 -79 dBm @ MCS11 -76 dBm @ MCS12 -73 dBm @ MCS13 -70 dBm @ MCS14 -69 dBm @ MCS15	
5 GHz	**802.11a (non-HT20)** -92 dBm @ 6 Mbps -89 dBm @ 9 Mbps -87 dBm @ 12 Mbps -84 dBm @ 18 Mbps -81 dBm @ 24 Mbps -78 dBm @ 36 Mbps -75 dBm @ 48 Mbps **-72 dBm @ 54 Mbps**	

Item	Specification	
	802.11n (HT20) -92 dBm @ MCS0 -87 dBm @ MCS1 -84 dBm @ MCS2 -81 dBm @ MCS3 -78 dBm @ MCS4 -75 dBm @ MCS5 -72 dBm @ MCS6 -71 dBm @ MCS7 -89 dBm @ MCS8 -84 dBm @ MCS9 -81 dBm @ MCS10 -78 dBm @ MCS11 -75 dBm @ MCS12 -72 dBm @ MCS13 -69 dBm @ MCS14 -68 dBm @ MCS15	**802.11n (HT40)** -89 dBm @ MCS0 -84 dBm @ MCS1 -81 dBm @ MCS2 -78 dBm @ MCS3 -75 dBm @ MCS4 -72 dBm @ MCS5 -69 dBm @ MCS6 -68 dBm @ MCS7 -86 dBm @ MCS8 -81 dBm @ MCS9 -78 dBm @ MCS10 -75 dBm @ MCS11 -72 dBm @ MCS12 -69 dBm @ MCS13 -66 dBm @ MCS14 -65 dBm @ MCS15
Maximum Transmit Power	**2.4 GHz** • 802.11b (CCK) ◦ 27 dBm with 2 antennas • 802.11g (non HT duplicate mode) ◦ 27 dBm with 2 antennas • 802.11n (HT20) ◦ 27 dBm with 2 antennas	**5 GHz** • 802.11a ◦ 27 dBm with 2 antennas • 802.11n (HT20) ◦ 27 dBm with 2 antennas • 802.11n (HT40) ◦ 27 dBm with 2 antennas
	Note: The maximum power setting will vary by channel and according to individual country regulations. Refer to the product documentation for specific details.	
Maximum Equivalent Isotropically Radiated Power (EIRP)	Tx power plus external antenna gain **Note:** The maximum EIRP will vary by channel and according to individual country regulations. Refer to the product documentation for specific details.	

Table 7. Antenna specifications

Please refer to antenna guide for all the antenna options available for industrial routers –

https://www.cisco.com/c/en/us/td/docs/routers/connectedgrid/antennas/installing-combined/industrial-routers-and-industrial-wireless-antenna-guide.html

Item	Specification
ANT-5-4G2WL2G1-O	Cisco transportation omnidirectional 5-element antenna for 2G, 3G, 4G cellular, GPS, and dual-band WiFi 2.4 GHz and 5GHz.
ANT-3-4G2G1-O	Cisco transportation omnidirectional 3-element antenna for 2G, 3G, 4G cellular and GPS
ANT-2-WLAN-D-O	Cisco transportation omnidirectional 2-element antenna dual-band WiFi 2.4 GHz and 5GHz

Item	Specification
ANT-2-4G2-O	Cisco transportation omnidirectional 2-element antenna for 2G, 3G, 4G cellular
ANT-4G-OMNI-OUT-N	Cisco outdoor omnidirectional antenna for 2G, 3G, and 4G LTE cellular
ANT-4G-PNL-OUT-N	Cisco multiband panel outdoor 4G LTE antenna
LTE-ANTM-D	Cisco LTE Advanced indoor swivel-mount dipole antenna
4G-ANTM-OM-CM	Cisco Multiband indoor omnidirectional antenna - Ceiling Mount
Antenna extension 4G-AE015-R	Cisco Single-unit antenna extension base (15 ft [457.2 cm])
Antenna extension 4G-AE010-R	Cisco Single-unit antenna extension base 10 ft [304.8 cm]
AIR-ANT2547V-N	Cisco Aironet Dual-Band Omnidirectional Antenna
AIR-ANT2547V-N-HZ	Cisco Aironet Dual-Band Omnidirectional Antenna
AIR-ANT5135	Cisco Aironet 3.5-dBi Articulated Dipole Antenna
AIR-ANT2524DB-R	Cisco Aironet Dual-band Dipole Antenna
GPS-ACT-ANTM-SMA	Cisco 4G Indoor/Outdoor Active GPS Antenna

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

Ordering information

For Cisco 829 Industrial Integrated Services Routers ordering information, visit the Cisco Ordering home page. See Tables 7 and 8.

Table 8. Ordering information

Product	Description
Cisco IR829GW 4G LTE Integrated Services Routers	
IR829M-2LTE-EA-*K9 * Wi-Fi regulatory domain	Compact Cisco IR829 ruggedized secure multimode 4G LTE industrial ISR for North America and Europe; LTE bands 1-5, 7, 12, 13, 20, 25, 26, 29, and TDD LTE band 41 with carrier aggregation, UMTS/HSPA+ bands 1-5 and 8; dual Wi-Fi radio with FCC compliance IR829M-2LTE-EA-BK9 - USA IR829M-2LTE-EA-EK9 - Europe IR829M-2LTE-EA-AK9 - Canada
IR829B-2LTE-EA-*K9 * WiFi regulatory domain	Compact Cisco IR829 ruggedized secure multimode 4G LTE industrial ISR for North America and Europe; LTE bands 1-5, 7, 12, 13, 20, 25, 26, 29, and TDD LTE band 41 with carrier aggregation, UMTS/HSPA+ bands 1-5 and 8; dual Wi-Fi radio with FCC compliance IR829B-2LTE-EA-BK9 - USA

Product	Description
	IR829B-2LTE-EA-EK9 – Europe IR829B-2LTE-EA-AK9 – Canada
IR829-2LTE-EA-*K9 * Wi-Fi regulatory domain	Compact Cisco IR829 ruggedized secure multimode 4G LTE industrial ISR for North America and Europe; LTE bands 1-5, 7, 12, 13, 20, 25, 26, 29, and TDD LTE band 41 with carrier aggregation, UMTS/HSPA+ bands 1-5 and 8; dual Wi-Fi radio with FCC compliance IR829-2LTE-EA-BK9 – USA IR829-2LTE-EA-EK9 – Europe IR829-2LTE-EA-AK9 – Canada
IR829M-LTE-EA-*K9 * Wi-Fi regulatory domain	Compact Cisco IR829 ruggedized secure multimode 4G LTE industrial ISR for North America and Europe; LTE bands 1-5, 7, 12, 13, 20, 25, 26, 29, and TDD LTE band 41 with carrier aggregation, UMTS/HSPA+ bands 1-5 and 8; dual Wi-Fi radio with FCC compliance IR829M-LTE-EA-BK9 – USA IR829M-LTE-EA-EK9 – Europe IR829M-LTE-EA-AK9 – Canada
IR829B-LTE-EA-*K9 * Wi-Fi regulatory domain	Compact Cisco IR829 ruggedized secure multimode 4G LTE industrial ISR for North America and Europe; LTE bands 1-5, 7, 12, 13, 20, 25, 26, 29, and TDD LTE band 41 with carrier aggregation, UMTS/HSPA+ bands 1-5 and 8; dual Wi-Fi radio with FCC compliance IR829B-LTE-EA-BK9 – USA IR829B-LTE-EA-EK9 – Europe IR829B-LTE-EA-AK9 – Canada
IR829M-LTE-LA-*K9 * Wi-Fi regulatory domain	Compact Cisco IR829 ruggedized secure multimode 4G LTE industrial ISR for LATAM and APJC; LTE FDD bands 1, 3, 5, 7, 8, 18, 19, 21, 28, and TDD LTE bands 38, 39, 40, 41 bands with carrier aggregation, UMTS/HSPA+ bands, and TD-SCDMA band 39; dual Wi-Fi radio with ETSI compliance IR829M-LTE-LA-ZK9 – Australia, New Zealand and Brazil
IR829GW-LTE-GA-*K9 * Wi-Fi regulatory domain	Compact Cisco IR829 ruggedized secure multimode 4G LTE industrial ISR for Europe, Australia, Malaysia, and Singapore;, LTE 800/900/1800/2100/2600 MHz, 850/900/1900/2100 MHz UMTS/HSPA+ bands and dual Wi-Fi radio with ETSI compliance IR829GW-LTE-GA-EK9 – Europe IR829GW-LTE-GA-ZK9 – Australia, New Zealand and Brazil IR829GW-LTE-GA-CK9 – China IR829GW-LTE-GA-SK9 – Hong Kong
	Recommended upgrade: IR829GW-LTE-GA-EK9 → IR829M-LTE-EA-EK9 for POE and IR829B-LTE-EA-EK9 for non-POE IR829GW-LTE-GA-ZK9 → IR829M-LTE-LA-ZK9 for POE and IR829GW-LTE-LA-ZK9 for non-POE IR829GW-LTE-GA-CK9 → IR829GW-LTE-LA-HK9 IR829GW-LTE-GA-SK9 → IR829GW-LTE-LA-SK9

Product	Description
IR829GW-LTE-NA-AK9	Compact Cisco IR829 ruggedized secure multimode 4G LTE industrial ISR 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) and dual Wi-Fi radio with FCC compliance **Recommended upgrade**: **USA (AT&T)**: IR829M-LTE-EA-BK9 for POE and IR829B-LTE-EA-BK9 for non-POE **Canada**: IR829M-LTE-EA-AK9 for POE and IR829B-LTE-EA-AK9 for non-POE
IR829GW-LTE-VZ-AK9	Compact Cisco IR829 ruggedized secure multimode 4G LTE industrial ISR 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.and dual Wi-Fi radio with FCC compliance **Recommended upgrade**: **USA**: IR829M-LTE-EA-BK9 for POE and IR829B-LTE-EA-BK9 for non-POE
IR829GW-LTE-LA-*K9 * Wi-Fi regulatory domain	Compact Cisco IR829 ruggedized secure multimode 4G LTE industrial ISR for LATAM and APJC; LTE FDD bands 1, 3, 5, 7, 8, 18, 19, 21, 28, and TDD LTE band 38, 39, 40, 41 bands with carrier aggregation, UMTS/HSPA+ bands and TD-SCDMA band 39; dual Wi-Fi radio with ETSI compliance IR829GW-LTE-LA-DK9 – India IR829GW-LTE-LA-KK9 – Korea IR829GW-LTE-LA-NK9 – Panama IR829GW-LTE-LA-QK9 – Japan IR829GW-LTE-LA-SK9 – Hong Kong IR829GW-LTE-LA-ZK9 – Australia, New Zealand and Brazil IR829GW-LTE-LA-LK9 – Malaysia IR829GW-LTE-LA-HK9 – China IR829GW-LTE-LA-TK9 – Taiwan IR829GW-LTE-LA-FK9 – Indonesia
IR800-IL-POE	IEEE 802.3at compatible POE module for the IR829-2LTE and IR829GW-LTE
IR829-DINRAIL	DIN rail kit for the IR829
IR829-PWR125W-AC	AC to DC power adapter for the IR829 in lab environment. Meets ITE standards and operating temperature range of -20C to 60C but not suited for industrial environment.
IR829-DC-PWRCORD	DC Power Cord for IR829
IR-SSD-MSATA-50G **IR-SSD-MSATA-50G= (spare)** **IR-SSD-MSATA-50++= (TAA)**	Cisco 50-GB SSD module for IR829M (only supported on IR829M-2LTE and IR829M-LTE platforms) • Field-replaceable unit (FRU) • Endurance: 18 Terabytes written (TBW) • Recommended to replace when wear ratio reaches 90%

Product	Description
IR-SSD-MSATA-100G **IR-SSD-MSATA-100G= (Spare)** **IR-SSD-MSATA-1H++= (TAA)**	Cisco 100GB SSD module for IR829M ((only supported on IR829M-2LTE and IR829M-LTE platforms) • FRU • Endurance: 33 TBW • Recommended to replace when wear ratio reaches 90%
LTE-SIM-VZ	Verizon LTE SIM 700MHz-2600MHz bands
IOS Software and Licenses included by default	
SL-IR800-IPB-K9	Cisco 800 Series IP Base License
SL-IR800-DATA-K9	Cisco 800 Series Data License
SL-IR800-SEC-K9	Cisco 800 Series Security License
SL-IR800-SNPE-K9	Cisco 800 Series No Payload Encryption 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
FW-7430-LTE-AU	Cisco LTE modem firmware for Telstra (Australia)
FW-7430-LTE-JP	Cisco LTE modem firmware for NTT DoCoMo (Japan)
FW-7430-LTE-SB	Cisco LTE modem firmware for Softbank (Japan)
FW-7430-LTE-KD	Cisco LTE modem firmware for KDDI (Japan)
FW-7430-LTE-GN	Cisco LTE modem generic firmware
FW-7455-LTE-AT	Cisco LTE modem firmware for AT&T (US)
FW-7455-LTE-VZ	Cisco LTE modem firmware for Verizon (US)
FW-7455-LTE-GN	Cisco LTE modem firmware for Europe and Canada

Table 9. Antenna ordering information

Note: None of the antennas are included by default along with the IR829.

Description	Part Number
Transportation omnidirectional 5-element antenna for 2G, 3G, 4G cellular, GPS, and dual-band Wi-Fi 2.4 GHz and 5GHz	ANT-5-4G2WL2G1-O ANT-5-4G2WL2G1-O= (Spare)
Cisco transportation omnidirectional 3-element antenna for 2G, 3G, 4G cellular and GPS	ANT-3-4G2G1-O ANT-3-4G2G1-O= (Spare)
Cisco transportation omnidirectional 2-element antenna dual-band WiFi 2.4 GHz and 5GHz	ANT-2-WLAN-D-O ANT-2-WLAN-D-O= (Spare)
Cisco transportation omnidirectional 2-element antenna for 2G, 3G, 4G cellular	ANT-2-4G2-O ANT-2-4G2-O= (Spare)
Multi-Band Omnidirectional Antenna-Ceiling Mount	4G-ANTM-OM-CM 4G-ANTM-OM-CM= (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)
LTEA, LTE, 4G and 3G omnidirectional dipole antenna	LTE-ANTM-D LTE-ANTM-D= (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)	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)
10-ft (3M) Ultra Low Loss LMR 400 Cable with TNC Connector	4G-CAB-LMR400-10 4G-CAB-LMR400-10= (Spare)
5-ft (3M) Ultra Low Loss LMR 400 Cable with TNC Connector	4G-CAB-LMR400-5 4G-CAB-LMR400-5= (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)

Description	Part Number
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)
10-ft (3M) Ultra Low Loss LMR 400 Cable RA-RP-TNC (m) to RP-TNC (f)	CAB-L400-10-R CAB-L400-10-R= (Spare)
20-ft (6 m) Ultra Low Loss LMR 400 Cable RA-N (m) to RP-TNC (f)	CAB-L400-20-N-R CAB-L400-20-N-R= (Spare)
Lightning Arrestor Kit: male to female	CGR-LA-NM-NF CGR-LA-NM-NF= (Spare)
Lightning Arrestor: TNC (female) to TNC (male)	4G-ACC-OUT-LA 4G-ACC-OUT-LA= (Spare)

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

Cisco and Partner Services for the Cisco ONE Enterprise Networks Architecture

Enable the Cisco ONE™ 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 ONE 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 https://www.cisco.com/go/services.

Warranty coverage and technical service options

The Cisco 829 Industrial Integrated Services Routers come with the Cisco 5-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 8 shows the available technical services.

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

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

Table 10. Cisco Technical Services for the Cisco 829 industrial 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
Cisco Smart Foundation Service • Next-business-day advance hardware replacement as available • Business-hours access to Small and Medium-sized Business (SMB) Cisco TAC (access levels vary by region) • Access to Cisco.com SMB knowledge base • Online technical resources through Smart Foundation Portal • OS 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 in the relevant region), with NBD delivery. Where NBD is not available, same-day shipment is provided. Restrictions apply; review the appropriate service descriptions for details.

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

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For more information

For more information about Cisco 829 Industrial Integrated Services Routers, visit https://www.cisco.com/go/ir829 or contact your local Cisco account representative.

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