

Cisco IR 910 Series

Product Overview

- Q.** What is the Cisco® Industrial Router (IR) 910?
- A.** The Cisco 910 Industrial Router (IR910) is Cisco IoT gateway with ruggedized design for smart city applications, even those in harsh environment, leveraging wireless sensor technology. With modular slot design, it can agilely adapt to a variety of wireless sensor technologies at regional RF bands and quickly go to market. Through programmable environment, sufficient headroom of CPU horsepower and onboard memory, IR910 allows to host partner’s applications and execute fog computing.
- Q.** Is IR 910 part of Cisco IoT portfolio?
- A.** Yes, the Cisco 910 Industrial Router belongs to the product family of Cisco 900 Series Industrial Routers under the umbrella of Cisco IoT product portfolios.
- Q.** What are some primary features of Cisco IR 910?
- A.** IR 910 is a ruggedized gateway that can be easily fit into any harsh environment, to aggregate wireless sensor network upwards to IP network. With its open platform and programmable environment, it not only enable different kinds of wireless sensor network technology to be integrated into this new platform, but also provide the capability to host the applications developed by 3rd party, which can help the end users to quickly build a total solution with partners to address different kinds of application in different verticals.
- Q.** What kinds of model options are available for the IR-910?
- A.** Table 1

Models	IR910 GE	IR910 Wi-Fi	IR910 3G
Skus	IR910-K9	IR910W-K9	IR910G-K9 IR910G-NA-K9 (North America)
Ethernet	1x GE Combo (RJ45/SFP)		
3G			3G HSPA/CDMA EV-DO Selective
WiFi		802.11 b/g/n, 1Tx1R, 2.4GHz	
Downlink	<ul style="list-style-type: none"> • 1 x Open Slot for sensor wireless interface, i.e. Semtech LoRa • 2 x RJ45 (RS232/485 Serials Ports) 		
Console	1 x RJ45		
USB	1 x USB 2.0		
Onboard Storage	2GB Flash		
External Storage	16GB SSD (optional)		
Power Supply	Dual 12 ~ 24VDC Input		
Working Temp	<ul style="list-style-type: none"> • -40 to +70°C (-40 to 158°F), without SSD storage, in a vented enclosure • -40 to +60°C (-40 to 140°F), without SSD storage, in a sealed enclosure • 0 to +60°C (32 to 140°F), with SSD storage 		
IP rating	<ul style="list-style-type: none"> • IP30 (without enclosure) and IP55 (with enclosure) 		

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- Q.** What's the availability of all the models in different region of the world?
- A.** Cisco IR910 is now available globally. IR910 3G models are available for regions where the 3G interfaces will be certified. IR910G-K9 is the Global model reference, while the IR910NA-G-K9 is available in North America with FCC compliance and Verizon certification.

Technology Overview - Hardware

- Q.** What is a dual-purpose port?
- A.** A dual-purpose port is a combination of one 10/100/1000-TX RJ45 copper port and one Small Form-Factor Pluggable (SFP)-based Gigabit Ethernet port. Only one of these two ports can be used at a time. This added flexibility allows cost-effective use of interfaces. The IR910 provides one dual-purpose Gigabit Ethernet port standard on the router.
- Q.** What SFP modules are supported on the Cisco IR910?
- A.** Cisco IR 910 supports both 100-Mbps and 1000-Mbps SFP modules. The options include
- 1 G SFP - GLC-SX-MM, GLC-LH-SM, GLC-SX-MM-RGD, GLC-LX-SM-RGD
 - 100M SFP - GLC-FE-100LX-RGD and GLC-FE-100FX-RGD
- Q.** How does IR 910 adapt to a variety of wireless sensor network (WSN) technology?
- A.** Cisco IR 910 is an open platform that allows 3rd party to build their own wireless sensor module card without any limitation of the type of wireless sensor network technology it is based on, or radio frequency it is on. A field replaceable sensor communication card can be inserted to the open slot to aggregate wireless sensor network complying with IEEE-802.15.4 standard or other standard and proprietary technologies. This card can be produced by Cisco or authorized partners through Cisco reference design specifications. Partners can build their own WSN module that is compatible to Cisco IR 910 by following the design guidance provided by Cisco.
- Q.** What is 3G? What is the difference between EVDO and HSPA?
- A.** Third-generation (3G) is the term for the last generation of mobile services, which provide advanced voice communications and high-speed data connectivity, including access to the Internet, mobile data applications, and multimedia content. EVDO and HSPA are parallel 3G data standards in the Code Division Multiple Access (CDMA) and Global System for Mobile Communications (GSM) environments. EVDO evolved from the Code Division Multiple Access 2000 (CDMA2000) standards, whereas high-speed packet access (HSPA) evolved from the Universal Mobile Telecommunication System (UMTS) standard that was developed for the countries using GSM technology.
- Q.** What 3G modem is the IR 910 based on?
- A.** The modem is based on the AirPrime MC9090, which supports data connectivity on HSDPA,, WCDMA, EDGE, GPRS and CDMA EVDO Rev A networks.
- Q.** What wireless radio frequency is supported with the 3G modem for the IR 910?
- A.** The following 2G and 3G wireless technologies are supported on the 3G modems:
- Quad-band GSM/GPRS/EDGE (850 MHz, 900 MHz, 1800 MHz, 1900 MHz)
 - Quad-band UMTS WCDMA FDD (800 MHz, 850MHz, 1900 MHz, 2100 MHz)
 - Dual-band CDMA EVDO Rev A (800MHz, 1900 MHz)

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- Q.** Does the IR910G support 4G/LTE?
- A.** No. Currently, there is now Cisco IR910 model supporting 4G/LTE.
- Q.** What is the compliance status of IR910G-NA-K9?
- A.** Cisco IR910G-NA-K9 has passed the FCC compliance and Verizon certification.
- Q.** Does IR910G-NA-K9 support other 3G service providers, like AT&T, Sprint, beside Verizon?
- A.** No. Currently IR910_NA-K9 only has Verizon certification.
- Q.** What are the available antenna solutions with the embedded 3G modem for the Cisco IR 910?
- A.** For Cisco IR910G-K9 and Cisco IR910G-NA-K9, swivel-mount dipole antennas is included by default.
- Q.** How many SIM slots are supported on the Cisco IR 910?
- A.** Only one card socket is located on the front panel of the routers of 3G model with a cover for protection.
- Q.** Can I use micro SIM or nano SIM card with Cisco IR 910?
- A.** Cisco IR 910 is equipped with a mini SIM (2FF) slot. Micro SIM (3FF) or nano SIM card (4FF) is not supported by default, but you may be able to use it along with an adapter to convert the micro SIM or nano SIM to mini SIM.
- Q.** What wireless LAN (Wi-Fi) radio is used in Cisco IR 910?
- A.** The Cisco IR 910 can be either as a WLAN client or an autonomous access point (AP). It supports wireless radio of 2.4 GHz used by IEEE 802.11b, 802.11g, and 802.11n.
- Q.** Can Cisco IR 910 Wi-Fi radio support 5.0GHz frequency band?
- A.** No, Cisco IR 910 Wi-Fi radio can operate only at 2.4GHz.
- Q.** Can Cisco IR 910 work as a thin AP with Cisco WLAN controller?
- A.** No, Cisco IR 910 can operate only at autonomous mode if it is set as an AP.
- Q.** Does Multiple-input and Multiple-output (MIMO) technology is applied on Cisco IR 910?
- A.** No. Cisco IR 910 now only supports single input single output.
- Q.** Does Wi-Fi antenna ship with IR910W-K9 by default?
- A.** Yes.
- Q.** What power supply options are available for the IR 910?
- A.** Cisco IR 910 has two power inputs (DC-A and DC-B), each as a backup for the other. Either input is of 12~24 VDC with the maximum current at 2.8 A. The base PIDs do not include any power supply in package. Customer can order the power supply complying with the power input specification of IR910.
- Q.** Does the IR910 support positive and negative DC power?
- A.** The power input of IR910 is from +12~24 VDC. It doesn't support negative DC power.
- Q.** Can the IR 910 run on one power supply?
- A.** Yes, only one power supply is needed for operation of the router. The Cisco IR 910 supports one or two power supplies. When two power supplies are used, one power will be a redundancy.
- Q.** What is the operating temperature range for Cisco IR 910?
- A.** The operation temperature is -40 to 158°F (-40 to 70°C).

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- Q.** What is the IP rating?
- A.** The protection of enclosures against ingress of dirt or against the ingress of water is defined in IEC60529. The degrees of protection are most commonly expressed as "IP" (Ingress Protection) followed by two numbers; The first digit, foreign bodies protection, shows the extent to which the equipment is protected against particles, and the second digit, water protection, indicates the extent of protection against water.
- Q.** What's the IP rating of Cisco IR 910?
- A.** Cisco IR 910 natively has IP 30 protection. Cisco also provides an IP55 enclosure (ACC-IR910-H-M=) with higher protection to enable the deployment in harsh environment.
- Q.** What mounting options does the Cisco IR 910 support?
- A.** Cisco IR 910 supports DIN rail mounting natively. Cisco IR 910 IP55 enclosure supports pole and wall mounting options.
- Q.** What LEDs are available on Cisco IR 910?
- A.** The LEDs, located at the front panel of the Cisco IR 910, include SYS, VPN, serial port 1 & 2, DC power supply, Wi-Fi status (IR910W-K9 only) and 3G status (IR910G-K9 only). Please refer to the Cisco Industrial Router 910 Hardware Installation Guide for detailed LED behavior. See <http://www.cisco.com/go/ir900>.

Technology Overview - Software

- Q.** Does IR 910 run Cisco IOS software?
- A.** No. The IR 910 doesn't run Cisco IOS software. It runs on Linux OS with Cisco IOS like command interfaces.
- Q.** Does Cisco IR 910 support SMS or GPS via 3G modem?
- A.** No, neither SMS nor GPS service is supported and only data service is supported.
- Q.** Is Cisco IR 910 a wireless router or access point?
- A.** Cisco IR 910 can be set as either router or access point. For detail information, please refer to Cisco Industrial Router 910 Software Configuration Guide.
- Q.** Does Cisco IR 910 support IPv6?
- A.** Cisco IR 910 acts as an IPv6 host, including IPv6 Addressing, ICMPv6, TCP/UDP over Ipv6, option processing, packet fragmentation, and Ipv6 application support like ping, traceroute, VTY, SSH, TFTP, SNMP. For more detail on IPv6 support, please refer to Cisco IR 910 software configuration guide.
- Q.** Does Cisco IR 910 support Point-to-Point Protocol over Ethernet (PPPoE)?
- A.** Yes, Cisco IR 910 supports PPPoE.
- Q.** What kind of VPN is supported?
- A.** Cisco IR 910 supports the following VPN connection types of both remote access and site-to-site VPN:
- IPSec (PSK)
 - IPSec (RSA)
 - L2TP with IPSec (PSK)
 - L2TP with IPSec (RSA)
 - L2TP
 - PPTP

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- Q.** How many VLANs are supported in Cisco IR 910?
- A.** The Cisco IR 910 supports 16 VLANs.
- Q.** What is the Linux kernel version? Will this kernel be kept as long as possible?
- A.** Cisco IR 910 runs on the kernel version 2.6.35. Currently Cisco IR 910 will stick to this kernel branch and provide appropriate patches to this branch if needed.
- Q.** What's the procedure of firmware upgrade of IR 910?
- A.** Cisco IR 910 support dual image mechanism as a fault-tolerant to avoid the upgrade failure due to unexpected situation (e.g. power outage). When IR 910 is getting started to upgrade the firmware, it will write new firmware into the partition whose firmware is not running after the image signature has been verified. And if it upgrades firmware successfully, IR 910 will revise the boot variable to notify bootloader the right partition which store new image. So even new image was corrupted during firmware upgrade, IR 910 can still use backup image to boot system.

Semtech LoRa Support

- Q.** What is LoRa technology?
- A.** LoRaWAN is a Low Power Wide Area Network (LPWAN) specification intended for wireless battery operated Things in regional, national or global network. LoRaWAN target key requirements of Internet of things such as secure bi-directional communication, mobility and localization services.
- Q.** Does the IR 910 support LoRa?
- A.** Yes, LoRa interface is available for the IR910. Currently, 433MHz and 868MHz modules are available for world regions allowing the use of these unlicensed bands. For regions allowing 915MHz frequency band or subset of it, a LoRa interface is not yet available.
- Q.** What is LoRa solution?
- A.** a LoRa solution requires a minimum set of components that are:
- LoRa endpoints - available from 3rd party
 - LoRa gateway - IR 910 with LoRa interface
 - LoRa Network Server - available soon through Solution Plus
 - Application Server - available from 3rd party
- LoRa endpoints, gateway and Network Server must work for the selected frequency band.
- Q.** Is Cisco offering a LoRa Network Server?
- A.** LoRa Network Server will be available from Solution Plus partnership.
- Q.** Where can I find technical information about the LoRa in the industry?
- A.** LoRa alliance website provides the information about LoRa, see <http://lora-alliance.org/>.
- Q.** Is Cisco part of the LoRa alliance?
- A.** Yes, Cisco is member of LoRa alliance.
- Q.** What are the Semtech LoRa chipset used by the IR910 LoRa module?
- A.** IR910 LoRa module implements one Semtech LoRa SX1301 and 2 Semtech SX1257 RF.
- Q.** Are the configurations for the IR910 available on the GitHub form Semtech?
- A.** IR910 LoRa packet forwarder is based on the Semtech code in Github.

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- Q.** Is the LoRa traffic forwarded to the default Semtech LoRa Network Server on <http://iot.semtech.com/gatewaylist.php>?
- A.** No, the LoRa traffic is forwarded to the configured LoRa Network Server.
- Q.** If the LoRa module is failed in field, should customer replace the full unit or the LoRa module only?
- A.** Customer shall replace the full unit including the LoRa module for RMA.

Technology Overview - Management

- Q.** What are the management capabilities of Cisco IR 910?
- A.** The Cisco IR910 supports numerous management features. Simple Network Management Protocol (SNMP) enables comprehensive in-band management, a command-line-based management console and a web based application that enables detailed, out-of-band, and comprehensive management.
- Q.** What kind of user interfaces does IR 910 provide for a single device?
- A.** IR 910 provides Cisco-IOS-command-like command line interface (CLI) and Web-based graphic user interfaces (GUI).
- Q.** Does IR 910 work with any centralized device management software? Do you have any plan to have IR 910 work with other network management product like NCS or Cisco Prime?
- A.** Currently, Cisco IR 910 series doesn't work with CG-NMS or Cisco Prime network management software. However, centralized network and device management is on the roadmap.

Technology - 2nd development

- Q.** Do you plan to provide the software development kit for 3rd party development?
- A.** Cisco will provide an SDK image release that contains all the header files and libs of the software as well as the tool chain, so that partners can link to these libraries to their C/C++ application. Besides, IR 910 also support python and Java runtime environment (JRE).
- Q.** For the 3rd party, do you plan to prepare the manner or program that supports the 3rd party to develop their own application?
- A.** Yes. Besides the SDK, Cisco will provide development guidelines so partners can design solution that is better fit into the IR910. Please contact ask-ir900-pm@cisco.com for more information.
- Q.** How does the IR 910 control the amount of the memory usage and CPU load of a 3rd party application?
- A.** Currently there is no control of the usage of the hardware resource. However, it is on the roadmap that an application container will be used to better control the usage of the environment.



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