



IR510 and IR530 Hardware–Cisco IOS

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Organization

This guide includes the following sections:

Conventions, page 1	Details on style conventions used in the guide.
Overview, page 2	Provides hardware and software specifications on IR510 and IR530.
Installation Guidelines, page 8	Provides a summary of warnings to note before you install the IR510 and IR530.
Configuring IR510 and IR530 Systems, page 8	Provides hardware and software specifications on the Cisco IR510 and IR530 Series Resilient Mesh Range Extender and supported antennas; and, configuration details using IoT FND 4.2.x and Cisco command line interface (CLI).

Conventions

This document uses the following conventions.

Conventions	Indication
bold font	Commands and keywords and user-entered text appear in bold font .
<i>italic font</i>	Document titles, new or emphasized terms, and arguments for which you supply values are in <i>italic font</i> .
[]	Elements in square brackets are optional.

Conventions	Indication
{x y z}	Required alternative keywords are grouped in braces and separated by vertical bars.
[x y z]	Optional alternative keywords are grouped in brackets and separated by vertical bars.
string	A nonquoted set of characters. Do not use quotation marks around the string or the string will include the quotation marks.
courier font	Terminal sessions and information the system displays appear in courier font.
< >	Nonprinting characters such as passwords are in angle brackets.
[]	Default responses to system prompts are in square brackets.
!, #	An exclamation point (!) or a pound sign (#) at the beginning of a line of code indicates a comment line.

Note: Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the manual.

Caution: Means *reader be careful*. In this situation, you might perform an action that could result in equipment damage or loss of data.

Warning: IMPORTANT SAFETY INSTRUCTIONS

Means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.

Caution: Cable distribution system should be grounded (earthed) in accordance with ANSI/NFPA 70, the National Electrical Code (NEC), article 800, Grounding of Outer Conductive Shield of a Coaxial Cable.

WARNING : Only trained and qualified personnel should be allowed to install, replace, or service this equipment.
Statement 1030

SAVE THESE INSTRUCTIONS

Regulatory: Provided for additional information and to comply with regulatory and customer requirements.

Overview

This chapter describes the Cisco Industrial Router 510 (IR510) WPAN Distribution Automation (DA) Gateway and includes the following topics:

- [IR 510 Hardware Overview, page 2](#)
- [IR530 Hardware Overview, page 5](#)

IR 510 Hardware Overview

The IR510 WPAN Distribution Automation (DA) Gateway operates within a wireless mesh network, providing intelligent control over endpoint devices that use Serial (RS232/RS485), USB (LS/FS/HS), or Fast Ethernet (10/100 Fast Ethernet) ports. Additionally, the gateway employs GPS for time synchronization and location tracking.

The IR510 DA Gateway works with the CGR1000 series of routers, primarily in the electrical grid to provide a low cost, low power, small size DA solution. The IR510 DA Gateway ([Figure 1 IR510 in IP30 Enclosure, page 3](#)) comes within a ruggedized IP30 enclosure. The enclosure allows installation of IR510 within outdoor cabinets.

Figure 1 IR510 in IP30 Enclosure



IR510 System Specifications

Table 1 IR510 Hardware Specifications

Item	Description
Dimensions	5.9 x 5 x 1.75 (Inches)
Operating ambient temperature range	-40C to +60 (Celsius)
DC Power Supply	Supports 12-48Vdc nominal, 9.6-60Vdc maximum range
Reset button	Allows factory reset when you press button for approximately 5 seconds.

Table 2 IR510 Device Interfaces

Item	Description
Alarm port	Port has one Isolated input for open and closed relay detection.
QMA Antenna Port	900 MHz ISM band, Omni stick, 24 inch, 5 dBi, N(f), Cisco PID ANT-WPAN-OM-OUT-N. Panel-mounted, 50-ohm connector for connecting the antenna to the WPAN gateway. Supports the IR509 antenna (ANT-WPAN-OM-OUT-N)
RJ45 Fast Ethernet 10/100 port	Provides 10/100 Mb/s device connections.
RJ45 RS232-DCE or RS485 port	Provides user the option to configure either port interface via software on the same RJ45 port. RS232 operates in full duplex mode port RS485 operates in half duplex or full duplex mode. Use the IoT Field Network Director (FND) 4.1 (and higher) User Guide to configure the port and provide statistics about the serial port including bytes sent and received information.
RS232 Console port	To access the console port, remove the front cover.
RS232-DTE port	Provides for direct connection to a DCE port. Use the IoT Field Network Director (FND) 4.1 (and higher) User Guide to configure the port and get statistics about the port including bytes sent and bytes received information.
USB-A (LS/FS/HS) Host port	Supports the following signaling rates: 1Mb/s (low speed), 12Mb/s (full speed) and 480 Mb/s (high speed).

Table 3 IR510 LEDs

LED	Green	Yellow	Red
PWR (Power)	OK: All Power	OK: 12K PSU only	---
SYS (System)	Blinking: Master Controller Unit (MCU) is running system software	Blinking: MCU is booting up	---
CPU (System)	Blinking: CPU is actively running user application	Blinking: CPU is booting up	---
ALM	---	---	Solid: Alarm Detected
FE	Solid: Ethernet Link Established Blinking: Ethernet Activity Detected	---	---
RS232-DCE	Solid: S0 Port is RS232 DCE	---	---
RS485	Solid: S0 Port is RS485	---	---
RS232-DTE	Solid: S1 Port is RS232 DTE	---	---

Table 4 IR510 Product IDs and Accessories

Product ID	Description
IR510-OFDM-FCC/K9	Cisco 510 WPAN Industrial Router
IR510-DINRAIL=	DIN Rail spare assembly
ANT-UN-MP-OUT-QMA	Antenna with QMA connector and 5 ft cable for use with IR510
ANT-UN-MP-OUT-QMA=	Antenna with QMA connector and 5 ft cable for use with IR510 (Spare)
ANT-WPAN-OM-OUT-N	Omni antenna for 900 MHz WPAN (Outdoor)

IR530 Hardware Overview

For details on Environmental Compliance, Immunity, EMC, Safety and Ingress Protection (dust/water) or to confirm any IR530 Hardware Specifications, please refer to the [Cisco IR530 Series Resilient Mesh Range Extenders Data Sheet](#).

Table 5 IR530 Hardware Specifications

Item	Description
Dimensions (W x D x H)	5.2" x 7.23" x 10.37"
Typical weight fully configured	8.4 lbs (3.8 kg)
Pole mount	Yes
Operating temperature	40° C to +70° C (–40° F to 158° F) with IEEE 1613 type test up to 85° C (185° F) for 16 hours
Typical power consumption or dissipation	Normal operation: 6W max with BBU charging: 23W max
IEEE 802.15.4 WPAN	IEEE 802.15.4g/e/v
Frequency support	
Spread spectrum technology	OFDM Option 2 802.15.4g Frequency hopping between up to quantity 31 800 kHz channels PHY data rates of 50 kb/s, 200 kbps, 800 kbps, and 1200kbps
Transmitter output (conducted)	28 dBm typical, at 50 kb/s, and 200 kbps 25 dBm typical, at 800 kb/s, 24 dBm typical, at 1200 kb/s,
Antenna connector	RF Mesh QMA N connector (female)
RS 232 serial console port	1
Digital alarm inputs	1
Integrated AC/DC power supply input range	85 – 264 VAC, 47 – 63 Hz
Power Consumption	6W (no BBU charging) 20W (BBU charging)

For details on Environmental Compliance, Immunity, EMC, Safety and Ingress Protection (dust/water) or to confirm any IR530 Hardware Specifications, please refer to the [Cisco IR530 Series Resilient Mesh Range Extenders Data Sheet](#).

Overview

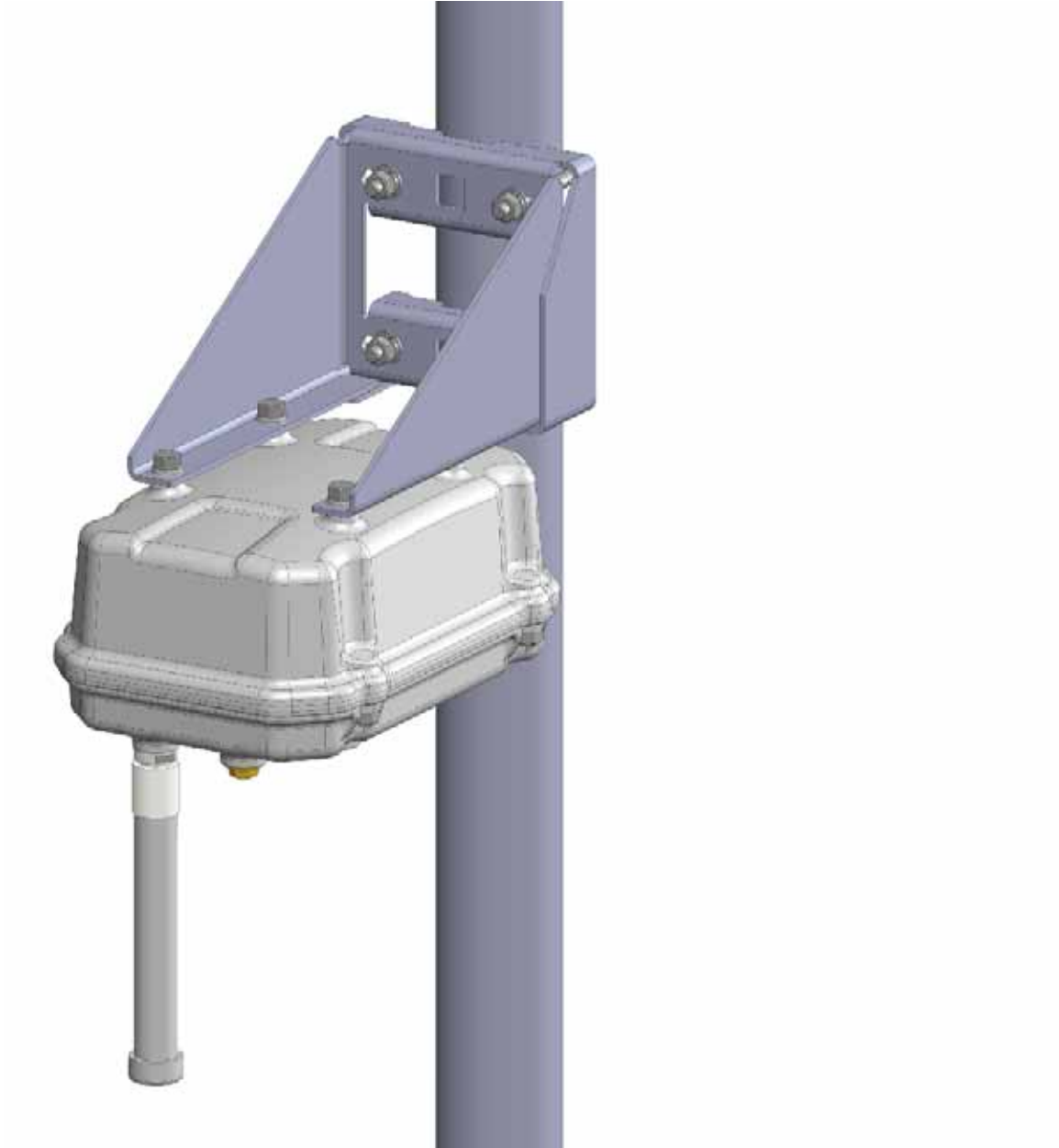


Table 6 LEDs for IR530

LED Name	Definition	State
RSSI	Measure of power present in the received radio signal.	Yellow (Off) / Green (Off): RSSI less than -105 dBm
		Yellow (On) / Green (Off): RSSI is -105 to -95 dBm
		Yellow (Off) / Green (Slow Blink): RSSI is -95 to -75 dBm
		Yellow (Off) / Green (Fast Blink): RSSI is -75 to -60 dBm
		Yellow (Off) / Green (Solid On): RSSI greater than -60 dBm
WPAN	WPAN traffic activity detect.	Yellow (Off) / Green (Off): WPAN port is disabled.
		Yellow (On) / Green (Off): Searching for network.
		Yellow (Off) / Green (Slow Blink): WPAN port is up.
		Yellow (Off) / Green (Fast Blink): Route is available and DHCPv6 configuration is starting.
		Yellow (Off) / Green (On): Global IPv6 address is available.
SYS	Indicates module status.	Green (Blinking): Broadcast slot time complete
		Yellow (Blinking): Bootload in process
		Yellow (Solid): Software update mode in process

Table 7 IR530 Antennas

Cisco Part Number	Description
ANT-WPAN-OM-OUT-N	Omni antenna for 900 MHz WPAN, outdoor

For more details on the supported antenna, please refer to the document below:

[Connected Grid Antennas Installation Guide](#)

Cable Options

Refer to the [Cisco IR530 Series Resilient Mesh Range Extenders Data Sheet](#) for a summary of all supported cables, see Table 4.

IR530 WPAN RF900 Range Extender (RE) Product IDs

Table 8 IR530 Product IDs and Accessories

Product ID	Description
R530-OFDM-FCC/K9	IR530 with 915MHz-WPAN, utility-grade DC power. For all North and South America except Brazil.
IR530-OFDM-BRZ/K9	IR530 with 915MHz-WPAN, utility-grade DC power. For Brazil.
IR530-OFDM-ANZ/K9	IR530 with 915MHz-WPAN, utility-grade DC power. For Australia and New Zealand.

Installation Guidelines

CAUTION : Do not place anything on top of the router that weighs more than 10 pounds (4.5 kilograms), and do not stack routers on a desktop. Excessive weight on top of the router could damage the chassis.

CAUTION : Do not install the router or power supplies next to a heat source of any kind, including heating vents.

WARNING : In order to comply with FCC radio frequency (RF) exposure limits, antennas for this product should be located a minimum of 7.9 in (20cm) or more from the body of all persons. Statement 332

WARNING : Read the installation instructions before connecting the system to the power source. Statement 1004

WARNING : Only trained and qualified personnel should be allowed to install, replace, or service this equipment. Statement 1030

WARNING : No user-serviceable parts inside. Do not open. Statement 1073

WARNING : Ultimate disposal of this product should be handled according to all national laws and regulations. Statement 1040

WARNING : Do not locate the antenna near overhead power lines or other electric light or power circuits, or where it can come into contact with such circuits. When installing the antenna, take extreme care not to come into contact with such circuits, because they may cause serious injury or death. For proper installation and grounding of the antenna, please refer to national and local codes (for example, U.S.:NFPA 70, National Electrical Code, Article 810, Canada: Canadian Electrical Code, Section 54). Statement 1052

WARNING : This product is not intended to be directly connected to the Cable Distribution System. Additional regulatory compliance and legal requirements may apply for direct connection to the Cable Distribution System. This product may connect to the Cable Distribution System ONLY through a device that is approved for direct connection. Statement 1078

Configuring IR510 and IR530 Systems

[IoT Field Network Director \(IoT-FND\) 4.2.x release](#) provides the user interface for IR510 and IR530 configuration as well as the configuration and management and the CGM-WPAN-OFDM Module.

IoT-FND Configuration Notes

The following guides provide information on installing and configuring the Cisco IR510 and IR530 systems:

- Cisco IoT Field Network Director Installation Guide, Release 4.2.x
- Cisco IoT Field Network Director User Guide, Release 4.2.x

CLI Configuration Notes

Table 9 Summary of New CLI Interface commands for the IR510 and IR530

Command	Definition
ieee154 phy-mode <64 96 66 98 144 146 147 149 150 192>	Defines the IEEE154 phy-mode. Possible options noted below, default value is 149.

