



Installing the Router

This chapter describes the equipment and the procedures for successfully installing the Cisco IR809.



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 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

**Note**

Shielded cable (STP – shielded twisted pair) shall be used to achieve compliance for emission and immunity criteria.

**Note**

The ground lug need to be installed permanently.

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Equipment, Tools, and Connections

This section describes the equipment, tools, and connections necessary for installing your Cisco 809 ISR.

Items Shipped with your Router

Unpack the box and verify that all items listed on the invoice were shipped with the Cisco 809 ISR.

The following items are shipped with your router:

- Grounding Lug Kit
- Mounting Screws
- Power Connector

Additional Items

The following items are not shipped with the router but are required for installation:

- Screws for mounting the router on a wall.
- Two number-10 wood screws (round- or pan-head) with number-10 washers or two number-10 washer-head screws, for mounting on a wall stud. The screws must be long enough to penetrate at least 3/4 inch (20 mm) into the supporting wood or metal wall stud.

- Two number-10 wall anchors with washers, for mounting the router on a hollow wall.
- Wire crimper for chassis grounding.
- Wire for connecting the chassis to an earth ground.
- Ethernet cables for connecting devices to the Ethernet ports.
- Ratcheting torque flathead screwdriver that exerts up to 15 in-lb (1.69 N-m) of pressure.
- A number-2 Phillips screwdriver.

Ethernet Devices

Identify the Ethernet devices that you will connect to the router: hub, servers, and workstations or PCs. Ensure that each device has a network interface card (NIC) for connecting to Ethernet ports.

Installing the Router

This section describes how to install the Cisco 809 ISR. This router can be installed on a table top or other flat horizontal surface, mounted on a wall, or DIN rail.

The recommended clearance when horizontally mounted is 1 inch on non-connector sides and 2 inches on top. Stacking heat-dissipating objects on top of the router is not allowed. I/O side clearance is needed as it is required to access the cable connections. Clearance is not required on the backside (opposite side from I/O face) unless DIN rail mounting is required. Clearance is required to attach and mount the DIN rail bracket. The same clearances apply when mounted vertically.

This section also describes how to attach external antennas to the routers



Warning

This equipment needs to be grounded. Use a green and yellow 14 to 18 AWG ground wire to connect the host to earth ground during normal use. Statement 242

Accessing the SIM Cards

Two USIM sockets are provided with easy access via a secured panel on the back side of the router. The SIM cards will be connected directly to the 4G radio.

Note : The IR800 series of routers use the Mini-SIM (2FF). Specifications are:

ISO/IEC 7810:2003, ID-000

Length - 25mm, Width - 15mm, Thickness - 0.76mm

This section describes how to install and/or replace a SIM card. Ensure that the router is not mounted to a wall, floor, or DIN rail.



Caution

Do not touch any part of the exposed PCB circuit area when the SIM cover is removed.



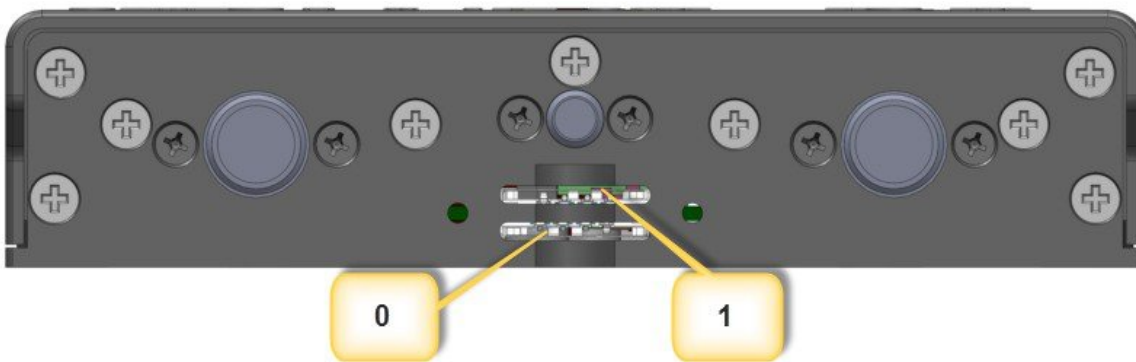
Warning The covers are an integral part of the safety design of the product. Do not operate the unit without the covers installed. Statement 1077



Warning Hot surface. Statement 1079

To access the SIM card in the Cisco IR809, follow these steps:

- Step 1** Power off the router and disconnect the power cable from the power source.
- Step 2** Place the router on its bottom and ensure that any installed antennas are carefully oriented or disconnected to be out of the way.
- Step 3** Remove the protective cover over the SIM slots by unscrewing the screws and setting them aside.
- Step 4** Locate the SIM card you wish to install/replace. The two slots are on the rear of the device. Slot 1 is the top and Slot 0 is the bottom. The following figure shows the slots with the protective cover removed.



- Step 5** If SIM card is present, then push the SIM card to eject it out of the slot. Install the new SIM card by pushing it into the slot until you hear a clicking sound.
- Step 6** Replace the protective cover and the screws.

Modems

There is one internal mini-PCIe connector to support a 4G modem. The 4G modems from Sierra Wireless MC73xx will be used:

Product	Modem Chipsets	Carrier	2G	3G (Diversity)	4G (MIMO)
MC7350	MDM9615 WTR1605L PM8018	Verizon Sprint	BC0 - CDMA -800 BC1 - CDMA -1900 BC10 - CDMA -800	BC0 - CDMA -800 BC1 - CDMA -1900 BC10 - CDMA -800	B4 - UMTS AWS B13 - UMTS-700 B25 - PCS 1900
MC7354	MDM9215 WTR1605L PM8018	ATT Canada	Quad GSM	B2 - UMTS 1900 B4 - UMTS AWS B5 - UMTS 850	B2 - UMTS 1900 B4 - UMTS AWS B5 - UMTS 850 B7 - UMTS-2600 B17 - UMTS-700
MC7304	MDM9215 WTR1605L PM8018	Europe New Zealand Australia	Quad GSM	B1 - UMTS 2100 B2 - UMTS 1900 B5 - UMTS 850 B6 - UMTS 800 B8 - UMTS 900	B1 - UMTS 2100 B3 - UMTS 1800 B7 - UMTS-2600 B8 - UMTS 900 B20 - UMTS - E800



Important The 900 MHz B8 band may not be used in Mexico.

Installing Antennas

There are two TNC connectors on the backside of the device. The TNC connectors are used to connect to the 4G modem. The SMA connector is for the GPS antenna.

Orient the antennas. For optimum wireless performance, the antennas should be perpendicular with respect to the floor.

If the router is being mounted on a desk, orient the antennas straight up.

To attach the radio antennas to your wireless router, follow these steps:

Before you begin

Before you install the Cisco 809 Integrated Services Router on a table, wall, or DIN rail, install the antennas on the back panel. It is difficult to install the antennas after the router is installed.

In some cases it is necessary to install two antennas:

- Sierra Wireless MC73xx modem series supports MIMO on LTE. WCDMA UMTS HSPA DC-HSPA+ is diversity only, without MIMO.
- The IR809 must be installed with 2 antennas (Main & Aux) to guarantee the best performance level. Using a single antenna may impact downlink performance by a minimum of 3dB, and can be much more (10-20dB) due to multipath fading (destructive interference between direct and reflected radio waves).
- In case of 3G UMTS, a solo antenna would not be able to switch to the diversity port.

Step 1 Manually screw the antenna tight to the TNC connectors on the back of the router.

Step 2 Orient the antennas. For optimum wireless performance, antennas should be generally perpendicular to each other.

Mounting on a Wall, Table, or Other Flat Surface

To mount the router on a wall, follow these steps:

Before you begin

The Cisco 809 ISR has mounting holes on the bottom of the chassis for mounting the unit on a wall or other vertical surface.



Tip When choosing a location for wall-mounting the router, consider cable limitations and wall structure.

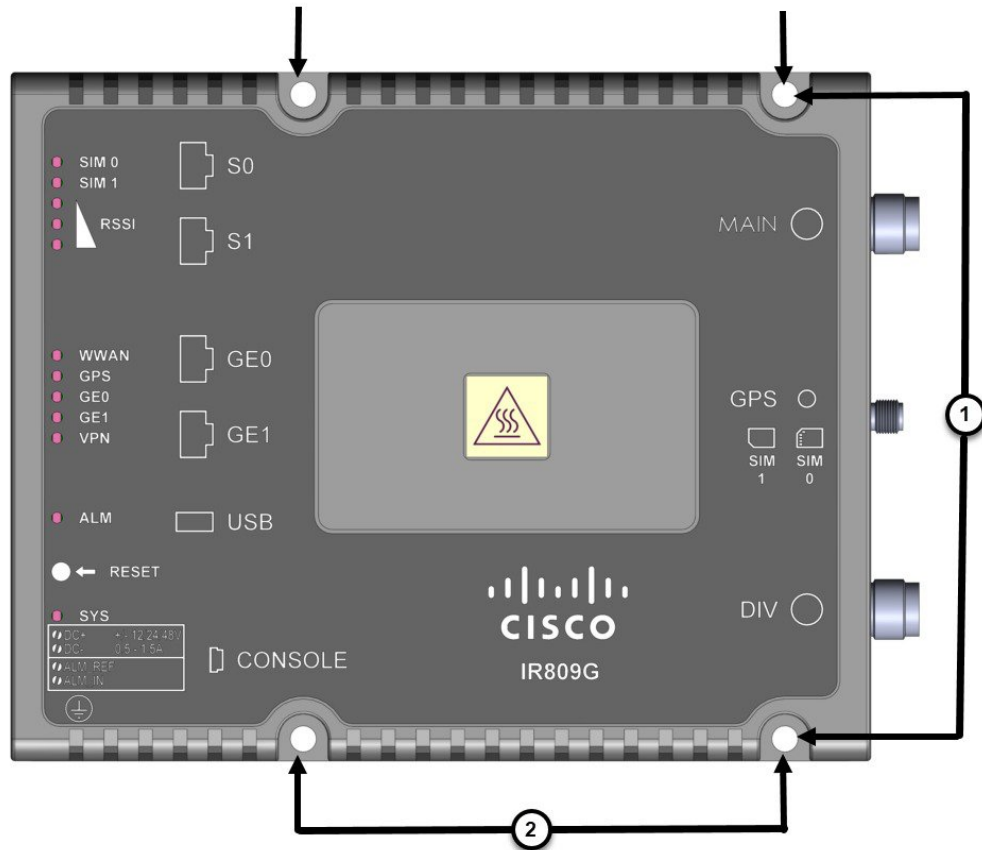


Warning Read the wall-mounting instructions carefully before beginning installation. Failure to use the correct hardware or to follow the correct procedures could result in a hazardous situation to people and damage to the system. Statement 378



Note When mounted from the back using #10 screws, the torque is 22-30 in-lbs. When mounted from front using #6 screws the torque is 8.3-11 in-lbs.

Step 1 Locate the mounting holes on the router. There are 4 holes shown by arrows in the following figure: Dimensions noted by **1** in the graphic are 4.7 in (11.9 cm). Dimensions noted by **2** in the graphic are 3.5 in (8.9 cm).



Step 2 Install the router to a wall stud using two number-10 wood screws, round- or pan-head, with number-10 washers or two number-10 washer-head screws. The screws must be long enough to penetrate at least 1.0 inch (25.4 mm) into the supporting wood or metal wall stud.

Note For hollow-wall mounting, each bracket requires two wall anchors with washers. Wall anchors and washers must be size number 10.

Step 3 Route the cables so that they do not put a strain on the connectors or mounting hardware. To comply with IP 40, cables should be routed down relative to the router to prevent water from traveling on the cables.

Installing a DIN Rail

The DIN Rail can be installed in two different orientations. With the cable side of the device facing up or down. The DIN Rail bracket can be mounted on the front or the back of the router.



Note The IR809 meets IP30 rating when mounted vertically.

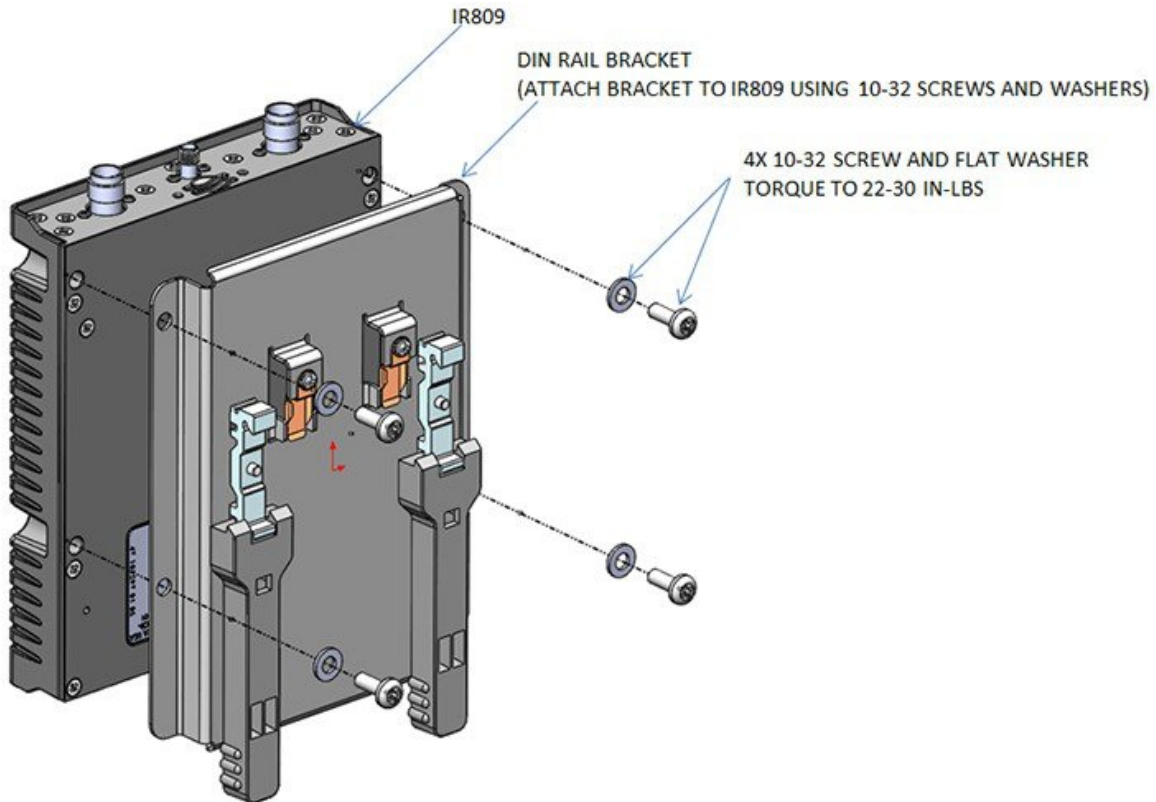
To attach the Cisco IR809 to a DIN rail, follow these steps:

Before you begin

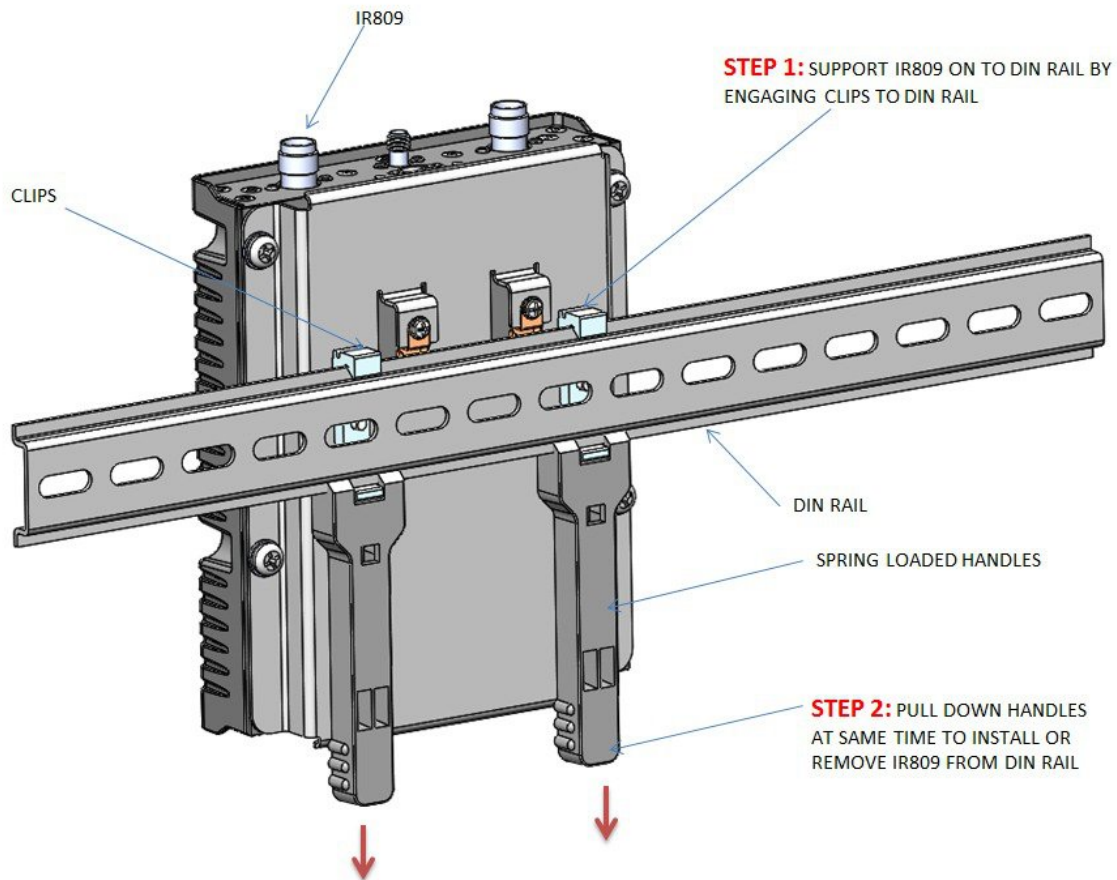
The DIN Rail kit is ordered separately.

Step 1

Attach the DIN rail bracket to the back of the router. Align the DIN rail bracket on the back of the router and secure/attach it to the 4 mounting points using the screws provided. See the following figure.

**Step 2**

Once the bracket is attached to the router, it can be mounted onto the DIN Rail. See the following figure.



- Step 3** Position the router so that the hook on the DIN rail bracket hooks onto the top edge of the DIN rail. The weight of the product can rest on the hook temporarily while the DIN rail bracket latches are secured.
- Step 4** Pull down the spring loaded handles at the same time and slide the DIN Rail bracket up and over the latches.
- Step 5** Push the DIN rail bracket latch up after the router is over the DIN rail to secure it. The router is now installed in the DIN rail.
- Step 6** To remove the router from the DIN Rail, simply reverse the procedure.

Installing the Router Ground Connection

To install the ground connection, follow these steps:

Before you begin

The router must be connected to a reliable earth ground. Install the ground wire in accordance with local electrical safety standards.

- For NEC-compliant grounding, use size 14 AWG (1.6mm) or larger copper wire and a ring terminal with an inner diameter of 1/4 in. (5 to 7 mm).

- For EN/IEC 60950-compliant grounding, use size 18 AWG (1.02mm) or larger copper wire.

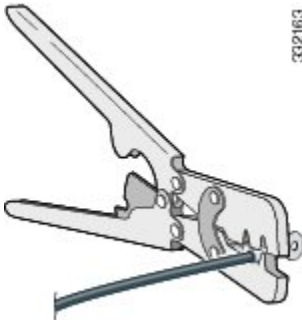


Warning This equipment must be grounded. Never defeat the ground conductor or operate the equipment in the absence of a suitably installed ground conductor. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available. Statement 1024

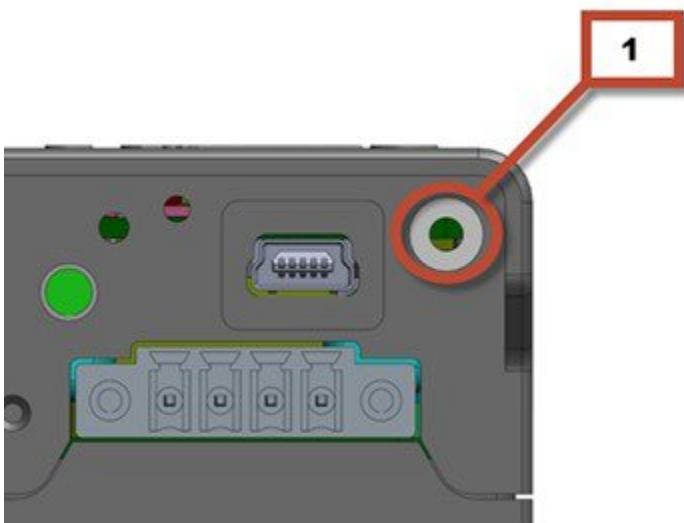


Warning This equipment needs to be grounded. Use a green and yellow 14 to 18 AWG ground wire to connect the host to earth ground during normal use. Statement 242

- Step 1** Locate the ring terminal lug and screw in the packaging kit. Store the ground screw for later use.
- Step 2** Use a wire stripping tool to strip the 14-16 AWG (1.6mm -to- 1.3mm) grounding wire to 0.22 in. (5.56 mm).
- Step 3** Insert the ground wire into the ring terminal lug, and using a crimping tool, crimp the terminal to the wire.



- Step 4** Slide the ground screw through the ground lug.
- Step 5** Insert the ground screw into the grounding point shown in the graphic.



- Step 6** Use a ratcheting torque screwdriver to tighten the ground screw and ring terminal to the router side panel to 3.5 in-lb (0.4 N-m). The torque should not exceed 3.5 in-lb (0.4 N-m).
- Step 7** Attach the other end of the ground wire(#1 in the graphic above) to a grounded bare metal surface, such as a ground bus, a grounded DIN rail, or a grounded bare rack.
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