



## Prepare for Router Installation

---

Before you install the Cisco 1100 Series Integrated Services Routers, you must prepare your site for the installation. This chapter provides pre-installation information, such as recommendations and requirements that should be considered before installing your router.

See the following sections to prepare for installation:

- [Safety Recommendations, on page 1](#)
- [Safety With Electricity, on page 2](#)
- [Prevent Electrostatic Discharge Damage, on page 2](#)
- [General Site Requirements, on page 3](#)
- [NEBS Deployment Site Requirements, on page 4](#)
- [Rack Requirements, on page 5](#)
- [Router Environmental Requirements, on page 5](#)
- [Power Guidelines and Requirements, on page 6](#)
- [Network Cabling Specifications, on page 6](#)

## Safety Recommendations



---

### Warning IMPORTANT SAFETY INSTRUCTIONS

This warning symbol 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. **SAVE THESE INSTRUCTIONS**  
Statement 1071





---

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

---

## Safety With Electricity



---

**Warning** Only skilled person should be allowed to install, replace, or service this equipment. Refer to statement 1089 for description of skilled person. Statement 1090

---



---

**Warning** Read the installation instructions before using, installing or connecting the system to the power source. Statement 1004

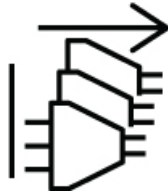
---



---

**Warning** This unit might have more than one power supply connection. To reduce risk of electric shock, all connections must be removed to de-energize the unit. Statement 1028

---



---

**Warning** Instructed person is someone who has been instructed and trained by a skilled person and takes the necessary precautions when working with equipment. Skilled person/Qualified personnel is someone who has training or experience in the equipment technology and understand potential hazards when working with equipment. Statement 1089

---

## Prevent Electrostatic Discharge Damage

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. It can occur if electronic printed circuit cards are improperly handled and can cause complete or intermittent failures. Always follow ESD prevention procedures when removing and replacing modules:

- Ensure that the router chassis is electrically connected to ground.
- Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. Connect the clip to an unpainted surface of the chassis frame to channel unwanted ESD voltages safely to ground. To guard against ESD damage and shocks, the wrist strap and cord must operate effectively.

- If no wrist strap is available, ground yourself by touching a metal part of the chassis.

**Caution**

For the safety of your equipment, periodically check the resistance value of the anti-static strap. It should be between 1 and 10 megohms (Mohm).

## General Site Requirements

**Warning**

To reduce risk of electric shock or fire, installation of the equipment must comply with local and national electrical codes. Statement 1074

**Warning**

To reduce the risk of electric shock, the chassis of this equipment needs to be connected to permanent earth ground during normal use. Statement 445

**Warning**

This product relies on the building's installation for short-circuit (overcurrent) protection. To reduce risk of electric shock or fire, ensure that the protective device is rated not greater than: 20A (AC), 5A (HVDC), 7A (DC). Statement 1005

**Warning**

To reduce risk of electric shock and fire, a readily accessible two-poled disconnect device must be incorporated in the fixed wiring. Statement 1022

**Warning**

This unit is intended for installation in restricted access areas. A restricted access area can be accessed by skilled, instructed or qualified personnel. Statement 1017

**Warning**

To reduce the risk of fire or bodily injury, do not operate it in an area that exceeds the maximum recommended ambient temperature of: 40 °C Statement 1047

## Site Selection Guidelines

The Cisco 1100 Series ISRs require specific environmental operating conditions. Temperature, humidity, altitude, and vibration can affect the performance and reliability of the router. The following sections provide specific information to help you plan for the proper operating environment.

The Cisco 1100 Series ISRs are designed to meet the industry EMC, safety, and environmental standards described in the Regulatory Compliance and Safety Information for the Cisco 1100 Series ISR document.

# NEBS Deployment Site Requirements

The NEBS GR-1089-CORE and GR-63-CORE compliance statements and requirements are listed in this section. These statements only apply for deployments where NEBS compliance is mandated.



**Warning** The intra-building port(s) (LAN, WAN, Serial, and T1 (NIM-xMFT-T1/E1 module)) of the equipment or subassembly must use shielded intra-building cabling/wiring that is grounded at both ends. Statement 7003



**Warning** The intra-building port(s) (LAN, WAN, Serial, and T1 (NIM-xMFT-T1/E1 module)) of the equipment or subassembly is suitable for connection to intra-building or unexposed wiring or cabling only. The intra-building port(s) of the equipment or subassembly must not be metalically connected to interfaces that connect to the OSP or its wiring for more than 6 meters (approximately 20 feet). These interfaces are designed for use as intra-building interfaces only (Type 2, 4, or 4a ports as described in GR-1089) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metalically to an OSP wiring system. Statement 7005



**Warning** The AC power ports have been evaluated for deployments where an external Surge Protective Device (SPD) is utilized at the AC power service equipment (see definition in National Electric Code). Statement 7012



**Warning** This product is designed for a Common Bonding Network (CBN) installation. Statement 7013



**Warning** This product can be installed in network telecommunication facilities or locations where the National Electric Code applies. Statement 8015 and 8016



**Warning** The DC return connection to this system should remain isolated from the system frame and chassis (DC-I). Statement 7016



**Note** **Statement 7018**—System Recover Time

The equipment is designed to boot up in less than 30 minutes provided the neighboring devices are fully operational.

The following instructions and requirements are mandated for the C1100TG series when the NIM-LTEA-EA module is installed in a NEBS deployment utilizing cables connected to outdoor antennas:

- Additional surge protection is required if an outdoor antenna is being connected to the GPS connector and/or the LTE TNC connectors. The Lightning Protector must be able to provide a low clamping voltage (less than 600V).
- Lightning protection must be mounted at the location where the antenna cable enters the building. The primary lightning protection must be capable of conducting all potentially dangerous electrical energy to PE (Protective Earth).
- Surge arrestors should support DC-pass and suitable for the frequency range with low attenuation.

## Rack Requirements

Cisco 1100 Terminal Gateway Routers includes brackets for use with a 19-inch rack and 23-inch rack.



---

**Note** The 23-inch rack mount brackets have not been evaluated for NEBS compliance. If 23-inch racks are being used, 19-inch to 23-inch adapter plates compliant with GR-63-CORE Zone 4 waveforms must be used.

---

The following information can help you plan your equipment rack configuration:

- Allow clearance around the rack for maintenance.
- Allow at least one rack unit of vertical space between routers; more clearance is required when stacking multiple Cisco 1100 Terminal Gateway Routers. Provide adequate heat removal mechanism to keep the surrounding air temperature well within the specified operating temperature condition.



---

**Note** More spacing may be required depending on the installation environment.

---

- Enclosed racks must have adequate ventilation. Ensure that the rack is not congested, because each router generates heat. An enclosed rack should have louvered sides and a fan to provide cooling air. Heat generated by equipment near the bottom of the rack can be drawn upward into the intake ports of the equipment above it.
- When mounting a chassis in an open rack, ensure that the rack frame does not block the intake or exhaust ports. If the chassis is installed on slides, check the position of the chassis when it is seated in the rack.

## Router Environmental Requirements

Cisco 1100 Terminal Gateway Routers can be placed on a desktop or installed in a rack. The location of your router and the layout of your equipment rack or wiring room are extremely important considerations for proper operation. Equipment placed too close together, inadequate ventilation, and inaccessible panels can cause malfunctions and shutdowns, and can make maintenance difficult. Plan for access to both front and rear panels of the router.

When planning your site layout and equipment locations, refer to the General Site Requirements , section. If you are currently experiencing shutdowns or an unusually high number of errors with your existing equipment, these precautions and recommendations may help you isolate the cause of failure and prevent future problems.

- Ensure that the room where your router operates has adequate air circulation. Electrical equipment generates heat. Without adequate air circulation, ambient air temperature may not cool equipment to acceptable operating temperatures.
- Always follow ESD-prevention procedures described in the Preventing Electrostatic Discharge Damage to avoid damage to equipment. Damage from static discharge can cause immediate or intermittent equipment failure.
- Baffles can help to isolate exhaust air from intake air, which also helps to draw cooling air through the chassis. The best placement of the baffles depends on the airflow patterns in the rack, which can be found by experimenting with different configurations.
- When equipment installed in a rack (particularly in an enclosed rack) fails, try operating the equipment by itself, if possible. Power off other equipment in the rack (and in adjacent racks) to allow the router under test a maximum of cooling air and clean power.

## Power Guidelines and Requirements

Check the power at your site to ensure that you are receiving power that is free of spikes and noise. Install power conditioner if necessary.

## Network Cabling Specifications

The following sections describe the cables and their specifications required to install Cisco 1100 Series ISRs:

### Console Port Connections

The Cisco 1100 Terminal Gateway Routers has EIA/TIA-232 asynchronous (RJ-45) and ASYNC ports. The console port does not have any hardware flow control.

#### EIA/TIA-232

Depending on the cable and the adapter used, this port appears as a DTE or DCE device at the end of the cable. Only one port can be used at the same time.

The default parameters for the console port are 9600 baud, 8 data bits, 1 stop bit, and no parity. The console port does not support hardware flow control. For detailed information about installing a console terminal, see the Connecting to a Console Terminal or Modem section.

For cable and port pinouts, see the Cisco Modular Access Router Cable Specifications document located on Cisco.com.

### Console Port Considerations

The router includes an asynchronous serial console port. The console ports provide access to the router using a console terminal connected to the console port. This section discusses important cabling information to consider before connecting the router to a console terminal or modem.

Console terminals send data at speeds slower than modems do; therefore, the console port is ideally suited for use with console terminals.

## Preparing for Network Connections

When setting up your router, consider distance limitations and potential electromagnetic interference (EMI) as defined by the applicable local and international regulations.

Network connection considerations are provided for:

See the following online document for more information about network connections and interfaces:

- Cisco Modular Access Router Cable Specifications

## Ethernet Connection



---

**Note** To reduce the risk of electric shock, the following ports must be connected through an approved network termination unit with integral circuit protection if the port cabling is routed outdoors: ethernet. Statement 1044

---

The IEEE has established Ethernet as standard IEEE 802.3. The routers support the following Ethernet implementations:

- 1000BASE-T—1000Mb/s full-duplex transmission over a Category 5 or better unshielded twisted-pair (UTP) cable. Supports the Ethernet maximum length of 328 feet (100 meters).
- 100BASE-T—100 Mb/s full-duplex transmission over a Category 5 or better unshielded twisted-pair (UTP) cable. Supports the Ethernet maximum length of 328 feet (100 meters).
- 10BASE-T—10Mb/s full-duplex transmission over a Category 5 or better unshielded twisted-pair (UTP) cable. Supports the Ethernet maximum length of 328 feet (100 meters).

See the Cisco Modular Access Router Cable Specifications document at Cisco.com for information about Ethernet cables, connectors, and pinouts

## Required Tools and Equipment for Installation and Maintenance

You need the following tools and equipment to install and upgrade the router and its components:

- ESD-preventive cord and wriststrap
- Number 2 Phillip screwdriver
- Phillips screwdrivers: small, 3/16-in. (4 to 5 mm) and medium, 1/4-in. (6 to 7mm)
- To install or remove modules
- Screws that fit your rack
- Wire crimper
- Wire for connecting the chassis to an earthground:
  - 6 AWG

