



Prepare to Install

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General Safety Guidelines

When you install any component in a chassis, observe all caution and warning statements mentioned in this chapter. For warning translations, see the regulatory compliance and safety documentation that came with this product.

The following guidelines will help ensure your safety and protect the equipment. However, these guidelines may not cover all potentially hazardous situations you may encounter during system installation, *so be alert*.

- Install your product in compliance with the national and local electrical codes. In the United States, this means the National Fire Protection Association (NFPA) 70, United States National Electrical Code. In Canada, Canadian Electrical Code, part I, CC22.1. In other countries, International Electrotechnical Commission (IEC) 364, part 1 through part 7.
- Review the safety warnings listed in the regulatory compliance and safety documentation before installing, configuring, or performing maintenance on the product.
- Disconnect power at the source before you install or remove a chassis.
- Do not attempt to lift an object you might find too heavy to lift safely.
- Keep the chassis area clear and as dust free as possible during and after installation.
- Keep tools and chassis components away from walk areas.
- Do not wear loose clothing, jewelry (including rings and chains), or other items that could get caught in the chassis.

- Use the product in accordance with its marked electrical ratings and product usage instructions.



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

Safety Instructions



Note Do not unpack the module until you are ready to install it. Keep the module in the shipping container to prevent accidental damage until you determine an installation site. Use the appropriate unpacking documentation included with the module.



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

Warning Definition



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. Statement 1071

SAVE THESE INSTRUCTIONS

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) damage occurs when electronic cards or components are improperly handled, and can result in complete or intermittent failures. All line cards consist of a printed circuit card that is fixed in a metal carrier. Electromagnetic interference (EMI) shielding and connectors are integral components of the carrier. Although the metal carrier helps to protect the cards from ESD, use an antistatic strap each time you handle the modules. Handle the carriers by the edges only; never touch the cards or connector pins.



Caution Always tighten the captive installation screws on all system components when you are installing them. These screws prevent accidental removal of the module, provide proper grounding for the system, and help to ensure that the line card connectors are properly seated in the backplane. To ensure proper grounding and mechanical support, the captive screws on the front cards should be tightened to 10-12 in-lbs and the rear PIC cards should be tightened to 6-8 in-lbs. Never use cordless or corded drills to tighten screws; power screwdrivers and hand tools are acceptable.

Static electricity can harm delicate components inside your system. To prevent static damage, discharge static electricity from your body before you touch any of your system components. As you continue to work on your system, periodically touch an unpainted metal surface on the computer chassis.

The following guidelines can prevent ESD damage:

- Always use an ESD-preventive wrist or ankle strap and ensure that it makes good skin contact. Before removing a card from the chassis, ensure that the chassis is grounded to the rack.
- Handle line cards by the faceplate and carrier edges only; avoid touching the card components or any connector pins.
- When removing a card, place the removed module component-side-up on an antistatic surface or in a static-shielding bag. If the module will be returned to the factory, immediately place it in a static-shielding bag.
- Avoid contact between the modules and clothing. The wrist-strap protects the card from ESD voltages on the body only; ESD voltages on clothing can still cause damage.
- When transporting a sensitive component, first place it in an antistatic container or packaging.
- Handle all sensitive components in a static-safe area. If possible, use antistatic floor pads and workbench pads.



Caution For safety, periodically check the resistance value of the antistatic strap. The measurement should be between 1 and 10 megohms.

Plant Wiring Guidelines

When planning the location of the new system, consider the distance limitations for signaling, EMI, and connector compatibility, as described in the following sections.



Warning This product requires short-circuit (overcurrent) protection, to be provided as part of the building installation. Install only in accordance with national and local wiring regulations. Statement 1045.

Interference Considerations

When wires are run for any significant distance in an electromagnetic field, interference can occur between the field and the signals on the wires. This fact has two implications for the construction of plant wiring:

- Bad wiring practice can result in radio interference emanating from the plant wiring.
- Strong EMI, especially when it is caused by lightning or radio transmitters, can destroy the signal drivers and receivers in this equipment, and can even create an electrical hazard by conducting power surges through lines and into equipment. (Review the safety warnings.)



Note To predict and remedy strong EMI, you may also need to consult experts in radio frequency interference (RFI).

If wires exceed recommended distances, or if wires pass between buildings, give special consideration to the effect of a lightning strike in your vicinity. The electromagnetic pulse caused by lightning or other high-energy phenomena can easily couple enough energy into unshielded conductors to destroy electronic devices. If you have had problems of this sort in the past, you may want to consult experts in electrical surge suppression and shielding.

Electrical Equipment Guidelines

- Before beginning any procedures requiring access to the chassis interior, locate the emergency power-off switch for the room in which you are working.
- Disconnect all power and external cables before moving a chassis.
- Do not work alone in potentially hazardous conditions.
- Never assume that power has been disconnected from a circuit; always check.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Carefully examine your work area for possible hazards such as moist floors, ungrounded power extension cables, and missing safety grounds.

Unpacking and Verifying Shipping Contents



Note Save the original Cisco box and packaging in which your equipment was sent and received in.

Before you begin

Read the safety guidelines and review the electrical safety and ESD-preventive guidelines.



Caution Ensure that you are properly grounded with an ESD-preventive wrist strap.



Note We recommend that you have at least two people available to help with the installation and ensure safe lifting.

Required Tools and Equipment

- #2 Phillips screwdriver
- 3/16" flat-blade screwdriver
- Wire cutters
- ESD-preventive wrist strap
- Antistatic mat or bag

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- Step 1** Inspect the box for any shipping damage. (If there is damage contact your service representative).
- Step 2** Carefully cut the packaging straps that secure the shipping container to the pallet and open the top of the outer shipping container.
- Step 3** Locate and remove the accessory kit. Set the accessory kit aside.
- Step 4** Remove the top foam cap.
- Step 5** Remove the screws that fasten the brackets used for attaching the chassis to the pallet using #2 Phillips screwdriver.
- Step 6** Slide the ESD plastic bag off the chassis.
- Step 7** Verify that you have received all of the required and ordered components.
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Chassis-Lifting Guidelines

A fully loaded configured system can weigh up to 430 lbs. The chassis is not intended to be moved frequently. Before you install the system, ensure that your site is properly prepared so you can avoid having to move the chassis later to accommodate power sources and network connections.

You must use a hydraulic lift or forklift to move a fully populated chassis.

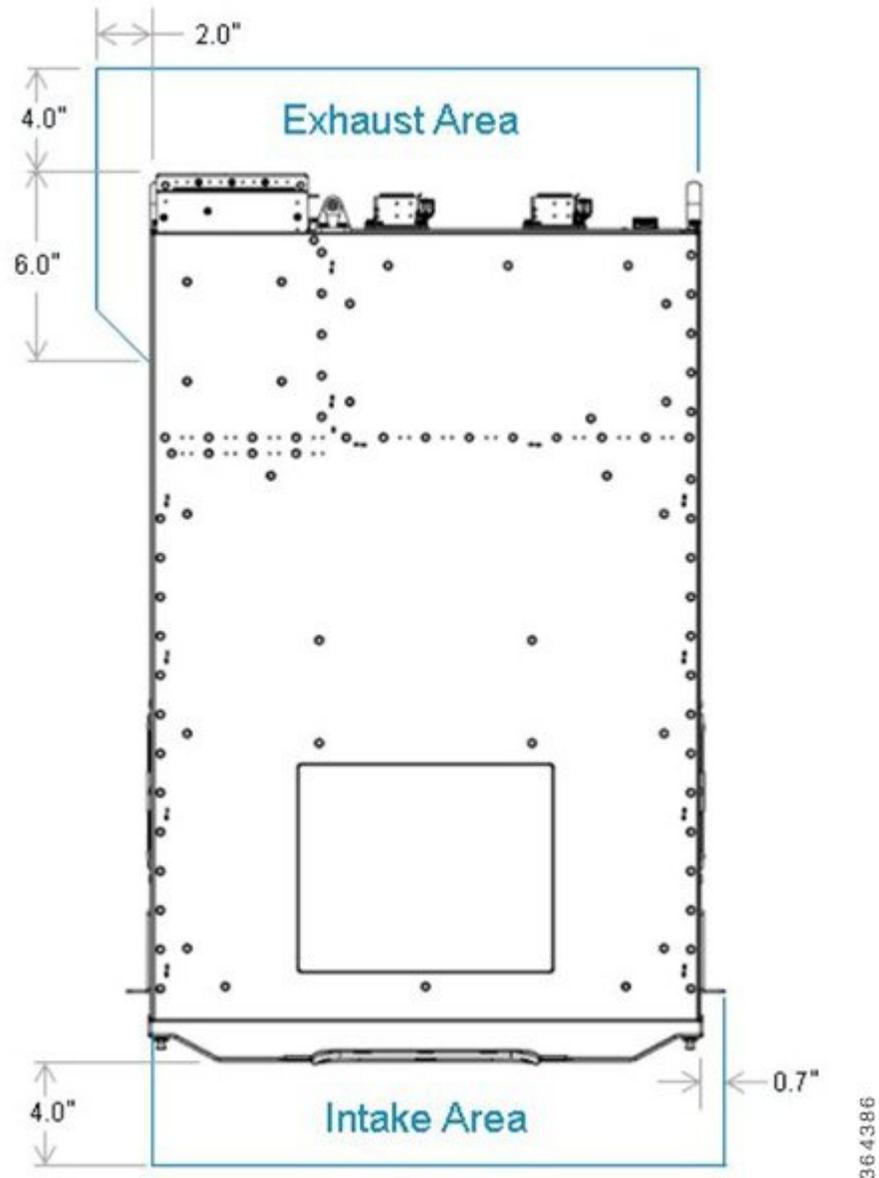
General Rack Installation Guidelines

When planning your rack installation, consider the following guidelines:

- The Cisco cBR-8 router requires a minimum of 13 rack units (22.75 inches or 57.785 cm) of vertical rack space. Measure the proposed rack location before mounting the chassis in the rack.
- Before using a rack, check for obstructions (such as a power strip) that could impair the rack-mount installation. If a power strip impairs the rack-mount installation, remove the power strip before installing the chassis, and then replace it after the chassis is installed.

- Allow sufficient clearance around the rack for maintenance. If the rack is mobile, you can push it back near a wall or cabinet for normal operation and pull it out for maintenance (installing or moving cards, connecting cables, or replacing or upgrading components). Otherwise, allow 36 inches (91.44 cm) of access to remove field-replaceable units.
- Maintain a minimum clearance of 4 inches (10.16 cm) on the front, and rear of the chassis for the cooling air inlet and exhaust ports, respectively. In addition, there is a small air inlet area on the front right side of the chassis in front of the mounting ear and a small exhaust area on the rear left hand side.

Figure 1: Minimum Clearance Area



- Avoid placing the chassis in an overly congested rack or directly next to another equipment rack; otherwise, the heated exhaust air from the other equipment can enter the inlet air vents and cause a high temperature condition inside the router.

**Caution**

To prevent chassis overheating, never install a Cisco cBR-8 router in an enclosed room that is not properly ventilated or air conditioned.

- Always install heavier equipment in the lower half of a rack to maintain a low center of gravity to prevent the rack from falling over.
- Install and use the cable-management accessories included with the Cisco cBR-8 router to keep cables organized and out of the way of the cards and processors. Ensure that cables from other equipment already installed in the rack do not impair access to the cards or require you to disconnect cables unnecessarily to perform equipment maintenance or upgrades.
- Install rack stabilizers (if available) before you mount the chassis.
- Provide an adequate chassis ground (earth) connection for your Cisco cBR-8 chassis.

Cabling Guidelines

The size of your networks and the distances between connections depend on the type of signal, the signal speed, and the transmission media (the type of cabling used to transmit the signals). For example, standard coaxial cable has a greater channel capacity than twisted-pair cabling. The distance and rate limits in the following descriptions are the IEEE recommended maximum speeds and distances for signaling; however, you can usually get good results at speeds and distances far greater than these. For example, the recommended maximum rate for V.35 is 2 Mbps, but it is commonly used at 4 Mbps without any problems. If you understand the electrical problems that might arise and can compensate for them, you should get good results with rates and distances greater than those shown here; however, do so at your own risk.

When preparing your site for network connections to the chassis, you must consider a number of factors related to each type of interface:

- Type of cabling required for each type (fiber, thick or thin coaxial, foil twisted-pair, or unshielded twisted-pair cabling)
- Distance limitations for each signal type
- Specific cables you need to connect each interface

The extent of your network and the distances between network interface connections depend in part on the following factors:

- Signal type
- Signal speed
- Transmission medium

