



# Preparing to Install a SIP or Shared Port Adapter

This chapter describes the general equipment, safety, and site preparation requirements for installing SIPs and SPAs. This chapter contains the following sections:

- [Required Tools and Equipment, page 1](#)
- [Safety Guidelines, page 1](#)
- [Laser and LED Safety, page 3](#)

## Required Tools and Equipment

You need the following tools and parts to install SIPs and SPAs. If you need additional equipment, contact a service representative for ordering information.

- SPA interface processor (SIP)
- Shared port adapters (SPAs)
- Medium Phillips screwdriver
- Your own electrostatic discharge (ESD)-prevention equipment or the disposable grounding wrist strap supplied with the SIP or SPA
- Antistatic mat
- Antistatic container

## Safety Guidelines

This section provides safety guidelines that you should follow when working with any equipment that connects to electrical power.

## Safety Warnings

Safety warnings appear throughout this guide in procedures that, if performed incorrectly, might harm you. A warning symbol precedes each warning statement.

Review the safety warnings listed in the Regulatory Compliance and Safety Information for the Cisco CRS Carrier Routing System before installing, configuring, or troubleshooting any SIP or SPA.

## General Guidelines

Before you perform any procedure in this document, review the following safety guidelines to avoid injuring yourself or damaging the equipment. These guidelines are for your safety. The guidelines do not include all hazards. Be alert.

- Never attempt to lift an object that might be too heavy for you to lift by yourself.
- Keep the work area clear and dust free during and after installation.
- Do not allow dirt or debris to enter into any laser-based components.
- Keep tools and router components away from walk areas.
- Do not wear loose clothing, jewelry, and other items that could get caught in the router while working with line cards, PLIMs, and SIPs.
- Use Cisco equipment in accordance with its specifications and product-usage instructions.
- Do not work alone if potentially hazardous conditions exist.
- Make sure your installation follows national and local electrical codes: in the United States, National Fire Protection Association (NFPA) 70, United States National Electrical Code; in Canada, Canadian Electrical Code, part I, CSA C22.1; in other countries, International Electrotechnical Commission (IEC) 60364, part 1 through part 7.
- Connect only a DC power source that follows the safety extra-low voltage (SELV) requirements in UL/CSA/IEC/EN 60950-1 and AS/NZS 60590 to the FCC DC-input power system.
- Make sure that you have a readily accessible two-poled disconnect device incorporated in the fixed wiring of a line card chassis (LCC) configured with the DC-input power system. The LCC requires short-circuit (overcurrent) protection to be provided as part of the building installation.

## Electrical Equipment Guidelines

Follow these basic guidelines when working with any electrical equipment:

- 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 when potentially hazardous conditions exist.
- 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.

## Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) damage, which can occur when electronic cards or components are improperly handled, results in complete or intermittent failures. SIPs, SPAs, and processor modules comprise printed circuit boards that are fixed in metal carriers. Electromagnetic interference (EMI) shielding and connectors are integral components of the carrier. Although the metal carrier helps to protect the board from ESD, use a preventive antistatic strap during handling.

Following are guidelines for preventing ESD damage:

- Always use an ESD wrist or ankle strap and ensure that it makes good skin contact.
- Connect the equipment end of the strap to an unfinished chassis surface.
- When installing a component, use any available ejector levers or captive installation screws to properly seat the bus connectors in the backplane or midplane. These devices prevent accidental removal, provide proper grounding for the system, and help to ensure that bus connectors are properly seated.
- When removing a component, use any available ejector levers or captive installation screws to release the bus connectors from the backplane or midplane.
- Handle carriers by available handles or edges only; avoid touching the printed circuit boards or connectors.
- Place a removed board component-side-up on an antistatic surface or in a static shielding container. If you plan to return the component to the factory, immediately place it in a static shielding container.
- Avoid contact between the printed circuit boards and clothing. The wrist strap only protects components from ESD voltages on the body; ESD voltages on clothing can still cause damage.
- Never attempt to remove the printed circuit board from the metal carrier.



### Caution

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

## Laser and LED Safety

An optical single-mode transmitter uses a small laser to transmit the light signal to the network ring. Keep the transmit port covered whenever a cable is not connected to it. Although multimode transceivers typically use LEDs for transmission, it is good practice to keep open ports covered and avoid staring into open ports or apertures. These warnings apply to SPAs and SFP modules that transmit signals through an optical carrier signal. The single-mode aperture port contains a laser warning label, as shown in the figure below.

**Figure 1: Class 1 Laser Warning Labels for Single-Mode Port**



**Danger**

Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments. Statement 1051

**Danger**

Class 1 laser product. Statement 1008

The multimode aperture contains a Class 1 LED warning label, as shown in the figure below.

**Figure 2: Class 1 LED Warning Label for Multimode Port**

**Danger**

Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments. Statement 1051

**Danger**

Class 1 LED product. Statement 1027