



Installing and Removing a Shared Port Adapter

- [Online Insertion and Removal, page 1](#)
- [Handling SPAs, page 2](#)
- [SPA Installation and Removal, page 2](#)
- [Field Upgrade of the SPA, page 5](#)
- [Optical Device Installation and Maintenance, page 8](#)
- [SPA Blank Filler Plates, page 9](#)
- [Installing SPA Cable-Management Brackets, page 9](#)

Online Insertion and Removal

The Cisco uBR10012 router supports online insertion and removal (OIR) of the SPA interface processor (SIP) and of the shared port adapters (SPAs). Therefore, you can remove a SIP with its SPAs still intact, or you can remove a SPA independently from the SIP, leaving the SIP installed in the router.



Important

If you are replacing the SPA after a duration of three months, perform a field upgrade of the SPA. Do not perform an OIR. For more information on field upgrade, see [Field Upgrade of the SPA, on page 5](#).



Note

If the SIP is running normally in chassis, SPA cards can be installed and removed directly from SIP without installing SIP.

Preparing for Online Removal of a SPA

See “Preparing for Online Removal of a SPA” section in the [Cisco uBR10012 Universal Broadband Router SIP and SPA Software Configuration Guide](#).

Handling SPAs

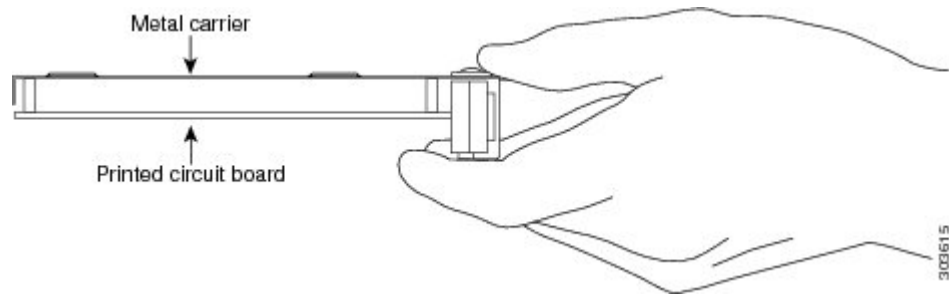
Each SPA circuit board is mounted to a metal carrier and is sensitive to electrostatic discharge (ESD) damage. Before you begin installation, see [Preparing to Install a SIP or a SPA](#) chapter for a list of parts and tools required for installation.


Note

Always handle the SPA by the carrier edges and handle; never touch the SPA components or connector pins.

When a subslot is not in use, a SPA blank filler plate must fill the empty subslot to allow the router or switch to conform to electromagnetic interference (EMI) emissions requirements and to allow proper airflow across the installed modules. If you plan to install a SPA in a subslot that is not in use, you must first remove the SPA blank filler plate.

Figure 1: Handling a SPA



SPA Installation and Removal

Installing a SPA in a SIP


Warning

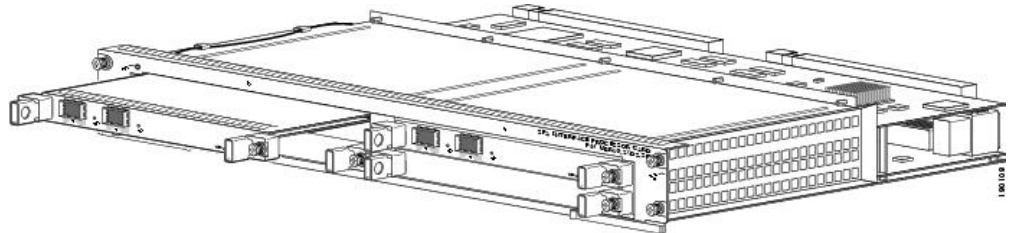
When performing the following procedures, wear a grounding wrist strap to avoid ESD damage to the SPA. Some platforms have an ESD connector for attaching the wrist strap. Do not directly touch the midplane or backplane with your hand or any metal tool, or you could receive an electrical shock.

Procedure

- Step 1** Attach a grounding wrist strap to your wrist and to a bare metal surface on the chassis or frame.

- Step 2** To insert the SPA in the SIP, locate the guide rails inside the SIP that hold the SPA in place. In each SPA bay, there are two guide rails for the SPA. The guide rails are recessed about an inch. The figure below shows one guide rail on the right side of bay 0.

Figure 2: SPA Installation and Removal (Horizontal Orientation)

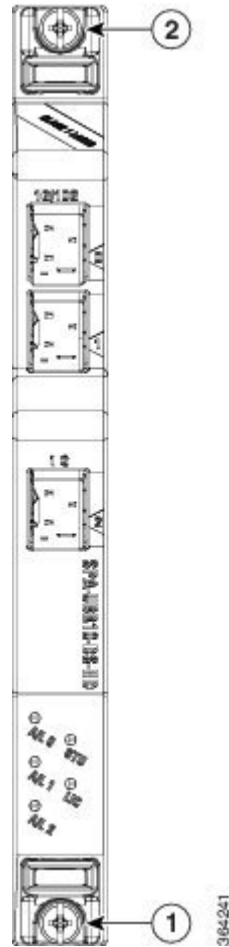


- If the SIP is in a horizontal orientation, the guide rails are on the top left and top right of the bay.
- If the SIP is in a vertical orientation, the guide rails are at the top and bottom of the right side of the bay.

- Step 3** Align the SPA edges with the two guide rails in the SIP.
- Step 4** Carefully slide the SPA all the way into the SIP until the SPA is firmly seated in the SPA interface connector. When fully seated, the SPA might be slightly behind the SIP faceplate.
- Important** When seating the SPAs, use your two hands together to push the two plastic handles at the same time gently applying even pressure to the handles until the SPA is seated.
- Step 5** Insert the other SPA in its slot. If you are using a single SPA, insert a blank filler plate in the empty slot.
- Step 6** Ensure that both ears on the SPA have attached to the SIP front panel without any tilt before tightening screws. The tilt will increase the connection issue risk and may damage the connector. If there is a tilt, re-seat the SPA.

- Step 7** Tighten the two captive installation screws on each SPA with a torque screw driver using the sequence shown in the figure below. The torque recommendation is 5 to 10 lb-in.

Figure 3: SPA in the Slot (Vertical Orientation)



1	Bottom captive installation screw	2	Top captive installation screw
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Note Before running any SW, make sure that all captive screws in all SPA cards have been tightened. If there is any connection issue, re-seat the SPA.

- Step 8** Install the interface cables. We recommend that you clean the fiber-optic connections before attaching the cables. See the [Inspection and Cleaning Procedures for Fiber-Optic Connections](#) document.

Removing a SPA from the SIP

**Warning**

When performing the following procedures, wear a grounding wrist strap to avoid ESD damage to the SPA. Some platforms have an ESD connector for attaching the wrist strap. Do not directly touch the midplane or backplane with your hand or any metal tool, or you could receive an electrical shock.

Procedure

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- Step 1** Attach a grounding wrist strap to your wrist and to a bare metal surface on the chassis or frame.
- Step 2** Identify the SPA to be removed. If interface cables are attached, unplug the cables connected to the SPA. Be sure to note the current connections of the cables to the ports on the SPA.
- Note** Before removing a SPA from a SIP, check that the top and bottom captive screws on the SIP are tight so that they secure the SIP in the router chassis.
- Step 3** To remove the SPA from the SIP, unfasten the two captive screws on the SPA.
- Step 4** Grasp the handle of the SPA and pull the SPA from the SIP.
- Step 5** If you are not installing a new or replacement SPA, install blank filler plates to cover the empty slots and tighten the captive screws on the blank filler plates.

Warning Blank faceplates (filler panels) serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards and faceplates are in place. Statement 1029

Field Upgrade of the SPA

Perform the field upgrade of SPA when installing the SPA for the first time or replacing it after a duration of three months.

**Warning**

When performing the following procedures, wear a grounding wrist strap to avoid ESD damage to the SPA. Some platforms have an ESD connector for attaching the wrist strap. Do not directly touch the midplane or backplane with your hand or any metal tool, or you could receive an electrical shock.

Procedure

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- Step 1** Attach a grounding wrist strap to your wrist and to a bare metal surface on the chassis or frame.
- Step 2** Power down the Cisco uBR10012 chassis.
- Step 3** Remove the existing SPA or blank filler plate from the slot.

Step 4 Remove any debris from the SPA interface connector by blowing it using compressed air.

Step 5 Insert the two SPAs in the SIP.

Important If you are using a single SPA, insert a blank filler plate in the empty slot.

- a) To insert the SPA in the SIP, locate the guide rails inside the SIP that hold the SPA in place. In each SPA bay, there are two guide rails for the SPA. The guide rails are recessed about an inch.
- b) Align the SPA edges with the two guide rails in the SIP.
- c) Carefully slide the SPA all the way into the SIP until the SPA is firmly seated in the SPA interface connector. When fully seated, the SPA might be slightly behind the SIP faceplate.

Important When seating the SPAs, use your two hands together to push the two plastic handles at the same time gently applying even pressure to the handles until the SPA is seated.

Step 6 Unseat and reseal each SPA in the slot three times to clear any debris.

Step 7 Ensure that both ears on the SPA have attached to the SIP front panel without any tilt before tightening the screws. The tilt will increase the connection issue risk and may damage the connector.

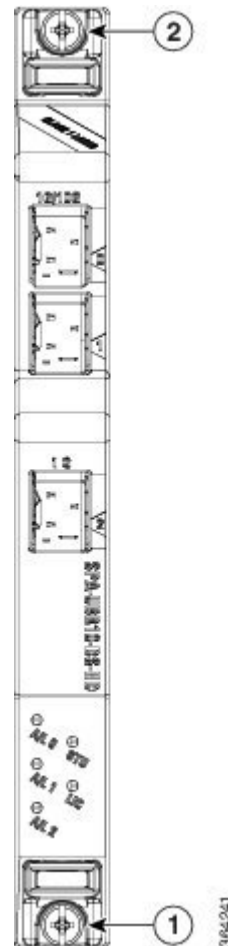
Note If there is a tilt, reseal the SPA.

Step 8 After the SPAs are properly seated, perform the following:

- a) Lightly tighten the bottom captive installation screw of each SPA.

Note Do not tighten the screw completely.

Figure 4: SPA in the Slot



1	Bottom captive installation screw	2	Top captive installation screw
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b) Lightly tighten the top captive installation screw of each SPA.

Note Do not tighten the screw completely.

c) Tighten the bottom captive installation screw of each SPA to 7 lb-in using a torque screw driver.

d) Tighten the top captive installation screw of each SPA to 7 lb-in using a torque screw driver.

Step 9 Install the interface cables. We recommend that you clean the fiber-optic connections before attaching the cables. See the [Inspection and Cleaning Procedures for Fiber-Optic Connections](#) document.

Optical Device Installation and Maintenance

This section describes the Cisco SFP and SFP+ transceiver modules installation and maintenance.

Installing and Removing Cisco SFP and SFP+ Transceiver Modules

For information on installing and removing Cisco SFP and SFP+ transceiver modules, see the [Cisco SFP and SFP+ Transceiver Module Installation Notes](#) document. SPAs only accept supported SFP and SFP+ modules. For details about supported SFP and SFP+ modules, see the [Modular Optics Compatibility](#) section.

Cleaning Optical Devices

Any contamination of the fiber connection can cause failure of the component or failure of the whole system. A particle that partially or completely blocks the core generates strong back reflections, which can cause instability in the laser system. Inspection, cleaning, and reinspection are critical steps to take before making fiber-optic connections.

For more information on cleaning optical devices, see the [Inspection and Cleaning Procedures for Fiber-Optic Connections](#) document.

Cisco Wideband SIP and SPA PLD Configuration Image Upgrades

The programmable logic device (PLD) configuration images for the Cisco Wideband SIP and Cisco Wideband SPA are automatically upgraded. Both upgrade processes require no user intervention.

- The Cisco Wideband SIP field-programmable gate array (FPGA) configuration image is not persistent. The image is bundled and downloaded with LCDOS every time the Cisco Wideband SIP is powered up. This process is invisible to the user.
- The Cisco Wideband SPA FPGAs and Complex Programmable Logic Devices (CPLDs) use configuration images that are automatically upgraded as needed. The upgrade information is part of the Cisco IOS release rather than a separate file to be downloaded by users. The Cisco IOS build contains a specific revision of the FPGA and CPLD images. When a Cisco Wideband SPA is powered up, if the Cisco IOS build has FPGA and CPLD images that are newer than those resident in the Cisco Wideband SPA, the FPGAs and CPLDs are automatically upgraded. The FPGA upgrade process takes about 12 minutes per Cisco Wideband SPA. The CPLD upgrade process takes about 13 seconds per Cisco Wideband SPA.

For more information, see the Upgrading Field-Programmable Devices chapter in [Cisco uBR10012 Universal Broadband Router SIP and SPA Software Configuration Guide](#).

Cisco 10000 Series SPA Interface Processor-600 and SPA PLD Configuration Image Upgrades

See the Upgrading Field-Programmable Devices chapter in [Cisco uBR10012 Universal Broadband Router SIP and SPA Software Configuration Guide](#).

SPA Blank Filler Plates

SPA blank filler plates are available to fill an unused SPA bay (subslot).

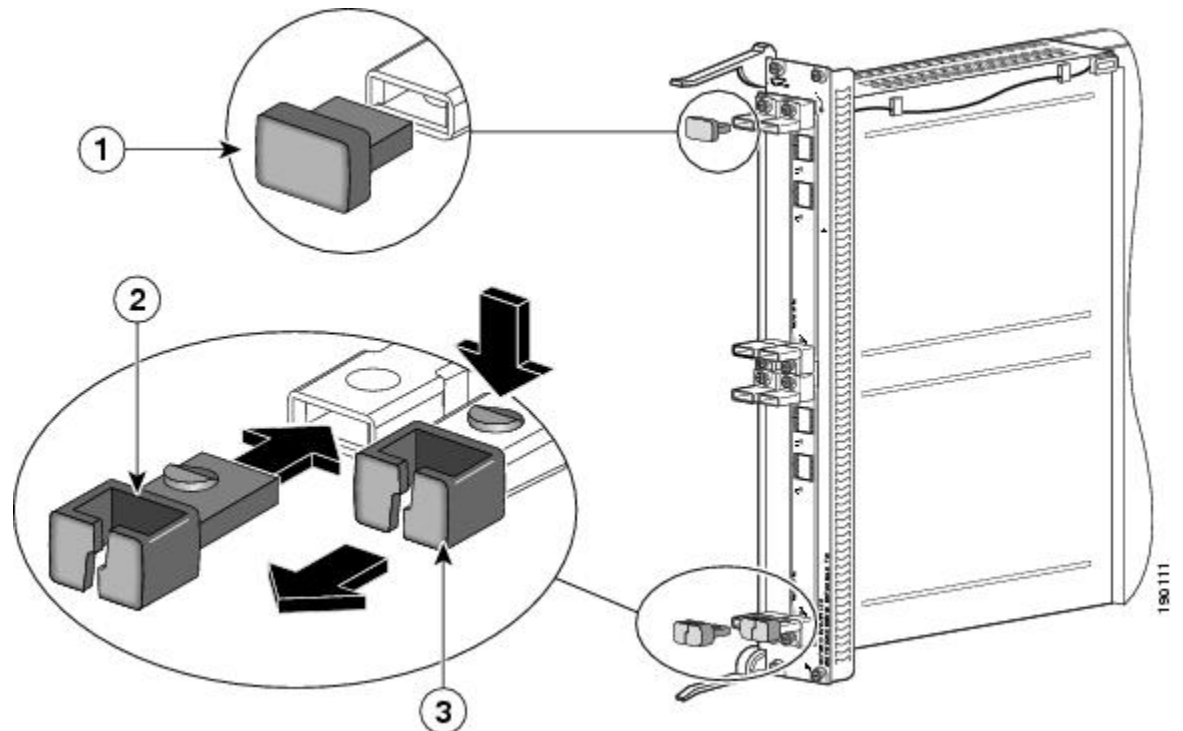
When a SPA bay is not in use, a SPA blank filler plate must be installed in the empty bay to allow the router or switch to conform to electromagnetic interference (EMI) emissions requirements and to allow proper airflow across the SPAs. If you plan to install a new SPA in a bay that is not in use, you must first remove the SPA blank filler plate.

Installing SPA Cable-Management Brackets

SPAs are shipped with an accessory kit that includes cable-management brackets.

The figure below shows cable-management brackets installed in a SPA, as well as cable routing.

Figure 5: SPA Cable-Management Brackets



1	Blank filler plug	3	Cable-management clip being removed
2	Cable-management clip being installed		

Procedure

- Step 1** Screw the two pull assemblies into both sides of the SPA.
- Step 2** Insert the cable-management clip into the slot.
- Step 3** To remove the cable-management clip, depress the button on the clip and pull it out.
- Note** Blank filler plugs are provided if no cable-management clips are installed.
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