7x50 High Scale (HS) MDA

Installation Guide

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Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous laser radiation exposure.

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Preface

About This Manual

This guide provides site preparation recommendations and procedures to install and remove the Alcatel-Lucent High-Scale Media Dependent Adapter (HS MDA).

The HS MDA is designed for use in 7450 ESS-7 and ESS-12 and 7750 SR-7 and SR-12 IOM-20Gs and IOM2s.

After you finish the hardware installation process, refer to the following documents for details on the boot process, software configuration, and command line interface (CLI) information to configure your system and network parameters:

7450 Documentation

- 7450 ESS OS Basic System Configuration Guide

  This guide describes basic system configurations and operations.

- 7450 ESS OS System Management Guide

  This guide describes system security and access configurations as well as event logging and accounting logs.

- 7450 ESS OS Interface Configuration Guide

  This guide describes card, Media Dependent Adapter (MDA), and port provisioning.

- 7450 ESS OS Router Configuration Guide

  This guide describes logical IP routing interfaces and associated attributes such as an IP address, port, link aggregation group (LAG), systems with IP interfaces as well as IP and MAC-based filtering, and VRRP.

- 7450 ESS OS Routing Protocols Guide

  This guide provides an overview of routing concepts and provides configuration examples for RIP, OSPF, IS-IS, and route policies.

- 7450 OS MPLS Guide

  This guide describes how to configure Multiprotocol Label Switching (MPLS) and Label Distribution Protocol (LDP).

- 7450 ESS OS Services Guide

  This guide describes how to configure service parameters such as service distribution points (SDPs), customer information, user services, service mirroring and Operations, Administration and Management (OAM) tools.

- 7450 ESS OS Triple Play Guide

  This guide describes Triple Play services and support provided by the 7450 ESS OS and presents examples to configure and implement various protocols and services.

- 7450 ESS OS Quality of Services Guide

  This guide describes how to configure Quality of Service (QoS) policy management.

- 7450 ESS OS Router Configuration Guide

  This guide describes logical IP routing interfaces and associated attributes such as an IP address, port, link aggregation group (LAG), systems with IP interfaces as well as IP and MAC-based filtering, and VRRP.

- 7450 ESS OS Routing Protocols Guide

  This guide provides an overview of routing concepts and provides configuration examples for RIP, OSPF, IS-IS, and route policies.

- 7450 OS MPLS Guide

  This guide describes how to configure Multiprotocol Label Switching (MPLS) and Label Distribution Protocol (LDP).

- 7450 ESS OS Services Guide

  This guide describes how to configure service parameters such as service distribution points (SDPs), customer information, user services, service mirroring and Operations, Administration and Management (OAM) tools.

- 7450 ESS OS Triple Play Guide

  This guide describes Triple Play services and support provided by the 7450 ESS OS and presents examples to configure and implement various protocols and services.

- 7450 ESS OS Quality of Services Guide

  This guide describes how to configure Quality of Service (QoS) policy management.

7750 Documentation

- 7750 SR OS Basic System Configuration Guide

  This guide describes basic system configurations and operations.

- 7750 SR OS System Management Guide

  This guide describes system security and access configurations as well as event logging and accounting logs.

- 7750 SR OS Interface Configuration Guide

  This guide describes card, Media Dependent Adapter (MDA), and port provisioning.

- 7750 SR OS Router Configuration Guide

  This guide describes logical IP routing interfaces and associated attributes such as an IP address, port, link aggregation group (LAG) as well as IP and MAC-based filtering, VRRP, and Cflowd.

- 7750 SR OS Routing Protocols Guide

  This guide provides an overview of routing concepts and provides configuration examples for RIP, OSPF, IS-IS, and route policies.

- 7750 SR OS MPLS Guide

  This guide describes how to configure Multiprotocol Label Switching (MPLS) and Label Distribution Protocol (LDP).

- 7750 SR OS Services Guide

  This guide describes how to configure service parameters such as service distribution points (SDPs), customer information, and user services.

- 7750 SR OS OAM and Diagnostic Guide

  This guide describes how to configure service parameters such as service mirroring and Operations, Administration and Management (OAM) tools.

- 7750 SR OS Triple Play Guide

  This guide describes Triple Play services and support provided by the 7750 SR and presents examples to configure and implement various protocols and services.

- 7750 SR Quality of Service Guide

  This guide describes how to configure Quality of Service (QoS) policy management.

Warnings and Notes

Observe the warnings and notes to avoid injury or router damage during installation and maintenance. Follow the safety procedures and guidelines when working with and near electrical equipment. Warning statements and notes are provided in each chapter.
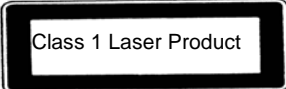
Audience

This guide is intended for network installers and system administrators who are responsible for installing, configuring, or maintaining networks. This guide assumes you are familiar with electronic and networking technologies.

Information Symbols

Table 1 describes symbols contained in this guide:

Table 1: Information Symbols

Symbol	Meaning	Description
	Danger	This symbol warns that improper handling and installation could result in bodily injury. Before you begin work on this equipment, be aware of hazards involving electrical circuitry, networking environments, and instigate accident prevention procedures.
	Caution	This symbol warns that improper handling and installation could result in equipment damage or loss of data.
	Warning	This symbol warns that improper handling may reduce your component or system performance.
	Note	This symbol provides additional operational information.
Class 1 Laser Product		Class 1 laser products are listed within this document. Only approved Class 1 replaceable laser transceivers should be used with this product.

Technical Support

If you purchased a service agreement for your router chassis and related products from a distributor or authorized reseller, contact the technical support staff for that distributor or reseller for assistance. If you purchased an Alcatel-Lucent service agreement, contact technical assistance at:

Web: http://www1.alcatel-lucent.com/comps/pages/carrier_support.jhtml

INSTALLING HS MDAS

IN THIS CHAPTER

This chapter provides information on the following topics:

PROVISIONING REQUIREMENTS

To configure cards, MDAs, and ports, you must be able to access the router by console or Telnet connection. Refer to the hardware installation guide for information and instructions.

IOM slots and types as well as MDA slots and types must be provisioned in order to configure ports. A port cannot be configured until the MDA is provisioned. Provision components in the following order:

1. Card slot number
2. Card type
3. MDA slot number
4. MDA type
5. Ports

COMPONENT POWER CONSUMPTION

Table 2: Chassis Power Consumption

Component	Maximum Power Consumption (Watts)
ESS-6	
ESS-6 chassis (low RPMs)	125
ESS-6 chassis (high RPMs)	255
ESS-6v	
ESS-6v chassis (low RPMs)	211
ESS-6v chassis (high RPMs)	604
ESS-7	
ESS-7 chassis (low RPMs)	58
ESS-7 chassis (high RPMs)	230

Table 2: Chassis Power Consumption (Continued)

Component	Maximum Power Consumption (Watts)
ESS-12	
ESS-12 chassis (low RPMs)	144
ESS-12 chassis (high RPMs)	380

Table 3: HS MDA Power Consumption

Component	Maximum Power Consumption (Watts)
M10-1GB-HS-SFP	60

Table 4: Board Power Consumption

Component/	Board	Maximum Power Consumption (Watts)
IOM	iom-20g	168
	iom-20g-b	200
SFM	200g	110
SFM2	200g	110
SFM2	400g	150

PROVISIONING HS MDAs

After the IOM is configured, use the following CLI commands to provision the HS MDA(s). A maximum of two HS MDAs can be configured on a single IOM.

	Command	Example
Step 1	card *slot-number*	card 1
Step 2	mda *mda-number*	mda 1
Step 3	mda-type *mda-type*	mda-type **m10-1gb-hs-sfp**
Step 4	no shutdown	no shutdown
Step 5	exit	exit

To provision an additional HS MDA, continue the configuration process with Step 6:

	Command	Example
Step 6	mda *mda-number*	mda 2
Step 7	mda-type *mda-type*	mda-type **m10-1gb-hs-sfp**
Step 8	no shutdown	no shutdown
Step 9	exit	exit

EXAMPLE

The following example displays card slot, card type, MDA slot, and MDA type command usage:

```
ALA-1>config# card 1
ALA-1>configcard# mda 1
ALA-1>config>card>mda# mda-type m10-1gb-hs-sfp
ALA-1>config>card>mda# no shutdown
ALA-1>config>card>mda# exit
ALA-1>config>card# mda 2
ALA-1>config>card>mda# mda-type m10-1gb-hs-sfp
ALA-1>config>card>mda# no shutdown
ALA-1>config>card>mda# exit
```

Sample Output

```
ALA-1>config# show card 1
===============================================================================
Card 1
===============================================================================
Slot      Provisioned          Equipped             Admin       Operational
          Card-type            Card-type            State       State
-------------------------------------------------------------------------------
1         iom3-xp              iom3-xp              up          up
===============================================================================
ALA-1>config#


ALA-1>config# show mda 1
===============================================================================
MDA 1/1
===============================================================================
Slot  Mda   Provisioned          Equipped             Admin       Operational
            Mda-type             Mda-type             State       State
-------------------------------------------------------------------------------
1     1     m10-1gb-hs-sfp       m10-1gb-hs-sfp       up          up
===============================================================================
MDA 1/2
===============================================================================
Slot  Mda   Provisioned          Equipped             Admin       Operational
            Mda-type             Mda-type             State       State
-------------------------------------------------------------------------------
      2     m10-1gb-hs-sfp       m10-1gb-hs-sfp       up          up
===============================================================================
ALA-1>config#


ALA-1>config# info
. . .
---------------------------------------------
echo "Card Configuration "
#--------------------------------------------
  card 1
        card-type iom3-xp
        mda 1
            mda-type m10-1gb-hs-sfp
        exit
        mda 2
            mda-type m10-1gb-hs-sfp
        exit
  exit
---------------------------------------------
ALA-1>config#
```

INSTALLATION PROCEDURES

WARNINGS AND NOTES

Warning:

- Electrostatic discharge (ESD) damage can occur if SF/CPMs, IOMs, or MDAs are mishandled. Always wear an ESD-preventive wrist or ankle strap and always connect an ESD strap to the grounding plug on the front of the chassis.
- Invisible laser radiation can be emitted from the aperture ports of an MDA when no cable is connected. *Avoid exposure and do not stare into open apertures.*
- Always place components on an anti-static surface.
- Do not power up a 7450 ESS or 7750 SR router until all components are installed and verified.
- Use only approved small form factor pluggable fiber optic devices in MDA ports.

Notes:

- Ports cannot be configured until the MDA is configured.
- Services cannot be provisioned until ports are configured.
- MDAs can be installed as follows:
  → Installed on the IOM and then loaded into the chassis slot. See "Installing an HS MDA on an IOM" on page 21.
  → Installed after the IOM is loaded in the chassis slot. See "Installing an HS MDA on a Chassis-Installed IOM" on page 22.
- MDA slots are numbered 1 and 2.
- The IOM is factory installed in 7450 ESS-1 and 7750 SR-1 routers. IOMs in this model are not field replaceable. MDAs must be installed directly into the chassis's integral MDA slot.

INSTALLING AN HS MDA ON AN IOM

HS MDAs can be installed on an IOM before installing the IOM into a router chassis. Figure 1 shows the installation of an HS MDA on an IOM that is not yet installed in a chassis.
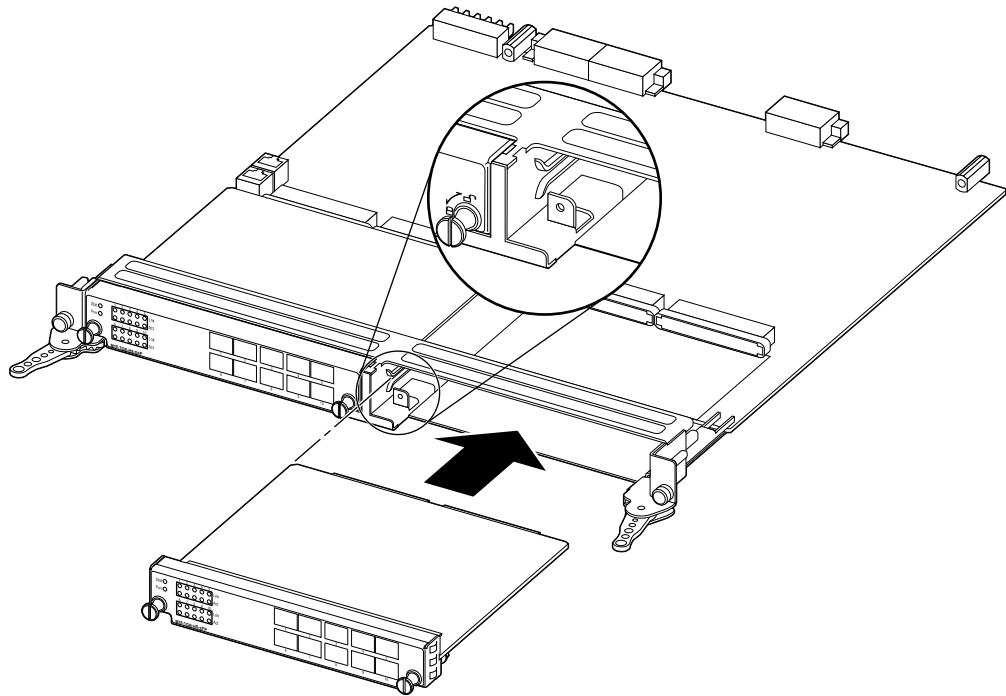
SR40053

Figure 1: Installing an HS MDA on an IOM

To install HS MDAs *before* an IOM is installed in a router chassis:

Step 1   Remove the HS MDA from the packaging and place it on a flat anti-static work surface. Avoid touching board components and connector pins.

Step 2   Insert the HS MDA into an MDA slot on the IOM. Align the HS MDA with the slot guides and the captive screws with the threaded receptacles.

Step 3   Press the HS MDA firmly into the slot. Make sure that the connectors are fully seated in the IOM receptacle. The faceplate of the HS MDA should be flush with the IOM faceplate.

Step 4 Tighten the captive screws to secure the HS MDA. Do not over-tighten. The maximum recommended torque is 10 lbf.in.

Step 5 If the system is powered up, check the Power LED on the HS MDA faceplate.
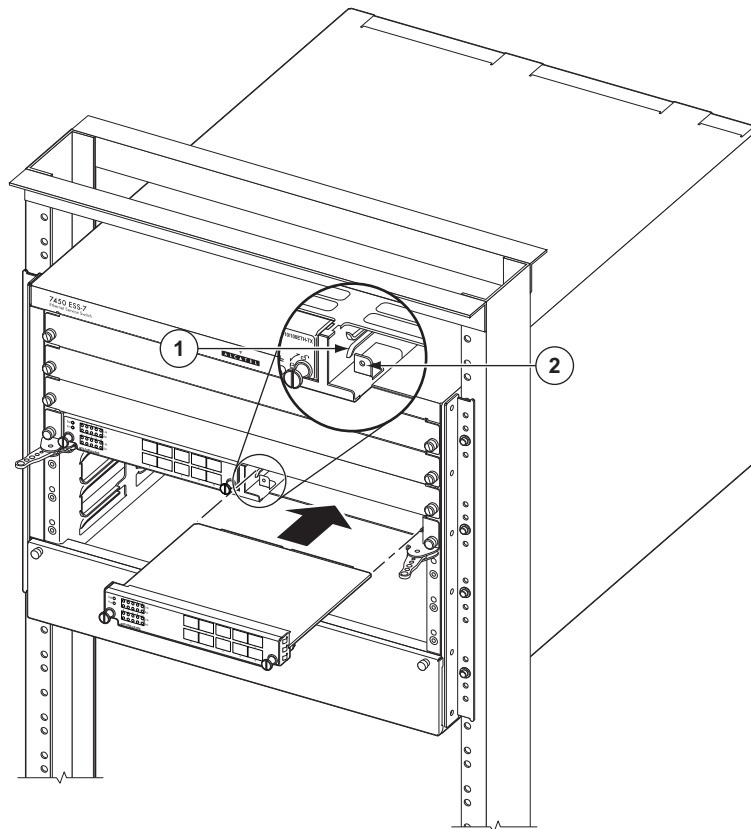
➡ If the HS MDA self test fails after you reseat the HS MDA, enter the **clear mda** *x/x* command.

Step 6 Attach cables to the MDA ports.

INSTALLING AN HS MDA ON A CHASSIS-INSTALLED IOM

Depending on the 7x50 chassis model, IOMs and HS MDAs are either installed in horizontal or vertical IOM slots. The basic installation techniques are the same for all chassis types.


ESS7007A

Figure 2: Installing an HS MDA on an IOM in a 7x50 Chassis

To install an HS MDA:

Step 1   Remove the HS MDA from the packaging. Avoid touching board components and connector pins.

Step 2   Insert the HS MDA into the MDA slot on an IOM. Align the HS MDA with the slot guides and the captive screws with the threaded receptacles.

Step 3   Press the HS MDA firmly into the slot. Make sure that the connectors are fully seated in the IOM receptacle. The faceplate of the HS MDA should be flush with the IOM faceplate.

Step 4   Tighten the captive screws to secure the HS MDA. Do not over-tighten. The maximum recommended torque is 10 lbf.in.

Step 5   If the system is powered up, check the Power LED on the HS MDA faceplate (see "LEDs" on page 26).

Step 6   Attach cables to the HS MDA ports.

REMOVING AN HS MDA
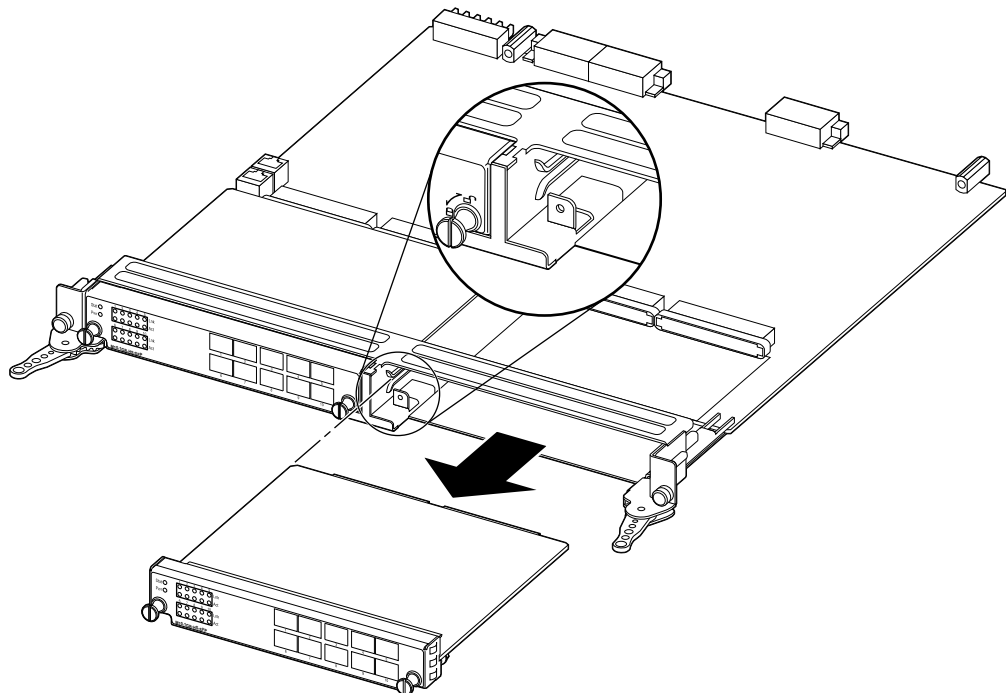
SR40054

Figure 3: Removing an HS MDA

To remove an HS MDA:

Step 1   Disconnect all cables from the HS MDA ports.

Step 2   Loosen the HS MDA captive screws.

> **NOTE**: The HS MDA cannot be removed if the captive screws are tightened.

Step 3   Slide the HS MDA out of the slot.

Step 4   Place the HS MDA on an anti-static surface.

Step 5   You must either immediately install another MDA into the slot or cover the MDA slot with an impedance panel.

LED DESCRIPTIONS

IN THIS CHAPTER

HS MDA LEDs described in this section are:

- 10-Port 1000BASE HS SFP MDA on page 26

LEDs

10-PORT 1000BASE HS SFP MDA

⚠ **Warning:**
- This is a Class 1 laser product.
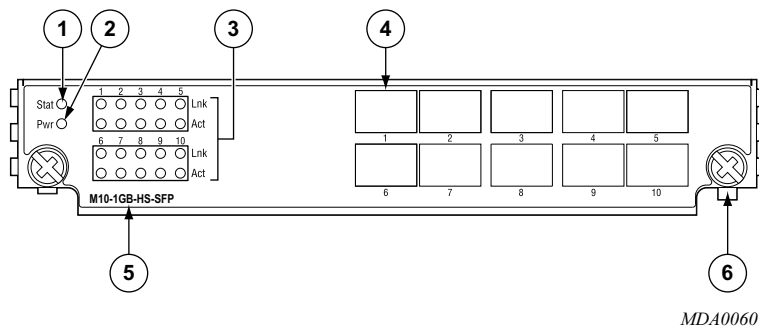- Only approved Class 1 replaceable laser transceivers should be used on this product.

MDA0060

Figure 4: 10-Port 1000BASE HS SFP MDA

Table 5: M10-1GB-HS-SFP MDA Features

Key	Label	Description
1	Status	• Green (blinking): Initializing. • Green: Operationally up, administratively up. • Amber: Operationally down, administratively up. • Off: Administratively down, shut down.
2	Power	• Blue: On • Off: No power
3	Port LEDs	
	Link	• Green: Valid communications link is established: 1000 Mbps • Amber (slow blinking): No SFP is installed. • Amber (fast blinking): Indicates loopback. • Amber: Optics installed but no link is present. • Unlit: Disabled, shut down.
	Active	• Green: Port is active and receiving or transmitting data. • Amber: Indicates an error condition. • Unlit: No activity.

Table 5: M10-1GB-HS-SFP MDA Features (Continued)

Key	Label	Description
4	Ports	Ports are numbered 1 through 10.
5	Model number	M10-1GB-HS-SFP
6	Captive screws	Loosen both captive screws to install and remove an HS MDA.

LEDs

SFPs

IN THIS CHAPTER

This chapter describes how to replace Small Form Factor Pluggable (SFP) transceivers on HS MDA ports that support these devices.

The 7450 ESS and 7750 SR routers support qualified SFPs only. Refer to the current Alcatel-Lucent price list for supported SFPs. Third-party SFPs are not supported.

Each SFP-type HS MDA accepts SFP-1GE-xx optical modules including CWDM modules. SFPs are hot-swappable modules that plug into HS MDA ports, linking the ports with fiber optic and copper networks.

HS MDAs support all the existing Gigabit Ethernet SFPs. When an optical SFP is used, the 1000BASE operation is supported. When a copper Gigabit Ethernet SFP is used, 10/100/1000BASE-T operation is supported.

This chapter contains the following sections:

WARNINGS AND NOTES

Danger:

• Fiber optic equipment can emit laser or infrared light that can injure your eyes. Never look into an optical fiber or connector port. Always assume that fiber optic cables are connected to a light source.

Caution:

• Make sure the plug is inserted while you install or remove the SFP. *Only* remove the plug when you are ready to attach network cables.

• Electrostatic discharge (ESD) damage can occur if router components, including SFPs, are mishandled. Always wear an ESD-preventive wrist or ankle strap and always connect an ESD strap to the grounding plug on the front of the chassis.

• Always place router components on an anti-static surface.

• Avoid bending fiber optic cable beyond its minimum bend radius.

• Do not exceed the recommended minimum 1 1/2-inch (3.81 cm) bend radius for fiber optic cables.

Warning:

• Do not remove the dust cover on the connector until you are ready install the SFP.

Always replace the the dust cover when the SFP is removed.

Notes:

• Discard SFPs according to all local laws and regulations.

• SFPs can be installed and replaced without disabling the interfaces or removing the MDA from the IOM.

• SFPs are keyed to prevent incorrect insertion.

INSTALLATION PREPARATION

Clean the connector before inserting it to prevent transfer of small particles and contamination of the transceiver. Do not interchange SFPs from one port to another without first cleaning the connectors.

To clean the connector, you can either:

- Wipe the side and end of the ferrule with a lint-free alcohol-dampened cloth.
- Blow dry the ferrule with compressed air and inspect for lint. Do not insert the compressed air nozzle into the receptacle when blowing out.

LOCKING MECHANISMS

Alcatel-Lucent SFPs can use different lock and release methods. Possible lock and release mechanisms include:

- Locking handle—A locking handle (lever) in the front of the SFP that you gently raise or lower to insert or remove from the port.
- Bail — A bar or wire latch in the front of the SFP that you pull down and outward to release the module.
- Tabs on the sides of the SFP that you press inward.

INSTALLING SFPS

To install an SFP transceiver:

Step 1   Remove the SFP from its anti-static packaging.

Step 2   Holding the SFP by its sides, slide the unit into the port until it clicks into place.

Step 3   Remove the plug from the SFP optical bore when you are ready to attach the network cable.

REMOVING SFPS

If you are removing an SFP, have a replacement SFP or slot plug, an anti-static mat, and a safety cap for the SFP transceiver ready.

To remove an SFP:

Step 1   Disconnect the network cable from the optical connector.

Step 2   Pull the lever located in the front of the SFP with your thumb and forefinger. Slide the connector out of the port.

Step 3   Place the SFP on an anti-static mat or in an electrostatic bag.

Step 4   Install an SFP replacement or re-insert the plug.

Step 5   Connect the network cable or place a safety cap over the optical transceiver.