

Silver Peak Systems

# Small Form-Factor Pluggable (SFP+) Module Installation Guide

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## Introduction

These installation instructions provide overview and specification information for small form-factor pluggable (SFP+) modules, as well as instructions for installing and removing SFP+ modules.

## Laser Compliance

The fiber-optic SFP+ modules contain a laser that is classified as a “Class 1 Laser Product” in accordance with US FDA regulations and the IEC 60825-1. The product does not emit hazardous laser radiation.



**WARNING:** Use of controls or adjustments or performance of procedures other than those specified herein or in the laser product’s installation guide may result in hazardous radiation exposure. To reduce the risk of exposure to hazardous radiation:

- Do not try to open the module enclosure. There are no user-serviceable components inside.
- Do not operate controls, make adjustments, or perform procedures to the laser device other than those specified herein.
- Do not stare into open optical ports.

## Federal Communications Commission Notice

This equipment has been tested and found to comply with the limits of a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio-frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case users will be required to correct the interference at their own expense.

Modifications to this product not authorized by Silver Peak Systems could void the FCC approval and negate your authority to operate the product.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This device is certified by TUV and CSA to meet Class 1 eye safety requirements of EN (IEC) 60825 and the electrical safety requirements of EN (IEC) 60950.

## Product Overview

Silver Peak small form-factor pluggable (SFP+) modules are hot-pluggable and field-replaceable. You can use the SFP+ modules for connection to other devices.

Only use Silver Peak SFP+ modules in your Silver Peak chassis. Each SFP+ module has an internal serial EEPROM that is encoded with security information. This encoding provides a way for the Silver Peak chassis to identify and validate that that SFP+ module meets the requirements for the device.

The following Silver Peak SFP+ modules are available:

- EC-SFP-SR: conforms to 1000Base-SX and 10GBase-SR fiber-optic Gigabit Ethernet standards; and
- EC-SFP-LR: conforms to 1000Base-LX and 10GBase-LR fiber-optic Gigabit Ethernet standards.

## SFP+ Module Specifications

### *EC-SFP-SR*

Parameter	Minimum	Maximum
Optical Output Power (1G)	-9.5 dBm	
Optical Receive Sensitivity (1G)		-17 dBm
Maximum Input Power (1G)		+0.5 dBm
Output Transmit Power (10G)	-5 dBm	
Optical Receive Sensitivity (10G)		-11.1 dBm
Maximum Input Power (10G)		+0.5 dBm

### *EC-SFP-LR*

Parameter	Minimum	Maximum
Optical Output Power (1G)	-11 dBm	
Optical Receive Sensitivity (1G)		-19 dBm
Maximum Input Power (1G)		+0.5 dBm
Output Transmit Power (10G)	-8.2 dBm	
Optical Receive Sensitivity (10G)		-12.5 dBm
Maximum Input Power (10G)		+0.5 dBm

## Fiber-Optic Cable Specifications

EC-SFP-SR  
When Operated in 1000Base-SX Mode  
  
Wavelength: 850 nanometers

Core Size (micron)	Modal Bandwidth (MHz/km)	Cable Distance	Cable Type	Connector Type
62.5	160	722 feet (220 m)	Multi-mode	LC fiber Optics
62.5	200	902 feet (275 m)	Multi-mode	LC fiber Optics
50	400	1640 feet (500 m)	Multi-mode	LC fiber Optics
50	500	1804 feet (550 m)	Multi-mode	LC fiber Optics
50	2000	>1804 feet (550 m)	Multi-mode	LC fiber Optics

EC-SFP-SR  
When Operated in 10GBase-SR Mode  
  
Wavelength: 850 nanometers

Core Size (micron)	Modal Bandwidth (MHz/km)	Cable Distance	Cable Type	Connector Type
62.5	160	85 feet (26 m)	Multi-mode	LC fiber Optics
62.5	200	108 feet (33 m)	Multi-mode	LC fiber Optics
50	400	217 feet (66 m)	Multi-mode	LC fiber Optics
50	500	269 feet (82 m)	Multi-mode	LC fiber Optics
50	500	984 feet (300 m)	Multi-mode	LC fiber Optics

EC-SFP-LR  
When Operated in 1000Base-LX Mode  
  
Wavelength: 1310 nanometers

Core Size (micron)	Cable Distance	Cable Type	Connector Type
9	3.1 miles (5 km)	Single-mode	LC fiber Optics

EC-SFP-LR  
When Operated in 10GBase-LR Mode  
  
Wavelength: 1310 nanometers

Core Size (micron)	Cable Distance	Cable Type	Connector Type
9	6.21 miles (10 km)	Single-mode	LC fiber Optics

## Installing the SFP+ Transceiver Module

An SFP+ (small form-factor pluggable) transceiver module plugs into the SFP+ cage of a Silver Peak chassis.

**CAUTION:** Observe electrostatic discharge (ESD) precautions when handling SFP+ transceiver modules. Always wear a wrist strap that connects to an approved grounding source when installing or handling the modules.

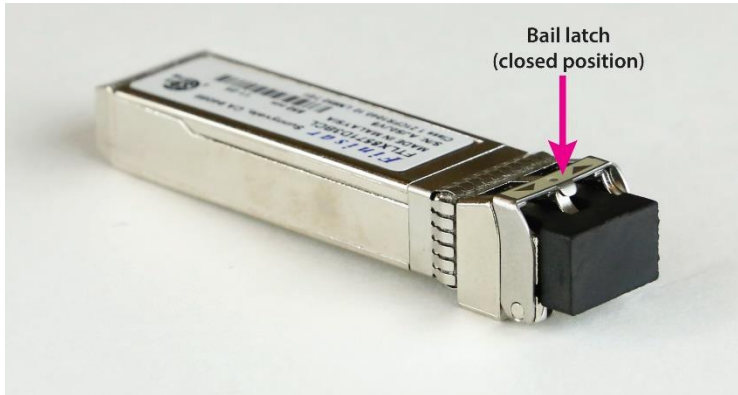
**CAUTION:** To prevent damage to an SFP+ module and to any connected cables, disconnect all cables before installing or removing a module.

**NOTE:** An SFP+ module is a hot-pluggable device; therefore, there is no need to power down the appliance when installing or removing a module.

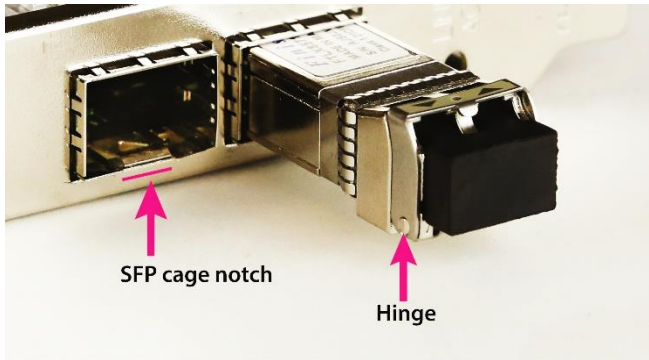
To install an optical SFP+ module into an SFP+ cage, perform the following procedure.

**NOTE:** Do not remove the dust cap from the optical SFP+ module until directed to do so in the following procedure. In addition, always keep the dust caps on the fiber-optic cable connectors until ready to make a connection.

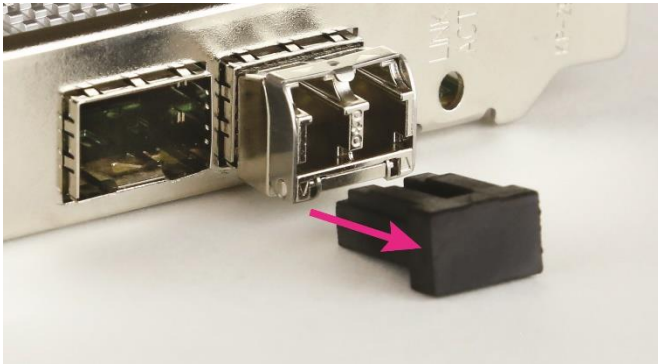
1. Verify that the bail latch is closed.



2. Verifying that the SFP+ cage notch and hinge are along the same edge, insert the module into the SFP+ cage until the module latches into place. The module is fully seated when you hear a click.



3. At one end of the fiber-optic cable, remove the dust caps from the LC connectors. Save the dust caps for future use.
4. Inspect and clean the now uncovered fiber-optic end faces of the LC connectors.
5. Remove the dust cap from the SFP+ module. Save the dust cap for future use.

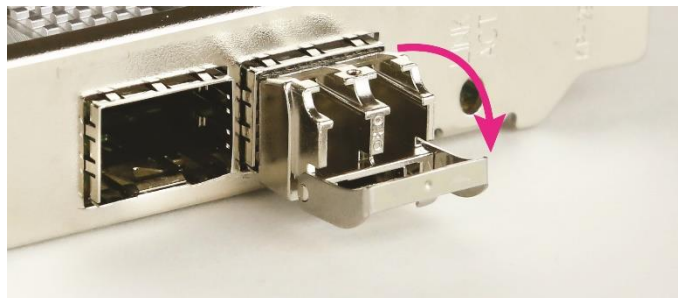


6. Connect the LC connectors of the fiber-optic cable to the SFP+ module.

## Removing the SFP+ Transceiver Module

To remove an optical SFP+ module from an SFP+ cage, perform the following procedure.

1. Disconnect the LC cable connector from the SFP+ module.
2. Reinstall the dust cap onto each LC cable connector.
3. Remove the SFP+ module from the SFP+ cage.
  - a. Open the bail latch by rotating it 90 degrees.



- b. Grasp the SFP+ module, and then carefully remove the module from the SFP+ cage.
4. Close the bail latch.
  5. Reinstall the dust cap into the SFP+ module.