

Small Form-Factor Pluggable (SFP / SFP+ / SFP28) Module Installation Guide



Hewlett Packard
Enterprise

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Introduction

These installation instructions provide overview and specification information for small form-factor pluggable (SFP/ SFP+/SFP28) modules, as well as instructions for installing and removing the modules.

Laser Compliance

The fiber-optic SFP+ / SFP28 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 HPE Aruba Networking 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) 60950-1 and 62368-1.

Third party Transceiver Support Policy

HPE Aruba Networking utilizes a rigorous process for certifying pluggable transceivers for operation within EdgeConnect platforms. HPE Aruba Networking Technical Assistance Center (TAC) provides full support for customers utilizing HPE Aruba Networking-supplied transceivers that are designed for operations in EdgeConnect, as well as those 3rd party transceivers that are identified in our Hardware Reference Guide and which are certified for operation within EdgeConnect. HPE Aruba Networking will provide limited technical support for transceivers that are not procured through HPE Aruba Networking and which are not on the certified list. This support is limited to normalizing configuration related issues, but does not include root cause analysis and diagnosis, and thus may or may not resolve the issue nor guarantee a successful outcome. TAC will likely request that you check the 3rd-party transceiver module and, if required, replace it with a certified component.

For ensuring consistent operations and support, HPE Aruba Networking highly recommends customers utilize HPE Aruba Networking-supplied transceiver designed for EdgeConnect operations or procure only certified 3rd party transceivers per the Hardware Reference Guide.

Installing the Transceiver Module

Small form factor transceiver modules (including SFP, SFP+, and SFP28 modules) plug into the SFP cage of an HPE Aruba Networking chassis. The installation process is identical for SFP, SFP+ and SFP28 modules.

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

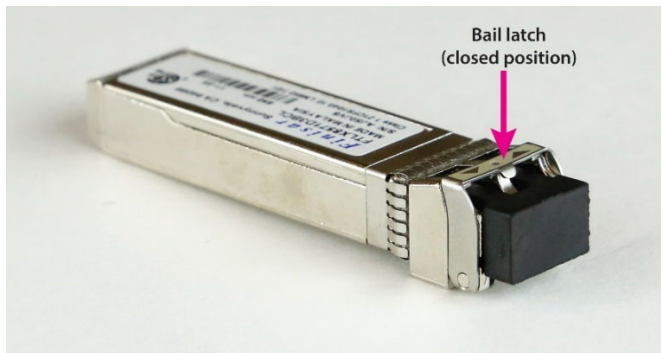
CAUTION: To prevent damage to a transceiver module and to any connected cables, disconnect all cables before installing or removing a module.

IMPORTANT: SFP, SFP+ and SFP28 modules are hot-pluggable devices. There is no need to power down the SD-WAN gateway when installing or removing a module.

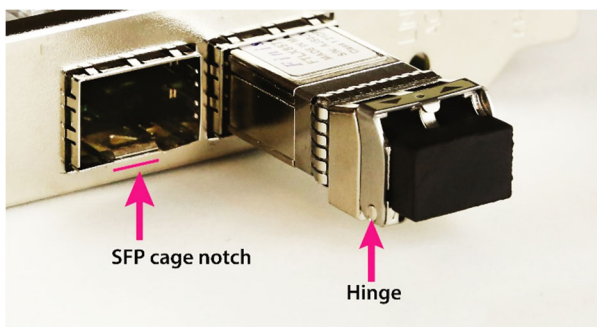
To install a transceiver module into an SFP cage, perform the following procedure.

IMPORTANT: (SFP+ and SFP28 modules) Do not remove the dust cap from the optical 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.

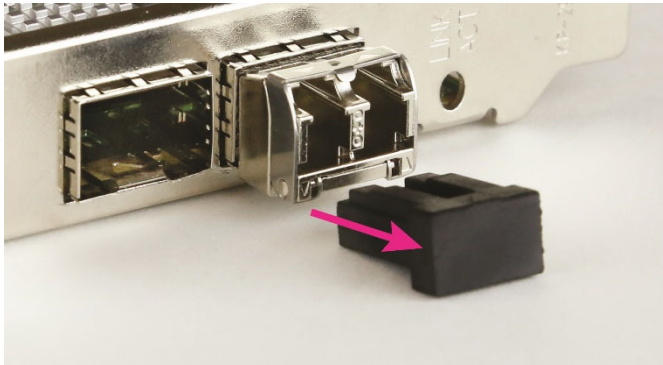


2. Verifying that the cage notch and hinge are along the same edge, insert the module into the cage until the module latches into place. The module is fully seated when you hear a click.



3. (SFP+ and SFP28 modules) At one end of the fiber-optic cable, remove the dust caps from the LC connectors. Save the dust caps for future use.

4. (SFP+ and SFP28 modules) Inspect and clean the uncovered fiber-optic end faces of the LC connectors.
5. (SFP+ and SFP28 modules) Remove the dust cap from the module. Save the dust cap for future use.

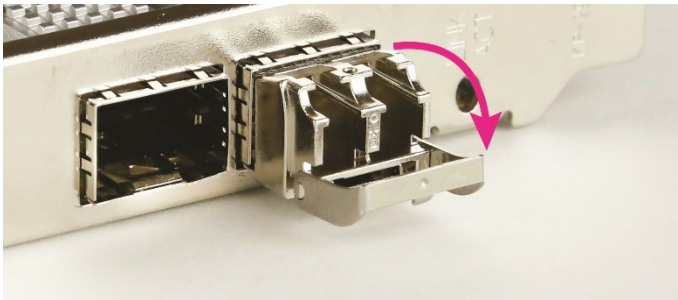


6. (SFP+ and SFP28 modules) Connect the LC connectors of the fiber-optic cable to the module.

Removing the Transceiver Module

To remove a transceiver (SFP, SFP+ or SFP28) module from an SFP cage, perform the following procedure. (The removal process is identical for each type of transceiver).

1. (SFP+ and SFP28 modules) Disconnect the LC cable connector from the module.
2. (SFP+ and SFP28 modules) Reinstall the dust cap onto each LC cable connector.
3. Remove the module from the SFP cage.
 - a. Open the bail latch by rotating it 90 degrees.



- b. Grasp the module and carefully remove it from the cage.
4. Close the bail latch.
5. Reinstall the dust cap onto the SFP+ / SFP28 module.

Appendix

Product Overview

HPE Aruba Networking small form-factor pluggable (SFP, SFP+, and SFP28) transceiver modules are hot-pluggable and field-replaceable. You can use the SFP modules for connecting to other devices.

Only use HPE Aruba Networking SFP / SFP+ / SFP28 modules in your HPE Aruba Networking chassis. Each module has an internal serial EEPROM that is encoded with security information. This encoding provides a way for the HPE Aruba Networking chassis to identify and validate that the module meets the requirements for the device.

The following HPE Aruba Networking SFP, SFP+ and SFP28 modules are available:

HPE Aruba Networking P/N	Silver Peak P/N	Minimum
JM535A	500405-001	EC-SFP-SR: conforms to 1000Base-SX and 10GBase-SR fiber-optic Gigabit Ethernet standards
JM534A	500406-001	EC-SFP-LR: conforms to 1000Base-LX and 10GBase-LR fiber-optic Gigabit Ethernet standards
JM533A	500590-001	EC-SFP28-25G-SR: conforms to 25GBase-SR and 10GBase-SR fiber-optic Gigabit Ethernet standards
JM532A	500591-001	EC-SFP28-25G-LR: conforms to 25GBase-LR and 10GBase-LR fiber-optic Gigabit Ethernet standards
R9Y49A	500666-001	EC-SFP-1000BT: conforms to 10/100/1000 Base-T Copper Gigabit Ethernet standards

Bail Latch Color

Transceiver Type	Bail Latch Color
EC-SFP-SR	Beige
EC-SFP-LR	Blue
EC-SFP28-25G-SR	Black
EC-SFP28-25G-LR	Blue
EC-SFP-1000BT	Yellow

EdgeOS Default Settings

Transceiver Type	
EC-SFP-SR	10G
EC-SFP-LR	10G
EC-SFP28-25G-SR	25G
EC-SFP28-25G-LR	25G
EC-SFP-1000BT	1G

SFP Module Specifications

EC-SFP-1000BT

Parameter	Typical
Line Frequency	125 MHz
Tx Output Impedance	100 Ohm
Rx Input Impedance	100 Ohm
Tx Input Impedance	50 Ohm
Rx Input Impedance	50 Ohm

SFP+ Module Specifications

EC-SFP-SR

Parameter	Minimum	Maximum
Optical Output Power (1G)	-9.5 dBm	-1 dBm
Optical Receive Sensitivity (1G)	-17 dBm	
Maximum Input Power (1G)	+ 0.5 dBm	
Optical Output Power (10G)	-5 dBm	-1 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	-3 dBm
Optical Receive Sensitivity (1G)		-19 dBm
Maximum Input Power (1G)		- 3 dBm
Optical Output Power (10G)	-8.2 dBm	+ 0.5 dBm
Optical Receive Sensitivity (10G)		-12.6 dBm
Maximum Input Power (10G)	- 14.2 dBm	+ 0.5 dBm

SFP28 Module Specifications

EC-SFP28-25G-SR

Parameter	Minimum	Maximum
Optical Output Power (10G)	-8.4 dBm	+ 2.4 dBm
Optical Output Power (25G)	-8.4 dBm	+ 2.4 dBm
Optical Receive Sensitivity (10G)		-10.1 dBm
Maximum Input Power (25G)	-10.3 dBm	+ 3.0 dBm

EC-SFP28-25G-LR

Parameter	Minimum	Maximum
Optical Output Power (10G)	-8.2 dBm	+ 0.5 dBm
Optical Receive Sensitivity (10G)		-12.6 dBm
Maximum Input Power (10G)	- 14.2 dBm	+ 2.0 dBm
Optical Output Power (25G)	-7.0 dBm	+ 2.0 dBm
Optical Receive Sensitivity (25G)		-11.3 dBm
Maximum Input Power (25G)	- 13.3 dBm	+ 2.0 dBm

Fiber-Optic Cable Specifications

EC-SFP-SR

When Operated in 1000Base-SX Mode

Wavelength: 850 nanometers

Core Size (micron)	Modal Bandwidth (MHz/km)	Transmission Distance	Cable Type	Connector Type	Cable Color
62.5	160	220 m (722 feet)	Multi-mode, FDDI	LC fiber Optics	Orange
62.5	200	275 m (902 feet)	Multi-mode, OM1	LC fiber Optics	Orange
50	500	550 m (1804 feet)	Multi-mode, OM2	LC fiber Optics	Orange
50	2000	>550 m (1804 feet)	Multi-mode, OM3	LC fiber Optics	Aqua

EC-SFP-SR

When Operated in 10GBase-SR Mode

Wavelength: 850 nanometers

Core Size (micron)	Modal Bandwidth (MHz/km)	Transmission Distance	Cable Type	Connector Type	Cable Color
62.5	160	26 m (85 feet)	Multi-mode, FDDI	LC fiber Optics	Orange
62.5	200	33 m (108 feet)	Multi-mode, OM1	LC fiber Optics	Orange
50	500	82 m (269 feet)	Multi-mode, OM2	LC fiber Optics	Orange
50	1500	300 m (984 feet)	Multi-mode, OM3	LC fiber Optics	Aqua

EC-SFP-LR

When Operated in 1000Base-LX Mode

Wavelength: 1310 nanometers

Core Size (micron)	Transmission Distance	Cable Type	Connector Type	Cable Color
9	5 km (3.1 miles)	Single-mode, OS2	LC fiber Optics	Yellow

EC-SFP-LR

When Operated in 10GBase-LR Mode

Wavelength: 1310 nanometers

Core Size (micron)	Transmission Distance	Cable Type	Connector Type	Cable Color
9	10 km (6.21 miles)	Single-mode, OS2	LC fiber Optics	Yellow

EC-SFP28-25G-SR

When Operated in 10GBase-SR Mode

Wavelength: 850 nanometers

Core Size (micron)	Modal Bandwidth (MHz/km)	Transmission Distance	Cable Type	Connector Type	Cable Color
50	1500	70 m (230 feet)	Multi-mode, OM3	LC fiber Optics	Aqua
50	1500	550 m (1804 feet)	Multi-mode, OM4	LC fiber Optics	Aqua
50	3500	100 m (328 feet)	Multi-mode, OM5	LC fiber Optics	Lime Green

EC-SFP28-25G-SR

When Operated in 25GBase-SR Mode

Wavelength: 850 nanometers

Core Size (micron)	Modal Bandwidth (MHz/km)	Transmission Distance	Cable Type	Connector Type	Cable Color
50	1500	70 m (230 feet)	Multi-mode, OM3	LC fiber Optics	Aqua
50	1500	550 m (1804 feet)	Multi-mode, OM4	LC fiber Optics	Aqua
50	3500	100 m (328 feet)	Multi-mode, OM5	LC fiber Optics	Lime Green

EC-SFP28-25G-LR
 When Operated in 10GBase-LR Mode
 Wavelength: 1310 nanometers

Core Size (micron)	Transmission Distance	Cable Type	Connector Type	Cable Color
9	10 km (6.21 miles)	Single-mode, OS2	LC fiber Optics	Yellow

EC-SFP28-25G-LR
 When Operated in 25GBase-LR Mode
 Wavelength: 1310 nanometers

Core Size (micron)	Transmission Distance	Cable Type	Connector Type	Cable Color
9	10 km (6.21 miles)	Single-mode, OS2	LC fiber Optics	Yellow

Ethernet Cable Specifications

EC-SFP-1000BT

Transmission Distance	Cable Type	Connector Type
100 m (328 feet)	Category 5 UTP	RJ-45



Hewlett Packard Enterprise Company
Attn: General Counsel
WW Corporate Headquarters
1701 E Mossy Oaks Rd
Spring, TX 77389
United States of America

1.800.943.4526 (toll-free in USA)
+1.650.750.0350

Support: <https://networkingsupport.hpe.com/home>

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