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OmniSwitch AOS Release 8 Transceivers Guide

www.alcatel-lucent.com

This user guide contains transceiver specifications and compatibility information for the OmniSwitch 6860/6860E. The information described in this guide is subject to change without notice.

Attention: Use of any transceivers other than those part numbers listed in the Compatibility Matrices is prohibited. Failure to comply with these matrices is not guaranteed for proper performance and may result in voiding the warranty for the affected platforms.

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Contents

About This Guide

This *OmniSwitch Transceivers Guide* provides specifications and compatibility information for the supported OmniSwitch transceivers for all OmniSwitch AOS 8 Release Products.

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Supported Platforms

This information in this guide applies to the following products:

- OmniSwitch 6860/6860E Series

Who Should Read this Manual?

The audience for this user guide is network administrators and IT support personnel who need to provide network connectivity using transceivers on an OmniSwitch.

When Should I Read this Manual?

Read this guide as soon as you are ready to integrate your OmniSwitch into your network and you are ready to provide connectivity using the supported transceivers. You should have already stepped through the first login procedures and read the brief software overviews in the appropriate user guides.

This guide includes information about the supported OmniSwitch transceivers.

What is Not in this Manual?

Procedures for switch management methods, such as CLI, web-based (WebView or OmniVista) or SNMP, are outside the scope of this guide.

For information on WebView and SNMP switch management methods consult the *OmniSwitch AOS Release 8 Switch Management Guide.* Information on using WebView and OmniVista can be found in the context-sensitive on-line help available with those network management applications.

This guide is designed to provide transceiver specification and compatibility information only and is not intended as a reference for any CLI commands or configuration information. Refer to the Documentation Roadmap for a list of available user guides.

How is the Information Organized?

Chapters in this guide are broken down by transceiver type. Additional sub-sections are provided for the various types of transceivers.

Specification Information. Each transceiver has an associated table providing individual specifications for all supported transceivers.

Compatibility Information. A compatibility chart is provided for each transceiver specifying which modules or switch the transceiver is supported on.

Documentation Roadmap

The OmniSwitch user documentation suite was designed to supply you with information at several critical junctures of the configuration process. The following section outlines a roadmap of the manuals that will help you at each stage of the configuration process. Under each stage, we point you to the manual or manuals that will be most helpful to you.

Stage 1: Using the Switch for the First Time

Pertinent Documentation: *Hardware 6860/6860E Hardware Users Guides*
Release Notes

The *Hardware Users Guide* contains information that provides the basic information you need to unpack and identify the components of your shipment. It provides information on unpacking the switch, unlocking access control, setting the switch's IP address, and setting up a password. It also includes overview information on fundamental aspects of the switch, such as hardware LEDs, the software directory structure, CLI conventions, and web-based management.

At this time you should also familiarize yourself with the Release Notes that accompanied your switch. This document includes important information on feature limitations that are not included in other user guides.

Stage 2: Gaining Familiarity with Basic Switch Functions

Pertinent Documentation: *Hardware 6860/6860E Users Guides*
OmniSwitch AOS Release 8 Switch Management Guide
OmniSwitch AOS Release 8 OmniSwitch Transceivers Guide

Once you have your switch up and running, you will want to begin investigating basic aspects of its hardware and software. Information about switch hardware is provided in the *Hardware Guide*. This guide provide specifications, illustrations, and descriptions of all hardware components, such as chassis, power supplies, Chassis Management Modules (CMMs), Network Interface (NI) modules, and cooling fans. It also includes steps for common procedures, such as removing and installing switch components.

The *Switch Management Guide* is the primary users guide for the basic software features on a single switch. This guide contains information on the switch directory structure, basic file and directory utilities, switch access security, SNMP, and web-based management. It is recommended that you read this guide before connecting your switch to the network.

Stage 3: Integrating the Switch Into a Network

Pertinent Documentation: *OmniSwitch AOS Release 8 Network Configuration Guide*
OmniSwitch AOS Release 8 Advanced Routing Configuration Guide

When you are ready to connect your switch to the network, you will need to learn how the OmniSwitch implements fundamental software features, such as 802.1Q, VLANs, Spanning Tree, and network routing protocols. The *Network Configuration Guide* contains overview information, procedures, and examples on how standard networking technologies are configured in the OmniSwitch.

The *Advanced Routing Configuration Guide* includes configuration information for networks using advanced routing technologies (OSPF and BGP) and multicast routing protocols (DVMRP and PIM-SM).

Anytime

The *OmniSwitch AOS Release 8 CLI Reference Guide* contains comprehensive information on all CLI commands supported by the switch. This guide includes syntax, default, usage, example, related CLI command, and CLI-to-MIB variable mapping information for all CLI commands supported by the switch. This guide can be consulted anytime during the configuration process to find detailed and specific information on each CLI command.

Related Documentation

The following are the titles and descriptions of all the related OmniSwitch AOS Release 8 user manuals:

- *OmniSwitch 6860/6860E Series Hardware User Guide*

  Complete technical specifications and procedures for all chassis, power supplies, and fans. Also includes comprehensive information on assembling and managing virtual chassis configurations.

- *OmniSwitch AOS Release 8 CLI Reference Guide*

  Complete reference to all CLI commands supported on the OmniSwitch Series switches. Includes syntax definitions, default values, examples, usage guidelines and CLI-to-MIB variable mappings.

- *OmniSwitch AOS Release 8 Switch Management Guide*

  Includes procedures for readying an individual switch for integration into a network. Topics include the software directory architecture, image rollback protections, authenticated switch access, managing switch files, system configuration, using SNMP, and using web management software (WebView).

- *OmniSwitch AOS Release 8 Network Configuration Guide*

  Includes network configuration procedures and descriptive information on all the major software features and protocols included in the base software package. Chapters cover Layer 2 information (Ethernet and VLAN configuration), Layer 3 information (routing protocols, such as RIP), security options (authenticated VLANs), Quality of Service (QoS), and link aggregation.

- *OmniSwitch AOS Release 8 Advanced Routing Configuration Guide*

  Includes network configuration procedures and descriptive information on all the software features and protocols included in the advanced routing software package. Chapters cover multicast routing (DVMRP and PIM-SM), and OSPF.

- *OmniSwitch AOS Release 8 Transceivers Guide*

  Includes transceiver specifications and product compatibility information.

- *Technical Tips, Field Notices*

  Includes information published by Alcatel-Lucent's Customer Support group.

- *Release Notes*

  Includes critical open Problem Reports, feature exceptions, and other important information on the features supported in the current release and any limitations to their support.

Published / Latest Product Documentation

All user guides are included on the Alcatel-Lucent public website. This website also includes user guides

for other Alcatel-Lucent Enterprise products.

The latest user guides can be found on our website at:

http://enterprise.alcatel-lucent.com/?dept=UserGuides&page=Portal

Technical Support

An Alcatel-Lucent service agreement brings your company the assurance of 7x24 no-excuses technical support. You'll also receive regular software updates to maintain and maximize your Alcatel-Lucent product's features and functionality and on-site hardware replacement through our global network of highly qualified service delivery partners. Additionally, with 24-hour-a-day access to Alcatel-Lucent's Service and Support web page, you'll be able to view and update any case (open or closed) that you have reported to Alcatel-Lucent's technical support, open a new case or access helpful release notes, technical bulletins, and manuals. For more information on Alcatel-Lucent's Service Programs, see our web page at service.esd.alcatel-lucent.com, call us at 1-800-995-2696, or email us at esd.support@alcatel-lucent.com.

1 Small Form-Factor Pluggables (SFPs)

OmniSwitch Series switches use both copper-based and fiber-based optical Small Form Factor Pluggable (SFP) transceivers. SFPs are fully hot-swappable and are available for both short-reach and long-reach applications. Copper-based and fiber-based optical SFPs can be mixed on the same module.

In This Chapter

This chapter describes the technical specifications for all the OmniSwitch supported transceivers. For additional details about OmniSwitch modules, see the appropriate *OmniSwitch Hardware Guide*.

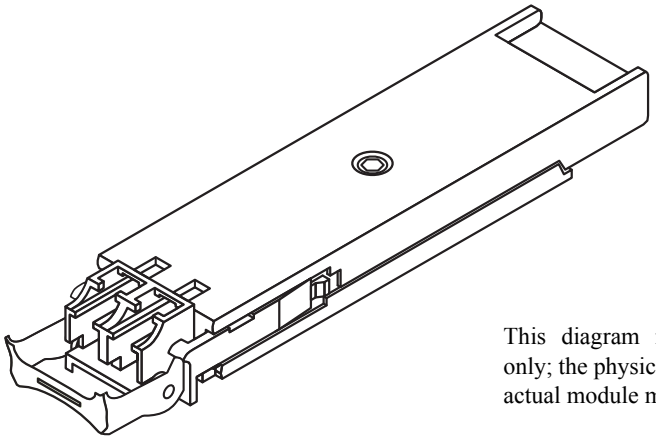
SFP specifications in this chapter include:

- SFP MSA Specifications. See "SFP MSA Specification" on page 1-2
- SFP Transceiver Installation. See "SFP Transceiver Installation and Removal" on page 1-3
- Gigabit Ethernet Transceivers. See "Gigabit Ethernet Transceivers" on page 1-6.
- Dual-Speed Ethernet Transceivers. See "Dual-Speed Ethernet Transceivers" on page 1-11.
- 100-FX Ethernet Transceivers. See "100-FX Ethernet Transceivers" on page 1-13.
- 10-Gigabit SFP+ Transceivers. See "10-Gigabit SFP+ Transceivers" on page 1-15.
- 20-Gigabit VFL Transceivers. See "20-Gigabit VFL Transceivers" on page 1-18
- OmniSwitch Transceiver compatibility, see "OmniSwitch Compatibility Matrix" on page 1-19.

SFP MSA Specification

The Small Form-Factor Pluggable (SFP) MSA (Multi Source Agreement) is a specification for a common interface for optical modular transceivers. The SFP connector consists of a 20-pin receptacle and an SFP housing cage. The connector provides the interface for the hot pluggable SFP module. Each SFP module contains a serial interface to provide identification information that describes the SFP capabilities, stand interfaces, manufacturer and other information.

For information on installing SFPs, refer to the documentation included with the transceiver.



This diagram is a representation only; the physical appearance of the actual module may vary slightly.

Small Form Factor Pluggable (SFP)

SFP Transceiver Installation and Removal

Follow the instructions below for the appropriate SFP type.

ESD Caution: Before handling the module, you must discharge all static electricity on your person to avoid Electrostatic Discharge (ESD) damage. If using a wrist strap, ensure that the wrist strap touches your skin. Attach the other end of the strap to the chassis. If your chassis provides a grounding lug, this can be used. Refer to your hardware user guide for details.

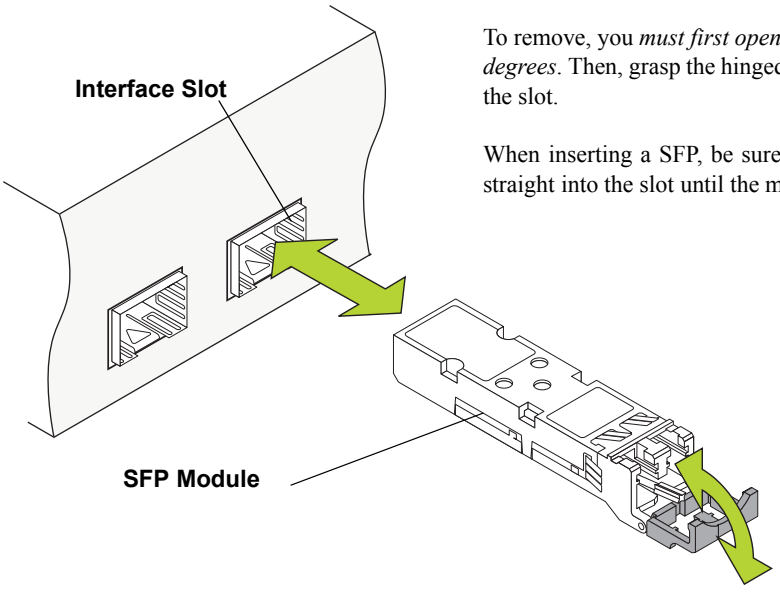
If using a wrist strap, ensure that the wrist strap touches your skin. Attach the other end of the strap to the chassis. If your chassis provides a grounding lug, this can be used. Refer to your hardware user guide for details.

Dust Exposure: To reduce the risk of dust exposure and physical damage, be sure to replace the protective rubber cover (provided) when the SFP is not in use.

Eye Safety: SFP transceivers are international Class 1 laser products and are eye-safe devices *when operated within the limits of manufacturers' specifications*. Operating SFP transceivers in a manner inconsistent with intended usage and specification may result in hazardous radiation exposure.

Note: After removing a transceiver, wait for a minimum of 5 seconds before re-inserting any transceiver into the same port. This allows sufficient time for software to detect the removal of the transceiver.

Note: *Never force the transceiver in or out of the transceiver slot.*



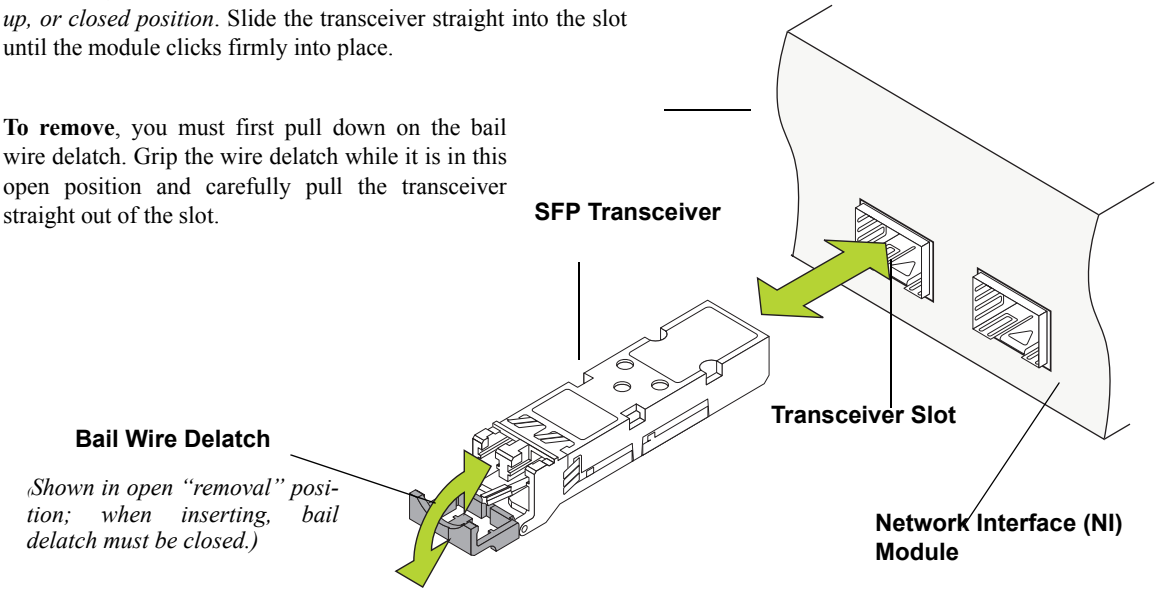
To remove, you *must first open the SFP's hinged face to approximately ninety degrees*. Then, grasp the hinged face and carefully pull the SFP *straight* out of the slot.

When inserting a SFP, be sure that the hinged face is *closed*. Slide the SFP straight into the slot until the module clicks firmly into place.

SFP - Hinged

To install, align the transceiver with the transceiver slot on the NI module, as shown. Be sure that the bail wire delatch is in the *up, or closed position*. Slide the transceiver straight into the slot until the module clicks firmly into place.

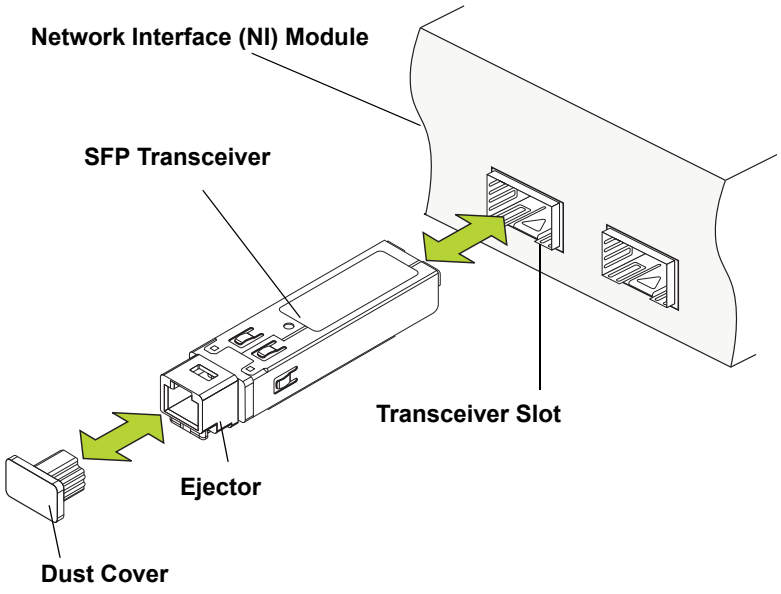
To remove, you must first pull down on the bail wire delatch. Grip the wire delatch while it is in this open position and carefully pull the transceiver straight out of the slot.



SFP - Bail Wire

To install, align the transceiver with the transceiver slot on the NI module, as shown. Carefully slide the transceiver back until it clicks into place; this is an indication that the connectors are firmly seated.

To remove, use the ejector tool (provided with each switch chassis) to push the transceiver's ejector button. The ejector button is located just below the transceiver port; refer to the diagram for more information. The transceiver will disengage from the connectors and eject slightly. Once disengaged, *use the clip end of the ejector tool* to carefully pull the transceiver straight out and away from the NI module.

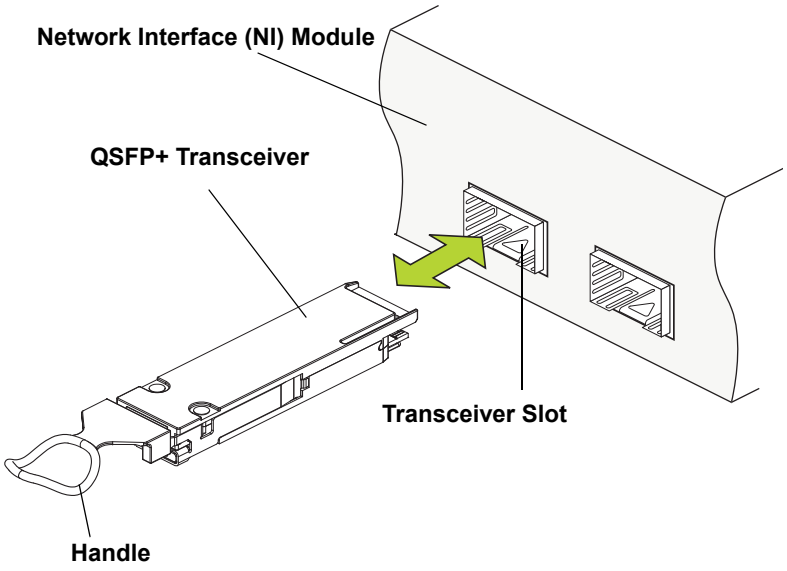


SFP - Ejector Button

To install, align the transceiver with the transceiver slot on the NI module, as shown. Carefully slide the transceiver back until it clicks into place; this is an indication that the connectors are firmly seated.

To remove, use the rubber or metal ejector handle and pull transceiver straight out and away from the NI module.

Note: *Never force the transceiver in or out of the transceiver slot.*



QSFP+ - Removal

Gigabit Ethernet Transceivers

Part Number	**SFP-GIG-SX**
Connector Type	LC
Standards Supported	802.3z, SFP MSA
Connections Supported	1000Base-SX
Fiber Type	MMF
Wavelength	850 nm
Optical Power Output	-9.5 to -4 dBm
Receiver Sensitivity	-17 dBm
Transmission Distance	~275 m on 62.5/125µm ~550 m on 50/125µm
Operating Temperature	0ºC to 70ºC
Digital Diagnostic Monitoring	Not Supported

Part Number	**SFP-GIG-LX**
Connector types	LC
Standards supported	802.3z, SFP MSA
Connections supported	1000Base-LX
Fiber Type	SMF
Wavelength	1310 nm
Optical Power Output	-9.5 to -3 dBm
Receiver Sensitivity	-20 dBm
Transmission Distance	~10 km
Operating Temperature	-40ºC to 85ºC / 0ºC to 70ºC
Digital Diagnostic Monitoring	Not Supported

Part Number	**SFP-GIG-LH40**
Connector Type	LC
Standards Supported	802.3z, SFP MSA
Connections Supported	1000Base-LH40r
Fiber Type	SMF
Wavelength	1310 nm
Optical Power Output	-2 to +3 dBm

Gigabit Ethernet Transceivers

Reciever Sensitivity	-22 dBm
Transmission Distance	~40 km
Operating Temperature	0ºC to 70ºC
Digital Diagnostic Monitoring	Supported

Part Number	**SFP-GIG-LH70**
Connector Type	LC
Standards Supported	802.3z, SFP MSA
Connections Supported	1000Base-LH70
Fiber Type	SMF
Wavelength	1550 nm
Optical Power Output	0 to +5 dBm
Receiver Sensitivity	-22 dBm
Transmission Distance	~70 km
Operating Temperature	0ºC to 70ºC
Digital Diagnostic Monitoring	Supported

Part Number	**SFP-GIG-EXTND**
Connector Type	LC
Standards Supported	802.3z, SFP MSA
Connections Supported	1000Base-SX
Fiber Type	MMF
Wavelength	1310 nm
Optical Power Output	-
Receiver Sensitivity	-
Transmission Distance	~2 km
Operating Temperature	0ºC to 70ºC
Digital Diagnostic Monitoring	Not Supported

Part Number	**SFP-GIG-T**
Connector Type	RJ-45
Standards Supported	802.3z, SFP MSA
Connections supported	10/100/1000Base-T

Gigabit Ethernet Transceivers

Cable Type	CAT5, CAT5e, CAT6
Transmission Distance	~100 m
Digital Diagnostic Monitoring	Not Supported

Part Number	**SFP-GIG-BX-D**
Connector Type	LC
Standards Supported	802.3ah, SFP MSA
Connections Supported	1000Base-BX10
Fiber Type	SMF
Wavelength	Transmit: 1490 mm Receive: 1310 nm
Average Power Output	-9 to -3 dBm
Receiver Sensitivity	-19.5 dBm
Transmission Distance	~10 km
Operating Temperature	0ºC to 70ºC
Digital Diagnostic Monitoring	Supported
Notes	Designed for use with SFP-GIG-BX-U

Part Number	**SFP-GIG-BX-U**
Connector Type	LC
Standards Supported	802.3ah, SFP MSA
Connections Supported	1000Base-BX10
Fiber Type	SMF
Wavelength	Transmit: 1310 nm Receive: 1490 nm
Average Power Output	-9 to -3 dBm
Receiver Sensitivity	-19.5 dBm
Transmission Distance	~10 km
Operating Temperature	0ºC to 70ºC
Digital Diagnostic Monitoring	Supported
Notes	Designed for use with SFP-GIG-BX-D

Part Number	**SFP-GIG-BX-D20**
Connector Type	LC

Gigabit Ethernet Transceivers

Standards Supported	802.3ah, SFP MSA
Connections Supported	1000Base-BX20
Fiber Type	SMF
Wavelength	Transmit: 1490 mm Receive: 1310 nm
Average Power Output	-8 to -3 dBm
Receiver Sensitivity	-23 dBm
Transmission Distance	~20 km
Operating Temperature	-5ºC to 70ºC
Digital Diagnostic Monitoring	Supported
Notes	Designed for use with SFP-GIG-BX-U20

Part Number	**SFP-GIG-BX-U20**
Connector Type	LC
Standards Supported	802.3ah, SFP MSA
Connections Supported	1000Base-BX20
Fiber Type	SMF
Wavelength	Transmit: 1310 nm Receive: 1490 nm
Average Power Output	-8 to -3 dBm
Receiver Sensitivity	-23 dBm
Transmission Distance	~20 km
Operating Temperature	-5ºC to 70ºC
Digital Diagnostic Monitoring	Supported
Notes	Designed for use with SFP-GIG-BX-D20

Part Number	**SFP-GIG-BX-D40**
Connector Type	LC
Standards Supported	802.3ah, SFP MSA
Connections Supported	1000Base-BX40
Fiber Type	SMF
Wavelength	Transmit: 1490 mm Receive: 1310 nm
Average Power Output	-2 to +3 dBm

Gigabit Ethernet Transceivers

Receiver Sensitivity	-23 dBm
Transmission Distance	~40 km
Operating Temperature	-5ºC to 70ºC
Digital Diagnostic Monitoring	Supported
Notes	Designed for use with SFP-GIG-BX-U40

Part Number	**SFP-GIG-BX-U40**
Connector Type	LC
Standards Supported	802.3ah, SFP MSA
Connections Supported	1000Base-BX40
Fiber Type	SMF
Wavelength	Transmit: 1310 nm Receive: 1490 nm
Average Power Output	-2 to +3 dBm
Receiver Sensitivity	-23 dBm
Transmission Distance	~40 km
Operating Temperature	-5ºC to 70ºC
Digital Diagnostic Monitoring	Supported
Notes	Designed for use with SFP-GIG-BX-D40

Part Number	**SFP-GIG-CWD**
Description	Coarse Wavelength Division Multiplexing (CWDM) optical transceiver supporting single-mode fiber over various wavelengths.
Connector Type	LC
Standards Supported	802.3z, SFP MSA
Connections Supported	1000Base-LX
Fiber Type	SMF
Wavelength	1470, 1490, 1510, 1530, 1550, 1570, 1590, 1610
Optical Power Output	-2 to +3 dBm
Receiver Sensitivity	-24 dBm
Transmission Distances	~62 km
Operating Temperature	-5ºC to 70ºC
Digital Diagnostic Monitoring	Not Supported

Dual-Speed Ethernet Transceivers

Part Number	**SFP-DUAL-MM**
Connector Type	LC
Standards Supported	802.3z, 802.3ah, SFP MSA
Connections Supported	100Base-FX, 1000Base-LX
Fiber Type	MMF
Wavelength	1310 nm
Average Power Output	100Base-FX: -20 to -14 dBm 1000Base-LX: -11.5 to -3 dBm
Receiver Sensitivity	100Base-FX: -28 dBm 1000Base-LX: -22 dBm
Transmission Distance	550 m at 1000 Mbps 2 km at 100 Mbps
Operating Temperature	0ºC to 70ºC
Digital Diagnostic Monitoring	Not Supported

Part Number	**SFP-DUAL-SM10**
Connector Type	LC
Standards Supported	802.3z, 802.3ah, SFP MSA
Connections Supported	100Base-FX, 1000Base-LX
Fiber Type	SMF
Wavelength	1310 nm
Average Power Output	100Base-FX: -15 to -8 dBm 1000Base-LX: -9.5 to -3 dBm
Receiver Sensitivity	100Base-FX: -28 1000Base-LX: -22
Transmission Distances	10 km
Operating Temperature	0ºC to 70ºC
Digital Diagnostic Monitoring	Not Supported

Part Number	**SFP-DUAL-BX-D**
Connector Type	LC
Standards Supported	802.3z, SFP MSA
Connections Supported	1000BASE-BX10-D
Fiber Type	SMF

Wavelength	Transmit: 1550 nm Receive: 1310 nm
Average Power Output	-9 to -3 dBm
Receiver Sensitivity	-18.7 dBm
Transmission Distance	~ 10 km
Operating Temperature	0ºC to 70ºC
Digital Diagnostic Monitoring	Supported

Part Number	**SFP-DUAL-BX-U**
Connector Type	LC
Standards Supported	802.3z, SFP MSA
Connections Supported	1000BASE-BX10-U
Fiber Type	SMF
Wavelength	Transmit: 1310 nm Receive: 1550 nm
Average Power Output	-9 to -3 dBm
Receiver Sensitivity	-18.7 dBm
Transmission Distances	~ 10 km
Operating Temperature	0ºC to 70ºC
Digital Diagnostic Monitoring	Supported

100-FX Ethernet Transceivers

Part Number	**SFP-100-LC-MM**
Connector Type	LC
Standards Supported	802.3u, SFP MSA
Connections supported	100Base-FX
Fiber Type	MMF
Wavelength	1310 nm
Optical Power Output	-19 to -14 dBm on 62.5/125µm -22 to -14 dBm on 50/125µm
Transmission Distance	~2 km on 62.5/125µm ~2 km on 50/125µm
Operating Temperature	0ºC to 70ºC
Digital Diagnostic Monitoring	Not Supported

Part Number	**SFP-100-LC-SM15**
Connector Type	LC
Standards Supported	802.3u, SFP MSA
Connections Supported	100Base-FX
Fiber Type	SMF
Wavelength (nm)	1310 nm
Optical Power Output	-15 to -8 dBm
Receiver Sensitivity	-34 dBm
Transmission Distance	~15 km
Operating Temperature	0ºC to 70ºC
Digital Diagnostic Monitoring	Not Supported

Part Number	**SFP-100-LC-SM40**
Connector Type	LC
Standards Supported	802.3u, SFP MSA
Connections Supported	100Base-FX
Fiber Type	SMF
Wavelength	1310 nm
Optical Power Output	-15 to -8 dBm
Receiver Sensitivity	-34 dBm

100-FX Ethernet Transceivers

Transmission Distances	~40 km
Operating Temperature	0ºC to 70ºC
Digital Diagnostic Monitoring	Not Supported

Part Number	**SFP-100-BXLC-D**
Connector Type	LC
Standards Supported	802.3ah, SFP MSA, ITU-T G.983
Connections Supported	100Base-BX
Fiber Type	SMF
Wavelength	Transmit: 1550 mm Receive: 1310 nm
Average Power Output	-14 to -8 dBm
Receiver Sensitivity	-32 dBm
Transmission Distance	~20 km
Operating Temperature	0ºC to 70ºC
Digital Diagnostic Monitoring	Not Supported
Notes	Designed for use with SFP-100-BXLC-U

Part Number	**SFP-100-BXLC-U**
Connector Type	LC
Standards Supported	802.3ah, SFP MSA, ITU-T G.983
Connections Supported	100Base-BX
Fiber Type	SMF
Wavelength	Transmit: 1310 nm Receive: 1550 nm
Average Power Output	-14 to -8 dBm
Receiver Sensitivity	-32 dBm
Transmission Distance	~20 km
Operating Temperature	0ºC to 70ºC
Digital Diagnostic Monitoring	Not Supported
Notes	Designed for use with SFP-100-BXLC-D

10-Gigabit SFP+ Transceivers

Part Number	**SFP-10G-SR**
Connector Type	LC
Standards Supported	802.3 Clause 52
Connections supported	10GBase-SR
Fiber Type	MMF
Wavelength	850 nm
Optical Power Output	-7.3 to -1.3 dBm
Receiver Sensitivity	-11.1 dBm
Transmission Distance	~ 300 m
Operating Temperature	0ºC to 70ºC
Digital Diagnostic Monitoring	Supported

Part Number	**SFP-10G-LR**
Connector Type	LC
Standards Supported	802.3 Clause 52
Connections supported	10GBase-LR
Fiber Type	SMF
Wavelength	1310 nm
Optical Power Output	-8.2 to 0.5 dBm
Receiver Sensitivity	-12.6 dBm
Transmission Distance	~ 10 km
Operating Temperature	0ºC to 70ºC
Digital Diagnostic Monitoring	Supported

Part Number	**SFP-10G-ER**
Connector Type	LC
Standards Supported	802.3ae
Connections supported	10GBase-ER
Fiber Type	SMF
Wavelength	1550 nm
Optical Power Output	-4.7 to 4.0 dBm
Receiver Sensitivity	-14.1 dBm

10-Gigabit SFP+ Transceivers

Transmission Distance	~ 40 km
Operating Temperature	0ºC to 70ºC
Digital Diagnostic Monitoring	Supported

Part Number	**SFP-10G-LRM**
Connector Type	LC
Standards Supported	802.3aq
Connections supported	10GBase-LRM
Fiber Type	MMF
Wavelength	1310 nm
Optical Power Output	-6.5 to .5 dBm
Receiver Sensitivity	-6.5 dBm
Transmission Distance	~ 220 m
Operating Temperature	0ºC to 70ºC
Digital Diagnostic Monitoring	Supported

Part Number	**SFP-10G-GIG-SR**
Connector Type	LC
Standards Supported	802.3-2005
Connections supported	10GBase-SR/SW, 1000Base-SX
Fiber Type	MMF
Wavelength	850 nm
Optical Power Output	-5 to -1 @ 10G -9.5 to -1dBm @ 1G
Receiver Sensitivity	-11.1 dBm @ 10G -17 dBm @ 1G
Transmission Distance	OM1: ~33m @ 10G, ~275m @ 1G OM2: ~82m @ 10G, ~550m @ 1G OM3: ~300m @ 10G, ~550m @ 1G
Operating Temperature	-5 ºC to 70ºC
Maximum Power Consumption	<1.0 Watt
Digital Diagnostic Monitoring	Supported

Part Number	**SFP-10G-C**
Description	10-Gigabit SFP+ direct attach copper transceiver.
Connector Type	Direct Attached

10-Gigabit SFP+ Transceivers

Standards Supported	802.3ae, SFF-8431
Cable Length	1m, 3m, 7m
Wire Gauge	24AWG
Bend Radius	1.25 in.
Digital Diagnostic Monitoring	Not Supported

20-Gigabit VFL Transceivers

Part Number	**QSFP-40G-SR**
Description	Four channel 40-Gigabit QSFP+ optical transceiver.
Connector Type	MPO
Standards Supported	802.3ba, QSFP+ MSA
Connections supported	40GBase-SR4
Fiber Type	MMF
Wavelength	850 nm
Optical Power Output	-7.6 to +2.4 dBm
Receiver Sensitivity	-5.4 dBm
Transmission Distance	OM3 - ~ 100 m OM4 - ~150 m
Operating Temperature	0 ºC to 70ºC
Maximum Power Consumption	1.5 W
Digital Diagnostic Monitoring	Supported
Notes	Supports 20-Gigabit VFL connections only.

Part Number	**OS6860-CBL**
Description	20-Gigabit QSFP+ direct attached copper transceiver.
Connector Type	Direct Attached Copper
Standards Supported	802.3ba, QSFP+ MSA
Cable Length	1m, 3m, 40cm
Wire Gauge	26AWG
Bend Radius	1.69 in.
Digital Diagnostic Monitoring	Not Supported

CAUTION - CLASS 1M LASER RADIATION WHEN OPEN. DO NOT VIEW DIRECTLY WITH OPTICAL INSTRUMENTS.

OmniSwitch Compatibility Matrix

The following table shows the available transceivers and minimum release required for support on the OmniSwitch:

Transceiver	OS6860/6860E (*Excluding U28*)	OS6860E-U28
SFP-GIG-SX	8.1.1	N/S
SFP-GIG-LX	8.1.1	8.1.1
SFP-GIG-LH40	8.1.1	8.1.1
SFP-GIG-LH70	8.1.1	8.1.1
SFP-GIG-EXTND	8.1.1	8.1.1
SFP-GIG-T[1]	8.1.1	8.1.1
SFP-GIG-BX-D	8.1.1	8.1.1
SFP-GIG-BX-U	8.1.1	8.1.1
SFP-GIG-BX-D20	8.1.1	8.1.1
SFP-GIG-BX-U20	8.1.1	8.1.1
SFP-GIG-BX-D40	8.1.1	8.1.1
SFP-GIG-BX-U40	8.1.1	8.1.1
SFP-GIG-CWD	8.1.1	8.1.1
SFP-DUAL-MM [2]	N/S	8.1.1
SFP-DUAL-SM10 [2]	N/S	N/S
SFP-DUAL-BX-D [2]	N/S	8.1.1
SFP-DUAL-BX-U [2]	N/S	8.1.1
SFP-100-LC-MM [2]	N/S	8.1.1
SFP-100-LC-SM15 [2]	N/S	8.1.1
SFP-100-LC-SM40 [2]	N/S	8.1.1
SFP-100-BXLC-D [2]	N/S	N/S
SFP-100-BXLC-U [2]	N/S	N/S
SFP-10G-SR [3]	8.1.1	8.1.1
SFP-10G-LR[3]	8.1.1	8.1.1
SFP-10G-ER[3]	8.1.1	8.1.1
SFP-10G-LRM[3]	8.1.1	8.1.1
SFP-10G-GIG-SR[3]	8.1.1	8.1.1
SFP-10G-C[3]	8.1.1	8.1.1
QSFP-40G-SR[4]	8.1.1	N/S
OS6860-CBL[4]	8.1.1	8.1.1

1. OS6860E-U28 user ports (1 - 28) support 10/100/1000. All 6860 uplink ports support 1Gbps only with this transceiver. If manually setting the user port speed to 10M the transceiver must first be inserted before setting the speed.

2. Supported on OS6860E-U28 user ports (1 - 28) only.

3. Supported on uplink ports only.

4. Supported for 20-Gigabit VFL connections only.