

How to use a gigabit single-mode optical module



AI Overview

To connect a gigabit single-mode optical module, insert the SFP into a compatible switch or router port, use single-mode fiber cables, and apply an inline attenuator if the link is short to prevent receiver saturation.

Step 1: Choose the Correct SFP Module
Select a single-mode SFP module compatible with your network device. Common types include:
1000BASE-LX/LH: Up to 10 km over single-mode fiber, can work on multimode with a mode-conditioning patch cable.
1000BASE-EX: Up to 40 km over single-mode fiber; may require a 5 dB inline attenuator for short links.
1000BASE-ZX: Up to 70 km over single-mode fiber; may require a 10 dB inline attenuator for short distances.
Ensure the SFP is hot-swappable and MSA-compliant for compatibility with your switch or router.

Step 2: Prepare the Fiber Optic Cable
Use single-mode fiber (SMF) with the correct connectors (LC or SC depending on the SFP). For bidirectional (BiDi) modules, ensure you pair the transmitter and receiver correctly, as each module transmits and receives on different wavelengths.

Step 3: Insert the SFP Module
Power on the switch or router. Insert the SFP module into the SFP port until it clicks. Connect the single-mode fiber cable to the module's transmitter (TX) and receiver (RX) ports, ensuring proper orientation.

Step 4: Apply Attenuators if Needed
For short-distance links, the optical signal may be too strong, causing receiver saturation. Use inline attenuators according to the module type:
1000LX (10–15 km): 5 dB
1000XD (40–50 km): 15 dB
1000ZX (70–80 km): 28 dB
1000EX (100–120 km): 45 dB

Step 5: Test the Connection
Verify link status on the switch or router. Check for optical power levels to ensure they are within the module's receiving range. Avoid exceeding the maximum or minimum optical power to prevent light saturation or signal loss.

Step 6: Monitor and Maintain
Enable Digital Optical Mo...

Article Content

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1000BASE-SX vs 1000BASE-LX, EX, ZX & BX SFP Guide

1000BASE-SX, 1000BASE-LX, 1000BASE-EX, 1000BASE-ZX and 1000BASE-BX are all Gigabit Ethernet fiber optic module terms, but they are not the same type of link. They differ in fiber

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This module supports four 10 Gbit/s channels carrying 10 Gigabit Ethernet, Fibre Channel, or InfiniBand. Use Case: Core switches in enterprise networks connecting to 10G access switches. QSFP28 (100G

How to test Gigabit single-mode fiber modules

Therefore, the connection test of single-mode fiber is different from that of multi-mode modules. When single-mode fiber optic modules use jumpers for short-distance (local) testing, they

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100 Gigabit Ethernet

The 40/100 Gigabit Ethernet standards encompass a number of different Ethernet physical layer (PHY) specifications. A networking device may support different PHY types by means of pluggable

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Have you ever experienced: the network cable in the computer room suddenly breaks in the middle of pulling, and the fiber optic interface does not match and you stare blankly; temporary

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The Ultimate Guide to SFP Modules (2026): Types, Speeds

Confused by SFP vs SFP+? Read the definitive 2026 guide on SFP modules. We explain Single Mode vs Multimode, DDM diagnostics, and how to choose the right transceiver for Cisco, Juniper, and more.

A Complete Guide to 1G Optical Modules and How 1000BASE-LR

This comprehensive guide explores the world of 1Gbase optical modules and delves into the workings of the 1000BASE-LR standard for long-distance transmission.

Gigabit single-mode single-core fiber optic module

The general parameters and basic knowledge of Gigabit optical transceivers are difficult to master. The following will introduce the general parameters of the optical module and the basic

Used Allied TAA SFP/LC 1G Single Mode 10KM 1310NM Module

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Gigabit Ethernet

Optical fiber transceivers are most often implemented as user-swappable modules in SFP form or GBIC on older devices. IEEE 802.3ab, which defines the widely

Cisco SFP and SFP+ Transceiver Module Installation Notes

Learn more about how Cisco is using Inclusive Language. This installation note provides the installation instructions for the Cisco small form-factor pluggable (SFP) and SFP+ transceiver

A Comprehensive Guide to Understanding 1G Optical Modules and

Explore the key differences between 1000BASE-LX and 1000BASE-SX modules, and grasp the vital role they play in enabling efficient and reliable data transmission over fiber optic

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Understanding 100G Single Fiber QSFP28 Module for Modern Networks

A 100G single fiber QSFP28 module sends 100-gigabit Ethernet data using one optical fiber. This device helps networks get faster without needing extra fiber cables.

Contact Us

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