Multimode fiber optic transceiver with two optical fibers



Overview

Improve safety, signal integrity, and reliability by using two optical fibers instead of wire to transfer bidirectional serial data plus hardware flow-control signals.

Key Takeaways

A multimode fiber optic transceiver with two optical fibers uses separate fibers for transmitting and receiving data, enabling reliable full-duplex communication over short distances.

Overview

Multimode fiber optic transceivers are designed for short-distance communication, typically within buildings or data centers, using multimode fibers with core diameters of 50–100 µm. These transceivers convert electrical signals into optical signals for transmission and back into electrical signals for reception, supporting data rates from 1G up to 100G depending on the module type and network design.

Dual-

Fiber (Duplex) TransceiversDual-fiber transceivers, also known as duplex modules, use two separate fibers: one for transmitting (TX) and one for receiving (RX). This setup provides full-duplex communication, meaning data can flow simultaneously in both directions, which improves network performance and reliability. Common wavelengths for 1G multimode dual-fiber SFP modules are 850 nm, 1310 nm, and 1550 nm.

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Advantages

Stable communication: Separate fibers reduce crosstalk and signal interference. Ease of setup: Duplex connections are straightforward to install and maintain. Full-duplex support: Enables simultaneous bidirectional data transfer.

Compatibility: Works with standard multimode fibers such as OM1, OM2, OM3, OM4, and OM5.

Typical Applications

Data center interconnectsEnterprise network backbonesShort-range fiber links within buildingsIndustrial or automation systems requiring reliable optical communication Comparison with Single-Fiber (Simplex/BiDi) ModulesSingle-fiber or BIDI transceivers use a single fiber for both transmitting and receiving by employing different wavelengths for each direction. While this saves fiber resources, dual-fiber transceivers are generally easier to deploy and provide more consistent performance for high-reliability applications.

Deployment Considerations

Fiber type: Ensure the transceiver matches the multimode fiber type (OM1–OM5) for optimal distance and bandwidth. Distance: Multimode dual-fiber transceivers typically support distances up to 2 km for 1G links, depending on fiber type and wavelength. Connector type: LC or ST connectors are commonly used for multimode duplex connections.

Pairing: Transceivers must be used in pairs with matching wavelengths to establish a proper link. In summary, multimode dual-fiber transceivers are ideal for short-range, high-reliability networks where full-duplex communication is required. They are cost-effective, easy to deploy, and compatible with standard multimode fiber types, making them a common choice for enterprise and data center environments.

Article Content

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Multi-mode optical fiber

OverviewApplicationsComparison with single-mode fiberTypesEncircled fluxExternal links

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Multi-mode optical fiber is a type of optical fiber mostly used for communication over short distances, such as within a building or on a campus. Multi-mode links can be used for data rates up to 800 Gbit/s. Multi-mode fiber has a fairly large core diameter that enables multiple light modes to be propagated and limits the maximum length of a transmission link because of modal dispersion. The standard G.651.1 defines the mos

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Multimode Fiber Types: OM1 vs OM2 vs OM3 vs OM4

Identified by ISO 11801 standard, multimode fiber optic cables can be classified into OM1 fiber, OM2 fiber, OM3 fiber, OM4 fiber and newly released

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ULTIMODE SFP-023G cooperates with two multimode fibers transmitting data at speeds up to 1.25 Gb/s. The maximum transmission range is 2 km. Optical SFP modules of the ULTIMODE series used

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Single-Mode vs Multi-Mode Compatibility — Guide, Best

Learn how single-mode and multi-mode transceivers differ, compatibility rules, testing tips, and best practices for reliable fiber deployments.

Differences Between Dual Fiber SFP and Simplex SFP Modules

Although both dual fiber SFP and simplex SFP modules are used to convert electrical signals to light signals, they differ in several ways, including transmission distance, fiber utilization, and use methods.

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Learn how to choose the right fiber optic cable for SFP, SFP+, SFP28, QSFP+, QSFP28, QSFP-DD, and OSFP optical transceivers. Avoid common fiber compatibility mistakes and improve

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The FOA Reference For Fiber Optics

A fiber optic datalink consists of fiber optic transceivers or individual transmitters and receivers at either end that transmit over optical fibers. In operation, the fiber optic datalink gets an electrical pulse input

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