

How to match dual-fiber optical modules



AI Overview

To match dual-fiber optical modules, ensure both ends use the same fiber type, wavelength, speed, and proper Tx/Rx orientation for reliable full-duplex communication.

Key Matching Considerations

- 1. Fiber Type:** Dual-fiber modules require two separate fibers—one for transmitting (Tx) and one for receiving (Rx). Ensure both ends of the link use the same fiber type: single-mode (SMF) for long distances or multi-mode (MMF) for short distances, typically under 2 km for MMF and over 2 km for SMF.
- 2. Wavelength:** Both transceivers must operate at the same wavelength. For example, a 1310 nm module will not communicate with an 850 nm module. Dual-fiber modules usually use identical wavelengths on each fiber, unlike single-fiber BiDi modules that use complementary wavelengths.
- 3. Tx/Rx Orientation:** Connect the transmit port of one module to the receive port of the other and vice versa. This cross-connection ensures proper full-duplex communication. Using a duplex patch cable with TX→RX and RX→TX orientation is standard practice.
- 4. Speed and Duplex Mode:** Modules must support the same data rate (e.g., 1G, 10G, 100G) and duplex mode (full-duplex). Mismatched speeds or half-duplex/full-duplex combinations will prevent the link from functioning correctly.
- 5. Device Compatibility:** Verify that the optical modules are supported by the switches, routers, or media converters at both ends. Modules from different vendors can interoperate if they meet the same standards and specifications, but always check compatibility reports or test the link before deployment.

Practical Deployment Tips

- Use matched pairs:** Always pair dual-fiber modules designed to work together.
- Clean connectors:** Dust or dirt on fiber connectors can degrade signal quality.
- Check link LEDs:** Confirm that FX/Link or Link/Act LEDs on both devices indicate a solid connection.
- Cross-brand interoperability:** Compatible modules from different vendors can work if speed, wavelength, and fiber type match.

By following these steps—matching fiber type, wavelength, Tx/Rx orientation, spee...

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Optical Module and Patch Cord Compatibility: The

In fiber optic network systems, correctly matching optical modules with patch cords is critical. This compatibility directly impacts network connection

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