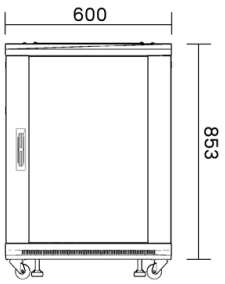
Dual-fiber optical module pairing method



Overview

Among these devices, single-fiber modules (BiDi) and dual-fiber modules (standard duplex) are two primary categories.

Key Takeaways

Dual-fiber optical modules use two fibers—one for transmitting (TX) and one for receiving (RX)—and must be connected with TX→RX cross-connections using duplex patch cords.

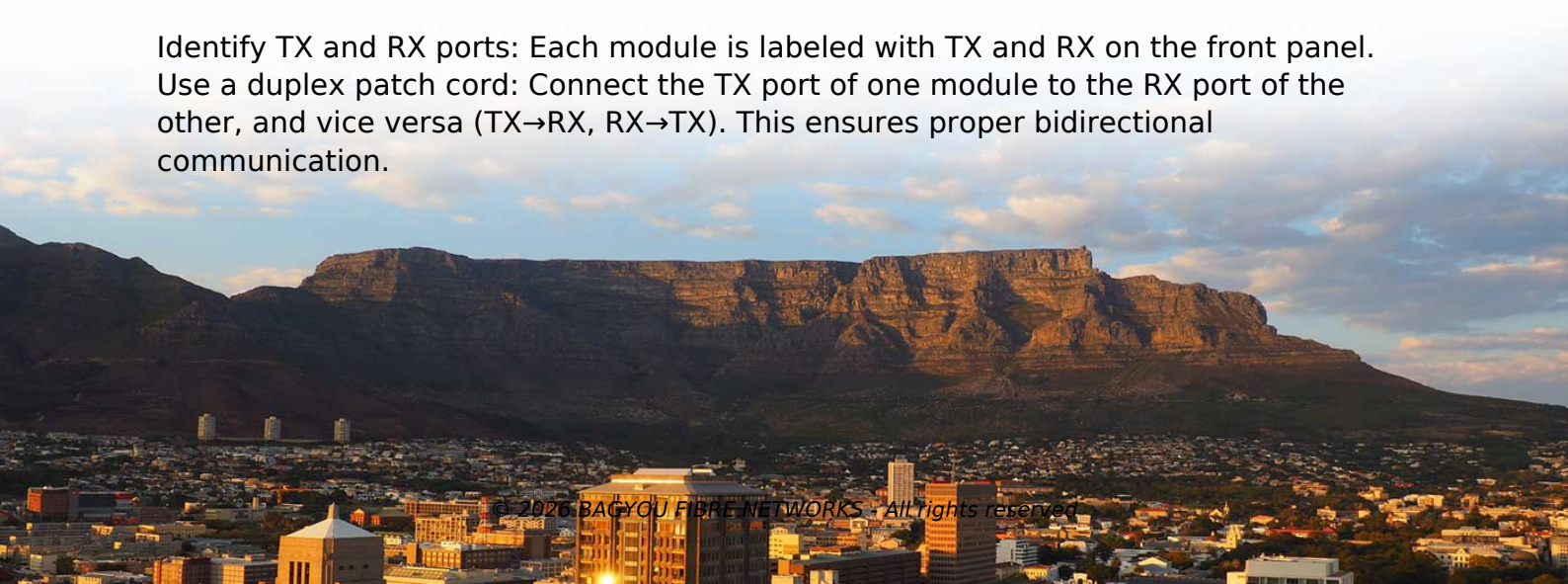
Understanding Dual-

Fiber ModulesDual-fiber transceivers have two ports: one for transmitting (TX) and one for receiving (RX). Unlike single-fiber BiDi modules, dual-fiber modules require two separate fibers for a single link, but they are simpler to deploy because any two dual-fiber modules can be connected without worrying about wavelength pairing. Common wavelengths include 850 nm for multimode and 1310/1550 nm for single-mode fibers.

Pairing Dual-

Fiber Modules

Identify TX and RX ports: Each module is labeled with TX and RX on the front panel. Use a duplex patch cord: Connect the TX port of one module to the RX port of the other, and vice versa (TX→RX, RX→TX). This ensures proper bidirectional communication.



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Check fiber type and connectors: Ensure both ends use the same fiber type (single-mode or multimode) and compatible connectors (LC, SC, etc.). Maintain cleanliness: Keep optical interfaces clean and avoid bending fibers too tightly to prevent signal loss.

Installation Steps

Insert the dual-fiber transceiver into the SFP or SFP+ port of your device. Remove the dust cap from the transceiver and the fiber connector. Keep the dust cap for future use.

Connect the duplex fiber patch cord following the TX→RX cross-connection. Verify link status on the network device to ensure proper communication.

Practical Tips

Distance and type: Single-mode dual-fiber modules can cover tens of kilometers, while multimode typically covers hundreds of meters to ~2 km depending on optics. Consistency: Both ends should match in speed and fiber type. Mismatched modules may cause communication failure.

Avoid mixing brands: While some modules are interoperable, using the same vendor reduces compatibility issues. By following these steps, dual-fiber optical modules can be reliably paired and used for high-speed, long-distance fiber-optic communication.

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