

Fiber Optic Patch Cord Types and Interface Models



Overview

This post provides an introduction to fiber optic patch cord types, and several popular cabling optical patch cables.

Key Takeaways

Fiber optic patch cords use various connector types such as LC, SC, ST, FC, MPO/MTP, MU, MT-RJ, and E2000, each suited for specific applications and fiber modes. Common Connector Types

- LC (Lucent Connector): Small form factor, duplex, widely used in modern data centers, compatible with high-density transceivers like QSFP via LC breakouts .
- SC (Subscriber Connector): Square, snap-in design, common in legacy networks and PON systems .
- ST (Straight Tip): Bayonet mount, older design, still used in some industrial LANs .
- FC (Ferrule Connector): Screw-on thread, ideal for high-vibration environments, less common today .
- MPO/MTP (Multi-Fiber Push-On / Multi-Fiber Termination Push-On): Multi-fiber connectors (8, 12, 24 fibers), essential for parallel optics in 40G, 100G, and 400G networks .
- MU (Miniature Unit): Small form factor, used in high-density applications .

- MT-RJ (Mechanical Transfer Registered Jack): Duplex connector, compact, used in some LAN and telecom setups .

- E2000: High-performance connector with spring-loaded shutter, used in telecom and high-speed networks .

Fiber Modes and Patch Cord Types

- Single-Mode (SM): Yellow jacket, small core ($\sim 9\mu\text{m}$), supports long-distance transmission with low attenuation, used in telecom and long-haul networks .

- Multimode (MM): Larger core ($50\text{--}62.5\mu\text{m}$), supports multiple light paths, suitable for short-distance, high-speed data center links. OM1/OM2 = Orange, OM3 = Aqua, OM4 = Violet, OM5 = Lime Green .

Simplex vs Duplex

- Simplex: Single fiber, one-way transmission.

- Duplex: Two fibers, supporting bidirectional communication, common in LC and SC connectors .

Polish Types

- PC (Physical Contact): Slightly spherical end-face, return loss $\sim -40\text{dB}$.

- UPC (Ultra Physical Contact): Refined polish, return loss $\sim -55\text{dB}$, common in digital applications.

- APC (Angled Physical Contact): 8° angled end-face, minimizes back-reflection, used in high-precision or analog systems .

Key Considerations

- Match fiber type (single-mode vs multimode) with transceiver and network requirements.

- Choose connector type based on density, equipment compatibility, and application (data center, telecom, industrial).

- Consider jacket type (PVC, OFNP, OFNR, LSZH) for safety and installation environment .

- For high-speed networks (400G/800G), MDC/CS connectors are emerging for higher density, while MPO/MTP remains standard for parallel optics . Understanding these interface types ensures optimal network performance, low signal loss, and future scalability in both enterprise and telecom environments.

Article Content

Fiber Optic Patch Cords Guide | Types, Connectors & Applications

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