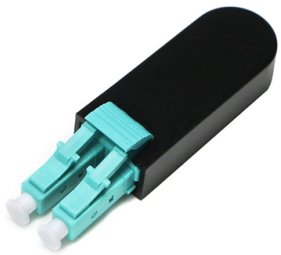
COETZER OPTICAL SYSTEMS (Pty) Ltd

Single-core optical module without fusion splicing



Overview

Fiber Cassettes | Pre-Terminated & Splice Cassettes | LegrandThe Fiber Pigtail Cassette enables quick installation, reduces splicing errors, and simplifies.

Key Takeaways

Single-core optical modules can operate without fusion splicing by using mechanical splicing or plug-and-play connectors, supporting single-mode transmission over long distances.Overview

A single-core optical module uses a single fiber core for data transmission, ideal for long-distance, high-speed communication. These modules are typically single-mode (SM), allowing light to travel in a straight path with minimal signal loss, making them suitable for distances ranging from 15 km up to 120 km depending on the wavelength and module type .

Connection Methods Without Fusion Splicing
• Mechanical Splicing Mechanical splicing aligns two fiber ends using a precision holder and index-matching gel, creating a stable optical connection without permanently fusing the fibers. This method is reversible and avoids high-temperature fusion, making it suitable for field installations or temporary setups .

• Connectorized Modules Many single-core modules come with LC or SC interfaces that allow plug-and-play connections. These modules can be directly inserted into fiber patch panels or network equipment without splicing, providing low insertion loss and easy maintenance .

Key Specifications

• Wavelengths: Common single-mode wavelengths include 1310 nm (medium distance, low dispersion) and 1550 nm (long distance, low loss, up to 120 km) for single-core modules .

• Data Rates: Typical rates include 155 Mbps, 1.25 Gbps, 2.5 Gbps, and 10 Gbps, with backward compatibility for older systems .

• Interfaces: SFP modules usually use LC connectors, while GBIC modules use SC connectors .

• Transmission Distance: Depending on the module and fiber type, distances can range from 15 km to 120 km without repeaters .

• Laser Type: Semiconductor lasers are used to generate the optical signal, with output power and receiver sensitivity designed to maintain signal integrity over the specified distance .

Advantages

• No permanent splicing required, simplifying installation and maintenance.

• Reversible connections allow easy reconfiguration or troubleshooting.

• Compatibility with standard fiber panels and cassettes, supporting enterprise and data center deployments .

• High reliability with long service life (typically 50,000 hours of continuous operation), .

Applications

Single-core optical modules without fusion splicing are widely used in:

• Data centers for high-speed interconnects.

• Telecom networks for long-distance single-mode transmission.

• Enterprise networks where modular, flexible deployment is required.

• Temporary or test setups where permanent splicing is impractical. By selecting the appropriate wavelength, connector type, and module interface, single-core optical modules can provide efficient, long-distance optical communication without the need for fusion splicing, while maintaining high performance and reliability.

Article Content

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Single Fiber Fusion Splicing

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