Connection method for a 1-to-2 optical splitter

Article Overview

A 1-to-2 optical splitter connects one input fiber to two output fibers using either pre-terminated connectors or splicing, depending on the splitter type and installation requirements.

Overview of 1-to-2 Optical Splitters

A 1x2 optical splitter is a passive device that divides a single optical signal into two output channels. It is commonly used in FTTH, PON, CATV, and LAN networks to distribute signals from one source to multiple endpoints . The splitter can be based on FBT (Fused Biconical Taper) or PLC (Planar Lightwave Circuit) technology. FBT splitters are typically used for small splits like 1:2 or 1:4, while PLC splitters are preferred for larger splits but also available in 1:2 configurations .

Connection Methods
o Connectorized Splitters
o Many 1x2 splitters come with pre-installed connectors such as SC, LC, FC, or ST, either UPC or APC types .
o Connection process:
o Plug the input fiber from the optical line terminal (OLT) or source device into the splitter's input port.
o Connect the two output fibers to the respective optical network terminals (ONTs) or devices.

o This method is quick and convenient, suitable for patch panels, wall-mounted boxes, or enclosures.

o Unconnectorized Splitters
o Some splitters, especially PLC types, are supplied without connectors for splicing .
o Connection process:
o Use fusion splicing to join the input fiber to the splitter's input fiber.
o Splice the two output fibers to the destination fibers.

o This method provides a permanent, low-loss connection and is often used in field installations or when custom lengths are required.

o Splice Tray or Enclosure Installation
o Splitters are often housed in splice trays, ABS boxes, or steel tubes to protect fibers and maintain mechanical stability .
o Fibers are routed carefully to avoid bending losses, and excess fiber is coiled inside the tray.

Key Considerations

o Insertion Loss: Each split introduces a loss; for a 1:2 split, the signal is typically reduced by ~3 dB plus any excess loss from connectors or splices .
o Connector Type Compatibility: Ensure the splitter connectors match the network fibers (e.g., SC/UPC to SC/UPC).
o Environmental Protection: Outdoor installations may require weatherproof enclosures.
o Mode Conditioning: For singlemode splitters, a small loop in the launch fiber may be used to stabilize measurements and reduce mode-dependent loss . In summary, a 1-to-2 optical splitter can be connected either via pre-terminated connectors for plug-and-play setups or fusion splicing for permanent installations, with careful attention to fiber handling, connector compatibility, and insertion loss management.

There are two main manufacturing technologies for optical splitters, each with its own advantages and ideal use

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