

Principle of China Unicom Optical Splitter



Overview

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Key Takeaways

China Unicom optical splitters operate as passive devices that divide a single incoming optical signal into multiple output signals using FBT or PLC technology, distributing light power according to a specified split ratio. Core Function

An optical splitter is a passive component in fiber-optic networks, particularly in FTTH (Fiber to the Home) systems, that allows a single optical signal to be shared among multiple users without requiring electrical power. The splitter takes an input light signal and distributes it into two or more output fibers, with the power divided according to the splitter's ratio (e.g., 1:2, 1:4, 1:16, 1:32) to serve multiple endpoints.

Working Mechanism

The operation relies on waveguide interaction and light propagation principles:

- **Signal Ingress:** The optical signal enters the splitter through a single input fiber.
- **Waveguide Interaction:** Inside the splitter, the light encounters a network of waveguides or fused fibers. These channels are engineered to guide and redistribute the light.

- **Power Division:** The light is split according to the split ratio. For example, a 1:4 splitter divides the input power equally among four output fibers, so each receives roughly 25% of the original signal .

- **Signal Egress:** The divided signals exit through the output fibers, which connect to end users or further network components.

Types of Splitters

China Unicom optical splitters typically use one of two technologies:

- **Fused Biconical Taper (FBT) Splitters:** Two or more fibers are stripped of their coating, twisted, and heated to form a tapered structure. The light couples between fibers in the tapered region, allowing control of the split ratio by adjusting the taper length and angle .

- **Planar Lightwave Circuit (PLC) Splitters:** Use photolithography to create waveguides on a silica substrate. PLC splitters provide precise, uniform splitting and are ideal for larger split configurations (e.g., 1:32, 1:64) with minimal insertion loss .

Key Features

- **Passive Operation:** No external power is required, making them reliable and suitable for remote locations .

- **Bidirectional Functionality:** Can split outgoing signals and combine incoming signals for two-way communication.

- **Compact Design:** Available in small form factors for integration into patch panels, ODFs, or outdoor enclosures.

- **Performance Parameters:** Include split ratio, insertion loss, uniformity, and isolation, which determine signal quality and efficiency . In summary, China Unicom optical splitters function by redistributing light from a single fiber into multiple fibers using either FBT or PLC technology, enabling efficient and cost-effective deployment of fiber-optic networks to multiple users.

Article Content

China Unicom optical splitter installed at your doorstep

During MWC 2024, Huawei and China Unicom released their latest cooperation results, including 5G-A, Whole-House Optical

Schematic diagram of low-light principle of China Unicom optical splitter

The optical splitter is an optical power distribution device that splits one optical signal into multiple optical fiber signals to achieve

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China Unicom Network Construction Optical Splitter

Nokia Siemens Networks says it will deploy a 5,000-km optical network for China Unicom that initially will support data rates as high

Optical Splitter

The working principle of an optical splitter is based on light propagation through fused fibers (FBT) or waveguides (PLC). In FBT

Fiber-optic splitter

It is an optical fiber tandem device with many input and output terminals, especially applicable to a passive optical network (EPON,

China Unicom Optical Fiber Distribution Box

The China Unicom Optical Fiber Distribution Box is a critical component in telecommunications infrastructure, designed for efficient

Fiber Optic Splitter Working Principle: An Overview

The working principle of fiber splitters involves the redistribution of optical power between the output fibers, ensuring

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This guide will demystify this pivotal passive device, exploring its types, working principles, and how it seamlessly

Optical Splitters in Modern Networks

Optical Splitter Types Optical splitters are classified based on their package style, transmission medium, and

The Working Principle and Application Scenarios of Fiber Optic Splitters

The working principle of fiber optic splitters is based on optical coupling and splitting . When a light signal enters the

Fiber Splitters The Role And Application Guide

The working principle of fiber splitters is relatively simple, and the signal distribution is achieved through the principle

Working Principle Of Optical Splitter

For example, a 1x4 optical splitter can distribute the optical signal in one optical fiber to four optical fibers in equal

How Does a Fiber Optic Splitter Work

How Does a Fiber Optic Splitter Work? There are three main working principles of the fiber splitter: 1. Signal Input: The

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Explore the workings of fiber optic splitters, their technical specifications, and wide-ranging industrial applications in

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