

Uplink and downlink interfaces of optical splitter

Article Overview

An optical splitter distributes downstream signals from the OLT to multiple ONUs and consolidates upstream signals from ONUs back to the OLT, enabling efficient bidirectional communication in PON networks.

Overview of Optical Splitters

An optical splitter is a passive device used in EPON/GPON networks to connect the Optical Line Terminal (OLT) at the service provider side with multiple Optical Network Units (ONUs) or Optical Network Terminals (ONTs) at user premises . It has one uplink optical interface and multiple downlink optical interfaces. The uplink interface connects to the OLT, while the downlink interfaces connect to the ONUs.

Downlink Function

The downlink refers to data transmission from the OLT to the ONUs. In this direction:

- o The OLT sends optical signals to the splitter.
- o The splitter broadcasts the downstream signal to all connected ONUs .
- o Each ONU receives the signal but only processes the data intended for it, filtering out other traffic.
- o Downlink transmission typically uses Time Division Multiplexing (TDM) to manage multiple users on the same fiber .
- o Wavelengths for downstream signals are usually 1490 nm or 1577 nm, with a separate wavelength (1550 nm) for CATV services .

Uplink Function

The uplink refers to data transmission from the ONUs back to the OLT. In this direction:

- o Each ONU sends its data to the splitter.
- o The splitter combines all upstream signals into a single uplink interface toward the OLT .
- o Uplink transmission typically uses Time Division Multiple Access (TDMA) to prevent collisions and ensure orderly communication .
- o Wavelengths for upstream signals are usually 1310 nm or 1270 nm .

Key Considerations

- o **Signal Attenuation:** Optical power decreases when signals pass through the splitter in either direction, so split ratios (e.g., 1:4, 1:8, 1:32) must be chosen based on distance, number of users, and bandwidth

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requirements .

- o Split Ratios: Fused Biconical Taper (FBT) splitters are suitable for small splits, while Planar Lightwave Circuit (PLC) splitters are preferred for large splits due to uniform signal distribution .
- o Deployment: Splitters can be installed in indoor or outdoor boxes, and multi-stage splitting can be used when ONUs are dispersed or fiber cores are limited .

Summary

In essence, the uplink and downlink of an optical splitter enable bidirectional communication in PON networks: the downlink broadcasts data from the OLT to all ONUs, while the uplink consolidates data from multiple ONUs back to the OLT. Proper selection of split ratios, wavelengths, and splitter types ensures efficient, scalable, and reliable network performance .

Optical splitter is a component of PON network. It is a passive device connecting OLT and ONU. Its function is to

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

Various split configurations are available, such as 1x2, 1x8, 2x32, 2x64, etc. Classified by Transmission Medium Based

One uplink optical interface and several downlink optical interfaces are present on a fiber optic splitter. The

The uplink ports are gig and copper/fiber capable. The expectation might be users hosts will connect to the downlink

The optical splitter is usually connected to other optical devices or equipment through

Hier sollte eine Beschreibung angezeigt werden, diese Seite lässt dies jedoch nicht zu.

It is possible to change the port type (Management, Uplink, and Downlink) in the Gaia Operating System on the

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

What's an optical splitter? How does the fiber optic splitter work? How many fiber splitter types? How to

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choose the

And using downlink ports at the other end of a switch uplink, allows you to connect the end devices directly to the

Its function is to distribute the downstream data and centralize the upstream data. The optical splitter has one uplink optical interface

At the same time, higher split ratio splitters reduce bandwidth per ONU (optical network unit). And there will be

PON architecture, or Passive Optical Network architecture, is defined as a passive optical network deployed in a point-to-multipoint

He designed optical interconnects, including optical backplanes (MTP, HBMT, PHD, OGI), and a fiber optic SMPTE compatible

Master optical splitter selection for FTTH & GPON networks. Compare PLC vs FBT, analyze insertion loss charts, and

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