

Maximum transmission distance of the optical splitter



AI Overview

The maximum transmission distance of an optical splitter in PON networks typically ranges from 20 km to 100 km, depending on the splitter type, split ratio, and network standard.

Typical Distances in PON Networks

In standard GPON and EPON deployments, the typical maximum distance between the Optical Line Terminal (OLT) and Optical Network Unit (ONU) is around 20 km, while the theoretical maximum can reach 60 km for GPON and up to 100 km for XG(S)-PON networks. These distances are influenced by the optical power budget, fiber attenuation, and the number of splits in the network.

Impact of Split Ratio

The split ratio of an optical splitter directly affects the maximum transmission distance:

- 1:16 split: Adds ~12 dB insertion loss, suitable for distances up to 20 km with high signal quality.
- 1:32 split: Adds ~15 dB insertion loss, typically supports distances up to 20 km but may reduce margin for signal degradation.
- 1:64 split: Adds ~18 dB insertion loss, limiting practical distance to 5–10 km due to reduced optical power at each output port. Higher split ratios reduce the optical po...

Article Content

Oct 25, 2025

Calculate the Maximum Attenuation for Optical Fiber Links

Introduction This document describes how to calculate the maximum attenuation for an optical fiber. You can apply

Oct 27, 2025

Comprehensive Guide to Optical Splitters

In an optical splitter, the input optical signal is divided into multiple output optical signals,

Nov 28, 2025

Knowledge of Optical Splitters

The signal processed by the FBT splitter cannot be evenly distributed due to lack of signal management, which

Apr 04, 2026

Calculating Fiber Optic Loss Budgets

Power Budgets And Loss Budgets The terms "power budget" and "loss budget" are often confused. The power budget refers to the

Apr 26, 2026

Optical Splitters: Split Ratios, Splitting Architectures & PON Network ...

This guide focuses on two critical aspects of optical splitters that define FTTH performance: split ratios (how signals

Sep 02, 2025

RLTECH PON (PON Line Indicators and Split Ratio Design)

PON line design requires comprehensive consideration of optical power budget, split ratio, transmission distance, and

Feb 13, 2026

Introduction to Passive Optical Network Splitter Architectures

In this configuration, typically more than one splitter is located in a cabinet some distance away from the OLT. Fewer fibers are used

Feb 25, 2026

Fiber Optic Cables How Far Is Too Far

Theoretically Speaking With no practical limitations, the maximum distance and speed at which optical fiber cables

Feb 02, 2026

Fiber-optic splitter

Balanced (2xN) splitters consists of 2 input fibers and N output fibers which divide the power of the optical signal proportionally. They

Jun 22, 2026

PASSIVE OPTICAL SPLITTER

A Passive Optical Network (PON) is a fiber optic technology utilizing point-to-multipoint topology and optical splitters to deliver data

Jul 09, 2026

Fiber Optic Transmission Distance: Single Mode vs. Multimode Guide

Learn how fiber optic transmission distance varies between single mode vs. multimode fiber. Discover key factors

Jul 02, 2026

What is the Maximum Transmission Distance Between OLT and ONU?

Learn the standard and extended transmission distances between OLT and ONU/ONT in EPON/GPON networks,

Jun 13, 2026

Introduction to Passive Optical Network Splitter Architectures

Fiber Broadband Association Technology Committee February 2025 The choice of splitter architecture for a passive optical network

Jul 13, 2026

What's the OLT (Optical Line Terminal)?

Maximum transmission distance: 20 km (12.5 miles). Supports up to 128 subscribers per PON port via optical splitters.

Jun 16, 2026

Understanding Optical Splitter Loss

Understanding Optical Splitter loss ratios and insertion loss is fundamental to building a reliable fibre optic network.

Mar 27, 2026

Wavelength and Transmission Distance of Optical Transceiver Modules

The maximum transmission distance for multi-mode is 2km, and single-mode can transmit up to 40km. Under 1310nm wavelength,

Oct 19, 2025

List of Cable Distance Limits: Ethernet, Fiber, HDMI, DVI and More

We are dealing with cables every day, but do you know the maximum transmission distance of various cables? In this

Jan 14, 2026

The Fiber Optic Association

During the design of a PON FTTx and POL networks, it is very important to determine the splitting of optical fibers, the number of

Jun 23, 2026

Fiber Link Loss Budget Calculator — TTI Fiber

Fiber Link Loss Budget Calculator end-to-end dB math for PON, Ethernet, and DWDM links. Enter your link details step by step. The

Apr 06, 2026

Network Cable Maximum Lengths: Ethernet, Coaxial, and Fiber Optic ...

This guide dives deep into the maximum length constraints of the three most common network cables—Ethernet,

Dec 19, 2025

A Comprehensive Guide to GPON and EPON Technologies in PON

The maximum distance a signal can travel depends on optical fiber quality and network design. The number of users a

Dec 30, 2025

Understanding Fiber Optic Splitters: Principles, Parameters, Types ...

4. What are the common types of fiber optic splitters? The common types of fiber optic splitters include the planar waveguide splitter,

Oct 23, 2025

Optical Fiber Maximum Transmission Distance Limited by Attenuation

Optical Fiber Maximum Transmission Distance Limited by Attenuation and Dispersion (Without Amplifier) In this tutorial, we will

Jul 20, 2026

Maximum Distance Between OLT and ONT in Fiber Networks | GPON Distance ...

The maximum distance between an OLT and an ONT in a GPON network is typically 20 kilometers. However, factors

Aug 21, 2025

Optical Fiber Transmission Distance Calculator

Calculation Example: The maximum transmission distance for a laser signal through an optical fiber is determined by

Jan 23, 2026

Basic Knowledge about Split Ratio and Insertion Loss of Optical Splitter

Optical splitters are vital in FTTH PON systems, distributing a single signal efficiently. Key parameters, Split Ratio and

Oct 18, 2025

Fiber Loss Calculator

Estimate the total link loss across an existing fiber optic link in the fiber length and loss variables are known Estimate

Jul 06, 2026

Understand GPON Technology

Varied distance between each ONU/ONT and OLT results in optical signal attenuation. As a result, power and level of

Jan 22, 2026

Optimal Fiber Transmission Range Estimation | True Geometry's Blog

Optimal Fiber Transmission Range Estimation 19 Oct 2024 Tags: Optical Communications Telecommunications Fiber

Oct 01, 2025

RLTECH PON (PON Line Indicators and Split Ratio Design)

The optical power budget determines the transmission distance and splitting capability of a PON system, following this

Contact Us

For more information, pricing, or custom solutions, please contact us:

Website: <https://ntmmgroup.co.za>

Email: sales@ntmmgroup.co.za

Phone: +27 82 471 2596

Address: Unit 7, Optic Park, 24 High-Tech Lane, Century City, Cape Town,
7441, South Africa

This document is for informational purposes only. Specifications subject to
change without notice.

