400-meter optical cable loss

Article Overview

A 400-meter fiber optic cable typically experiences a total loss of approximately 0.14–1.5 dB depending on fiber type, wavelength, and connectors.

Estimating Fiber Loss

Fiber optic loss, also called optical attenuation, is the reduction in signal strength as light travels through the fiber. It is caused by intrinsic factors such as absorption, scattering, and dispersion, and extrinsic factors like bending, splices, and connectors . The loss is usually expressed in dB per kilometer (dB/km).

• Single-mode fiber (SMF): Typical attenuation is 0.35–0.5 dB/km at 1310 nm and 0.25–0.4 dB/km at 1550 nm .
• Multimode fiber (MMF): Typical attenuation is 3.0–3.5 dB/km at 850 nm and 1.0–1.5 dB/km at 1300 nm . For a 400-meter (0.4 km) cable, the intrinsic fiber loss can be estimated as:
• Single-mode at 1310 nm: 0.4 km × 0.35–0.5 dB/km ≈ 0.14–0.2 dB
• Single-mode at 1550 nm: 0.4 km × 0.25–0.4 dB/km ≈ 0.1–0.16 dB
• Multimode at 850 nm: 0.4 km × 3.0–3.5 dB/km ≈ 1.2–1.4 dB
• Multimode at 1300 nm: 0.4 km × 1.0–1.5 dB/km ≈ 0.4–0.6 dB

Additional Losses

Connectors and splices add extra loss:

• Connectors: Typically 0.3 dB per connector for adhesive/polish or fusion splice-on...

Article Content

May 17, 2026

LMR400 Cable Loss Calculator Online

The LMR400 Cable Loss Calculator is used to determine the loss of signal strength that occurs while transmitting data

Mar 01, 2026

Optical Loss & Testing Overview | Kingfisher International

Application note: Practical overview of optical loss testing theory and practice for fiber optic communication systems.

Oct 02, 2025

Optical Fiber Loss: Causes and Calculations

Optical fiber loss in fiber optic communications: Understanding key factors and calculating methods for high-performance systems

Mar 15, 2026

What Is Acceptable dB Loss for Fiber Optics?

Learn what dB loss levels are acceptable in fiber optic systems, from connectors and splices to full loss budget

Aug 10, 2025

Introduction to Optical Fibers, dB, Attenuation and Measurements

This document is a quick reference to some of the formulas and important information related to optical technologies.

Aug 03, 2025

LMR 400 Cable Loss Calculator

This calculator helps you estimate that loss before you install cable. It converts frequency, length, power, connector loss, SWR, and

Nov 20, 2025

Calculate the Maximum Attenuation for Optical Fiber Links

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

Mar 15, 2026

Fibre Optic Cabling Loss Limits Explained – Trend Networks

Learn about fibre optic cabling loss limits & how to calculate them. Gain insights from experts on acceptable loss for

Jun 27, 2026

Fiber Loss Calculator

Calculating fiber loss using this calculator can estimate the fiber loss through an optical link, if fiber length, splice

Jan 03, 2026

Ultra Low Loss Fiber Performance Calculator

The Ultra Low Loss Fiber Performance Calculator enables users to evaluate fiber performance and optimize network designs efficiently.

Apr 23, 2026

Fiber Optic Loss Calculator | Free Signal Budget Tool

Calculate fiber optic link loss budget with our free calculator. Enter cable length, connectors, and splices to get total

Apr 25, 2026

The FOA Reference For Fiber Optics

Should a meter be set for dB or dBm? In the early days of fiber optics, source output power was usually measured in milliwatts and

Jun 16, 2026

Fiber Certification Testing: All You Really Need Is Loss, Length ...

The only way to accurately measure the reflectance of connections for short-reach single-mode applications is to use

Jun 15, 2026

Calculating Fiber Optic Loss Budget

Fiber Loss Factor – Fiber loss generally has the greatest impact on overall system performance. The fiber strand manufacturer

Jan 26, 2026

LMR-400 Loss Calculator

Use our LMR-400 loss calculator to accurately determine RF signal attenuation over cable length and frequency. Includes formula,

May 10, 2026

Calculating Fiber Optic Loss Budgets

Calculating Cable Plant Link Loss Budget Loss budget analysis is the calculation of a fiber optic cabling system''s estimated loss

Jun 18, 2026

Free Space Path Loss Calculator (FSPL)

The free space path loss is the loss in signal strength of a signal through free space. This calculator calculates this for you based on

Dec 26, 2025

Fiber Optic Cable Distance: A Comprehensive Guide

Fiber optic cables are the backbone of modern communications, enabling high-speed data transfer over vast

Nov 09, 2025

Understanding Fiber Loss: What Is It and How to Calculate It?

This post introduces the main fiber loss types, the calculation process of link loss including fiber attenuation,

Jan 21, 2026

Calculating Fiber Loss and Distance Estimates

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

Jul 26, 2026

Guidelines On What Loss To Expect When Testing Fiber Optic Cables

Short fiber optic premises cabling networks are generally tested in three ways, connector inspection/cleaning with a microscope,

Aug 03, 2025

How to Calculate Fiber Optic Loss: Key Factors and Standards

Learn how to accurately calculate fiber optic loss to ensure optimal network performance. Explore types of loss, industry standards,

Aug 19, 2025

Specifications For Fiber Optic Networks

Specifications For Legacy Fiber Optic Networks A listing of many fiber optic LANs and links available in the last 30 years, with basic

Dec 17, 2025

LMR-400 Cable Loss Calculator

Calculate LMR-400 cable loss (attenuation) in dB for various lengths and frequencies. Understand RF signal degradation with our

Jun 06, 2026

Signal Attenuation Calculator – Compute dB Loss in Cables, Fiber

Calculate signal attenuation in decibels (dB) for cables, fiber optics, and RF transmission lines instantly with our free online Signal

Contact Us

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

Website: https://www.greatpremiersolutions.co.za
Email: sales@greatpremiersolutions.co.za
Phone: +27 82 914 3675
Address: Unit 5, Silicon Heights, 22 Electron Avenue, Cape Town, 8001, South Africa

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