

The optical cable slope value is too large



Overview

The optical power meter usually reads in dBm for power measurements or dB with respect to a user-set reference value for loss.

Key Takeaways

A large slope in an OTDR trace indicates high attenuation in that section of the fiber, often caused by bending, poor splices, or fiber defects. What a Large Slope Means

In OTDR testing, the slope of the fiber trace represents the attenuation coefficient of the fiber, typically measured in dB/km. A steep slope indicates that the fiber is losing more signal per unit length than expected, which can compromise communication quality and signal integrity. Normally, a well-installed fiber shows a small, consistent slope along its length, reflecting uniform attenuation.

Common Causes of Large Slope

- **Fiber Bending or Microbends:** Sharp bends or improper routing in trays or conduits can increase attenuation, especially at 1550 nm, which is more sensitive to bending than 1310 nm.
- **Poor Splices or Connectors:** A fusion splice that is misaligned or a connector with contamination can create localized high loss, appearing as a steep slope in the OTDR trace.
- **Cable Extrusion or Mechanical Stress:** Excessive pressure or deformation during installation can damage the fiber, increasing attenuation along the affected section.

- **Fiber Defects:** Manufacturing defects or aging can also cause sections of the fiber to attenuate more than normal, producing irregular slopes .

Troubleshooting and Corrective Actions

- **Inspect Fiber Routing:** Check for sharp bends, tight loops, or stress points and adjust the fiber path to maintain the minimum bend radius.
- **Examine Splices and Connectors:** Clean connectors with alcohol and inspect splices for proper alignment. Re-splice if necessary .
- **Compare Wavelengths:** Test at both 1310 nm and 1550 nm to identify bending-sensitive sections, as 1550 nm is more affected by microbends .
- **Check OTDR Settings:** Ensure correct refractive index, pulse width, and averaging time are set to avoid measurement artifacts .
- **Bidirectional Testing:** Measure from both ends to confirm the location and severity of high-attenuation sections .

Key Takeaway

A large slope in an OTDR trace is a clear indicator of high attenuation, which can result from bending, poor splices, mechanical stress, or fiber defects. Proper inspection, cleaning, and testing at multiple wavelengths are essential to identify and correct the problem, ensuring reliable fiber optic performance .

Article Content

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When making the "0dB" reference with three cables, two connections are included in setting the reference so the measured value will

The FOA Reference For Fiber Optics

The problem was the recovery from the reflectance overload at the connection between the launch cable and the cable under test

Everything you need to know about Fiber Optic Testing

Fiber optic sources, including test equipment, are generally too low in power to cause any eye damage, but it's still a good idea to

Dispersion Slope

The dispersion slope can be adjusted by changing the cable parameters such as the core diameter, the refractive index profile, or the

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Measuring Power in dB and dBm

The optical power meter usually reads in dBm for power measurements or dB with respect to a user-set reference value for loss.

OTDR used in fiber network acceptance test

In addition, make note of the sequential markings at both ends of the cable, as well as the adjusted value of refractive

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value of the gradients. We have verified that the unique, "wonn-like" pattern seen in the gradient is associated with the optic and not

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Signal Loss in Multimode and Single-Mode Fiber-Optic Cable Multimode fiber is large enough in diameter to allow rays of light to

Fiber Loss Limits – How Much Loss Is Too Much in Fiber Optic Testing?

Fiber loss, or attenuation, refers to the reduction in optical power as light travels through a fiber optic cable. While

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What are good values to set a OTDR to for PASS/FAIL? Splice threshold Reflectance threshold Slope threshold (slope is attenuation

Fiber-optic communication

An optical fiber patching cabinet. The yellow cables are single-mode fibers; the orange and blue cables are multi-mode fibers:

Dispersion Slope

Moreover, if such systems employ large effective area fiber to mitigate nonlinear effects, the spread in chromatic dispersion slopes is

LuphoScan, Form Talysurf Slope error analysis

Introduction er for the quality control of optical lenses. With tolerances getting tighter, optical designers are becoming increasingly

VHO-OTDR

The slope of the fiber trace shows the attenuation coefficient of the fiber and is calibrated in dB/km by the OTDR. In order to measure

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