OTDR tester shows no loss in fiber optic cable

Overview

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Key Takeaways

An OTDR may show no loss in a fiber optic cable due to measurement limitations, non-reflective events, or testing setup issues rather than the fiber being completely lossless.Understanding OTDR Measurements

An OTDR works by sending high-power light pulses down the fiber and measuring backscattered and reflected light to create a trace of the fiber's condition, including splices, connectors, and breaks . Unlike a power meter, it does not directly measure total insertion loss but infers loss from the backscatter signal. Therefore, a zero-loss reading does not necessarily mean the fiber has no attenuation; it may indicate that the OTDR could not detect small losses or certain events.

Common Reasons for Zero-Loss Readings
• Non-Reflective Events: Some splices or connectors have very low reflectance and may not produce a measurable reflection. If the OTDR cannot detect these events, it may appear as if there is no loss along the fiber .

• Dead Zones: OTDRs have a minimum distance after a reflective event before they can accurately measure loss. If a splice or connector is too close to the launch point or another event, the OTDR may not resolve it, resulting in a flat trace .

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• Pulse Width and Range Settings: Using an inappropriate pulse width or measurement range can reduce the OTDR's sensitivity to small losses. A long pulse may average out minor attenuation, while a short pulse may not reach the far end of the fiber .

• Launch Cable Issues: Without a proper launch cable, the OTDR may not correctly measure the first few meters of fiber, masking initial losses .

• Fiber Quality and Short Length: Very short fibers or high-quality fibers with minimal attenuation may produce traces that appear nearly flat, especially if the OTDR's resolution is insufficient to detect small losses .
Recommendations
• Use a launch cable to separate the OTDR from the first connector and reduce dead zone effects.

• Perform bidirectional testing to capture losses from both ends of the fiber.

• Adjust pulse width and range to optimize resolution for the fiber length.

• Compare OTDR results with a power meter and light source to verify actual insertion loss, as OTDRs are not ideal for precise loss measurement . By understanding these limitations and adjusting the testing setup, you can obtain a more accurate representation of fiber loss and avoid misinterpreting a zero-loss OTDR trace.

Article Content

OTDR – Optical Time Domain Reflectometer

On This PageWhat Is An OTDR?Purpose of An OTDRBenefits of An OTDRTypes of OTDRsHow to Use An OTDRTroubleshooting with An OTDRKeep LearningEven after a fiber plant has been installed, tested, and commissioned, a fiber link may experience problems ranging from too much insertion loss, retransmits, and bit errors to not functioning at all. OTDRs are the ultimate tool for troubleshooting an existing fiber cable plant. While other tools — such as visual fault locators (VFLs), fault finder...See more on flukenetworks The Fiber Optic Association

FOA Fiber U Quickstart Guide: Fiber Optic Testing With OTDRs

This is your "QuickStart" guide to testing fiber optic cable plants with an OTDR. We''ll give you the basic information you need and

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