

Testing Loss in fiber optic cables

The simplest way to measure loss in fiber optic cables is by using a power meter and light source.

A Launch reference cable is used initially to reset the reading of the power meter and set the zero reference point, then the "cable to test" is attached in series with the launch cable so that the power meter can show the reading of the "cable to test" only. *Click here to see a diagram.*

When you do this you measure the loss of the connector mated to the launch cable and the loss of any fiber, splices or other connectors in the cable you are testing.

Below is the approximate loss that you can expect in a standard fiber link:

- Each Connector = 0.5 dB
- Each Fusion Splice = 0.02
- Each km of MM Fiber = 3dB (850nm) or 1dB (1300nm)
- Each km of SM Fiber = 0.5dB (1300nm) or 0.4 dB (1550)

Calculate by adding (# of connectors x 0.5dB)+ (# of Splices x 0.02dB) + Fiber Loss (MM or SM)



How to avoid loss in a Fiber Network

In addition to the standard component losses in a fiber link there are a number of other conditions that will cause loss. Most of these can be corrected or minimized by strict work practices when installing or maintaining a fiber network.

Contamination

Dirty connectors or other foreign substances can obstruct the fiber's ability to pass light.

Solution: Clean connectors and optical ports sudden bends or twists in the cable

Transmission Loss

Primarily the result of random scattering of light and absorption by actual impurities within the glass.

Solution: Use more powerful TX/RX optics in active hardware or change fiber type / quality

Bend radius

A tight bend in the cable can cause additional attenuation. The smaller the bend radius, the greater the loss.

Solution: Check cable path to make sure that there are no

Back Reflection or Fresnel Loss

Reflection caused at the entrance or exit of the fiber (connectors, gaps etc) can interfere with light source signals and create higher bit error rate (BER) in digital systems

Solution: Changing connector types to APC can dramatically reduce Fresnel Loss.



Above: Clean connector face (left), Dirty connector face (right)

Product of the Month



Yamasaki TVOA1 Variable Optical Attenuator

The Yamasaki TVOA1 Variable Optical Attenuator is an accurate and reliable tool for introducing precise amounts of attenuation into an active optical fiber cable.

Attenuation is shown on the LCD screen in both dB and dBm. On shut down the VOA1 stores your settings and attenuation stepping, so that next time you turn it on, the TVOA1 is ready to use with your previous settings.

Click Here for more information