CERTIFY FIBER OPTIC CABLE LIKE A CHAMP

If you're accustomed to certifying copper cable, you'll be pleasantly surprised at how easy it is to certify fiber optic cable because it's immune to electrical interference. You only need to check a few measurements.

Attenuation (or decibel loss)—Measured in decibels/kilometer (dB/km), this is the decrease of signal strength as it travels through the fiber cable. Generally, attenuation problems are more common on multimode fiber optic cables.

Return loss—This is the amount of light reflected from the far end of the cable back to the source. The lower the number, the better. For example, a reading of -60 decibels is better than -20 decibels. Like attenuation, return loss is usually greater with multimode cable.

Graded refractive index—This measures how the light is sent down the fiber. This is commonly measured at wavelengths of 850 and 1300 nanometers. Compared to other operating frequencies, these two ranges yield the lowest intrinsic power loss (NOTE: This is valid for multimode fiber only.)

Propagation delay—This is the time it takes a signal to travel from one point to another over a transmission channel.

Optical time-domain reflectometry (OTDR)—This enables you to isolate cable faults by transmitting high-frequency pulses onto a cable and examining their reflections along the cable. With OTDR, you can also determine the length of a fiber optic cable because the OTDR value includes the distance the optic signal travels.

There are many fiber testers on the market today. Basic fiber optic testers function by shining a light down on end of the cable. At the other end, there’s a receiver calibrated to the strength of the light source. With this test, you can measure how much light is going to the other end of the cable. Generally these testers give you the results in dB lost, which you can then compare to the loss budget. If the measured loss is less than the number calculated by your loss budget, you installation is good. Newer fiber optic testers have an even broader range of capabilities. They can test both 850- and 1300-nanometer signals at the same time and can even check your cable for compliance with specific standards.

Precautions to take when using fiber

Intrinsic power loss—As the optic signal travels through the fiber core, the signal inevitably loses some speed through absorption, reflection, and scattering. This problem is easy to manage by making sure your splices are good and your connections are clean.

Microbending—These are minute deviations in fiber caused by excessive bends, pinches, and kinks. Using cable with reinforcing fibers and other special manufacturing techniques minimizes this problem.

Connector loss—This occurs when two fiber segments are misaligned. This problem is commonly caused by poor splicing. Scratches and dirt introduced during the splicing process can also cause connector loss.

Coupling loss—Similar to connector loss, coupling loss results in reduced signal power and is from poorly terminated connector couplings. Remember to be careful and use common sense when installing fiber cable. Use clean components. Keep dirt and dust to a minimum. Don't pull the cable excessively or bend it too sharply around corners.

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