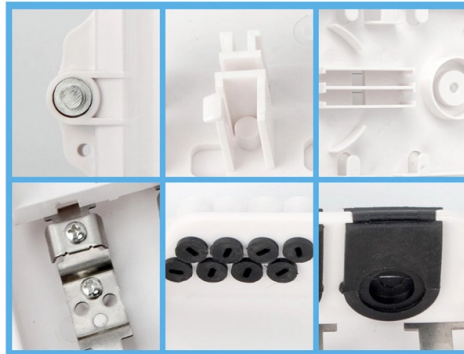


Analysis of the disadvantages of metallic optical cables



Article Overview

Metal optical cables, such as copper-based cables, are prone to signal degradation, electromagnetic interference, and environmental limitations compared to fiber optic alternatives.

Signal Degradation and Distance Limitations

Metal cables transmit data using electrical signals, which are subject to resistance and signal attenuation over long distances. This means that as the distance increases, the signal weakens, often requiring repeaters or amplifiers to maintain data integrity, which adds to cost and complexity. In contrast, fiber optic cables experience significantly lower attenuation and can transmit data over much longer distances without signal boosters.

Susceptibility to Electromagnetic Interference (EMI)

Metal cables are vulnerable to electromagnetic interference from nearby electrical equipment or other cables, which can degrade signal quality and cause data errors. Even shielded twisted pair designs cannot fully eliminate crosstalk or external EMI, making metal cables less reliable in high-interference environments such as industrial or military applications.

Environmental and Physical Limitations...

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While fiber optics dominate in performance, copper retains its technical and economic justification. Let's take a deeper

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