



FIBER OPTIC CABLING FOR INDUSTRIAL AUTOMATION



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Suitable for the Toughest Applications

In the past, fiber optic cable was considered too fragile and expensive for factory applications; a cutting-edge technology that was not suitable for the day-to-day requirements of industrial facilities. However, advancements over the past 10 years have resulted in fiber optic systems being used to meet the requirements of new and existing manufacturing environments. Fiber cables are able to carry a wide variety of signals and data with capabilities that copper cables cannot match.



Fiber can be easily integrated with the existing copper cabling with the use of media converters, providing the flexibility to add new devices without replacing costly equipment and cabling. Many industrial locations have intelligent device monitors and other remote equipment that need to be linked within the system. A fiber network can also provide centralized communication between the devices, as well as the bandwidth to allow for future expansion and upgrades.

Reasons to consider using fiber over copper in an industrial setting:

 <p>Optical fiber systems can easily accommodate modifications, additions and upgrades. Installation and maintenance of fiber has been simplified with the advancement of fiber termination and test equipment. Recent developments such as small form-factor pluggable (SFP) transceivers and dip switches simplify connections and configuration of a fiber network.</p>	 <p>Because it is electrically non-conductive, optical fiber is immune to electromagnetic interference, allowing highly reliable networks in high EMI environments and in crowded wire ways.</p>	
 <p>Optical fiber is secure. Many refineries and other critical industries are using fiber optic instead of wired and wireless Ethernet due to security concerns because fiber optic signals, unlike electronic signals traveling via copper, do not emit electromagnetic waves that are easily captured. Fiber optic signals also resist deciphering by hackers.</p>	 <p>Optical fiber offers higher data rates and wider bandwidths than copper, with a single optical fiber capable of carrying as much as 10Gbps in industrial applications.</p>	
 <p>Signal strength loss (attenuation) of optical fiber is significantly less than copper. In practice, transmission distances are so much greater over fiber than copper, distance becomes a non-issue in any industrial setting.</p>	 <p>Optical fiber don't spark cause shock or have ground loops, which protects personnel as well as connected equipment from lightning strikes, surges and electrical faults. It is compact and lightweight, saving space in panels, wire ways and ducts. It also resists corrosion and has a longer life expectancy than copper or coaxial cable.</p>	 <p>Optical fiber can transmit a wide variety of digital and analog signals, such as contact closure information, or can multiplex bi-directionally by using inexpensive converters that translate electrical signals to and from optical data streams. This includes copper/fiber media conversion of serial protocols such as RS232/485, Ethernet, Ethernet/IP, ControlNet, PROFIBUS, DH+ and Modbus.</p>
 <p>Optical fiber provides high ROI and low life cycle cost. In applications where distance, speed, security, reliability and safety are important, fiber optic cable often carries a lower installation cost than copper, as well as lower maintenance costs and a longer life.</p>		



Industrial automation applications have unique requirements for communication networks that differ from those of commercial-grade networks. Industrial network components must withstand much harsher environmental conditions, which can include extreme temperatures, lightning strikes, electromagnetic interference and installation in hazardous area locations.

The use of fiber optic data transmission for industrial automation and process control has become increasingly popular over the past decade. A basic fiber optic system, using an optical transceiver circuit and fiber optic media, offers a wide array of benefits that are not available with traditional copper conductors. Fiber optic cabling is commonly used in industrial automation applications to provide highly reliable networking systems that don't fail, thus maintaining revenue production and worker safety.

Examples include:

- Mines that require a fault-tolerant networking topology for hoisting people and equipment
- Conveyor systems for material handling
- Offshore rigs for drilling
- Rail and transportation projects involving access gates and turnstiles
- Emission monitoring systems for power utilities
- Fire, security, HVAC monitoring
- Oil and gas refineries
- Military and defense

Work with a Trusted Partner

Choosing the right supplier is an important consideration when developing the needs of your fiber network. Our HELUCOM[®] line of fiber products includes rugged indoor and outdoor cables designed to suit a wide variety of applications, including PROFINET and PROFIBUS systems. HELUKABEL also has a broad range of connectors, splice enclosures, MTP/MPO cassettes, tools and testers, as well as technical support to assist with design considerations. We have been the leading manufacturer of cable and wires since 1978 and will continue to develop cable products to remain at the forefront of technological advancement within the industrial sector.

For additional information on HELUKABEL's fiber optic cabling solutions for industrial applications, please reach out to our experts at cables@helukabel.com.

