Article Side

An Introduction to the world of fiber optics by Heather Protz

Article published on March 22nd 2012 | Communication

What is Fiber-optics?

Fiber-optics is the science that deals with the design and application of the optical fiber network. The optical fiber is a thin wire about the size of a human hair that is used to transmit data using the principles of total internal reflection of light. Transmitting data through optical fibers ensures the transmission of signals without much data loss. Because of their thin size, optical fibers have many advantages over traditional copper wires and are fast replacing other conventional modes of data transmission due to their vas applications.

How does it work?

Not going into the technical aspects in detail, we can simply say that optical fibers work on the principle of total internal reflection of light. Total internal reflection is not an overly complicated concept in itself. When light enters a medium of greater density from a rarer medium, the opposite of refraction takes place. Instead of the light passing through the medium, it gets reflected. This principle is manipulated and deployed into the fiber optic network. In an optical fiber, the light is guided into the fiber and transmitted. A simple optical fiber, in a lenient sense, consists of a tube within a tube. Technically, the inner and the outer tubes are referred to as the core and the cladding respectively. The outer tube has lesser density when compared to the inner tube, meaning the inner tube possesses a greater refractive index. This enables the light that enters the tube to get reflected multiple times. This type of data transmission is faster and is more viable for long distance communications.

Are there types to it?

Optical fibers come in two types: single-mode fibers and multi-mode fibers. While multi-mode optical fibers are ideal for communication within a short distance, single mode fibers are used for long distance communication across towns and cities. This results from the difference in the diameter of the tubes in the core and cladding of the fibers.

What are its applications?

From its deployment in image transmission in the nineteenth century, optical fibers are now used in various fields ranging from telecommunications. Due to its flexibility, the optical fibers can be used in the medicinal field to power cameras that are used to scan internal organs. In the telecommunications industry, fiber optic cables are ideal for data transmission. Because of their thin, almost transparent design, fiber optical cables can be bundled in long distance data transmission. In short distance communications, fiber optics can be used for ductless data transmission and therefore, they save a lot of space. Many telecommunication companies in the US like Verizon have long since switched to employing fiber optic networks for their data transmission.

What about the advantages?

There are many advantages that come with using the Fiber-optic network. First and foremost, a fiber-optic network has a higher carrying capacity. With a greater bandwidth and carrying capacity, data transfers can happen faster than before. Not only that, with fiber-optic communication you can expect lesser data loss and interference. This means you can watch the TV, browse the Internet and talk on the phone with few to no interruptions. Fiber-optic cables are made of non-conducting or

insulated material so there are less chances of signal leakage. As there is no current flow, there can be no electric sparks. With a fiber optic network, the chances of faulty cables are greatly reduced. Fiber optic networks are more secure hence there is no room for cross talking. This is why telecommunication companies like Verizon have switched to operate a fiber-optics network to provide excellent home phone service like the FiOS Digital Voice through which you can make calls at crystal clear qualities.

Above all, fiber-optic communication is especially advantageous over other forms of communications and data transmission because it can be used in long distance communication. Not only that, fiber opticals are less expensive too. Lengthy cables at cheaper prices capable of larger data transmissions over great distances in a lesser time-it may take a while to replace this form of technology.

Article Source:
http://www.articleside.com/communication-articles/an-introduction-to-the-world-of-fiber-optics.htm - Article Side

Heather Protz - About Author:
Heather is an active blogger and freelancer. A student by profession, she likes to write about study tips, adventure sports and the latest advancements in technology. Her activities include going on road trips, learning about different cultures and sourcing out some great deals like the one given on a FiOS Digital Voice

Article Keywords:
FiOS Digital Voice