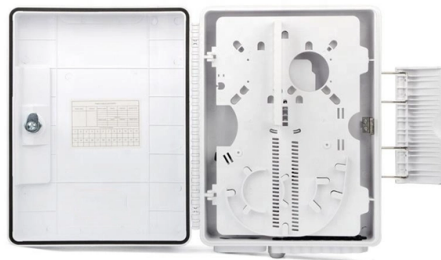


How do optical fibers transmit information



AI Overview

Optical fibers transmit information by converting electrical signals into light pulses, guiding them through glass or plastic fibers using total internal reflection, and converting them back into electrical signals at the destination.

Structure of Optical Fibers

An optical fiber consists of three main components: the core, cladding, and protective outer layer. The core is the innermost part where light travels and has a higher refractive index than the surrounding cladding, which keeps the light confined through total internal reflection. The protective outer layer shields the fiber from physical damage and environmental factors .

Transmission Mechanism

- **Light Source:** Data is first converted from electrical signals into light pulses using a laser diode or LED. These light pulses represent binary information (ones and zeros) .
- **Guiding Light:** The light travels through the fiber core, bouncing repeatedly off the cladding due to total internal reflection. This ensures minimal signal loss and allows the light to propagate over long distances .
- **Modulation:** Information is encoded onto the light by modulating its intensity, phase, or wavelength, allowing high-speed transmission of digital data .
- **Reception:** At the receiving end, a photoelectric detector converts the light pulses back into electrical signals that can be interpreted by computers or communication devices

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Contact Us

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