

Fiber Optic Dual-Heart Line



Article Overview

A Fiber Optic Dual-Heart Line is a system using fiber-optic sensors to simultaneously monitor cardiovascular signals from multiple points, enabling precise, non-invasive heart rate and pulse measurements.

Overview

A Fiber Optic Dual-Heart Line typically employs fiber Bragg gratings (FBGs) embedded in optical fibers to detect subtle mechanical vibrations caused by heartbeats. These sensors can be positioned at multiple locations on the body, such as the left and right radial arteries, to capture synchronized cardiac signals. The system converts mechanical pulse waves into optical signals, which are then processed to extract heart rate, pulse transit time, and other cardiovascular parameters .

Key Components

- Fiber Bragg Gratings (FBGs): Act as sensitive strain sensors that reflect specific wavelengths of light, shifting in response to arterial pulsations .
- Broadband Light Source: Provides illumination through the optical fibers.
- Edge Filters or Interferometers: Such as Mach-Zehnder interferometers, used to convert wavelength shifts into measurable intensity changes .
- Signal Processing Units: Often FPGA-based, these units analyze the optical signals to calculate heart rate, pulse transit time, and blood pressure .
- Multiplexing Systems: Coarse wavelength-division multiplexers (CWDM) allow multiple FBG sensors to operate on a single fiber line, enabling dual or multi-point...

Article Content

2 × 2 MIMO mm-wave wireless signal transmission based on a novel

To our knowledge, this is the first experimental demonstration of 2 × 2 MIMO wireless signal transmission using dual

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When planning a fiber optic network, one key decision is choosing between single-fiber (BiDi) and dual-fiber optical transceivers. This

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To verify the feasibility and general applicability of the proposed flexible misaligned fiber-optic sensor for monitoring

Difference Between Single vs Dual Fiber Optical Transceivers

Dual Fiber: Employs two separate optical fibers, one dedicated to transmitting and the other for receiving data. Offers a simpler

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Zipcord, Dual-Link and Micro-Dual Cable for short distance optical interconnects. Zipcord, DUAL-link and Micro-Dual cables provide

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