

Fiber Optic Speed Measurement Sensor



Article Overview

Fiber optic sensors provide precise, high-speed, non-contact measurement of rotational or linear speed using light modulation through optical fibers.

Principles of Operation

Fiber optic speed sensors operate by transmitting light through an optical fiber and detecting changes in the light signal caused by a moving target. These changes can be in intensity, phase, wavelength, or polarization, depending on the sensor design. The sensors are broadly categorized into:

- Intrinsic sensors: The fiber itself acts as the sensing element, directly modulating the light in response to motion.
- Extrinsic sensors: The fiber transmits light to an external sensing element, which modulates the light based on the target's speed. This approach allows non-contact measurement, making fiber optic sensors ideal for high-speed or delicate applications where traditional contact sensors may fail.

Key Features for Speed Measurement

- High bandwidth: Fiber optic sensors can operate at frequencies up to 100 kHz or higher, enabling accurate detection of rapid motion.
- Non-contact operation: The sensors can measure speed without physically touching the target, reducing wear and avoiding mechanical interference.
- Long-distance detection: With appropriate amplifiers and lenses, fiber optic sensors can detect targets at distances exceeding 300 mm.

Article Content

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Unlike point sensors, they can measure and provide a continuous spatial distribution of a physical quantity, effectively

Fibre Optic Sensor for Speed Measurement

There is however a demand for low-cost sensors capable of operating in potentially hazardous environments in which optical fibre

(PDF) Design and Development of Fiber Optic Sensor System for ...

PDF | On Jul 30, 2023, Shrikant M. Maske published Design and Development of Fiber Optic Sensor System for Rotational Speed

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Fiber Optic Sensors: Fundamentals, Principles & Applications

Extrinsic Fiber Optic Sensors Fiber is Only an Information Carrier To and From a Black Box Light Signal Generation in Black Box

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