

Principle of Through-beam Fiber Optic Sensors



AI Overview

Through-beam fiber optic sensors detect objects by transmitting light from a source to a receiver, sensing any interruption in the beam.

Working Principle

Through-beam fiber optic sensors operate using a transmitter-receiver configuration. One fiber carries light from a source to a receiver fiber positioned opposite it. When an object passes through the detection zone, it blocks or diminishes the light beam, and the receiver detects this change, signaling the presence, position, or shape of the object. Unlike reflective sensors, they do not rely on light reflection, making them effective for longer distances and reflective surfaces such as metal or glass.

Structure and Components

These sensors typically consist of:

- Transmitter fiber: Sends light across the detection path.
- Receiver fiber: Captures the transmitted light.
- Light source: Often LED, visible red, laser red, or infrared.
- Optional amplifier or self-contained module: Enhances signal detection and simplifies installation. Some modern designs, like self-contained thru-beam sensors, integrate the emitter and receiver into compact “fork” or “L-shaped” units, reducing setup complexity while maintaining high accuracy ...

Article Content

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Through Beam Fiber Optic Sensor, M3/M4/M6

This through beam fiber optic sensor has high performance and professional design, thread size M3, M4,

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Fiber Sensors

Detection Principles Optical fiber is comprised of a central core with a high refractive index surrounded by cladding with a low

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Understanding Fiber Optic's Role in Photoelectric Sensing

Photoelectric sensors and fiber optic sensors are very similar in a lot of ways, but which one

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Optical Fiber Sensors Guide

Operating principle fiber Bragg grating is wavelength-dependent filter/reflector formed by introducing a periodic refractive index

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Fiber optic through beam sensor

For installation with limited mounting space Operation as through-beam sensor Very long range For cutting to size Small bending radius

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FIBER OPTIC SENSOR GUIDE

Sensing type Select a fiber optic unit in consideration of the installation environment. Through-beam type,

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Fiber optic through beam sensor

For installation with limited mounting space Operation as through-beam sensor With 90° deflection of the light beam for use where

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Array Through-beam Fiber Optic Sensor

Array Through-beam Fiber Optic Sensor This Array Fiber optical sensor is ideal for a wide range of industries, including electronics

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Optical Fiber Sensors: Working Principle, Applications, and Limitations ...

Recent progress in numerous sensing fields, including environmental, industrial, and biomedical are discussed for

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Fiber Optic Sensors: Types, Working Principle

This article explores the different types of Fiber Optic Sensors, their working principles, and various

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Threaded Through-Beam Fiber Units | M3, M4, M6 Fiber Sensors

Discover how thru beam fibre optic sensors detect objects by blocking a light beam between emitter and receiver. Ideal for precise,

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Through Beam Fiber Optic Sensors - Mouser

Through Beam Fiber Optic Sensors are available at Mouser Electronics. Mouser offers inventory, pricing, & datasheets for Through

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What Are Through-Beam Photoelectric Sensors? | Working Principle

Through-beam photoelectric sensors work by having a separate emitter and receiver. The emitter sends a light beam, and the

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Thru-Beam Sensors

When an object breaks the beam of light between the emitter and receiver, the receiver's output changes state. Thru-beam sensing

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Optical Fiber Sensors and Sensing Networks: Overview of the Main ...

Therefore, the integration of optical fiber sensors in WSNs introduces benefits and new capabilities for the design of advanced hybrid

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Optical Fiber Sensors and Sensing Networks: Overview of the Main

Optical fiber sensors present several advantages in relation to other types of sensors. These advantages are

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Overview of Photoelectric Sensors | OMRON Industrial Automation

The incredibly high resolution achieved with these Sensors derives from advanced design technologies that yielded a very small spot

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Through-Beam Fiber Optic Sensors

Fiber optic sensors detect the presence of objects using highly focused light transmitted through a fiber optic cable and detected with

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fiber optic through-beam and dif. reflection sensors

It uses e.g. visible red light (660nm), which is transmitted through the fiber by the principle of total internal reflection (see figure

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10.083-97_Photo1

Fiber-optic waveguides These extend the range of possible applications of photoelectric fiber sensors with important additional fi

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How Through-Beam Photoelectric Sensors Work: A Technical

Learn how through-beam photoelectric sensors operate with a separate emitter and receiver. This article covers

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Fiber Optic Sensor Principles | How Photonic Sensors Work | MTI

Learn how MTI's Photonic fiber optic sensors measure displacement, vibration, and surface conditions using reflected light. Explore

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Introduction to Fiber Optic Sensors and their Types

Article provides different types of Fiber optic sensors and applications is a sensor that uses optical fibers for sensing the element

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How to Specify Fiber Optic Sensors | Library of Automation Direct

Fiber optic sensors, sometimes called fiber photoelectric sensors, include two devices which are typically specified

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Fiber Sensors

These Sensors operate on the principle that an object interrupts or reflects light, so they are not limited like Proximity Sensors to

Mar 16, 2026

Fiber optic sensors and fiber optics | Baumer USA

Unlike fiber optics with a single, point-shaped light beam, array fiber optics generate a broad, linear light band. Depending on the

Jul 27, 2025

Through-Beam Sensor Overview | PDF | Optics | Sensor

The document discusses through-beam photoelectric sensors, including their principle of operation using a light transmitter and

Nov 11, 2025

Through-beam sensors | Balluff

Through-beam sensors from Balluff serve to detect objects reliably, regardless of surface, color, material -

Mar 22, 2026

What is a fibre optic sensor? | Sensor Basics: Principle ...

The optical fibre consists of the core and the cladding, which have different refractive indexes. The light beam travels through the

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What is a Fiber Optic Sensor?

A fiber optic sensor operates with an optical fiber cable connected to a dedicated light source. These sensors offer great mounting

Contact Us

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