What is a through-beam fiber optic sensor



Overview

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

Key Takeaways

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

© 2026 METRA FIBER MARKET - All rights reserved

Advantages

Long detection range: Limited only by the separation between fibers, not the distance to the fiber end. High accuracy and resolution: Laser versions can detect objects as small as 0. 03 mm.

Reliable on reflective surfaces: Works well with metal, glass, or shiny materials. Robust in industrial applications: Self-contained designs offer high excess gain, tolerating dust, moisture, and debris.

Limitations

Precise alignment required: Transmitter and receiver must be carefully positioned, increasing installation complexity. Higher cost: More expensive than reflective fiber sensors due to dual-fiber setup and calibration needs. Environmental sensitivity: Performance can be affected by fog, dust, or rain if not properly protected.

ApplicationsThrough-beam fiber optic sensors are widely used in: Parts detection on conveyor belts (down to 0. 3 mm with visible red, 0. 03 mm with laser)Parts dimension verification (repeatability down to 0.

01 mm with laser)Counting and position verification in assembly linesTool breakage monitoring and press applicationsHigh-speed registration mark sensing in packaging machinery. SummaryThrough-beam fiber optic sensors are highly precise, long-range, and reliable devices ideal for detecting objects in industrial environments, especially when reflective surfaces or extended detection distances are involved. Their main trade-offs are installation complexity and cost, which are mitigated in modern self-contained designs.

They are preferred over reflective sensors when beam interruption detection is critical or when working with opaque or reflective targets.

Article Content

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, noise-immune sensing.

Fiber Optic Sensors | KEYENCE America

There are several types of fiber optic sensors. Detection methods include thrubeam, reflective, retro-reflective, and definite-reflective. Each method is used for different applications and targets.

Overview of Photoelectric Sensors | OMRON Industrial

© 2026 METRA FIBER MARKET - All rights reserved

An Area Sensor is a Through-beam Sensor which consists of a pair of Emitter and Receiver with multiple beams. Select the sensing width of the Sensor to fit the

Fiber Sensors

When a sensing object passing between the emitter and receiver fibers interrupts the emitted light, it reduces the amount of light that enters the receiver. This reduction in light intensity is used to detect

What is a Fiber Optic Sensor?

Learn all about the principles, structures, and features of eight sensor types according to their detection principles. The fiber optic sensor has an optical fiber connected to a light source to allow for detection

Through-Beam

Through-beam photoelectric sensors consist of an emitter and a receiver in separate housings. The emitter sends a beam of light to the receiver, which determines a

Thru-Beam/Opposed Mode Sensors | TRI-TRONICS

Self-contained, easy-to-use sensors available in a wide variety of sensing models (thru-beam, retroreflective, proximity and fiber optic) to fit virtually any application.

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 receiver detects it. When an object interrupts the beam, the sensor triggers a

Through-beam sensors

Through-beam sensors from Balluff serve to detect objects reliably, regardless of surface, color, material - even with a heavy gloss finish. They consist of separate

Omron E32-T16WR Fiber Optic Sensor | Features & Guide

Examine the Omron E32-T16WR fiber optic through-beam sensor. Learn its specs, features, amplifier options, and applications in this detailed overview.

Optical Tachometer: Non-Contact RPM Speed Sensor | Vibromera

An optical tachometer is a non-contact speed-measurement device that uses light — a visible LED, a laser, or infrared — together with a photodetector to sense rotation, either by detecting

Through Beam Laser Sensor Head KEYENCE IL-600, Output Type:

© 2026 METRA FIBER MARKET - All rights reserved

Keyence Through Beam Fiber Optic Sensor ₹ 5,000/Piece Contact Supplier Ghaziabad, Uttar Pradesh Smart Store TrustSEAL 9 yrs ★★★★★★★★★★3.7(58) View Mobile Number

Long Range Through Beam Fiber Optic Sensor Unit FU-71Z M6

Long Range Through Beam Fiber Optic Sensor Unit FU-71Z M6 Thread Industrial Automation Detection Equipment

PDF document

PDF document PDF document Read this PDF document online, download the original file, and browse related details on device.report. Additional coding instructions can be found in the Article File chapter

FU-R77G Green LED Through-beam Fiber Optic Sensor Stainless

FU-R77G Green LED Through-beam Fiber Optic Sensor Stainless Steel Semiconductor Inspection Industrial Automation Equipment

FN-T102 Super Small Optic Fiber Sensor Head Through Beam R15

FN-T102 Super Small Optic Fiber Sensor Head Through Beam R15 Bend Radius For FTS2-320-S15Q Permalink:

stemnet2.txt · 60856c1d2f06b2e3d4cea3560375fd3cf447af61 · etcart ...

TUT Dept. of Computer Systems GitLab server etcart / 60856c1d2f06b2e3d4cea3560375fd3cf447af61 Switch branch/tag RIVet stemnet2.txt Find file Blame History Permalink ...

Collimated beam

The term collimated may also be applied to particle beams – a collimated particle beam – where typically shielding blocks of high density materials (such as lead, bismuth alloys, etc.) may be used to absorb

© 2026 METRA FIBER MARKET - All rights reserved

Contact Us

Continue your research online:

Website: https://metramarket.es
Technical inquiry: https://metramarket.es/contact.html

This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

© 2026 METRA FIBER MARKET - All rights reserved