

Confocal Fiber Collimator



AI Overview

A Confocal Fiber Collimator is an optical device that converts diverging light from a fiber into a collimated beam or focuses light into a fiber, enabling precise fiber-to-fiber or fiber-to-free-space coupling.

Overview A fiber collimator is designed to transform the diverging light exiting an optical fiber into a nearly parallel, collimated beam, or conversely, to focus a free-space beam into a fiber core. In a confocal configuration, the fiber end is positioned at the focal point of a lens, ensuring that the output beam is collimated with minimal divergence and diffraction-limited performance. This setup allows for high-precision optical alignment and efficient light transfer between fibers or between fiber and free-space optics.

Design and Components

- Lens:** Typically a high-quality, diffraction-limited lens that determines the collimated beam diameter based on its focal length and the fiber's numerical aperture.
- Mechanical Housing:** Pre-aligned or adjustable mounts maintain the fiber at the lens focal point, providing long-term stability.
- Optional Coatings:** Anti-reflection coatings reduce back reflections and improve transmission efficiency.
- Adjustability:** Some collimators allow fine-tuning of lateral and angular alignment to optimize coupling efficiency.

Applications

- Fiber-to-Fiber Coupling:** Paired collimators can transfer light between fibers with minimal loss.
- Fiber-to-Free-Space Interfaces:** Collimators enable integration of fiber-coupled lasers with free-space optical systems.
- Optical Components:** Used with Faraday rotators, modulators, or sensors to create fiber-optic devices.
- Laser Systems:** Collimators provide stable, diffraction-limited beams for precision laser applications.

Performance Considerations

- Beam Diameter:** Determined by the lens focal length and fiber divergence; longer focal lengths produce larger collimated beams.
- Alignment Stability:** High-quality confocal collimators maintain alignment over time, critical for sensitive optical setups.
- Diffraction-Limited Output:** Ensures minimal beam distortion and high-quality focus...

Article Content

Overview of Andor Modular Solutions for

This article provides a description of several configurations for home-built micro-spectroscopy setups, including both upright and inverted microscopes.

What is RGB ACHROMATIC COLLIMATOR

UltraOpto RGB Achromatic Collimator, specially designed for the red, green, and blue three-band visible light, adopts low-dispersion glass and a stacked lens structure. It can eliminate

Multi-Wavelength Laser

A core-less end-cap is included for fiber tip protection against optical damage and degradation due to optical radiation. Fiber Termination - Collimator (CT): Collimator is a custom option in each case and

F-H10-IR-FC Datasheet

Newport MKS Fiber-optic Collimator, Adjustable, 1000 - 1700 nm, FC/PC F-H10-IR-FC
The F-H10-IR-FC Collimator is designed specifically for single-mode and polarization maintaining (PM) fiber

Adjustable Fiber Optic Collimators

Adjustable Fiber Optic Collimators Our adjustable fiber optic collimators allow the user to vary the beam for best collimation at the wavelength and the distance of

An ultra-compact metasurface-based chromatic confocal sensor

Metasurfaces are planar optical elements that provide much greater freedom in manipulating light than conventional optics. This article explores the potential for miniaturised

An ultra-compact metasurface-based chromatic confocal sensor

We consider the realisation of a chromatic confocal sensor for position measurement, where a conventional hyperchromatic lens is replaced by a metasurface. The design and fabrication

Multi-Wavelength Laser

Fiber Termination - Collimator (CT): Collimator is a custom option in each case and would require designing and development according to customer's requirements.

Optical Coupling Efficiency of a Coupler with Double-Combined

In the present study, a symmetrical fiber coupler with DCLs and TECF was designed. The optical coupling performance of the coupler was analyzed by investigating the structural

WaveSource Photonics, Inc.

We have the capability to design and manufacture custom collimators to the specs of your choice. Beam diameter, working distance, fiber type, and wavelength can

Fiber-Coupled Focusing Lens (Collimator) 525 nm FC/APC

The Fiber-Coupled Focusing Lens (Collimator) 525 nm FC/APC is a precision optical component engineered for high-fidelity beam manipulation in visible-light spectral applications.

OVERVIEW CHROMATIC CONFOCAL POINT SENSORS

Whatever your needs are in high-precision chromatic confocal sensor technology, we can meet them through our broad product portfolio of line and point sensors, multi-point sensors, and as an OEM

F-H5-NIR-APC Fiber-optic Collimator

The F-H5-NIR-APC Collimator is designed specifically for single-mode and polarization maintaining (PM) fiber applications in the 600 to 1000 nm range, which need to generate a clean Gaussian Beam at

How to Use Telemetry Confocal Fiber Collimator

Its core function is to achieve efficient coupling between coaxial fibers and free-space optical paths, converting the divergent light beam emitted from

Long-Distance Measurements Using a Chromatic

In this work, we demonstrate the use of a chromatic confocal sensor for long-distance measurements. The sensor increases the working distance of

F-H5-NIR-APC Fiber-optic Collimator

It is designed for long distance projection applications such as free space communications and alignment of very large objects. It is also ideal for interferometry, confocal microscopy and

TUTORIAL: Fiber Optic Collimators

Fiberoptic collimators come in many forms. They can be single mode or multimode. Their diameters can be as small as the fiber itself, for example 125 μm , or as

Fiber Coupling and Collimation

Fiber Coupling and Collimation Mounting options for Fiber Collimators series 60FC-T, 60FC-Q, and 60FC-L with an outer diameter $\varnothing$ 25/28 mm with flange

TUTORIAL: Fiber Optic Collimators

Gaussian beams maintain collimation over a certain distance, often called the beam confocal parameter which varies from a fraction of a millimeter for very small

Design and Research of Chromatic Confocal System for Parallel Non ...

This paper proposes a chromatic confocal system for parallel non-coaxial illumination based on the optical fiber bundle, and it solves the problem of a low signal-to-noise ratio and low light

Light to Fiber Couplers/Collimators

AMS Technologies welcomes opportunities to fiber couple into your specific photodiode. Please contact us with details of the fiber required and the photodiode specifications, and we will determine the best,

Contact Us

For more information, pricing, or custom solutions, please contact us:

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