

RIVO MULTITRADE OPTICAL SYSTEMS

Dedicated Coupling System for Optical Modules



Overview

The G&H PM Coupler enables the accurate monitoring and splitting of optical signals in polarisation maintaining fibre.

Key Takeaways

Dedicated coupling systems enable precise alignment and efficient optical signal transfer between fibers and optical modules, supporting both research and industrial applications.

Overview
Dedicated coupling systems are designed to align optical fibers with photonic devices or optical modules to ensure minimal signal loss and high coupling efficiency. These systems are critical in applications such as silicon photonic chips, AWG arrays, WDM modules, PLC splitters, and laser diodes, where precise optical alignment is essential for performance .

Types of Coupling Systems



1. **Semi-Automatic Waveguide Coupling Platforms** Platforms like the PWS-10E Series integrate dual-side XYZ motorized stages, 6-DOF precision adjustment, multi-axis microscopy, and optional temperature-controlled chip stages. They allow nanometer-level alignment of fibers to optical devices, supporting both single fibers and fiber array (FA) coupling. Optional modules such as UV curing and adhesive dispensing enable industrial-level packaging .

2. **Miniaturized Optical Coupling Modules** Modules such as HUBER+SUHNER Cube Optics WCM provide direct interfacing between electro-optical components and fibers. These modules are extremely compact (less than 1.2 mm in height) and can include integrated WDM functionality. They support automated assembly and alignment, with customizable spot spacing to match component layouts .

3. **Passive Alignment Optical Modules** Some optical modules use dedicated guide pins and optical elements to achieve passive alignment with fiber connectors. The guide pins ensure that the optical axis of the module aligns with the fiber axis without active feedback, simplifying integration while maintaining high coupling efficiency .

4. **Fused Fiber Couplers** Fused couplers, such as those from Corning, split or combine optical signals and are used for monitoring, feedback, and WDM applications. They offer low polarization-dependent loss and can be customized for split ratios, lengths, and packaging, providing a cost-effective solution for network expansion .

Applications

- **Research and Development:** High-precision platforms are used in universities and institutes for silicon photonics and optical-electrical packaging.
- **Industrial Production:** Automated coupling modules and fused couplers support high-volume manufacturing of optical transceivers and WDM devices.
- **Smart Optical Modules:** Advanced systems allow packet-based management and disaggregated control, enabling efficient operation of pluggable optical modules in modern optical networks .

Key Features

- **High-precision alignment:** Nanometer-level translation and sub-degree rotational control.
- **Automation:** Supports automated scanning, signal peak locking, and closed-loop optimization.
- **Modularity:** Configurable stages, microscopes, and curing systems for specific applications.
- **Compact design:** Miniaturized modules reduce board space while maintaining optical performance.
- **Integration with smart networks:** Some modules support virtualized transponders and independent addressability for network management . Dedicated coupling systems are essential for maximizing optical performance, reducing insertion loss, and enabling scalable production of optical modules in both research and commercial environments.

Article Content

PWS-HE Series Full-Auto Coupling System | Motorized 6-Axis Vision ...

Designed for optical-electrical packaging of semiconductor chips, silicon photonic devices, and other passive components, this

Semi-Auto Optical Coupling System | PWS-10E Series & Motorized 6

Designed for optical-electrical packaging of semiconductor chips, silicon photonic devices, and other passive components, this

Optical Coupler

Optical coupler is a semiconductor device, which is designed to transfer electrical signals by using light waves in order to provide

Optical module, optical module substrate and optical coupling structure

Various proposals have been made on the photoelectric conversion module, also called "optical module", in which an optical element

Optical Coupling Modules

The coupling module array is specifically designed for multi-channel applications. Our patent pending technology enables an

Optical Couplers

The G&H PM Coupler enables the accurate monitoring and splitting of optical signals in polarisation maintaining fibre. Manufactured

Fiber Optic Coupling

What a lens system can achieve is only to retrieve the efficiency of butt coupling when the fiber must be placed at a distance from a

A Mechanical-Optical Interface for 25+ Gbps VCSEL/PD Fiber

The mechanical-optical interface (MOI) is a monolithic component with an array of collimating lenses designed for efficient coupling

Fiber Couplers – optical fiber

A fiber coupler is an optical fiber device that connects multiple fibers, allowing light from an input fiber to be

A Review of Optical Coupler Theory, Techniques, and Applications

Grating coupling is a widely adopted strategy for coupling light into optical waveguides. While this versatile approach

Optical module design resources | TI

Design requirements Modern optical module designs often require: Reduced power consumption to control and limit module

Automatic Fiber-optic-coupling Alignment System

Automatic Fiber-optic-coupling Alignment System Spatial optical coupling is a key technology in wireless-optical communication

Optoelectronic Packaging Using Passive Optical Coupling

About 60% to 80% of the manufacturing cost of these components resides in fiber pigtailling and packaging. We discuss the

NTT Technical Review, April 2003, Vol. 1, No. 1

We have developed a technique called MOCA, which stands for multichannel optical coupling with an aspherical lens, and clarified

Optical Solutions

Optical Flex Circuits FlexPlane Optical Flex Circuits provide versatile, high-density routing on a flexible substrate, and Routed Ribbon

Automatic Fiber-optic-coupling Alignment System

Spatial optical coupling is a key technology in wireless-optical communication systems. Highly efficient coupling can

Progress in Research on Co-Packaged Optics

Intel is dedicated to conducting research and development on pluggable optical modules and microring modulator technology. Since

ELSFP Interconnect System

Supporting co-packaged optics (CPO) solutions for next-generation data center connectivity, the ELSFP Optical Connector system

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