

Connection of photoelectric converter and optical module



Overview

US9470864B1 The present invention relates to a photoelectric device, and more particularly, to a photoelectric conversion module to provide signal transmis.

Key Takeaways

A photoelectric converter connected to an optical module converts electrical signals into optical signals and vice versa, enabling high-speed data transmission over optical fibers.

Overview

A photoelectric converter is a device that transforms electrical signals into optical signals (for transmission) or optical signals into electrical signals (for reception). When integrated with an optical module, it forms a key component in fiber-optic communication systems, operating at the physical layer of the OSI model. Optical modules typically include optical transmitters, optical receivers, functional circuits, and optical interfaces to facilitate this conversion.

Working Principle

Transmission Side: Electrical signals are input into the optical module through a driver circuit. The internal semiconductor laser diode (LD) or light-emitting diode (LED) modulates the light according to the electrical signal, producing an optical signal. **Optical Transmission:** The modulated optical signal travels through an optical fiber or waveguide to the receiving end.

Reception Side: The optical signal is captured by a photodetector diode, which converts it back into an electrical signal. The signal is then amplified and output at the corresponding bit rate. Some advanced photoelectric conversion modules include flexible substrates, optical micro-reflection surfaces, and integrated IC chips to enhance signal transmission between the optical and electrical layers.

Applications
Fiber-optic communication: Extending Ethernet or industrial network signals over long distances, often several kilometers, without signal degradation.
Industrial Ethernet: Devices like the ZLAN9100 convert 10M/100M Ethernet signals to optical signals for long-distance transmission, connecting Ethernet devices to optical switches.
Specialized modules: Single-receiver or single-transmitter modules are used in scenarios requiring only reception or transmission, while CWDM modules combine multiple wavelengths for efficient fiber usage.

Practical Considerations

Connection orientation: Some optical transceivers require correct pairing (e.g., A terminal to B terminal) to function properly.
Power supply: Industrial modules often support wide voltage ranges (e.g., 9–24V) for flexible deployment.
Integration: Modules may include optical waveguides, flexible substrates, and IC chips packaged in carriers or optical connectors to ensure reliable signal conversion.

In summary, connecting a photoelectric converter to an optical module allows seamless electro-optical and opto-electrical conversion, enabling high-speed, long-distance data transmission in fiber-optic networks and industrial communication systems.

Article Content

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The present invention relates to a photoelectric device, and more particularly, to a photoelectric conversion module to provide signal transmission between the optical layer and...

Learn About Optical Transceiver Modules in One Minute

Role of Optical Transceiver Module The optical module is a carrier used for transmission between the switch and the equipment. It is a connection

Fundamentals of an Optical Module

As an important part of fiber-optic communication, an optical module is a photoelectric converter which converts electrical signals into optical signals and vice versa. An optical module works at the physical

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In this photoelectric conversion module, the photoelectric conversion element and the optical fiber are directly optically coupled without using an optical component such as a lens.

RF photoelectric conversion module

Two modules are used in pairs. The radio-frequency signal enters the launch module and is tuned into the optical signal, which is transferred into the receiving module via fiber optic transmission, is

Complete Guide to Photoelectric Sensor Wiring and Troubleshooting

This comprehensive guide will walk you through everything you need to know about wiring, setting up, and troubleshooting photoelectric sensors in industrial automation applications.

Optoelectronic Component Design for Photonic

The connection between the electronic and photonic realms is made by devices capable of encoding electrical signals on optical channels and recovering that

PHOTOELECTRIC CONVERSION CONNECTOR, OPTICAL

Field The present invention relates to a photoelectric conversion connector, an optical transmission module, an imaging apparatus provided with the optical transmission module,

ANO007 | Understanding Phototransistor Optocouplers

In order to design a functionally robust and reliable application with optocouplers, it is essential to understand not only the device's main parameters and parasitic elements, but also their tolerances

Optical Module vs Media Converter, How To Choose?

Knowledge Optical Module vs Media Converter, How To Choose? Both the optical module and the media converter are devices that achieve the

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Optical Transceiver Manufacturer,What's the difference between optical ...

Optical modules and media converters are both key photoelectric conversion devices widely used in fiber optic communication, data centers, enterprise networks, and broadband access

Learn About Optical Transceiver Modules in One Minute

An optical transceiver module is a photoelectric conversion accessory and one of the key devices in the field of optical communication transmission. It is composed of optoelectronic devices,

A co-packaged photoelectric converter module

In this paper, we introduced an ultra-compact photoelectric converter array module fabricated with hybrid-integration microassembly process, the practical test results showed a good optical coupling

What Is an Optical Module and Its FAQs (V200)

As an important part of fiber-optic communication, an optical module is a photoelectric converter which converts electrical signals into optical signals and vice versa.

RF photoelectric conversion module – 2GHz ~ 18GHz external

RF photoelectric conversion module – 2GHz ~ 18GHz external-modulated temperature-controlled wideband The RF optical transmission module mainly achieve 2GHz ~ 18GHz RF signal

Optical-To-Electrical Power Conversion and Data Transmission Module ...

Use of optical fiber to supply power for an electrical sensor or actuator is advantageous in applications where galvanic isolation between a control and remote unit is required or when immunity

Opto-isolator

An opto-isolator contains a source (emitter) of light, almost always a near infrared light-emitting diode (LED), that converts electrical input signal into light, a closed optical channel (also called dielectrical

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