

Article Overview

An OBD optical module is a fiber-optic transceiver used to extend or convert digital signals, such as video, audio, or serial data, over long distances with high fidelity.

Overview

OBD optical modules are compact, self-contained devices designed to transmit and receive digital signals over fiber-optic cables. They are commonly used in broadcast, professional audio/video, and automotive diagnostic systems. These modules allow high-bandwidth signals to travel long distances without degradation, often using WDM (wavelength-division multiplexing) for bi-directional communication over a single fiber .

Key Types and Applications

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Video Transmission (SDI)

o Example: OBD 1414 by Lynx Technik transmits 4 channels of 12G-SDI video over single fiber links. Each channel is independent and supports multiple SDI standards (12G, 6G, 3G, 1.5G). The modules auto-detect and re-clock signals to maintain broadcast-quality video over long distances .

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Audio Transmission (MADI)

o Example: OBD 1210 converts up to 64 audio channels between MADI optical and coaxial formats. It supports bi-directional, zero-latency transmission over distances up to 10km or 40km depending on the fiber type and configuration. CWDM versions allow multiplexing multiple wavelengths on a single fiber .

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Serial and GPI Data

o Example: OBD 1510 D extends RS232, RS422, RS485, and GPI signals up to 10km over a single bidirectional fiber link. It supports multiple serial standards simultaneously and allows flexible configuration of input/output modes .

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Automotive Diagnostics

o In automotive applications, optical modules are integrated into systems like BMW ICOM, which connects diagnostic interfaces to vehicle control units via fiber or LAN connections. These modules ensure stable

communication and maintain minimum voltage levels for reliable OBD diagnostics .

Technical Features

- o Bi-directional transmission using WDM for single-fiber operation.
- o Point-to-point applications; not compatible with CWDM multiplexed systems unless specifically designed.
- o Auto-detection and re-clocking for video or audio signals to prevent signal degradation.
- o Rack-mountable options with redundant power supplies for professional setups.
- o Support for multiple standards: SDI (video), MADI (audio), RS232/422/485 (serial), GPI, and automotive OBD protocols.

Summary

OBD optical modules are versatile devices that extend, convert, and maintain high-quality digital signals over fiber-optic links. They are essential in professional broadcast environments for video and audio distribution, in industrial or automotive systems for serial and diagnostic data, and in any application requiring long-distance, low-latency, and high-fidelity signal transmission .

View the TI Optical module block diagram, product recommendations, reference designs and start designing.

Fundamentals of an Optical Module As an important part of fiber-optic communication, an optical module is a photoelectric converter

The OBD 1510 D is a pair of multi-function modules which will extend the reach of serial RS232, RS422 or

Figure 2 illustrates how managed Optical Bypass Device operates in normal mode and bypass mode, activating when network

Access a full list of OBD II-related acronyms and terms. Includes common (and some less common) technical terms, as well as

solution. The fiber link supports distances up to 10Km and provides a single, high speed 1Gbit error-free optical connection between

OBD(TM) Flex Optics - Flexible linear lighting with on-board optics for grazing, wall washing, and architectural

The OBD 1210 is a matched pair of compact MADI fiber transceivers designed to extend the reach of MADI signals over long

Everything you need to build an optical network from end-to-end. Thin-film filter and PLC based AWG for multiplexing, a full suite of

ICOM (Integration Communication Optical Module) - 3rd generation vehicle interface used by BMW

Schematic of OBD sensors and optical microscope. The inset shows an optical micrograph of two cantilevers approaching a Si

TOPDON ONE Bidirectional Scan Tool, 10.1" OBD2 Scanner with J2534 Pass-Thru and ECU Coding, Over 50 Resets, Topology

An optical module serves as the backbone of modern fiber-optic communication. Its appearance often resembles a

The OBD 1910 kit is a simple, easy to use, plug and play solution which can extend a 1Gbit/s or 10Gbit/s electrical Ethernet network

Programming interfaces for various protocols and standards PCAN-Explorer 7 CAN ACCESSORIES CAN connection cables for

Technical Specifications The OBD 1410 is a bidirectional Fiber Optic to SDI transmitter and receiver which uses a single fiber link

Web: <https://www.supremeacademicresearch.co.za>

