# Parallel Port Optical Module



## Overview

Maximize port utilization and simplify cabling with 100G breakout-capable modules and QSFP28 cables, providing scalable, multi-speed connectivity for modern AI, cloud, and HPC networks.

## Key Takeaways

A Parallel Port Optical Module is a high-speed fiber-optic transceiver that transmits and receives data simultaneously over multiple optical fibers, enabling high-bandwidth, short- to medium-range communication.

### Overview

Parallel optical modules, also known as parallel optics or parallel optical interfaces, are designed to transmit data across multiple fibers simultaneously, rather than sequentially over a single fiber. This allows for higher aggregate bandwidth and improved signal integrity compared to traditional serial optical links. Each fiber carries a separate channel of data, which is then recombined at the receiver to reconstruct the original high-speed signal.

### Types and Configurations

Parallel optical modules are available in several configurations: Multi-mode parallel modules: Typically used for short-range connections (up to 300–400 meters), often within data centers for top-of-rack (TOR) to leaf switches. Single-mode parallel modules: Suitable for longer distances (up to 10 km), connecting leaf to spine or spine to core in large-scale networks. Channel counts: Commonly 4-channel (POP4) or 12-channel (SNAP12) modules, with each channel supporting data rates from 2.

7 to 3. 125 Gbps per fiber, providing aggregate bandwidths up to 100 Gbps or more.

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## Key Features

High bandwidth: Supports 40G, 100G, 200G, 400G, and beyond by splitting data across multiple fibers. Improved signal integrity: Lower per-channel data rates reduce crosstalk and noise, ensuring reliable transmission. Pluggable and modular: Many modules are designed for easy installation and upgrades in racks or boards, supporting both intra-system and inter-system connections.

## VCSEL and PI

N arrays: Use vertical-cavity surface-emitting lasers (VCSELs) for transmission and PIN photodiode arrays for reception, ensuring high-speed and low-power operation. Connector types: Typically use MPO/MTP connectors for high-density fiber connections.

## Applications

Parallel optical modules are widely deployed in: Data centers: High-speed server-to-server and switch-to-switch interconnects. High-performance computing (HPC): Low-latency, high-bandwidth links for supercomputers. Telecommunications: Replacing copper backplanes in large switching equipment for faster and more reliable data transfer.

## Cloud and A

I infrastructure: Handling massive data traffic efficiently with scalable optical networks.

## Advantages

Scalability: Easily supports future upgrades to higher bandwidths without replacing the entire infrastructure. Cost-effectiveness: Reduces the need for multiple serial links and copper cabling, especially for 40G and 100G connections. Reliability: Parallel transmission reduces interference between channels and maintains low bit error rates, meeting strict data center standards.

In summary, a Parallel Port Optical Module is a critical component for modern high-speed networks, enabling efficient, scalable, and reliable data transmission over multiple optical fibers simultaneously, making it ideal for data centers, HPC, and telecom applications.

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## Article Content

Breakout-Capable 100G Optical Modules: Everything You Need to Know

Maximize port utilization and simplify cabling with 100G breakout-capable modules and QSFP28 cables, providing scalable, multi-speed connectivity for modern AI, cloud, and HPC networks.

Parallel Optics

POIs differ from traditional fiber optic communication in that data is simultaneously transmitted over multiple optical fibers and received over multiple optical fibers.

Parallel Optic Modules

Designed to operate on multimode fi ber systems at a nominal wavelength of 850 nm, the Par-allel Fiber-Optic Modules feature high-performance, highly reliable, short wavelength optical devices, coupled

Parallel optical interface

A parallel optical interface is a form of fiber-optic technology aimed primarily at communications and networking over relatively short distances (less than 300 meters), and at high bandwidths.

Understanding Parallel Optics: Powering High-Speed Data Transmission

Learn what Parallel Optics is, how it enables high-speed data transmission and how LINK-PP QSFP28 SR4 and 200/400/800G transceiver modules support this technology.

EDGE8® Port Breakout Module | MTP/MPO Breakout Modules | Corning

With parallel optics, EDGE8 Port Breakout Module solutions easily and efficiently integrate switches with MPO/MTP into your data center network.

Parallel optical module or ordinary optical module

There are two approaches to deploying 40GbE multimode fiber (MMF) infrastructure. One is to use MTP multimode fiber jumpers (12 cores) and parallel optical modules, and the other is

Cisco OSFP 800G Transceiver Modules Data Sheet

It is compliant with IEEE 802.3 800GBASE-VR8 and OSFP MSA module requirements with integrated heat sink. Optical signals are carried over

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The Most Comprehensive Guide Of Optical Modules

Explore the ultimate guide to optical modules. Learn types, functions, performance metrics & how to choose the right module for your fiber network.

Parallel Optic Modules

As the leading worldwide supplier of parallel optic products, Avago Technologies'' pluggable Parallel Fiber-Optic Modules allow for easy assembly and system fi eld upgrades to add band-width. These

Parallel Optics

Parallel optics transmission technology spatially multiplexes or divides a high data rate signal among several fibers that are simultaneously transmitted and received. At the receiver, the

Optical module

An optical module is a typically hot-pluggable optical transceiver used in high-bandwidth data communications applications. Optical modules typically have an electrical interface on the side that

Parallel optical module or ordinary optical module

Parallel Optical Module The cost of building a 40G network using common duplex optical modules In the scheme using duplex optical modules such as (Juniper JNP-QSFP-40G-LX4 or Arista

Parallel Optical Link: PAROLI ® Tx AC, 1.6 Gbit/s Parallel Optical Link ...

The PAROLI receiver module converts parallel optical input signals into parallel electrical output signals. The optical signals received are converted into voltage signals by PIN diodes, transimpedance

What Is an Optical Module and Its FAQs (V200)

Describes what an optical module is and FAQs, including the fundamentals, appearance and structure, key performance counters, common types, and naming conventions of optical modules, causes of

Parallel Optics is the Answer

Parallel Optics is the Answer to Ever-Increasing Demand on Your Network With greater density, improved safety, higher signal quality, and cost reductions—in CapEx on day one, OpEx on day two,

Parallel Optic Technology

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Parallel optic transmission technology spatially multiplexes or divides a high-data-rate signal among several fibers that are simultaneously transmitted and received. At the receiver, the signals are de

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

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