

What is a programmable optical delay module



AI Overview

Programmable optical delay modules are devices that allow precise, computer-controlled adjustment of the time it takes for light to travel through an optical path, enabling dynamic control of signal timing in optical systems.

OverviewA programmable optical delay module (ODL) is designed to introduce a controllable time delay to an optical signal. Unlike traditional fixed-length delay lines, these modules allow users to dynamically select different delay values, either continuously or in discrete steps, using electronic or mechanical control systems. The core principle relies on the fact that light takes a finite time to travel through a medium, typically optical fiber or free-space paths, and varying the path length changes the signal's arrival time.

Key Components

- Optical Path Elements:** These include fiber coils, free-space mirrors, or retroreflectors that define the physical distance light travels.
- Switching Mechanisms:** Programmable ODLs often use mechanical or optical switches to select among multiple fiber paths of different lengths, creating discrete delay states.
- Control Electronics:** Modules are typically computer-controlled via interfaces like RS-232 or TTL signals, allowing precise adjustment of delay times and integration into automated test setups.
- Optical Components:** High-reflectance mirrors, prisms, and collimators are used to maintain signal integrity and minimize insertion loss and dispersion.

Performance Characteristics

- Delay Range:** Programmable ODLs can provide delays from picoseconds to milliseconds, depending on the fiber length or free-space path used.
- Resolution:** High-resolution modules can achieve sub-picosecond timing precision, critical for ultrafast laser applications.
- Insertion Loss and Isolation:** Mechanical optical switches offer low insertion loss and high isolation, ensuring minimal signal degradation and cross-talk between paths.

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Article Content

Programmable 28V DC SSPC Module, SPDP Series 1A-40A

Programmable 28V DC SSPC Module, SPDP Series 1A-40A Artikelnummer: B-020-002750 Kategorien: Leistungskreis, Halbleiter-Energiemanagement Marke: Sensitron Semiconductor

Field-programmable gate array

A field-programmable gate array (FPGA) is a type of configurable integrated circuit that can be repeatedly programmed after manufacturing. FPGAs are a subset of

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Liste von Abkürzungen

Fehlernachrichten und Ergänzungsvorschläge bitte an/Notice of errors and suggestions for new entries please to: Dieter.Guicking@phys.uni-goettingen .

Programmable Optical Delay Generator – TimeRI

nerator is the first such product on the market. With a total delay range up to 0.25 ms (75 km) and a delay resolution up to 12 bits, this easy-to-use instrument features low insertion loss (~0.5 dB per

DC 12V Programmable Time Delay Relay Module with Metal Enclosure

Overview This relay module operates on DC 12V and provides programmable time delay functions for on/off control. It is suitable for use in automobile, Raspberry Pi, industrial control, and other automatic

A Programmable High-Precision Real-Time Optical Beamforming

Abstract: We propose a high-precision beam steering real-time control system that leverages optical true time delay (OTTD) based on serial 2×2 optical switch differential delay pairs. The pre-designed

Optical Variable Delay Line: Components and Systems

We produce turn-key systems with computer GUI, OEM modules, and components. These delay lines can be reconfigured at high speed up to nano-seconds and

Programmable Optical Delay Generator -

Generating programmable time delay from nanoseconds to milliseconds is important for various applications ranging from wireless communications to radar, optical communications, and

Programmable Optical Delay Line (ADL-200)

The ADL-200 features an industry-leading delay tunability of up to 2.5ns. It comes in a benchtop model with a VFD screen, and allows easy control of the delay settings.

Planar Lightwave Circuits (PLCs) | Springer Nature Link

Planar lightwave circuits (PLCs) provide various important devices for optical WDM, TDM systems, subscriber networks and etc. This paper reviews the recent progress and future prospects of PLC

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Optical Delay Line

The time delay is achieved by selectively routing the optical signal through a set of fiber segments with required length. The 19" rack mountable module provides digitally variable time delay from 5ns to

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1.6T optical transceivers are overtaking 800G in 2026 AI clusters because NVIDIA Blackwell GB200 systems require doubled bandwidth per port, Silicon Photonics

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This document contains a long list of words beginning with "ab-" or "ac-". It does not appear to be a coherent text, but rather a collection of unrelated terms.

Optical networks

An optical transport network is a high-speed communication system that sends light signals over fiber-optic cables to move large amounts of data across long

Optical Delay Lines

An optical delay line is a device used to introduce a specific time delay for a light beam. It can provide either a fixed delay or a variable (tunable) delay, which can be adjusted during operation.

What Is an FPGA? Complete Guide to Field

Discover what is an FPGA and how field-programmable gate arrays empower engineers to create custom digital hardware. This guide combines a

The Top 10 Semiconductor Giants by Market Cap Today

The Biggest Semiconductor Companies by Market Cap in 2025 The semiconductor industry is the backbone of our digital world. The biggest

Delay Line - RFComm

Using optical switches, the time delay is variable and programmable with high resolution of 2 N delay selections. This system allows for a long delay up to ms in a compact package with the superior

Using Digitally Programmable Delay Generators Application Notes

The versatility of the AD9500 and AD9501 for generating programmable delays allows them to be used in applications that range from ATE to communications, computers, disk drives, lasers and

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