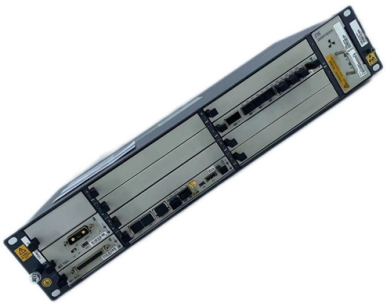
Digital Optical Module



Overview

IceCube – IceCubeThe in-ice component of IceCube consists of 5,160 digital optical modules (DOMs), each with a ten-inch photomultiplier tube and associated.

Key Takeaways

Digital Optical Modules (DOMs) are advanced sensors used primarily in neutrino detection, capturing faint light signals produced by high-energy particles interacting with matter.

Overview of Digital Optical Modules

Digital Optical Modules (DOMs) are crucial components in various scientific research applications, particularly in neutrino observatories like IceCube. These modules are designed to detect Cherenkov radiation, which is emitted when charged particles, produced by neutrino interactions, travel faster than the speed of light in a medium (like ice or water).

Key Features and Functions

Structure: Each DOM typically consists of a pressure-resistant glass sphere housing photomultiplier tubes (PMTs) that amplify the faint light signals. For instance, in the IceCube project, each DOM is about 30 cm in diameter and can withstand extreme pressures found at depths of up to 2,500 meters in Antarctic ice. Detection Mechanism: When a neutrino interacts with the ice, it can produce charged particles that emit Cherenkov radiation.

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The DO

Ms are sensitive enough to detect this faint light, allowing researchers to infer the presence and properties of neutrinos. Data Transmission: The signals detected by the PMTs are processed and transmitted to surface laboratories for analysis.

Each DO

M is connected to a cable that supplies power and sends data to the IceCube Lab.

Applications

Neutrino Astronomy: DOMs are primarily used in neutrino detectors like IceCube, which aims to study high-energy astrophysical phenomena such as supernovae, gamma-ray bursts, and black hole collisions by detecting neutrinos emitted from these events. Research Infrastructure: Similar technologies are employed in other neutrino research projects, such as KM3NeT, which uses multi-PMT modules to enhance detection capabilities in deep-sea environments.

Future Developments

The next generation of DOMs, known as IceCube-Gen2, is being designed to improve sensitivity and detection capabilities, allowing for more detailed studies of neutrino properties and their sources. In summary, Digital Optical Modules are essential for advancing our understanding of the universe through neutrino detection, providing insights into some of the most energetic and mysterious processes in astrophysics.

Article Content

IceCube – IceCube

The in-ice component of IceCube consists of 5,160 digital optical modules (DOMs), each with a ten-inch photomultiplier tube and associated electronics. The DOMs are attached to vertical “strings,” frozen

Digital Optical Module (DOM) from the IceCube neutrino

Digital Optical Module (DOM) from the IceCube neutrino detector. Designed by IceCube consortium led by University of Wisconsin-Madison and Lawrence

Digital Optical Module (DOM) Development

What is a DOM? How is it built? See the process from start to finish here! IceCube is operated by the University of Wisconsin–Madison and is

The Most Comprehensive Guide Of Optical Modules

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

What is an Optical Module?

Learn about the different types of optical modules, their functions, packaging, and key technical concepts like 400G, PAM4, and more. Understand how optical

The sensors

The sensor modules are pressure-resistant glass spheres housing multiple photomultiplier tubes (PMTs) for light detection and several instruments to determine the geometrical position of the sensor

What is DDM/DOM? Optical Module Monitoring & Troubleshooting 2026

Master DDM/DOM in optical modules. Learn how to monitor Tx/Rx power, temperature, and predict failures in enterprise, data center, and 800G AI networks.

Cisco 400G Digital Coherent Optics QSFP-DD Optical Modules

Cisco offers a comprehensive range of pluggable optical modules in the Cisco® pluggables portfolio. The wide variety of modules gives you flexible and cost-effective options for all types of interfaces.

Small Form-factor Pluggable

Small Form-factor Pluggable Small Form-factor Pluggable connected to a pair of fiber-optic cables Small Form-factor Pluggable (SFP) is a compact, hot-pluggable network interface module format used for

HTF DWDM equipment,OTN Solution,QSFP28 OSFP

HTFuture offers industry-leading fiber optic products and WDM system solutions with global recognition for excellence and innovation.

Digital Coherent Optical (DCO) Transceiver Modules Market

Digital Coherent Optical (DCO) transceiver modules are advanced optical communication devices used to transmit and receive data over fiber optic networks. They incorporate technology for

Cisco QSFP28 100G ZR Digital Coherent Optics Module Data Sheet

Cisco ® QSFP28 100G ZR extends 100GbE coherent links from QSFP28 ports reaching up to 80km over dark fiber and up to 300km over amplified Dense Wave Division Multiplexing

100G QSFP28 ER4 40KM LC Optical Transceiver (EML)

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100G QSFP28 ER4 LC optical transceiver delivers reliable 100GbE transmission up to 40km on single-mode fiber, compliant with IEEE 802.3ba standards. This hot-pluggable module features low power

100G QSFP28 ER4 30KM LC Optical Transceiver (EML)

Get 100G QSFP28 ER4 30KM LC Optical Transceiver (EML) from ETU-Link Technology CO .,LTD,we supply excellent 100G QSFP28 ER4 DOM Digital Diagnostic Module Transceiver. Long using

Cisco 400G Digital Coherent Optics QSFP-DD Optical

Cisco now offers a range of all new 400G Digital Coherent QSFP-DD transceivers. Cisco already offers a range of Digital Coherent CFP2 transceivers

Silicon Photonics Based 1.6T Transceiver Modules

Mar. 31, 2025. Coherent will show a live demonstration of its silicon photonics-based 1.6T-DR8 transceiver module using a Marvell® Ara 3nm optical digital signal processor (DSP) at OFC 2025.

Cisco QSFP-DD and OSFP 800G ZR/ZR+ Coherent

These digital coherent optics modules enable 800G traffic over amplified DWDM links up to 120 km for 800ZR and over 1000 km for 800G ZR+.

Coherent DSP | Critical enablers for efficient transmission ...

Marvell paves the way deploying merchant Digital Signal Processor (DSP) technology into low-power, high-density QSFP-DD, OSFP and CFP2-DCO coherent pluggable modules for cloud and telecom

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

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