Industrial-grade single-mode fiber optic module



Overview

This data sheet describes the benefits, specifications, and ordering information for the Cisco SFP Modules for Gigabit Ethernet Applications.

Key Takeaways

Industrial single-mode fiber optic modules are robust SFP transceivers designed for long-distance, high-speed, and harsh-environment network applications.

Overview

Industrial single-mode fiber optic modules, often in SFP (Small Form Factor Pluggable) form, are used to connect network devices over long distances while withstanding extreme environmental conditions. They are widely applied in industrial Ethernet, factory automation, outdoor surveillance, and backbone network links.

Key Features

Transmission Distance: Typically ranges from 10 km to 20 km, depending on the module and fiber type. Data Rate: Standard modules support 1. 25 Gbps, while higher-speed variants (SFP+, SFP28) can reach 10–25 Gbps for demanding applications.

Connector Type: Most industrial single-mode modules use LC duplex connectors for reliable fiber connections. Wavelength: Commonly operate at 1310 nm, suitable for long-distance single-mode fiber transmission.

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Hot-

Pluggable: Modules can be installed or removed without powering down the network switch, enabling flexible network maintenance. Digital Diagnostics Monitoring (DDM/DOM): Provides real-time monitoring of optical output/input power, temperature, laser bias current, and supply voltage. Environmental Tolerance: Designed to operate in extreme temperatures from -40°C to 85°C (-40°F to 185°F) and resist electromagnetic interference (EMI) and electrostatic discharge (ESD).

Compliance: Most modules are MSA-compliant, ensuring compatibility with a wide range of industrial switches and routers from vendors like Cisco, ZyXEL, TP-Link, and Ubiquiti.

Applications

Industrial Automation: Connecting robotic arms, HMI panels, and machine vision systems within production cells for low-latency, stable communication. Outdoor Surveillance: Linking cameras and monitoring centers over long distances, often mounted on poles or towers exposed to harsh weather. Backbone Networks: Inter-factory or campus backbone links requiring reliable, error-free transmission over kilometers.

Telecom and Data Centers: High-speed single-mode connections for corporate networks, FTTH installations, and long-distance fiber links.

Example Modules

Intellinet Industrial Gb

E SFP: 10 km single-mode, metal housing, DDM support, -40°C to 85°C operation.

F

S SFP1G-LX-31-I: 10 km single-mode, industrial-grade optics, EMI-resistant, ideal for outdoor and factory backbone links.

TREN

Dnet 1000Base-LX TI-MGBS20: 20 km single-mode, LC duplex, 1. 25 Gbps, extreme temperature tolerance. Utepo 1.

25G 20 km SFP: Duplex LC, 1310 nm, hot-pluggable, LVPECL-compliant, RoHS and IEC-60825 certified. Industrial single-mode fiber optic modules provide reliable, long-distance connectivity in challenging environments, making them essential for modern industrial, outdoor, and backbone network deployments.

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Article Content

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This data sheet describes the benefits, specifications, and ordering information for the Cisco SFP Modules for Gigabit Ethernet Applications.

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SFP Modules

SFP-4330 1.25Gbps Single-Mode BIDI (WDM) Industrial SFP Transceiver, 20km, TX 1310nm / RX 1550nm, Simplex LC, -40 to +85 °C, DDM SFP-4200 1.25Gbps

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TRENDnet''s 1000Base-LX Industrial SFP Single Mode LC Module, model TI-MGBS20, is designed to operate within an extreme temperature range and is

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Single-mode optical fiber

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