

Customization Process for New Smart City DWDM Modules



Overview

The Wolon Custom CWDM and DWDM 1.25G SFP MODULE series provides the ultimate customized multiplexing solution.

Key Takeaways

Customizing DWDM modules for smart cities involves selecting channels, configuring module form factors, integrating with SDN-controlled networks, and optimizing performance for high-capacity, energy-efficient data transmission. Module Selection and Form Factor

The first step in customization is choosing the DWDM module type and form factor. Modules can be standard or customized to include specific features such as the number of channels, tap/monitoring capabilities, and variable attenuation. Common form factors include LGX, FCH (Corning CCH compatible), ADC (Package A), and EIA-standard configurations, all designed for low insertion loss and high isolation. The choice of module depends on the network architecture, fiber type, and deployment environment.

Channel Planning and Wavelength Assignment



Customization requires careful channel selection and wavelength assignment. Engineers must forecast network traffic, considering current throughput needs for smart city applications like 5G backhaul, smart transport, and data centers, as well as expected growth rates of 30-50% annually . The number of DWDM channels and their spacing (e.g., 50/75/100 GHz) is determined based on fiber type, per-wavelength capacity, and desired scalability . Proper wavelength planning ensures efficient fiber utilization and minimizes interference.

SDN Integration and Dynamic Reconfiguration

For smart city networks, DWDM modules are often integrated with SDN-controlled optical networks. SDN controllers dynamically manage bandwidth allocation, route traffic, and optimize resource utilization using algorithms for inter-application wavelength redirection, dynamic load balancing, and bandwidth selection . This allows the network to adapt in real-time to varying data demands from smart homes, hospitals, transport systems, and other urban applications.

Configuration and Testing

Once modules are selected and integrated, configuration involves setting center wavelengths, channel IDs, and transmission modes on the optical interfaces. Multiplexers (MUX) and demultiplexers (DMUX) are configured to route optical signals correctly to the corresponding module interfaces . Testing includes evaluating bit error rate, eye diagrams, quality factor, and bandwidth satisfaction rate to ensure the network meets performance and quality-of-service requirements .

Reliability and Environmental Considerations

Customized DWDM modules must meet industrial reliability standards, including thermal and athermal packaging, low loss across temperature ranges, and compliance with damp heat and other environmental tests . This ensures stable operation in diverse urban conditions and long-term network reliability.

Summary

The customization process for DWDM modules in smart cities is a multi-step approach involving module selection, channel planning, SDN integration, configuration, testing, and reliability validation. By carefully designing each step, network engineers can achieve high-capacity, energy-efficient, and dynamically reconfigurable optical networks capable of supporting the complex data demands of modern smart city applications .

Article Content

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This chapter provides general dense wavelength division multiplexing (DWDM) design guidelines and explains the

dwdm

1 Introducing DWDM The following discussion provides some background on why dense wavelength division multiplexing (DWDM) is

What You Should Know About DWDM Tunable Optical Modules

DWDM tunable optical modules offer flexibility, cost savings, and scalability by dynamically adjusting wavelengths for

Design Process for Terrestrial and Undersea DWDM Network Upgrades

The design process for DWDM upgrades of terrestrial and undersea systems is presented in the form of realistic

DWDM Technology, DWDM Network and DWDM Architecture

A complete analysis of DWDM technology, exploring core concepts, principles, and long-haul network architecture.

DWDM — Enablence

High-performance AWG designs for DWDM applications including 100 / 75 / 50 GHz grid spacing, Gaussian / flat-top lineshape, and

Dense Wavelength Division Multiplexing (DWDM)

Dense wavelength division multiplexing (DWDM) employs multiple light wavelengths to transmit signals over a single optical fiber.

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DWDM provides fast and flexible provisioning of protocol transparent and bit-rate transparent, data-centric, protected

DWDM

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ACT/0005 5Q-factor

The history of DWDM The laying of new fiber was once the only way to cope with fiber exhaust in telecom-munication networks.A

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We have designed a novel SDN-controlled dynamically reconfigurable time division multiplexing and dense wavelength-division

DWDM Technology: Its Development and Application

The article firstly analyzes the relevant concepts and principles of dwdm technology, gives a theoretical system

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DWDM systems boost telecom with high-capacity, long-distance transmission. Overcome fiber constraints, support

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What is DWDM (Dense Wavelength Division Multiplexing)?

Dense Wavelength Division Multiplexing (DWDM) is an optical networking technology that dramatically increases the

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Top considerations when building your own DWDM network By Koby Reshef, PacketLight CEO (last updated 19-Apr-22) Dark fiber,

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Understanding DWDM Modules: Enhancing Network Performance

With their superior performance and cost-effective nature, DWDM Modules are a game-changer in network

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Corning's Dense Wavelength Division Multiplexers (DWDMs) are integrated optical modules that combine, or multiplex, and

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DWDM Primer

ex process. Network planning and analysis, ADM provisioning, Digital Cross-connect System (DCS) reconfiguration, path and circuit

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