Optical modules for long and short distances

Article Overview

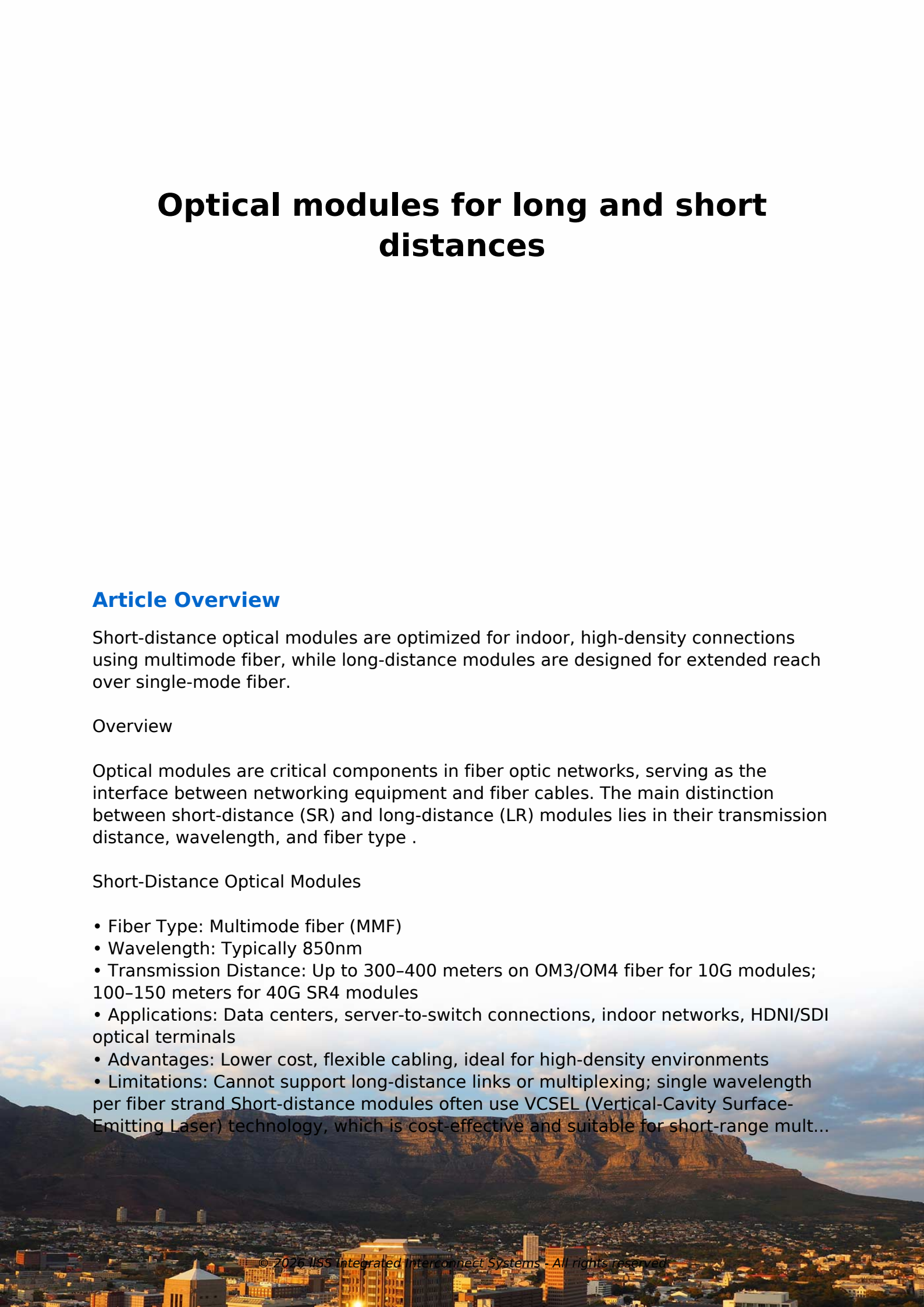
Short-distance optical modules are optimized for indoor, high-density connections using multimode fiber, while long-distance modules are designed for extended reach over single-mode fiber.

Overview

Optical modules are critical components in fiber optic networks, serving as the interface between networking equipment and fiber cables. The main distinction between short-distance (SR) and long-distance (LR) modules lies in their transmission distance, wavelength, and fiber type .

Short-Distance Optical Modules

• Fiber Type: Multimode fiber (MMF)
• Wavelength: Typically 850nm
• Transmission Distance: Up to 300–400 meters on OM3/OM4 fiber for 10G modules; 100–150 meters for 40G SR4 modules
• Applications: Data centers, server-to-switch connections, indoor networks, HDNI/SDI optical terminals
• Advantages: Lower cost, flexible cabling, ideal for high-density environments
• Limitations: Cannot support long-distance links or multiplexing; single wavelength per fiber strand Short-distance modules often use VCSEL (Vertical-Cavity Surface-Emitting Laser) technology, which is cost-effective and suitable for short-range mult...



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