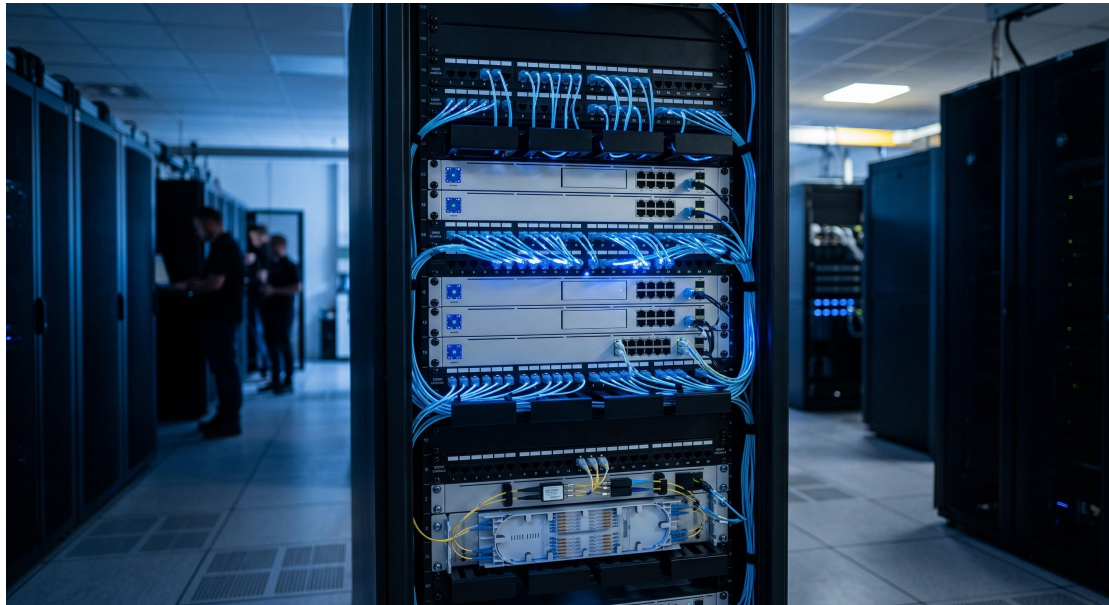


Dark Fiber Illumination - Official Technical Overview & Hardware Datasheet

EXECUTIVE SUMMARY

The exponential growth in data traffic, driven by 5G backhaul, hyperscale cloud interconnect, and enterprise edge services, has placed unprecedented demand on existing fiber infrastructure. Simultaneously, operators are confronted with the high capital expenditure (CAPEX) and operational expenditure (OPEX) associated with deploying new fiber optic cables. Our Dark Fiber Illumination solution addresses this critical challenge by leveraging advanced coherent optics and dense wavelength-division multiplexing (DWDM) to transform unlit fiber assets into high-capacity, revenue-generating network infrastructure. This document provides a comprehensive technical overview and hardware datasheet for the FSP-3000 Dark Fiber Illuminator, a carrier-grade platform engineered to maximize the financial return of dark fiber investments by extending reach, increasing spectral efficiency, and reducing per-bit transport costs.



ARCHITECTURE & CHASSIS DESIGN

The FSP-3000 is architected as a modular, high-density 2RU chassis platform designed for deployment in central offices, colocation facilities, and remote aggregation sites. The system is built around a high-speed, non-blocking backplane that provides a switching capacity of up to 2.4 Tbps. The chassis supports a mix of line cards, including the high-performance DCI-1000 optical transponder and the FTM-800 flexible grid muxponder, allowing operators to illuminate fiber pairs with capacities ranging from 400G to 800G per wavelength. The system incorporates a fully redundant architecture with 1+1 power supply units (AC or DC), redundant fan trays with N+1 cooling, and hitless protection switching for critical control and data paths. This robust design ensures an industry-leading Mean Time Between Failures (MTBF) of 320,000 hours, guaranteeing five-nines (99.999%) availability for

mission-critical services.

HARDWARE FEATURES

The FSP-3000 platform is equipped with a comprehensive set of hardware features that distinguish it in the market. The system utilizes next-generation 7nm DSP technology for coherent modulation, enabling long-haul transmission of up to 1,200 kilometers without regeneration. The platform supports C-band and L-band amplification, covering the full optical spectrum for maximum fiber utilization. Key hardware components include hot-swappable optical transceivers (QSFP-DD and OSFP), high-precision tunable lasers, and integrated Raman amplifiers for extended reach. The front panel provides clear LED status indicators, a craft interface for local management, and a dedicated console port for out-of-band management. Additionally, the unit supports a precision time protocol (PTP) grandmaster and synchronous Ethernet (SyncE) for delivering high-accuracy timing, making it ideal for mobile backhaul and 5G xHaul applications.

COMPLIANCE & STANDARDS

The FSP-3000 is designed to meet the rigorous demands of carrier-grade telecom environments. The hardware complies with Telcordia GR-63-CORE

(NEBS Level 3) and GR-1089-CORE for physical protection and electromagnetic compatibility. It adheres to the ITU-T G.709 standard for optical transport networks and supports the OpenZR+ MSA (Multi-Source Agreement) for interoperable transceivers. The platform has achieved FCC Part 15 Class A, CE, and RoHS compliance, ensuring global regulatory acceptance. Furthermore, the system is compliant with the Security and Trust in Telecommunications (STiT) guidelines, featuring secure boot, encrypted storage, and physical tamper detection mechanisms to protect against supply chain and cybersecurity threats.

TECHNICAL SPECIFICATIONS

Parameter	Specification
Form Factor	2RU Rack-Mountable Chassis
Switching Capacity	2.4 Tbps (Non-blocking)
Power Supply	1+1 Redundant, Dual 800W AC/DC
Cooling	N+1 Redundant Fan Trays
Operating Temperature	0°C to 50°C
MTBF	320,000 hours
Max Transmission Reach	1,200 km (w/ Amplification)
Supported Frequencies	C-Band & L-Band
Client Interfaces	QSFP-DD, OSFP

Timing	SyncE, IEEE 1588v2 (PTP)
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ORDERING OPTIONS

The FSP-3000 is available in a variety of factory-integrated configurations tailored to specific network deployment scenarios. The base unit (Part Number: FSP-3000-BASE-2RU) includes the chassis, dual 800W power supplies, a controller module, and two fan trays. Operators can populate the remaining five slots with a selection of line cards and optical amplifiers based on their distance and capacity requirements. The FSP-3000-LC-400G-QSFP supports up to four 400G client ports, while the FSP-3000-LC-800G-OSFP offers two 800G ports. For amplification, the FSP-3000-AMP-EDFA and FSP-3000-AMP-RAMAN are available. A pre-installed software license (FSP-3000-LIC-ADV) is recommended to unlock advanced features such as G.709 Forward Error Correction (FEC), in-service optical spectrum analysis, and performance monitoring. To facilitate rapid deployment, we offer a turnkey rack integration service and a 24x7 global support package (FSP-3000-SUPPORT-PLATINUM) that includes a 4-hour onsite hardware replacement guarantee.

