



XENOptics Advanced Remote Fiber Management Solutions

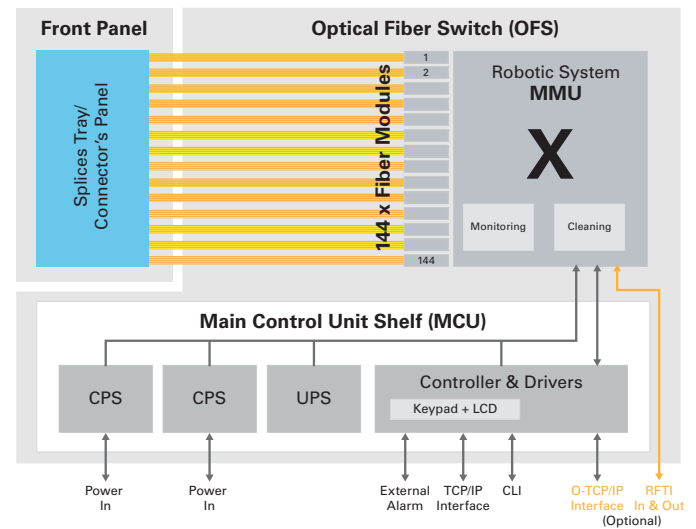
REMOTE FIBER MANAGEMENT

The XENOptics Remote Smart Optical Switch (XSOS-288) breaks new ground by replacing manual Optical Distribution Frames (ODFs) and patch panels with remotely managed and fully automated systems.

The foundation of the XSOS-288 is our patent-pending 3D optical switching (3D-OS) topology which delivers superb optical performance and complete traffic protection. Once the XSOS-288 is installed by splicing the system, all reconfiguration, monitoring, troubleshooting and maintenance operations can be carried out remotely.

This capability dramatically lowers the total cost of ownership of the fiber infrastructure and offers very rapid return on investment.

XSOS-288: PRODUCT ARCHITECTURE



XSOS-288 FEATURES

- **Optical Switching:** A non-blocking 144x144 fiber port switching fabric.
- **Cost-Effective:** Efficient architecture enables low cost per port.
- **High Optical Performance:** Maintains uniform insertion loss of < 0.5dB and return loss < -65dB.
- **Field Replacement:** Any modules can be replaced in the field safely, without traffic interruption.
- **Flexible Fiber Termination:** Connectivity via splices and/or connectors.
- **RFTS:** Integrated Remote Fiber Testing System.
- **Carrier-Class System:** Meets applicable Telcordia and ITU recommendations. Highly reliable field-proven system units.
- **Synchronized Database and Auto-Discovery:** Configurations are immediately reflected in the management systems and recovered automatically in case of failure.
- **High Density:** Based on 3D-OS technology which provides unique fiber density and allows fiber port management of up to 1728 ports using one side of a single standard 19" rack or up to 3456 ports by using dual sides of the 19" rack (back to back).
- **Standard Software Interfaces:** WEB Graphical User Interface. SDN compliant Restful API. SNMP/TL1 equipment interfaces.
- **Power-independent Traffic:** Latching mechanism consumes power only while switching and maintains traffic transmission in the event of power failure.



SYSTEM ARCHITECTURE

The XSOS-288 comprises of 2 modules: **Optical Fiber Switch (OFS)** and **Main Control Unit (MCU)**.

Optical Fiber Switch (OFS)

It offers breakthrough functionality by enabling remote, non-blocking switching capabilities.

Unlike other solutions XENOptics's OFS-288 matrix features three main advantages:

- **Cost-Effective:** Reduced product cost to a level of direct competition with the manual systems.
- **Phenomenal Density:** the unique 3D-OS patent-pending technology saves space is able to manage over 3000 fibers in one rack.
- **High Reliability:** All the components used by XENOptics are of the highest level of quality. XENOptics has signed technology partnerships with major high-end global vendors to supply, assemble, test and support key components in the field.

The 3D-OS robotic system combines active switching with a passive latching mechanism, enabling automated provisioning and configuration while ensuring traffic flow during field replacement operations. In addition, during a power loss state configuration changes in-progress will be completed safely with the aid of an inbuilt super-capacitor UPS and all provisioned services will remain active due to our passive latching mechanism.

In addition, the OFS comprises of the following 2 main modules: a single MMU (Main Manipulator Unit) and 144 Fiber Modules (FM). It is accompanied by a remote diagnostics camera, environmental sensors and a dust cleaning extraction unit to maintain high optical performance.

Main Control Unit (MCU)

This controls all switching elements. It monitors real-time status of cross-connections and network performance. It also transmits data and alarms to the central network management system. It provides in-band and out-band functionality with Telnet, SSH, Restful API and SNMP/TL1 interfaces.

The MCU comprises of the following modules:

- Dual redundant power supplies (-48 DC or 110-220AC)
- UPS that support the system in case of power failure.
- Real time controller, strong processing unit and drivers to support the MMU.

XSOS-FAMILY INTERFACES

Parameter	Unit
CLI	RS-232 interface for local or maintenance operation
Debugging Port	USB interface for R&D and technician use
TCP/UDP Interface	HTTP, HTTPS, SNMPv2/v3, Telnet, SSH, TFTP, NTP and Restful API
RFTS In (optional)	An optical interface that connects an OTDR interface to the matrix in order to scan and monitor any fiber is connected to the system
RFTS Out (optional)	An optical interface that connects the OTDR signal to the adjacent matrix's system in order to scan and monitor any fiber is connected to the adjacent system
RFTS Control (optional)	100BT OTDR control interface
Dual Power In	<ul style="list-style-type: none"> • 110 / 220 Volt AC interface • (Optional) Dual feed power 48V input for main CO power source and backup CO source
External Alarm	4x dry contact, normally closed ports
Keypad + LCD	A 5 command keys + display to control the system locally



MANAGEMENT

Web Graphical User Interface: Displays a simple and intuitive interface for controlling the XSOS platform from standard desktop browsers and mobile IOS/Android devices.

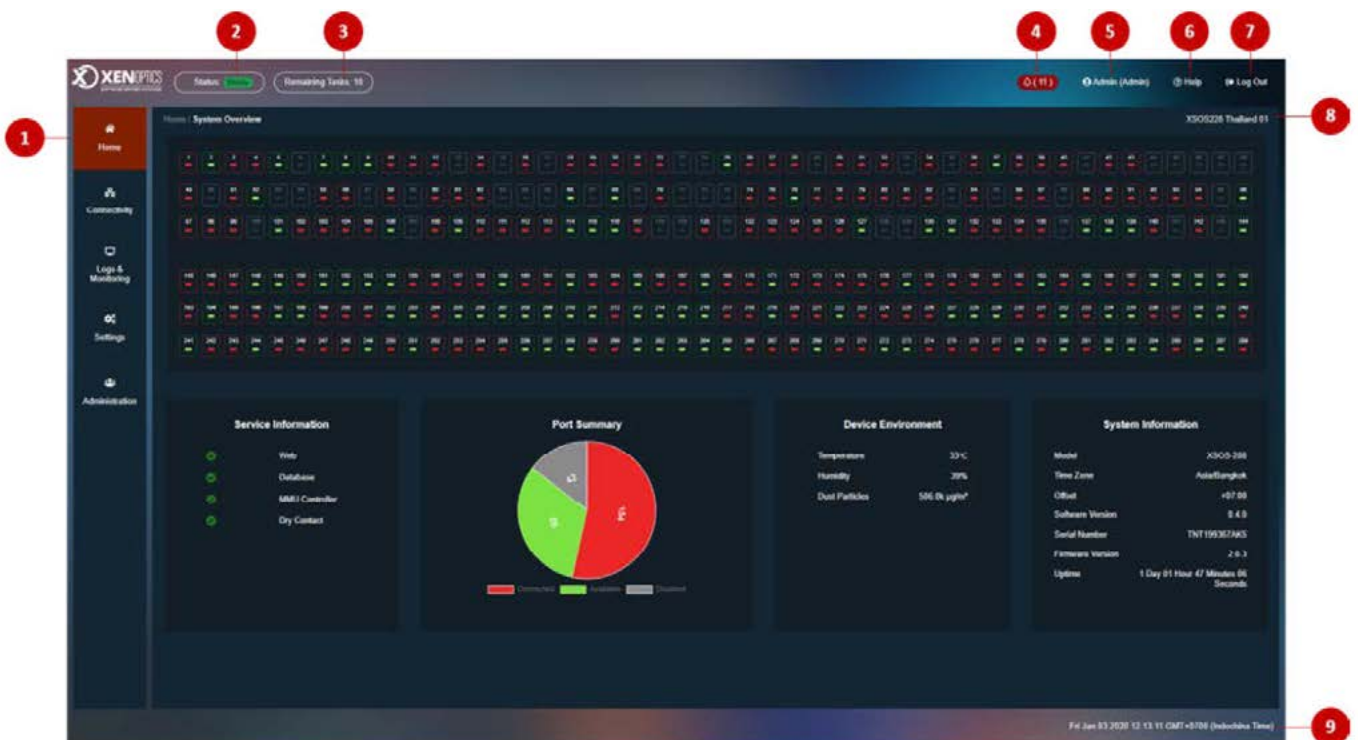
Local Terminal Management: Provides a simple interface to a dumb terminal with a command line interface that is primarily used in installation and maintenance modes by technicians during unit servicing.

Element Management System (EMS): Offers an overall system view, topology connectivity and provisioning of the overall fiber infrastructure, system by system, interfaced through the equipment using Restful API and SNMP/TL1 interface.

Network Management System: Provides full network view and supports end-to-end operations using Restful API and SNMP/TL1 interfaces.

APPLICATIONS

- Enterprise data centers
- Server farms & clouds computing
- Fiber-to-the-Home in the US public networks
- European municipality FTTH
- Central Office Management
- Remote long-haul CO management
- End-to-End Network Management
- Remote Fiber Test System
- Wavelength Management
- Municipality and Utility
- Internet exchanges and carrier hotels
- MDU distribution
- Disaster Recovery
- Laboratories and testing systems
- Inventory Management



Web Interface Layout
(Screenshot of System Overview)

1	Menu Navigation	6	Help section
2	Current machine status	7	Logout button
3	Total remaining tasks (If any)	8	Device Name
4	System notifications (Alarms)	9	Date and Time
5	Username (Role)		

SPECIFICATIONS: SINGLE MODE FIBER

Parameter	Unit	Min	Typical	Max
OPTICAL CHARACTERISTICS				
Operating Range	nm	1260		1630
Insertion Loss	dB		0.25	0.5
Insertion Loss Repeatability	dB		0.06	0.1
Crosstalk	dB			-70
Return Loss (UPC/APC)	dB			-55 / -65
PDL	dB			0.15
PMD	psec			0.1
Input Power	dBm			25
Switching Time	Sec		30	40
POWER REQUIREMENTS				
Input Voltage	V _{DC}	-40		-75
Power Consumption	W	0		5
Switching Operation	W			50
Input voltage (optional)	V _{AC}		110-220	
ENVIRONMENTAL CONDITIONS				
Temperature Range	°C	-5		+45
Temperature Range (street cabinet)	°C	-40		+65
Temperature Range (Transport)	°C	-40		+70
Relative Humidity	%	10		95
RELIABILITY				
Service Life Time	Years	20		

DIMENSIONS

XSOS - 288	Height	Width	Depth
Splices configuration	312 mm	445 mm	450 mm
Connectors configuration	312 mm	445 mm	480 mm
Weight	31.8 Kg		

APPLICABLE STANDARDS

Environmental	ETSI 300019 CLASS 3.2
EMC	EN 55022 CLASS B, IEC 1000-4-2-6
Safety	EN 60950, IEC 825-1; IEC 825-2, GR-1089-CORE
ESD	IEC-61000-4-2
EU Environmental	ETS-300 019
US Environmental	NEBS 3, GR-63-CORE



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