



# SERIES 7000<sub>n</sub>

Network  
Optical Matrix Switch

## SINGLE MODE NETWORK OPTICAL SWITCH UP TO 384x384 PORTS



The Polatis Series 7000n Network Optical Switch is the largest-capacity, highest-density, highest-performance and most reliable non-blocking all-optical matrix switch available in the industry. The Series 7000n 384x384 all-optical circuit switch is designed to meet the most demanding applications with exceptionally low optical loss, compact size, and fast switching speeds. With support for Software-Defined Networks (SDNs) via embedded

OpenFlow and NETCONF control interfaces, the Series 7000n can route time-critical traffic with very low-latency to enable new virtual cloud services in hybrid packet-optical data centers. The Series 7000n is the latest addition to the Polatis product line of optical switches and modules, creating the broadest portfolio available of dynamic fiber cross-connect solutions (from 4x4 to 384x384), all built on the Polatis' patented DirectLight® optical switching platform that has been proven in the most challenging data center, telecom and defense and test applications for over a decade.

### KEY FEATURES

- **Non-blocking 384x384 matrix switch**
- **SDN enabled with OpenFlow and NETCONF control interfaces**
- **Industry leading ultra-low insertion loss and superior optical specifications**
- **Available in symmetric NxN and asymmetric MxN port configurations**
- **Able to switch and hold dark fiber connections**
- **Transparent fully bidirectional optics**
- **Protocol and bit-rate agnostic up to 400Gbs and beyond**
- **Optional optical power monitoring and variable optical attenuation on every connection**
- **User configurable optical power alarms**
- **Carrier-class interfaces with OpenFlow, NETCONF, SNMP, TL1, and SCPI control**
- **High reliability distributed architecture**
- **Built-in user-friendly Web GUI interface**
- **Eco-friendly with very low power consumption**
- **Seamlessly interfaces with infrastructure automation and orchestration solutions including QualiSystems TestShell and CloudShell**
- **Easily integrated into popular SDN controllers such as OpenDaylight**

### DIRECTLIGHT TECHNOLOGY

The Series 7000n 384x384 optical switch uses Polatis' patented, highly reliable piezoelectric DirectLight beam-steering technology that sets the industry standard for lowest optical loss and highest optical performance that enables a wide range of network applications. Polatis' DirectLight technology makes connections without light being present on the fiber. This allows operators to pre-provision paths and perform intelligent network monitoring and test over lit or dark fiber. Polatis DirectLight can also switch bi-directional optical signals for PON, FTTx and other types of transmission systems.

### SDN ENABLED

Polatis supports an OpenFlow agent on the Series 7000n so that it can be easily deployed in a Software-Defined Network under an OpenFlow or NETCONF enabled control plane. This allows data center and network operators to reconfigure the network on demand to deploy capacity where it is most needed and make the most productive use of network resources at the lowest cost.

### SWITCH MATRIX SIZE OPTIONS

Polatis offers a wide variety of matrix switch size and configuration options from 4x4 to 384x384 to meet a broad range of application requirements. The Series 7000n switch is available in symmetric (NxN) and asymmetric (MxN) matrix configurations. Switch matrix sizes can also be optimized for individual applications.

### CARRIER-CLASS RELIABILITY

The Polatis Series 7000n switch has carrier-class reliability. The switch has a high reliability distributed architecture that eliminates the possibility of any single point of failure disabling the switch and includes dual hotswap power supplies and network interface cards. In addition, the switch software can be easily upgraded in the field without affecting in-service connections. OpenFlow, NETCONF, SNMP, TL1 and SCPI control interfaces allow for seamless integration with higher-level network management systems and test equipment controllers. A user-friendly web interface can also be used to provision, monitor and control the switch.

### OPTIONAL POWER MONITORS AND OPTICAL TAPS

The Polatis Series 7000n switches include options for integrated optical power monitoring or optical taps on every connection. These integrated features are ideal for network monitoring, data mirroring and intrusion detection, as well as for testing applications. Polatis switches can be easily configured to provide fully automated multilevel protection switching using a combination of power monitoring, threshold alarm indicators and fast switching. Systems can also be customized to incorporate a wide variety of passive and active components to suit individual customer needs.

**BENEFITS OF POLATIS SWITCHING**

- Low optical loss enables dynamic novel network architectures with minimal system impact
- Superior optical specifications enables DWDM operation at 400Gbs and beyond
- SDN OpenFlow and NETCONF interfaces enable faster deployment of new network orchestration solutions
- Bi-directional, all-band transmission with minimal signal impairment provides truly transparent connections
- Fast switching times enable efficient provisioning and protection services
- Dark-fiber switching enables preprovisioning and use with intermittent signals

**APPLICATIONS**

- Software-defined networking
- Data center aggregation
- Colocation peering
- Cloud computing and data center virtualization
- Automated access, metro and long-haul network operations
- Centralized equipment sharing and automated network testing
- UHD Video distribution
- Automated systems verification testing
- Fast automatic provisioning and protection switching
- Network monitoring and automatic fault location
- Infrastructure as a service (IaaS) automation and orchestration

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**Performance Parameters**

Performance Parameters	Polatis 7000n Specifications
Maximum Matrix Switch Size (NxN) <sup>1</sup>	384x384
Typical Insertion Loss <sup>2</sup>	1.5dB
Maximum Insertion Loss <sup>2,3</sup>	2.7dB
Loss Repeatability	+/-0.1dB
Connection Stability	+/-0.1dB
Dark Fiber Switching	Yes
Bi-Direction Optics	Yes
Switching Time	25ms
Polarization Dependent Loss (PDL)	<0.1dB (C+L Bands) <0.3dB with optional OPMs (C+L Band)
Crosstalk	<-50dB
Operating Wavelength Range	1260-1675nm
Wavelength Dependent Loss (WDL)	<0.3 dB (C+L Band)
Return Loss (with APC connectors)	>50dB
Data Latency through a switch connection	25ns
Optical Input Power Range	Dark to +27dBm
Optional Optical Power Monitoring (OPM)	Dynamic range -25dBm to +20dBm Accuracy +/-1.0dBm
Switch Lifetime	>10 <sup>9</sup> Cycles
Operating Temperature <sup>4</sup>	+10°C to +40°C <85% RH non-condensing
Storage Temperature	-40°C to +70°C <40% RH non-condensing

**Electrical and Mechanical**

Electrical and Mechanical	Polatis 7000n Specifications
Fiber Type	Single Mode
Single Fiber Connector Types	LC or LC-HD Connectors Angled or straight connector types available
Array Connector Types	MTP-8 or MTP-12 Elite Array Connectors
Control Interfaces	OpenFlow, NETCONF, SNMP, TL1, SCPI & Secure User-Friendly Web GUI
User Interfaces	RJ45 Dual Ethernet 10/100 Base T and USB
Craft Interface	RS232 Serial or RJ45 Ethernet 10/100 Base T
Power options	Hot Swappable Dual Redundant 100-240 VAC 50/60 Hz Hot Swappable Dual Redundant -48 VDC
Power Consumption	100W Standard switch 140W with optional OPMs

**Fiber Connector**

Fiber Connector	Polatis 7000n 384x384 Size (HxWxD)
MTP	4RU x 19" x 22"
MTP with optional OPMs	6RU x 19" x 22"
LC-HD (High Density LC)	6RU x 19" x 22"
LC	8RU x 19" x 22"

All parameters are measured excluding connectors at 1550nm and 20°C with an unpolarized source after thermal equalization unless otherwise noted.

1. Asymmetric MxN sizes available
2. Measured using the 3 patch-cord method as defined in ANSI/TIA/EIA-526-7-1998
3. Optional OPMs add max 0.3dB per port
4. Extended environmental option available