polatis

SERIES 6000n

Network Optical Matrix Switch

SINGLE MODE NETWORK OPTICAL SWITCH UP TO 192x192 PORTS

The Polatis Series 6000n Network Optical Switch is a high-performance, fully non-blocking all-optical 192x192 matrix switch. It is designed to meet the highest performance and reliability needs of the most demanding applications with exceptionally low optical loss, compact size, low power requirements and fast switching speeds. With support of Software-Defined Networks (SDNs) via an embedded OpenFlow and NETCONF control interfaces, the Series 6000n enables extremely low latency for time-critical traffic required for new virtual cloud services in hybrid packet-optical data centers. The Series 6000n is based on Polatis' patented DirectLight® optical switching technology that has been proven in the most challenging data center, telecom and defense applications and is also used by major network equipment manufacturers to automate testing of optical components and subsystems.

KEY FEATURES

- **Non-blocking 192x192 matrix switch**
- **SDN enabled with OpenFlow and NETCONF command interfaces**
- **Ultra-low insertion loss and superior optical specifications**
- **Available in symmetric NxN, asymmetric MxN and NxCC any-to-any port configurations**
- **Able to switch and hold dark fiber connections**
- **Fully bidirectional optics**
- **Protocol and bit-rate agnostic up to 100Gbs and beyond**
- **Optional optical power monitoring and variable optical attenuation on every connection**
- **User configurable optical power alarms**
- **Carrier-class interfaces with OpenFlow, SNMP, TL1 and SCPI control languages**
- **High reliability distributed architecture**
- **Built-in user friendly web GUI interface**
- **Eco-friendly with very low power consumption**

DIRECTLIGHT BEAM-STEERING

The Series 6000n 192x192 switch uses Polatis' patented, highly reliable piezoelectric DirectLight beam-steering technology that sets the industry standard for lowest optical loss and highest optical performance. Polatis' beam-steering technology can be switched without light being present on the fiber. This allows operators to pre-provision paths as well as perform intelligent network monitoring and test over lit or dark fiber. The Polatis DirectLight technology can also switch bi-directional optical signals for PON, FTTx and other types of transmission systems.

SDN ENABLED

Polatis offers an OpenFlow client on the Polatis Series 6000n so it can be 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 to meet a broad range of application requirements. The Series 6000n switch matrix is available in symmetric (NxN), asymmetric (MxN) and a single-sided (NxCC) customer configurable switch with any-to-any port connectivity. Switch matrix sizes can also be optimized for individual applications.

CARRIER-CLASS RELIABILITY

The Polatis Series 6000n 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 switch operations. OpenFlow, NETCONF, SNMP, TL1 and SCPI command languages allow for seamless integration with higher-level network management systems or test equipment controllers. Each switch also has a user- friendly HTML web browser GUI interface that can be used to provision, monitor and control the switch.

OPTIONAL POWER MONITORS AND OPTICAL TAPS

The Polatis Series 6000n switches include options for integrated optical power monitoring or optical monitoring 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. Switches can also be customized to incorporate a wide variety of passive and active components to suit individual customer needs.

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BENEFITS OF POLATIS SWITCHING

- **Low optical loss reduces the need for extra optical amplification and enables novel architectures**
- **Superior optical specifications enable operation at 100Gbs and beyond**
- **SDN OpenFlow and NETCONF interfaces enable faster deployment of new control applications**
- **Bi-directional, all-band transmission with minimal signal impairment provides truly transparent connections**
- **Fast switching times enable efficient provisioning and protection switching**
- **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**
- **Video feed distribution**
- **Automated systems verification testing**
- **Fast automatic provisioning and protection switching**
- **Network monitoring and automatic fault location**

Performance Parameters	Polatis 6000n 192x192 Specifications
Maximum Matrix Switch Size (NxN)[1]	192x192
Typical Insertion Loss[2]	1.0dB
Maximum Insertion Loss[2]	2.0dB
Maximum Insertion Loss with single OPM[2]	2.5dB
Loss Repeatability	+/-0.1dB
Connection Stability[3]	+/-0.1dB
Dark Fiber Switching	Yes
Bi-Direction Optics	Yes
Max Switching Time	25ms
Polarization Dependent Loss (PDL)	<0.1dB (C+L Bands) <0.3dB with optional OPM (C+L Band)
Crosstalk	<-50dB
Operating Wavelength Range	1260-1675nm 1260-1650nm with optional OPMS
Wavelength Dependent Loss (WDL)	<0.3 dB (C+L Band)
Return Loss (with APC connectors)	>50dB
Optional Optical Power Monitoring (OPM)	Wavelength range 1270-1330nm & 1510-1620nm Dynamic range -25dBm to +20dBm Accuracy +/-1.0dBm
Maximum Optical Input Power	+27dBm
Switch Lifetime	>10^8 Cycles
Operating Temperature (Normal)	+10ºC to +40ºC <85% RH non-condensing
Operating Temperature (Extended)	-5ºC to +55ºC <90% RH non-condensing
Storage Temperature (Normal)	-40ºC to +70ºC <40% RH non-condensing
Storage Temperature (Extended)	-40ºC to +70ºC <95% RH non-condensing

Electrical and Mechanical	Polatis 6000n 192x192 Specifications
Fiber Type	Single Mode
Single Fiber Connector Types	LC, SC or E-2000 Connectors Angled or straight connector types available
Array Connector Types	MTP-8 or MTP-12 Elite Array Connectors
Control Languages	OpenFlow, NETCONF, SNMP, TL1, SCPI & HTML
User Interfaces	RJ45 Dual Ethernet 10/100 Base T and USB
Craft Interface	RS232 Serial or RJ45 Ethernet 10/100 Base T
Power options	Single 100-240 VAC 50/60 Hz Hot Swappable Dual Redundant 100-240 VAC 50/60 Hz Hot Swappable Dual Redundant -48 VDC
Power Consumption	75W

Fiber Connector	Polatis 6000n 192x192 Size (HxWxD)	Polatis 6000n 192xCC[4] Size (HxWxD)
LC	6RU x 19" x 22"	3RU x 19" x 22"
SC	8RU x 19" x 22"	4RU x 19" x 22"
MTP	3RU x 19" x 22	3RU x 19" x 22""

All parameters are measured excluding connectors at 1550nm and 20oC 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. Stability is measured at maximum transmission
4. A single-sided 192xCC customer configurable switch with any-to-any port connectivity

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