polatis

SERIES 1000*n*

Network Optical Matrix Switch

SINGLE MODE NETWORK OPTICAL SWITCH UP TO 32x32 PORTS

The Polatis Series 1000n Network Optical Switch is a high-performance, fully non-blocking all-optical 32x32 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 control interface, the Series 1000n enables extremely low latency for time-critical traffic required for new virtual cloud services in hybrid packet-optical data centers. The Series 1000n 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 the testing of optical components and subsystems. Its' compact size coupled with very low power consumption make it space efficient while also being environmentally friendly.

KEY FEATURES

- **Non-blocking 4x4 to 32x32 matrix switch**
- **SDN enabled with OpenFlow command interface**
- **Ultra-low insertion loss and superior optical specifications**
- **Available in symmetric NxN and asymmetric MxN 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**
- **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 1000n 32x32 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' beamsteering 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 1000n so it can be deployed in a Software-Defined Network under an OpenFlow-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 1000n switch matrix is available in matrix sizes from 4x4 up to 32x32 and is available in both symmetric (NxN) and asymmetric (MxN) configurations. Switch matrix sizes can also be optimized for individual applications.

CARRIER-CLASS RELIABILITY AND INTERFACES

The Polatis Series 1000n switch has carrier-class reliability with full NEBS Level 3+ certification and dual hotswap power supplies. In addition, the switch software can be easily upgraded in the field without affecting in-service switch operations. OpenFlow, 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 secure 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 1000n switches include options for integrated optical power monitoring or optical monitoring taps on every connection. In addition, the switch can be equipped with a programmable variable optical attenuation on each connection where the switch optical output power level can be attenuated or held at a fixed value. These integrated features are ideal for network monitoring, data mirroring and intrusion detection, as well as for built-in fault isolation. 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 optical components to suit individual customer needs.

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 interface enables 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**
- **Could 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**

WEB GUI AND NETWORK MANAGEMENT

With dynamic remote connection management via a secure web GUI with support for SNMP and TL1, the Polatis series 1000n simplifies and automates management. It increases flexibility, significantly reduces operating costs and seamlessly interworks with higher lever network management systems.

ECO-FRIENDLY NETWORKING

The Polatis series 1000n has achieved a Verizon's Telecommunication Equipment Energy Efficiency Ratings (TEEER) of more than 10, or at least 1,000 times more energy efficient than the industry average, enabling network operators to significantly reduce their carbon footprints.

	Polatis 1000n Specifications	
Performance Parameters	**Matrix Size[1] 4x4 to16x16**	**Matrix Size[1] 20x20 to 32x32**
Typical Insertion Loss[2]	0.8dB	0.8dB
Maximum Insertion Loss[2]	1.3dB	1.7dB
Maximum Insertion Loss with a single OPM[2]	1.6dB	2.0dB
Maximum Insertion Loss with two OPMs[2]	1.9dB	2.3dB
Polarization Dependent Loss (PDL)	<0.1dB (C+L Bands)	<0.3dB (C+L Bands)

	For All Switch Sizes
Crosstalk	<-50dB
Loss Repeatability[3]	+/-0.15dB
Connection Stability[3]	+/-0.1dB
Dark Fiber Switching	Yes
Bi-Direction Optics	Yes
Max Switching Time	25ms
Operating Wavelength Range	1260-1675nm
Wavelength Dependent Loss (WDL)	<0.3 dB (C+L Band) Max
Return Loss (with APC connectors)	>50dB
Optional Optical Power Monitoring (OPM)	Wavelength range 1510-1610nm 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 1000n**
Fiber Type	Single Mode
Single Fiber Connector Types	LC, SC or Diamond E-2000 Connectors Angled or straight connectors types available
Array Connector Types	MTP-8 or MTP-12 Elite Array Connectors
Control Languages	OpenFlow, SNMP, TL1, SCPI & HTML
User Interfaces	RJ45 Ethernet 10/100 Base T
Craft Interface	RS232 Serial
Power options[6]	Single 100-240 VAC 50/60 Hz Hot Swappable Dual Redundant 100-240 VAC 50/60 Hz Hot Swappable Dual Redundant -48 VDC

Fiber Connector and Options	**Switch Dimensions[4,5] (HxWxD)**	
LC or MTP	4x4 to 16x16	1RU[6] x 19" x 14.7"
	20x20 to 32x32	3RU x 19" x 15.7"
SC or Diamond E-2000	4x4 to 8x8	1RU[6] x 19" x 14.7"
	12x12 to 16x16	2RU x 19" x 14.7"
	20x20 to 32x32	3RU x 19" x 15.7"

All parameters are measured excluding connectors and optical power monitors 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. Repeatability and stability are measured at maximum transmission
4. With optional dual hotswap powering switch dimensions are 3RU x 19" x 21.7"
5. With optional touch screen display switch dimensions are 3RU x 19" x 15.7"
6. Adding OPMs or protection switching changes the height to 2RU

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