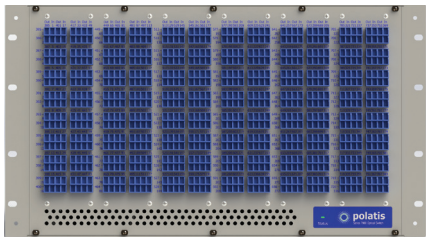
POLATIS® SERIES 7000i
Instrument Optical Matrix Switch

Single-mode instrument optical switch up to 384×384 ports



The POLATIS Series 7000i Instrument Optical Switch is a fully nonblocking all-optical matrix switch available in sizes up to 384×384. Its features and performance are designed to meet the needs of the most demanding test and measurement applications with exceptionally low optical loss, superior connection stability and repeatability in a compact form factor. With support for Software-Defined Networks (SDNs), the Series 7000i interfaces directly with cloud-based network and infrastructure testing applications. It is extensively used by major networks and equipment manufacturers to automate testing of optical subsystems and components. Its exceptionally low optical loss and low latency also make it particularly suitable for Quantum Network testbeds and QKD.

KEY FEATURES

- Non-blocking matrix sizes up to 384×384
- Available in symmetric N×N and single-side N×CC (customer configurable - any-to-any) port configurations (asymmetric M×N available on request)
- Industry leading low insertion loss and superior optical specifications
- Transparent fully bidirectional optics
- Protocol and bit-rate agnostic up to 400 Gbs and beyond
- Switch and hold dark fiber connections
- SDN enabled with NETCONF and RESTCONF control interfaces
- Configurable interface options with SNMP, TL1, and SCPI control languages
- Built-in user-friendly Web GUI interface
- Supports RADIUS secure user access protocols
- Seamlessly interfaces with test automation and orchestration solutions
- Optional optical power monitoring and variable optical attenuation (VOA) on every connection
- Exceptional optical stability and repeatability
- Programmable port shutter for fiber break simulation
- High reliability distributed architecture
- Eco-friendly low power consumption

DirectLight® technology

Series 7000i optical switches use patented, highly reliable piezoelectric DirectLight® technology beam-steering technology that sets the industry standard for lowest optical loss and highest optical performance. POLATIS DirectLight® technology allows true dark fiber switching where the connections can be made and held without light being present on the fiber. This allows operators to pre-provision paths over lit or dark fiber, as well as switch intermittent and variable-power test signals including bi-directional optical test signals for PON, FTTx, and other types of transmission systems.

SDN enabled with user friendly interfaces

POLATIS switches can be easily deployed in an SDN platform using NETCONF or RESTCONF interfaces enabling operators to monitor and dynamically reconfigure test beds in real time to quickly respond to changing demands from users. This added level of flexibility increases equipment utilization and lowers overall costs while increasing testing capacity. In addition, POLATIS also offers SNMP, TL1, and SCPI command languages that allow for seamless integration with test equipment controller systems. Each switch has a user-friendly secure web browser GUI interface that can be used to provision, monitor, and control it.

Switch matrix size options

The POLATIS Series 7000i is available in sizes up to 384×384 in symmetric (N×N) and single-sided customer-configurable (N×CC) switch matrices, to meet a broad range of test and measurement applications. Asymmetric (M×N) configurations are available on request.

Integrated features for test lab applications

POLATIS Series 7000i include options for integrated Optical Power Monitors (OPMs) on every connection. These are ideal for identifying signal degradation or loss and can be used to provide Variable Optical Attenuation (VOA) on every connection to protect sensitive equipment from higher power levels. POLATIS Series 7000i switches have a unique user-programmable shutter function that can be used to simulate single or repeated fiber breaks on any number of switch connections for network stress testing. Switches can also be partitioned in software to enable multiple test teams to use the same switch without risk of conflict.

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BENEFITS OF POLATIS® SWITCHING

- Low optical loss minimizes impact on equipment and system optical power budgets
- Exceptional stability and repeatability increase measurement consistency, accuracy and precision
- NETCONF and RESTCONF SDN interfaces communicate directly to cloud-based manufacturing and network test configurations.
- Signal format, wavelength, direction and bitrate independence with minimal signal impairment provides truly transparent connections
- Remote operation and fast switching times speed up and simplify testbed setup and reconfiguration
- Dark-fiber switching enables preprovisioning and use with intermittent signals or variable power signals
- Interoperates with popular third-party test software

APPLICATIONS

- Network and data center SIT lab test applications
- Centralized test equipment sharing and automated network testing
- Component, transponder, line card and subsystem testing
- Automated regression testing for new product releases
- Lab as a Service (LaaS) and Test as a Service (TaaS) automation and orchestration
- Cloud-based SDN test configurations
- Satellite uplink and RFoF testing
- PON and FTTx system testbeds
- Quantum technology test beds
- QKD

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Performance Parameters	POLATIS® 7000i Specifications
Maximum Matrix Switch Size (N×N)[1]	384×384 and 384×CC
Other Matrix Sizes (N×N)[1]	256×256, 320×320, 360×360
Typical Insertion Loss[2]	1.5 dB
Maximum Insertion Loss[2]	2.7 dB
Maximum Insertion Loss with single OPM[2]	3.0 dB
Loss Repeatability[3]	+/-0.1 dB
Connection Stability[3]	+/-0.1 dB
Dark Fiber Switching	Yes
Bi-Direction Optics	Yes
Switching Time	50 ms for a single connection or to reconfigure the entire switch
Polarization Dependent Loss (PDL)	<0.1 dB (C+L Bands) <0.3 dB with optional OPMs (C+L Band)
Crosstalk	<-50 dB
Operating Wavelength Range	1260-1675 nm
Wavelength Dependent Loss (WDL)	<0.3 dB (C+L Band)
Return Loss (with APC connectors)	>50 dB
Data Latency through a switch connection	75 ns
Optical Input Power Range	Dark to +24 dBm
Optional Optical Power Monitoring (OPM)	Dynamic range -40 dBm to +22 dBm Accuracy +/-0.5 dBm
Switch Lifetime	>10^9 Cycles
Operating Temperature	+5 °C to +40 °C <85 % RH non-condensing
Storage Temperature	-40 °C to +70 °C <40 % RH non-condensing

Electrical and Mechanical	POLATIS® 7000i Specifications
Fiber Type	Single-mode
Single Fiber Connector Types	LC or LC-HD Connectors Angled (APC) or Ultra (UPC) connector types available
Array Connector Types	MTP-8 or MTP-12 Elite Array Connectors
Control Interfaces	NETCONF. RESTCONF, SNMP, TL1, SCPI & Secure User-Friendly Web GUI
User Interfaces	Dual Gigabit Ethernet
Craft Interfaces	RS232 Serial and USB
Secure User Access Protocols	RADIUS AAA (EAP-TTLS, PAP)
Power options	Hot Swappable Dual Redundant 100-240 VAC 50/60 Hz Hot Swappable Dual Redundant -48 VDC
Power Consumption	140 W standard switch 180 W with optional OPMs

Switch Chassis Height[4]	POLATIS® 7000i	POLATIS® 7000i
Optical Connector Type	Up to Matrix Size 320×320	Matrix Size 360×360 and 384×384
MTP	6RU	6RU
LC-HD (High Density LC)	6RU	6RU
LC	6RU	8RU

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

1. Asymmetric MxN sizes available as options on request
2. Measured using the 3 patch-cord method as defined in ANSI/TIA/EIA-526-7-1998
3. Stability and repeatability are measured at maximum transmission
4. The switch chassis width is 19" and the depth is 22" for all Series 7000 switches