

### FEATURES

- ▷ Low optical loss reduces the need for extra optical amplification and enables novel architectures
- ▷ Superior optical specifications enable operation at 100Gbs and beyond
- ▷ NETCONF and RESTCONF 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
- ▷ Compact physical size fits into applications other switches cannot

### APPLICATIONS

- ▷ Software-defined networking
- ▷ Data center aggregation
- ▷ Colocation peering and demarcation
- ▷ High performance computing
- ▷ 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

### Single-Mode Network Optical Switch From 8X8 To 192x192 Ports

#### DIRECTLIGHT BEAM-STEERING

The LightningSwitch uses highly reliable piezoelectric beam-steering technology that sets the industry standard for lowest optical loss and highest optical performance. 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 beam-steering technology can also switch bi-directional optical signals for PON, FTtx and other types of transmission systems.

#### SDN ENABLED

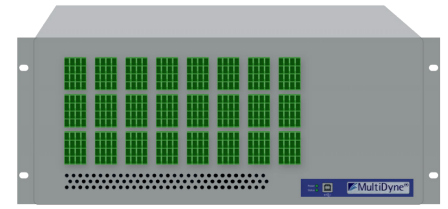
MultiDyne switches can be easily deployed in an SDN platform using NETCONF or RESTCONF interfaces. Optical switching combined with SDN enables network operators to monitor and dynamically reconfigure the network in real time to quickly respond to changing network conditions. This added level of flexibility increases equipment utilization and lowers overall costs while increasing network availability.

#### SWITCH MATRIX SIZE OPTIONS

MultiDyne offers a wide variety of matrix switch size and configuration options to meet a broad range of application requirements. The LightningSwitch 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 are available from 8x8 to 192x192 allowing designers to select the optimum size for each application.

#### CARRIER-CLASS RELIABILITY AND INTERFACES

The LightningSwitch 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



MultiDyne 192x192 Switch



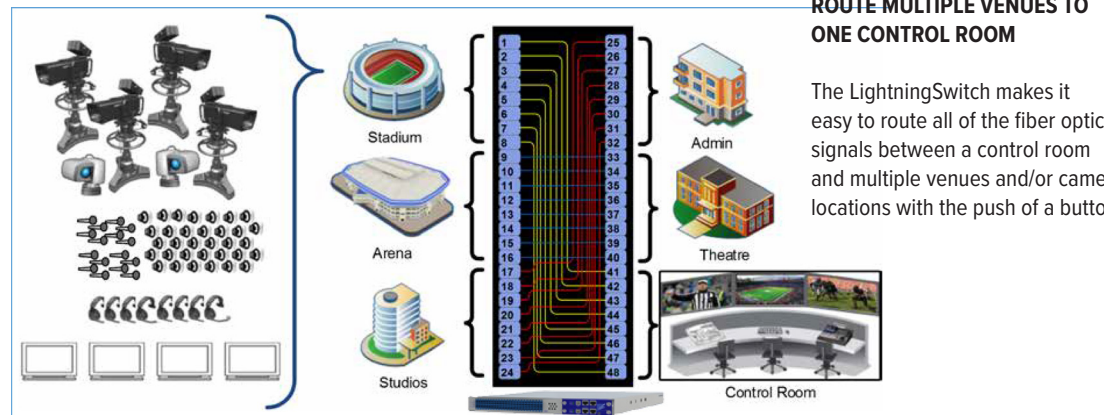
MultiDyne 48x48 Switch

network interface cards. In addition, the switch software can be easily upgraded in the field without affecting in-service switch operations. NETCONF, RESTCONF, 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

MultiDyne's LightningSwitch includes options for integrated Optical Power Monitors (OPMs) and 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. Switches can be configured to provide fully Automated Protection Switching (APS) based on loss or degradation of the signal optical power. The power monitoring can be used to provide Variable Optical Attenuation (VOA) on every connection. Switches can also be customized to incorporate a wide variety of passive and active components to suit individual customer needs.

### APPLICATION DIAGRAM



#### ROUTE MULTIPLE VENUES TO ONE CONTROL ROOM

The LightningSwitch makes it easy to route all of the fiber optic signals between a control room and multiple venues and/or camera locations with the push of a button.

### TECHNICAL SPECIFICATIONS

#### Performance Parameters

Matrix Switch Sizes (NxN) <sup>1</sup>	8x8 up to 192x192
Typical Insertion Loss <sup>2</sup>	1.0dB
Maximum Insertion Loss <sup>2</sup>	2.0dB
Maximum Insertion Loss with single OPM <sup>2</sup>	2.5dB
Loss Repeatability <sup>3</sup>	+/-0.1dB
Connection Stability <sup>3</sup>	+/-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)	Dynamic range -25dBm to +20dBm Accuracy +/-1.0dBm
Maximum Optical Input Power	+27dBm
Switch Lifetime	> 10 <sup>9</sup> Cycles
Operating Temperature (Normal)	+10°C to +40°C <85% RH non-condensing
Storage Temperature (Normal)	-40°C to +70°C <40% RH non-condensing

#### Electrical and Mechanical

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 Languages	NETCONF, RESTCONF, SNMP, TL1, SCPI & HTML
User Interfaces	RJ45 Dual redundant Hot-Swap Gigabit Ethernet
Craft Interface	RS232 Serial and USB
Secure User Access Protocols	RADIUS
Power options	Hot Swappable Dual Redundant 100-240 VAC 50/60 Hz Hot Swappable Dual Redundant -48 VDC
Power Consumption	25-75W

#### Switch Chassis Size<sup>4,5</sup>

	48x48	144x144	192x192
MTP or LC-HD (High Density LC)	1RU	3RU	4RU
LC	2RU	4RU	6RU
SC	3RU	6RU	8RU

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

- Asymmetric MxN switches and single-sided NxCC customer-configurable switches with any-to-any port connectivity are also available
- Measured using the 3 patch-cord method as defined in ANSI/TIA/EIA-526-7-1998
- Stability and repeatability are measured at maximum transmission
- The switch chassis width is 19" and the depth is 22" for all LightningSeries switches
- LightningSwitch with optional optical power meters may have larger switch chassis height

### ORDERING INFORMATION

Part #	DESCRIPTION
LSWOST-12X12LU-DMHNS	Optical Matrix Switcher, 24 Port, LC/UPC connectors, Hot swappable 100/240VAC
LSWOST-24X24LU-DMHNS	Optical Matrix Switcher, 48 Port, LC/UPC connectors, Hot swappable 100/240VAC
LSWOST-32X32LU-DMHNS	Optical Matrix Switcher, 64 Port, LC/UPC connectors, Hot swappable 100/240VAC
LSWOST-48X48LU-DMHNS	Optical Matrix Switcher, 96 port, LC/UPC connectors, Hot swappable 100/240VAC
LSWOST-72X72LU-DMHNS	Optical Matrix Switch, 144 ports, LC/UPC connectors, Hot swappable 100/240VAC
LSWOST-96X96LU-DMHNS	Optical Matrix Switch, 192 ports, LC/UPC connectors, Hot swappable 100/240VAC

*If you don't see the model you need below, please contact your MultiDyne salesperson for other available signal configurations.*