

# MEMS 64 x 64 Fiber Optical Switch

## (Non-Blocking, Bidirectional, Passive)

(Protected by U.S. patents 7224860, 6757101, 6577430 and pending patents)

### Product Description

The MEMS FIBER Optical switches establish optical signal paths passively in milliseconds supporting all data rates, ideally suited to manage and monitor large optical networks intelligently and remotely. The flexible platform supports NxM configurations (N, M=1 to 64). The MEMS switches are reliable with longevity suited for continuous operation. The control is net-based GUI that is compatible with standard network management protocols. It can be made to fit into a 1U box if LC connectors are selected.

### Features

- Low Cost
- High Reliability
- Low Insertion Loss
- Broad Band
- Compact Design
- Low Voltage



### Performance Specifications

Parameters	Min	Typical	Max	Unit
Center Wavelength		1270-1630		nm
Wavelength Bandwidth			± 30	nm
Insertion Loss <sup>[1]</sup> (SM)		3	3.3	dB
Dynamic Cross Talk	45			dB
Static Cross Talk	50			dB
Switching Speed		10	20	ms
Durability	10 <sup>9</sup>			cycle
Polarization Dependent Loss		0.04	0.2	dB
Wavelength Dependence Loss <sup>[2]</sup>		0.1	0.3	dB
Return Loss	50 <sup>[4]</sup>			dB
Repeatability		0.3	0.5	dB
Operating Temperature <sup>[3]</sup>	-5		65	°C
Port to Port Time Delay Difference			0.2	ns
Optical Power Handling (CW)		300	500	mW
Storage Temperature	-40		85	°C
Electrical Power Consumption			10	W
Package Dimension		2RU/4RU		

1. without connectors, connector ad 0.25dB each
2. Within 50nm bandwidth
3. -25 °C-75°C version is also available.
4. For SM fiber, MM fiber is 35dB

### Applications

- Optical Signal Routing
- Network Protection
- Wavelength Management
- Signal Monitoring
- Instrumentation

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## Mechanical Dimension

19-inch rack with 2U or 4U depending on the connector type

\*Product dimensions may change without notice. This is sometimes required for non-standard specifications.

## Control & Electric Interface

The switch default control is Ethernet with a GUI.

- Physical Layer: 10/100Base-T
- Data Link Layer: Ethernet Protocol per IEEE 802.3
- Network Layer: IPv4
- Transport Layer: UDP
- Application Protocol: SNMP
- Connector Type: RJ-45
- Dual 48V/120-220V Power Input

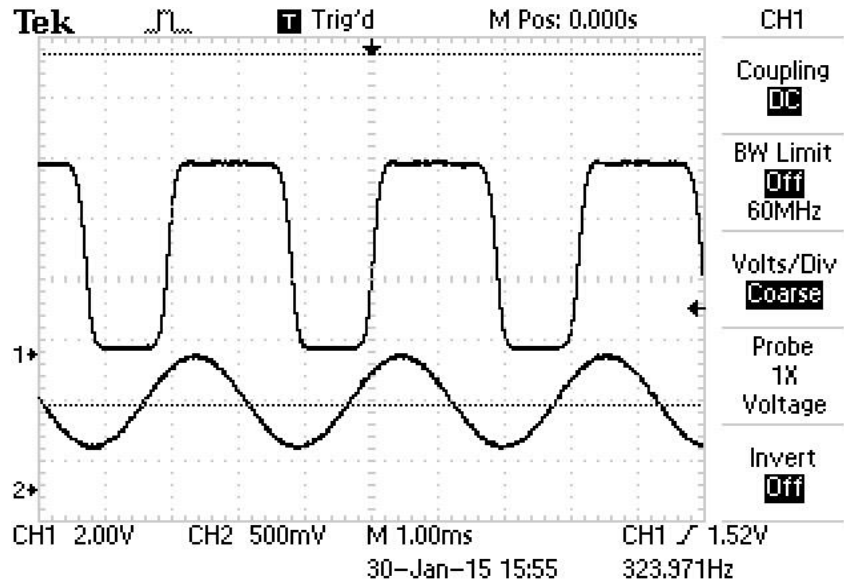
## Ordering Information

MEMS-	A64	<input type="checkbox"/>	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Type	Wavelength	Control Interface	Package	Fiber Type	Power Supply	Connector
		1310=3 1550=5 1310/1550=2 1620 =6 Special=0	Ethernet = 2 Special=0	2RU=2 4RU=4 Special=0	SMF-28 =1 MM 50/125=2 Special=0	120-220V =4 48V= 5	FC/PC=2 FC/APC=3 SC/PC=4 SC/APC=5 ST/PC=6 LC=7 Duplex LC=8 Special=0

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## 10<sup>9</sup> Switching Cycle Test

We have tested MEMS 1x2 switch at the resonant frequency ~300Hz for more than 40 days, as shown in the attachment, which corresponds over 10<sup>9</sup> switching cycles. The measurements show little changes in Insertion loss, Cross Talk, Return loss, etc, all parameters are within our specs.



## Example of Ethernet Remote Control GUI

PHOTONWARES | Home | Optical Communication Management System

System Management | Home | C05

**OXC8 Monitor Info**

NOTE

Chan	IN1	IN2	IN3	IN4	IN5	IN6	IN7	IN8	Operation
OUT	0	0	0	0	0	0	0	0	Config

**Card Basic Info**

Type	Slot	SoftVer	HardVer	MadeDate	DevType	SeqNum	UserNote	Operation
OXC8	05	1.01.07	1.01.01	2022/06/13	OXC-8x8	162022060001	NOTE	Config



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## Questions and Answers

**Q:** If the device were to fail, would the switch continue to pass the fiber light through the switch as configured before failure?

**A:** This depends, if one mirror fails, it only affects the light going through that mirror.

**Q:** When power is restored, does the IN/OUT configuration before failure remain in place?

**A:** Yes, when power back up it will go to the previous flightpath

**Q:** If the power to the device were shut off, would the device continue to pass the fiber light as configured before failure?

**A:** This function is called latching. We uniquely offer MEMS latching switches but cost more.

**Q:** With the Ethernet Control Option, does the switch support SNMPv3

**A:** Yes. This internet standard protocol allows user to write their own control code

**Q:** With the Ethernet Control Option, what type of encryption does the SNMPv3 use?

**A:** MD5/DES

**Q:** With the Ethernet Control Option, could this device be controlled by multiple users at different locations and all users will also see the configuration updates?

**A:** Yes

**Q:** With the Ethernet Control Option, does the user need to install any software on their computer other than a web browser?

**A:** No