

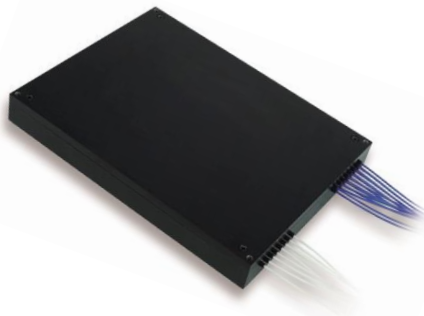
# MEMS Quad 1x16 Fiber Optical Switches



1260-1625nm, bidirectional, SM28, 3 year warranty

DATASHEET

BUY NOW



The MEMS Quad 1x16 Fiber Optical Switch is based on a reflecting silicon mirror that directs light from an input fiber to the requested output fiber among the 16 output fibers. The difference in light path length between each state is small. The switch is bidirectional. The matrix switch is truly independent, with little hit interferences during the switching. The module integrated four 1x16 in a compact metal casing. It contains a PCB with control electronics powered by 5VDC. TTL control interface is standard. USB or RS232 with GUI is achieved through an optional adapting board that comes with a wall pluggable power supply and a computer interface cable. The module is in compliance with RoHS, CE, and GR-1073 standards. The package is rugged, with optical and electrical interface connectors on the box.

## Applications

- Network
- Data Storage
- Sensor System
- Instrument

## Features

- Compact
- Low Cost
- High Reliability

## Specifications

Parameter	Min	Typical	Max	Unit
Wavelength	1260		1625	nm
Insertion Loss <sup>[1]</sup>		1.4	1.6	dB
Cross Talk, On/Off	50			dB
Return Loss <sup>[3]</sup>	45		50	dB
Repeatability	0.03		0.1	dB
Polarization Dependent Loss			0.2	dB
Wavelength Dependent Loss <sup>[4]</sup>			0.3	dB
Temperature Dependent Loss			0.3	dB
Switching Time		5	30	ms
Optical Power Handling		300	400	mW
Life Time	10 <sup>9</sup>			cycle
Operating Temperature	-20		70	°C
Storage Temperature	-40		80	°C
Operation Humidity			90	%RH
Storage Humidity			95	%RH
Power Supply	0		5	VDC
Power Consumption			2	W
Fiber Type		G657A2		
Fiber Connect Type		MU adapter x 4 pcs	MPO adapter x 8 pcs	

### Notes:

- [1]: measured without connectors @1550nm ±30nm, 23°C: each connector adds 0.3dB. 0.6dB for 1x16,  
[2]: 30dB for multimode fiber, 45dB for >single mode 24 ch., 50dB for < single mode 16 ch.  
[3]: 30dB for multimode fiber, 50dB for single mode  
[4]: @CWL ±30nm, 23°C

**Legal notices:** All product information is believed to be accurate and is subject to change without notice. Information contained herein shall legally bind Agiltron only if it is specifically incorporated into the terms and conditions of a sales agreement. Some specific combinations of options may not be available. The user assumes all risks and liability whatsoever in connection with the use of a product or its application.

Rev 02/20/24

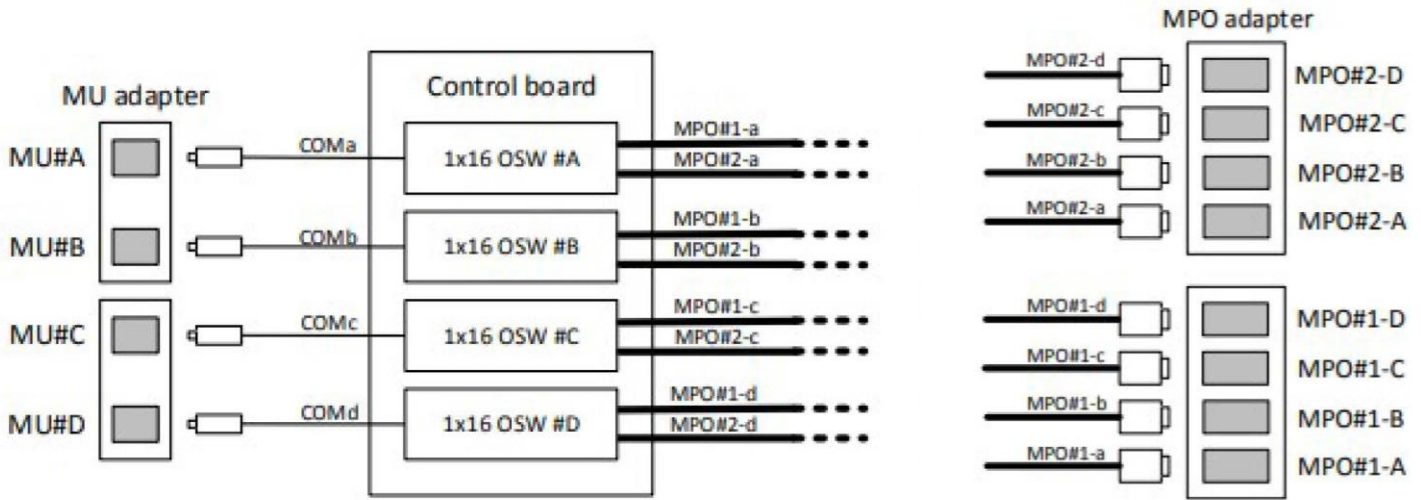
# MEMS Quad 1x16 Fiber Optical Switches



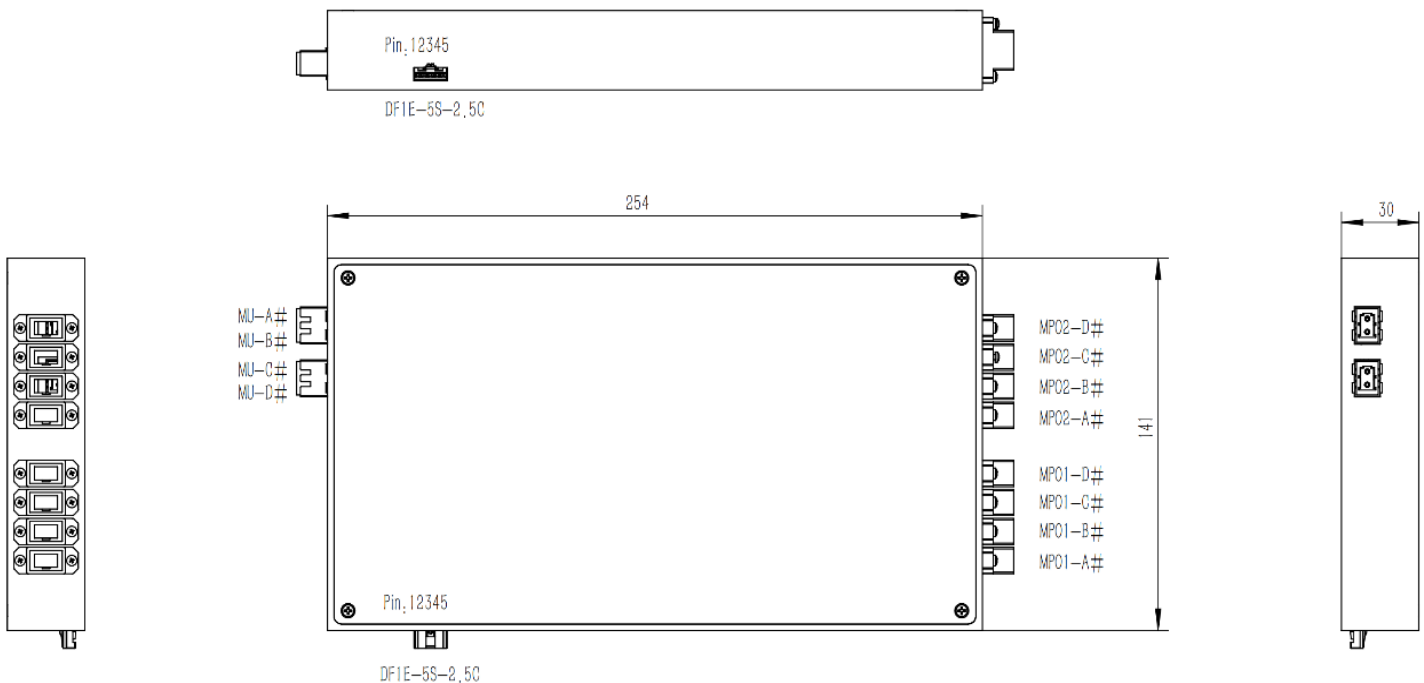
1260-1625nm, bidirectional, SM28, 3 year warranty

## DATASHEET

### Optical Path Diagram



### Mechanical Dimensions (mm)



Information contained herein is deemed to be reliable and accurate as of the issue date. Photonwares reserves the right to change the design or specifications at any time without notice. Agiltron is a registered trademark of Photonwares Corporation in the U.S. and other countries.

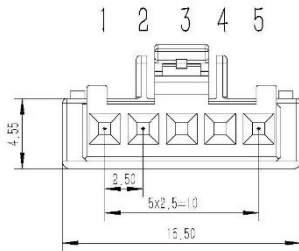
# MEMS Quad 1x16 Fiber Optical Switches



1260-1625nm, bidirectional, SM28, 3 year warranty

## DATASHEET

### Electrical Driving Pin Definition



Pin	Name	Function	Level
1	VCC	Power Supply	5.0±5% V
2	GND	Ground	0
3	I2C Clock <sup>1</sup>	I/O	LVTTTL
4	I2C Data <sup>1</sup>	I/O	LVTTTL
5	Reset <sup>2</sup>	I	LVTTTL

### I2C

■ Bus	I <sup>2</sup> C Bus Specifications			Minimum	Typical	Maximum
	I <sup>2</sup> C Clock Frequency			10kHz	100kHz	100kHz
	Capacitive Loading					400pF

■ Address	1	1	1	0	0	0	0	R/W
-----------	---	---	---	---	---	---	---	-----

### Communication Protocol

■ Command	FLAG1	LEN	RES	CMD	DATA	SUM
	2 Byte	1 Byte	1 Byte	1 Byte		1 Byte

FLAG1: 0xEFEF  
LEN: Total number of bytes from RES to SUM  
RES: 0xFF  
SUM: Checksum, SUM=FLAG+LEN+RES+CMD+DATA

■ Response	FLAG2	LEN	RES	RESP	DATA	SUM
	2 Byte	1 Byte	1 Byte	1 Byte		1 Byte

FLAG2: 0xEDFA  
LEN: Total number of bytes from RES to SUM  
RES: 0xFF  
SUM: Checksum, SUM=FLAG+LEN+RES+ RESP+DATA

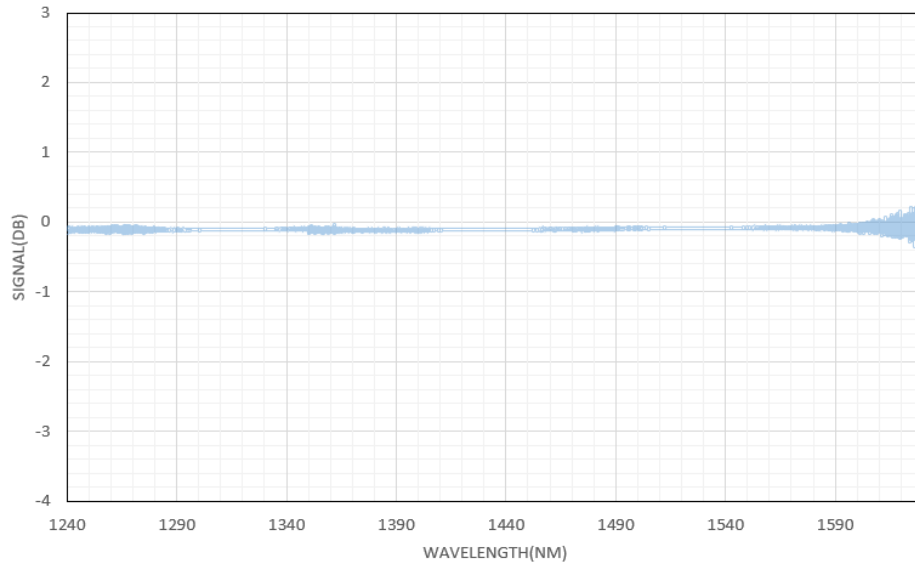
# MEMS Quad 1x16 Fiber Optical Switches



1260-1625nm, bidirectional, SM28, 3 year warranty

## DATASHEET

### Typical Insertion Loss vs Wavelength (1240-1630nm)



# MEMS Quad 1x16 Fiber Optical Switches



1260-1625nm, bidirectional, SM28, 3 year warranty

## DATASHEET

### Ordering Information

Prefix	Configuration	Wavelength	Control	Fiber Type	Fiber Cover	Fiber Length	Connector
MSWJ-	0416	5	<input type="checkbox"/>	1	0	0	0
		1240-1630nm = 1 1550nm = 5 1310nm = 3 1310/1550nm = B 850nm = 8 850/1310 = C 1060nm = 6	TTL = 1 USB = 2 RS232 = 3 Special = 0	SM28 = 1 50/125 = 2 Hi1060 = 3 PM1550 = 5 Special = 0	Bare fiber = 1 900um tube = 3 Special = 0	0.25m = 1 0.5m = 2 1.0m = 3 Special = 0	None = 1 FC/PC = 2 FC/APC = 3 SC/PC = 4 SC/APC = 5 SC/UPC = 5 ST/PC = 6 LC/PC = 7 MTP = 9 LC/UPC = U Special = 0

#### Fiber Core Alignment

Note that the minimum attenuation for these devices depends on excellent core-to-core alignment when the connectors are mated. This is crucial for shorter wavelengths with smaller fiber core diameters that can increase the loss of many decibels above the specification if they are not perfectly aligned. Different vendors' connectors may not mate well with each other, especially for angled APC.

#### Fiber Cleanliness

Fibers with smaller core diameters (<5 μm) must be kept extremely clean, contamination at fiber-fiber interfaces, combined with the high optical power density, can lead to significant optical damage. This type of damage usually requires re-polishing or replacement of the connector.

#### Maximum Optical Input Power

Due to their small fiber core diameters for short wavelength and high photon energies, the damage thresholds for device is substantially reduced than the common 1550nm fiber. To avoid damage to the exposed fiber end faces and internal components, the optical input power should never exceed 20 mW for wavelengths shorter 650nm. We produce a special version to increase the handling by expanding the core side at the fiber ends.

# MEMS Quad 1x16 Fiber Optical Switches

1260-1625nm, bidirectional, SM28, 3 year warranty



DATASHEET

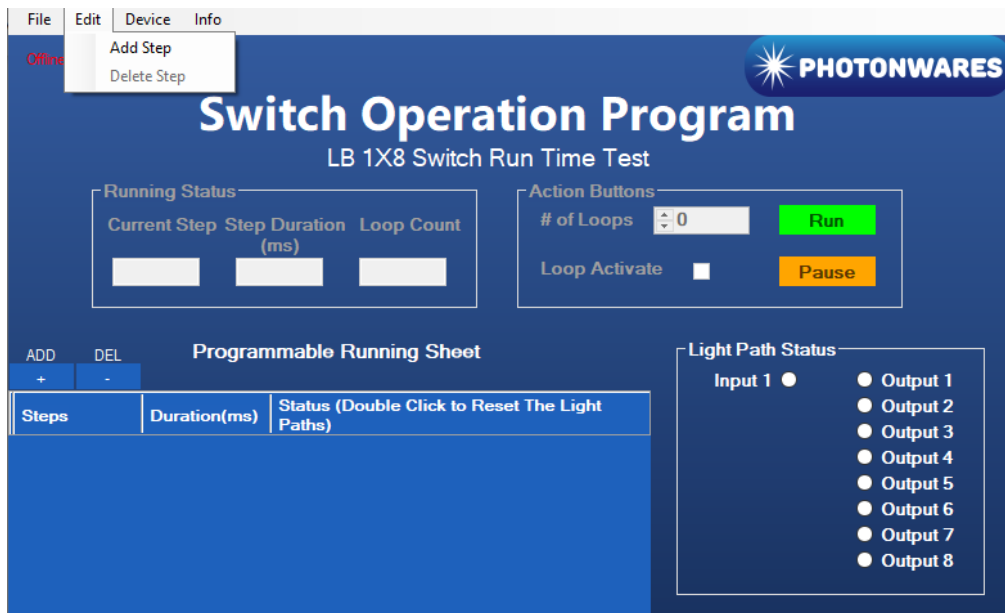
## USB Control/ GUI

We provide an adapting PCB for USB (Virtual COM) control with a user-friendly GUI Windows™ program supporting UART commands. It is intended for convenient laboratory use or switch performance evaluation. The unit has a mini USB connector with a USB-to-MicroUSB cable. It can be powered by an accompanied 5V wall pluggable power supply.

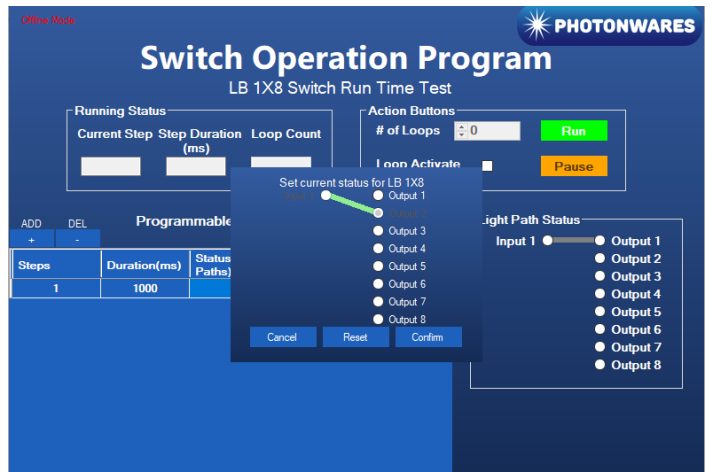
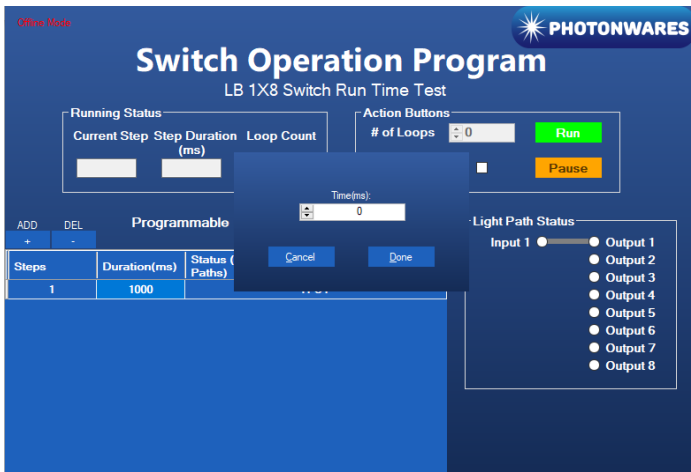
- **Create and edit testing time sequence**

**Add step:** Click the “Add Step” button in the menu strip or click the “+(ADD)” button would both add a step to the Programmable Running Sheet.

**Delete step:** Click the “Delete Step” button in the menu strip or click the “-(DEL)” button would both delete a step in the Programmable Running Sheet.



**Edit step:** There are two things that you can modify for one step. One is the light path, and the other is the duration for each step. Double click the cell that you want to modify, and the program will allow you to modify the setting.



# MEMS Quad 1x16 Fiber Optical Switches



1260-1625nm, bidirectional, SM28, 3 year warranty

## DATASHEET

### Command List

Set Channel for switch x						
Command	FLAG1	LEN	RES	CMD	DATA	SUM
	0xEFEF	0x06	0xFF	0x0D	3 bytes	SUM
Byte 1 = switch index, from 1 to 4 Byte 2~3 = channel = (Byte_2<<8) + Byte_3						
Response	FLAG2	LEN	RES	RESP	DATA	SUM
	0xEDFA	0x04	0xFF	0x0D	1 byte	SUM
	Result = 0xEE		Success			
Result = 0xEF		Fail				

Get Channel for switch x						
Command	FLAG1	LEN	RES	CMD	DATA	SUM
	0xEFEF	0x04	0xFF	0x0E	1 byte	SUM
DATA = switch index, from 1 to 4						
Response	FLAG2	LEN	RES	RESP	DATA	SUM
	0xEDFA	0x05	0xFF	0x0E	2 bytes	SUM
DATA = Channel = (Byte_1<<8) + Byte_2						

Read Module Information						
Command	FLAG1	LEN	RES	CMD	DATA	SUM
	0xEFEF	0x03	0xFF	0x01		SUM
Response	FLAG2	LEN	RES	RESP	DATA	SUM
	0xEDFA	0x27	0xFF	0x01	36 bytes	SUM

Item	Bytes	Type	Note
Vendor Code	10	ASCII	
Reserved	10	ASCII	Information about the channel and the type
Hardware Version	2	Hex	X.Y (X—byte0 Y—byte1)
Firmware Version	2	Hex	X.Y (X—byte0 Y—byte1)
Production Date	4	Hex	YYYY—MM—DD YYYY—byte0 byte1 MM—byte2 DD—byte3
Serial Number	8	ASCII	

Reset Module						
Command	FLAG1	RES	CMD	DATA	SUM	
	0xEFEF	0xFF	0x03		SUM	
Response	FLAG2	RES	RESP	DATA	SUM	
	0xEDFA	0xFF	0x03		SUM	