

LightBend™ 1x4 High Power Fiber Optic Switch

(SM, MM, PM, up to 10W, Bidirectional)

(Protected by U.S. pending patents)



DATASHEET

BUY NOW



Applications

- Channel Blocking
- Configurable Add/Drop
- System Monitoring
- Instrumentation

Features

- Unmatched Low Cost
- Low Optical Distortions
- High Isolation
- High Reliability
- Epoxy-Free Optical Path

The LB 1x4 Series fiber optic switch connects optical channels by redirecting an incoming optical signal into a selected output fiber. This is achieved by using a patent pending opto-mechanical configuration activated via an electrical control signal. Latching operation preserves the selected optical path after the drive signal has been removed. The switch has integrated electrical position sensors, and the new material based advanced design significantly reduces moving part position sensitivity, offering unprecedented high stability as well as an unmatched low cost. Electronic driver is available for this series of switches.

Specifications

Parameter	Min	Typical	Max	Unit
Operation Wavelength	850, 980, 1060, 1310, 1550			nm
Insertion Loss ^[1]		0.7	1.1	dB
Extinction Ratio ^[1] (PM)	18			dB
Polarization Dependent Loss (SM, PM)			0.1	dB
Return Loss ^[1]	SM, PM	50		dB
	MM	35		dB
Cross Talk ^[1]	SM, PM	50		dB
	MM	35		dB
Switching Time		3	10	ms
Repeatability			± 0.05	dB
Operating Voltage	4.5	5	6	VDC
Operating Current ^[2]	Latching		26	mA
	Non-Latching		36	mA
Voltage Pulse Width (Latching)		20		ms
Switching Type	Latching / Non-Latching			
Operating Temperature	-5		70	°C
Storage Temperature	-40		85	°C
Optical Power Handling	Standard	300	500	mW
	High Power	5	10	W
Fiber Type	SM, MM	SMF-28, MM 50/125, MM 62.5/125		
	PM	Panda PM 250		

Notes:

- [1]. Exclude connectors.
- [2]. Tested at 5VDC for each coil actuation.
- [3]. Measure at Light Source CPR<14 dB.

Warning: This device must use the reference circuit to driver otherwise it is unstable

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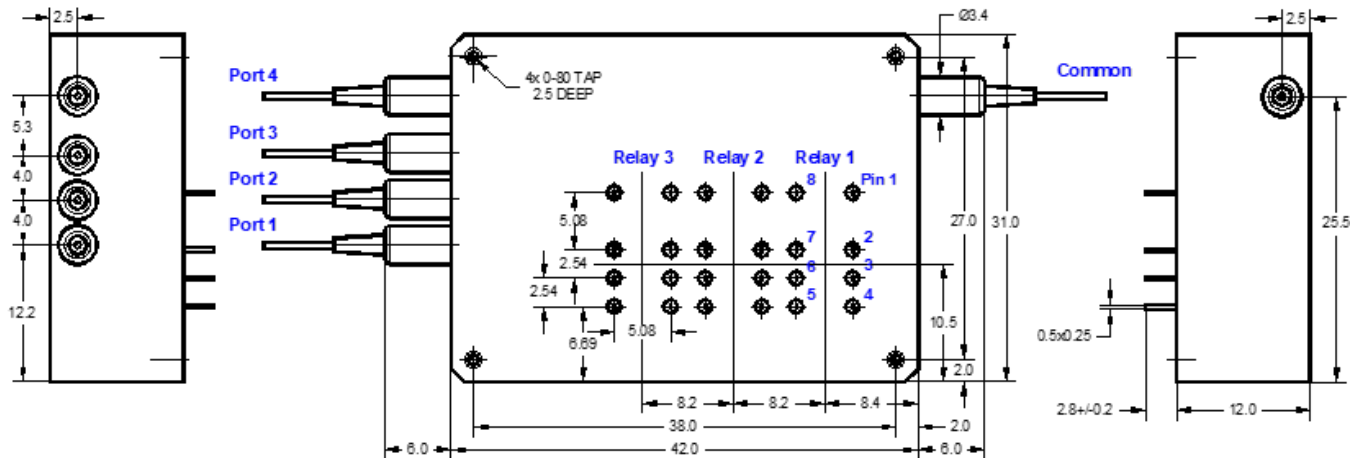
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Mechanical Dimensions (Unit: mm)



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

Electrical Driving Requirements

Agiltron offers a computer control kit with TTL and RS232 interfaces and Windows™ GUI

The load is a resistive coil which is activated by applying 5V (draw ~ 40mA). However, the current flow direction must be correct otherwise it will cancel the permanent magnet inside causing instability. We strongly recommend to use the reference circuit to avoid major issues. We offer pushbutton elevation driver for verifications or convenient income inspection.

Latching Type

Optical Path	Relay	Electrical Drive		Status Sensor			
		Pin 1	Pin 8	Pin 2-3	Pin 3-4	Pin 5-6	Pin 6-7
Common → Port 1	Relay 1	5V	0	Open	Close	Close	Open
	Relay 2, 3	N/A	N/A				
Common → Port 2	Relay 1	0	5V	Close	Open	Open	Close
	Relay 2	5V	0	Open	Close	Close	Open
	Relay 3	N/A	N/A				
Common → Port 3	Relay 1, 2	0	5V	Close	Open	Open	Close
	Relay 3	5V	0	Open	Close	Close	Open
Common → Port 4	Relay 1, 2, 3	0	5V	Close	Open	Open	Close

Non-Latching Type

Optical Path	Relay	Electrical Drive		Status Sensor			
		Pin 1	Pin 8	Pin 2-3	Pin 3-4	Pin 5-6	Pin 6-7
Common → Port 1	Relay 1	5V	0	Open	Close	Close	Open
	Relay 2, 3	No Power		Close	Open	Open	Close
Common → Port 2	Relay 2	5V	0	Open	Close	Close	Open
	Relay 1, 3	No Power		Close	Open	Open	Close
Common → Port 3	Relay 3	5V	0	Open	Close	Close	Open
	Relay 1, 2	No Power		Close	Open	Open	Close
Common → Port 4	Relay 1, 2, 3	No Power		Close	Open	Open	Close

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Ordering Information

Prefix	Type	Wavelength	Switch	Power	Fiber Type	Fiber Cover	Fiber Length	Connector
LBHP- ^[1]	1x2 = 12	1060 = 1	Latching = 1	5W = 4	SMF-28 = 1	Bare fiber = 1	0.25m=1	None=1
LBPH- ^[2]	1x3 = 13	1310 = 3	Non-latching = 2	10W = 5	MM 50/125 = 5	900um tube = 3	0.5m=2	FC/PC=2
	1x4 = 14	1550 = 5	Special = 0	Special = 0	MM 62.5/125 = 6	Special = 0	1.0m=3	FC/APC=3
	4x1 = 41	780 = 7			PM1550 = B		Special=0	SC/PC=4
	Special = 00	850 = 8			PM1310 = D			SC/APC=5
		980 = 9			PM980 = E			ST/PC=6
		Special = 0			PM850 = F			LC/PC = 7
					Special = 0			Duplex LC/PC = 8
								LC/UPC = U
								Special=0

[1]. LBHP-: LightBend 1x4 High Power Switch.

[2]. LBPH-: LightBend 1x4 PM High Power Switch.

NOTE:

- PM1550 fiber works well for 1310nm

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 how handling by expanding the core side at the fiber ends.