

# LightBend™ Mini 1x1, 1x2, 2x2 (Bypass) OptoMechanical Fiberoptic Switch (Bidirectional)

(Protected by U.S. patent 6823102 and pending patents)

## Product Description

The LB Series miniature fiber optic switch connects optical channels by redirecting incoming optical signals into selected output fibers, in 1x1, 1x2 and 2x2 (bypass) configurations. This is achieved using a patent pending opto-mechanical configuration and activated via an electrical control signal. Latching operation preserves the selected optical path after the drive signal has been removed. The switch has integrated status contacts to provide an electrical readout of switch position. The new material based advanced design significantly reduces moving part position sensitivity, offering unprecedented high stability as well as an unmatched low cost. It is designed for use in reconfigurable OADM, optical cross-connect system and network switching for fault protection applications. Electronic driver is available for this series of switches. The switch is bidirectional.

We offer tight-bend-fiber version, which reduces the minimum bending radius from normal 15 mm to 7 mm. This feature enables smaller overall foot print.



## Performance Specifications

LB 1x1,1x2, 2x2 (Bypass) Switch	Min	Typical	Max	Unit
Operation Wavelength	850	1260-1360 and/or	1510-1620	nm
Insertion Loss <sup>1</sup>		0.5	1.0	dB
Wavelength Dependent Loss	SW <sup>1</sup>		0.15	dB
	DW <sup>2</sup>		0.25	
Temperature Dependent Loss		0.15	0.4	dB
Polarization Dependent Loss			0.1	dB
Return Loss	55			dB
Cross Talk	55			dB
Switching Time		3	10	ms
Repeatability			±0.02	dB
Durability	10 <sup>7</sup>			Cycle
Operating Voltage	4.5	5	6	VDC
Operating Current (Latching/Non-Latching)		30	60	mA
Voltage Pulse Width (Latching)		20		ms
Switching Type	Latching or Non-Latching			
Operating Temperature	-5		+70	°C
	-40		+85	
Optical Power Handling		300	500*	mW
Storage Temperature	-40		+85	°C
Package Dimension	36.5L x 12.5W x 8.2H			mm

Note:

1. Exclude connectors.
2. SW: Single window.
3. DW: Dual window.
- \* Continuous operation, for pulse operation call

## Features

- Unmatched Low Cost
- Low Optical Distortions
- Low Cross Talk
- High Reliability
- Epoxy-Free Optical Path

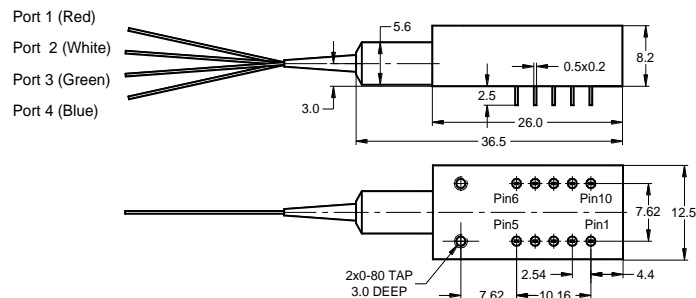
## Applications

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



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## Mechanical Dimensions (Unit:mm)



## Electrical Driving Requirements

The load is a resistive coil which is activated by applying 5V (draw ~ 40mA). Applying too long pulse for the latching version will heat up the device. Agiltron offers a computer control kit with TTL and USB interfaces and Windows™ GUI. We also offer RS232 interface as an option - please contact Agiltron sales.

### Latching Type

#### LB Mini 1x2 Switch

Optical Path	Electrical Drive		Status Sensor					
	Pin1	Pin10	Pin5	Pin6	Pin2-3	Pin3-4	Pin7-8	Pin 8-9
Port 1 → Port 2	GND	5V Pulse	N/A	N/A	Close	Open	Open	Close
Port 1 → Port 3	5V Pulse	GND	N/A	N/A	Open	Close	Close	Open

#### LB Mini 2x2 Bypass Switch

Optical Path	Electrical Drive		Status Sensor					
	Pin1	Pin10	Pin5	Pin6	Pin2-3	Pin3-4	Pin7-8	Pin 8-9
Port 1 → Port 2 Port 4 → Port 3	GND	5V Pulse	N/A	N/A	Close	Open	Open	Close
Port 1 → Port 3	5V Pulse	GND	N/A	N/A	Open	Close	Close	Open

### Non-Latching Type

#### LB Mini 1x2 Switch

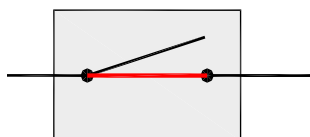
Optical Path	Electrical Drive		Status Sensor					
	Pin1	Pin10	Pin5	Pin6	Pin2-3	Pin3-4	Pin7-8	Pin 8-9
Port 1 → Port 2	No Power		N/A	N/A	Close	Open	Open	Close
Port 1 → Port 3	5V	GND	N/A	N/A	Open	Close	Close	Open

#### LB Mini 2x2 Bypass Switch

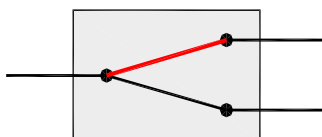
Optical Path	Electrical Drive		Status Sensor					
	Pin1	Pin10	Pin5	Pin6	Pin2-3	Pin3-4	Pin7-8	Pin 8-9
Port 1 → Port 2 Port 4 → Port 3	No Power		N/A	N/A	Close	Open	Open	Close
Port 1 → Port 3	5V	GND	N/A	N/A	Open	Close	Close	Open

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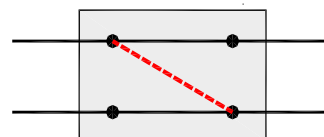
## Functional Diagram



LB 1x1 Switch



LB 1x2 Switch



LB 2x2 Bypass Switch

## Ordering Information

LBSW-	Type	Wavelength	Switch	Package	Fiber Type	Fiber Length	Connector
	1x1 Latching=11 1x1 N/O*=10 1x1 N/C**=1C 1x2=12 2x1=21 2x2 Bypass=22 Special=00	1060=1 C+L=2 1310=3 1410=4 1550=5 650=6 780=7 850=8 1310 & 1550=9 1260-1620=B Special=0	Latch=1 Non-latch=2	-5-+70°C=7 -40-+85°C=8 Special=0	SMF-28=1 Corning XB=2 Draka BBE=3 Special=0	Bare fiber=1 900µm 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 ST/PC = 6 LC = 7 Duplex LC=8 Special = 0

\* N/O: LB 1x1 Switch Non-Latching Normally Open.

\*\* N/C: LB 1x1 Switch Non-Latching Normally Close.