**LightBend™ Straight Series Fiber Optic Switch**

(1x1, 1x2, 2x2, 2x2 Bypass, Dual 1x1, Dual 1x2, Dual 2x2, Dual 2x2 Bypass, Quad 1x1. Multimode: Full 2x2, Dual Full 2x2) Bidirectional

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

### Product Description

The LB Straight Series Fiber Optic Switch connects optical channels by redirecting an incoming optical signal into a selected output fiber. 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 driver signal has been removed. The switch has integrated electrical position sensors. 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. The switch is bidirectional. The LB Mini Straight Series Switches can be directly mounted on printed circuit board with configurations of 1x1, Dual 1x1, Quad 1x1, 1x2, Dual 1x2, 2x2, Dual 2x2, Dual 2x2 Bypass both Single mode and Multimode, also we provide configurations Full 2x2 and Dual Full 2x2 Multimode. If you want to looking for Single mode Full 2x2 and Dual Full 2x2 Switches, please pay attention to our MEMS series Switch.

We offer tight-bend-fiber version, which reduces the bending radius. This feature enables smaller overall footprint.

### Performance Specifications

<table>
<thead>
<tr>
<th>LB Straight Series Switch</th>
<th>Min</th>
<th>Typical</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Wavelength</td>
<td>Single mode</td>
<td>1310 or/and 1550</td>
<td>nm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Multimode</td>
<td>1260 - 1650</td>
<td>nm</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>850 or/and 1310</td>
<td>nm</td>
<td></td>
</tr>
<tr>
<td>Insertion Loss [1], [2]</td>
<td>0.5</td>
<td>1.0 (1.2 [3])</td>
<td>dB</td>
<td></td>
</tr>
<tr>
<td>Polarization Depended Loss (Single Mode)</td>
<td>0.1</td>
<td>dB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wavelength Depended Loss</td>
<td>0.15</td>
<td>0.25 (0.3 [3])</td>
<td>dB</td>
<td></td>
</tr>
<tr>
<td>Cross Talk [1]</td>
<td>Single mode</td>
<td>50</td>
<td>dB</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Multimode</td>
<td>35</td>
<td>dB</td>
<td></td>
</tr>
<tr>
<td>Return Loss [1]</td>
<td>Single mode</td>
<td>50</td>
<td>dB</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Multimode</td>
<td>35</td>
<td>dB</td>
<td></td>
</tr>
<tr>
<td>Switching Time</td>
<td>3</td>
<td>10</td>
<td>ms</td>
<td></td>
</tr>
<tr>
<td>Repeatability</td>
<td>± 0.02</td>
<td></td>
<td>dB</td>
<td></td>
</tr>
<tr>
<td>Durability</td>
<td>10⁷</td>
<td></td>
<td>Cycles</td>
<td></td>
</tr>
<tr>
<td>Operating Optical Power</td>
<td>300</td>
<td>500 [4]</td>
<td>mW</td>
<td></td>
</tr>
<tr>
<td>Switching Type</td>
<td>Latching / Non-Latching</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-5 - 70</td>
<td></td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>-40 - 85</td>
<td></td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>Fiber Type</td>
<td>Single mode</td>
<td>SMF-28, or equivalent</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Multimode</td>
<td>MM 50/125, MM 62.5/125, or equivalent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Package Dimension</td>
<td>35.5L x 12.5W X 9.0H</td>
<td></td>
<td>mm</td>
<td></td>
</tr>
</tbody>
</table>

[1]. Excluding Connectors.
[2]. Multimode IL Measure @ Light source CPR<14 dB.
[3]. Dual band, Broad band.
[4]. Continuous operation, for pulse operation call.
### Mechanical Dimensions (Unit: mm)

**LB Straight 1x1 Switch**

- Port 1 (Black)
- Port 2' (Red)
- Port 1' (Black)

**LB Straight 1x2 Switch**

- Port 1 (Black)
- Port 2 (Red)
- Port 1' (Black)
- Port 2' (Red)

**LB Straight Quad 1x1 Switch**

- Port 1 (Black)
- Port 2 (Red)
- Port 3' (Blue)
- Port 4' (White)

**LB Straight Dual 1x2 Switch**

- Port 1 (Black)
- Port 2 (Red)
- Port 1' (Black)
- Port 2' (Red)

**LB Straight Dual 2x2 Bypass Switch**

- Port 1 (Black)
- Port 2 (Red)
- Port 3' (Blue)
- Port 4' (White)

**LB Straight Full 2x2 MM Switch**

- Port 1 (Black)
- Port 2 (Red)
- Port 3 (Blue)
- Port 4 (White)

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**LightBend™ Straight Series**

**Fiber Optic Switch**

(1x1, 1x2, 2x2, 2x2 Bypass, Dual 1x1, Dual 1x2, Dual 2x2, Dual 2x2 Bypass, Quad 1x1. Multimode: Full 2x2, Dual Full 2x2)
Electrical Connector Configurations

The load is a resistive coil which is activated by applying 5V (draw ~ 40mA). 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

Application Note: Applying a constant driving voltage increases stability. The switches can also be driven by a pulse mode using Agiltron recommended circuit for energy saving.

Non-Latching Type

1. LB Straight Full 2x2, Dual Full 2x2 Switch are for Multimode only. If you want Single mode Full 2x2, Dual Full 2x2, Octc Full 2x2 Switch, please see Agiltron MEMS Series Switch.
2. Typical Pulse Width is 20 ms.
3. We can provide 3V or other Driving voltage switches, please call sales.

[1] LB Straight Full 2x2, Dual Full 2x2 Switch are only for Multimode switches. If you want Single mode Full 2x2, Dual Full 2x2, Octc Full 2x2 Switch, please see Agiltron MEMS Series Switch.
[2] We can provide 3V or other Driving voltage switches, please call sales.
**LightBend™ Straight Series**

**Fiber Optic Switch**

(1x1, 1x2, 2x2, 2x2 Bypass, Dual 1x1, Dual 1x2, Dual 2x2, Dual 2x2 Bypass, Quad 1x1. Multimode: Full 2x2, Dual Full 2x2)

## Functional Diagram

- 1x1
- Dual 1x1
- Quad 1x1
- 1x2
- Dual 1x2
- 2x2
- Dual 2x2
- 2x2 Bypass
- Dual 2x2 Bypass

## Ordering Information

<table>
<thead>
<tr>
<th>Type</th>
<th>Wavelength</th>
<th>Switch</th>
<th>Package</th>
<th>Fiber Type</th>
<th>Fiber Length</th>
<th>Connector</th>
</tr>
</thead>
<tbody>
<tr>
<td>[1]. LSSW</td>
<td>1060=1</td>
<td>Latching=1</td>
<td>Standard=1</td>
<td>SMF-28</td>
<td>None=1</td>
<td>FC/PC=2</td>
</tr>
<tr>
<td>[2]. LSBS</td>
<td>1310=3</td>
<td>Non-latching=2</td>
<td>Special=0</td>
<td>MM 50/125</td>
<td>FC/APC=3</td>
<td>FC/APC=3</td>
</tr>
<tr>
<td>[3]. LSDS</td>
<td>1550=5</td>
<td></td>
<td>Special=0</td>
<td>MM 62.5/125</td>
<td>SC/PC=4</td>
<td>SC/PC=4</td>
</tr>
<tr>
<td>[4]. LSDB</td>
<td>780=7</td>
<td></td>
<td>Special=0</td>
<td>900um tube=3</td>
<td>ST/PC=5</td>
<td>ST/PC=5</td>
</tr>
<tr>
<td>[5]. N/T</td>
<td>850=8</td>
<td></td>
<td>Special=0</td>
<td>None=1</td>
<td>LC=7</td>
<td>LC=7</td>
</tr>
<tr>
<td>[6]. N/D</td>
<td>1310 &amp; 1550=9</td>
<td>Latching=1</td>
<td>Special=0</td>
<td>0.25m</td>
<td>Duplex LC=8</td>
<td>Duplex LC=8</td>
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<tr>
<td></td>
<td>850 &amp; 1310=9</td>
<td>Non-latching=2</td>
<td>Special=0</td>
<td>0.5m</td>
<td>Special=0</td>
<td>Special=0</td>
</tr>
<tr>
<td></td>
<td>1260-1650=8</td>
<td>Special=0</td>
<td>Special=0</td>
<td>1.0m</td>
<td>Special=0</td>
<td>Special=0</td>
</tr>
</tbody>
</table>

1. **LSSW**: LB Straight 1x1, 1x2, Full 2x2 (MM only) Switch.
2. **LSBS**: LB Straight 2x2 Bypass Switch.
3. **LSDS**: LB Straight Dual 1x1, 1x2, Full 2x2 (MM only) Switch.
4. **LSDB**: LB Straight Dual 2x2 Bypass Switch.
5. **N/T**: Non-Latching type, Normally Transparent.
6. **N/D**: Non-Latching type, Normally Dark.