## 1x4／4x1 Optical Switch

## Product Description

Lightwave Link 1X4／4X1 Fiber Optical Switches optimized for a wide range of fiber－optic applications．Design is based on worldwide telecommunications，data communication，system monitoring and component testing requirements．This $1 \times 4$／ $4 \times 1$ OSW Module has 1 Input Port， 4 Output Ports or 4 Input Ports， 1 Output port．The Module is controlled by a set of electrical connections．Electrical feedback will be provided by the Module indicating which state the optical switch is in．Lightwave Link Inc． $1 \times 4$／ $4 \times 1$ OSW Module fully complies with RoHS Directive 2002／95／EC
 （2008／385／EC）．

## Applications

－Optical network monitoring
－Optical measurement systems
－Low Insertion－Loss
－Fast Switching Speed
－Built－In position monitoring
－Latching Type available
－RoHS Compliance

Performance Specification

| Parameter | $9 \mu \mathrm{~m}$ Core Single Mode |  |  | $50 \mu \mathrm{~m}$ or $62.5 \mu \mathrm{~m}$ Core Multi Mode |  |  | Unit |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Min． | Typ． | Max． | Min． | Typ | Max． |  |
| Wavelength Range ${ }^{1}$ |  | 1260～16 |  |  | 850／1 |  | nm |
| Insertion Loss ${ }^{2}$ |  | 0.8 | 1.2 |  | 0.8 | 1.0 | dB |
| Return Loss |  | －50 |  |  |  |  | dB |
| PDL |  |  | 0.1 |  |  |  | dB |
| WDL |  |  | 0.3 |  |  |  | dB |
| Crosstalk |  | －80 |  |  | －80 |  | dB |
| Repeatability |  |  | $\pm 0.1$ |  |  | $\pm 0.1$ | dB |
| Switching Time ${ }^{3}$ |  |  | 5 |  |  | 5 | ms |
| Absolute Optical Input Power |  |  | 500 |  |  | 500 | mW |
| Operating Voltage | 4.5 | 5.0 | 5.5 | 4.5 | 5.0 | 5.5 | VDC |
| Power Consumption |  |  |  | $\pm 10 \%$ |  |  | mW |
| Switching Life Expectancy | $3 \times 10^{7}$ |  |  | $3 \times 10^{7}$ |  |  | Cycles |
| Operation Temperature－Normal | －5 |  | 70 | －5 |  | 70 | ${ }^{\circ} \mathrm{C}$ |
| Operation Temperature－Special | －20 |  | 70 | －20 |  | 70 | ${ }^{\circ} \mathrm{C}$ |
| Storage Temperature | $-40$ |  | 85 | －40 |  | 85 | ${ }^{\circ} \mathrm{C}$ |
| Operation Humidity | 5 |  | 85 | 5 |  | 85 | \％RH |
| Storage Humidity | 5 |  | 85 | 5 |  | 85 | \％RH |
| Dimension（ $\mathrm{H}^{*} \mathrm{~W}$＊ L ） | Normal Type ： $18 \times 76 \times 76 /$ Mini Type ： $15 \times 44 \times 55$ |  |  |  |  |  | mm |
| Weight ${ }^{4}$ | Normal Type ： 135 ／Mini Type ： 100 |  |  |  |  |  | g |

1．Special wavelength would be upon request．
2．Optical parameters excluded connectors．
3．A minimum $\geqq 20 \mathrm{~ms}$ pulse is recommended for latching type of switch．
4．The product weight excluded optical connectors．

## Physical Dimension



## PIN Description

| Pin Number | Name | Input or Output | Function |
| :---: | :---: | :---: | :---: |
| 1 | S1 | Input | Port Selection Pin1 (TTL signals) |
| 2 | S0 | Input | Port Selection Pin2 (TTL signals) |
| 3 | NC |  | NO Connect |
| 4 | Vcc | Input | +5.0V Power Supply (TTL Power) |
| 5 | NC |  | NO Connect |
| 6 | NC |  | NO Connect |
| 7 | Vbb | Input | +5.0V Power Supply (OSW Power) |
| 8 | GND | Input | Power Ground |
| 9 | M3 | Output | Input / Output fiber 4 "ON", M3 = High |
| 10 | M2 | Output | Input / Output fiber 3 "ON", M2 = High |
| 11 | M1 | Output | Input / Output fiber 2 "ON", M1 = High |
| 12 | MO | Output | Input / Output fiber 1 "ON", M0 = High |
| 13 | NC |  | NO Connect |
| 14 | NC |  | NO Connect |
| 15 | NC |  | NO Connect |
| 16 | NC |  | NO Connect |

## Operation of the optical switch

| Input Signals |  | The Selected Path | Monitor Signals |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| S1 | S0 |  | MO | M1 | M2 | M3 |
| 0 | 0 | Input / Output Fiber 1 | 1 | 0 | 0 | 0 |
| 0 | 1 | Input / Output Fiber 2 | 0 | 1 | 0 | 0 |
| 1 | 0 | Input / Output Fiber 3 | 0 | 0 | 1 | 0 |
| 1 | 1 | Input / Output Fiber 4 | 0 | 0 | 0 | 1 |

## Logic Levels

| Command | Minimum (V) | Maximum (V) |
| :---: | :---: | :---: |
| High Level Input Voltage, 1 | 2.0 | - |
| Low Level Input Voltage, 0 | 0.0 | 0.8 |
| High Level Output Voltage, 1 | 2.4 | - |
| Low Level Output Voltage, 0 | 0.0 | 0.4 |

## Operation

Operating sequences are listed below:

1. Connect the switch unit with power supply. ( $\operatorname{Pin} 4$ and $\operatorname{Pin} 7$ connect to $+5.0 \mathrm{VDC}, \mathrm{Pin} 8$ connects to GND )
2. Use the $\operatorname{Pin} 1$ and $\operatorname{Pin} 2(\mathrm{~S} 1$ and SO$)$ to switch the switch unit to the selected path.
3. Use the Pin9 ~ Pin12 (M3 ~ M0) to monitor the selected path of the switch unit.

Note:
When Pin1, Pin2 are open, but the switch unit is connected to the power supply, the switch unit is in Input / Output Fiber 4.
The switch unit is in Input / Output Fiber 1 when the Non-Latching type switch unit without power supply.

## Ordering Information



- Do not open the case of LLI's product without authorization to maintain warranty.

