



# CrystalLatch™ 1x4 Series Fiber Optical Switch

(SM, PM, SM High Power, PM High Power, SM Bidirectional, PM Bidirectional, SM High Power Bidirectional, PM High Power Bidirectional)

(Protected by U.S. patents 7224860, 6757101, 6577430 and pending patents)

## Product Description

The CL Series 1x4 Series fiber optical switch connects optical channels by redirecting an incoming optical signal into a selected output fiber. This is achieved using patented non-mechanical configurations and activated via an electrical control signal. Latching operation preserves the selected optical path after the drive signal has been removed. The CL 1x4 series fiber optic switch feature low insertion loss, high extinction ratio, high channel isolation, and extremely high reliability and repeatability. It is designed to meet the most demanding switching requirements of continuous operation without failure, longevity, operation under shock/vibration environment and large temperature variations, and fast response time.

The switch also has build-in circulator and isolator functions. Electronic driver is available for this series of switches.



## Performance Specifications

CL 1x4 Series Switch		Min	Typical	Max	Unit
Operation Wavelength <sup>[1]</sup>		1520	1550	1580	nm
		1295	1310	1325	nm
Insertion Loss <sup>[2]</sup>			1.2	1.7	dB
Crosstalk <sup>[2]</sup>	Bidirectional Series	Single Stage	17	25	dB
		Dual Stage	35	50	dB
	Unidirectional Series	Single Stage	20	25	dB
		Dual Stage	40	50	dB
Return Loss <sup>[2]</sup>		50	55		dB
PDL (SM Series Switch only)			0.15	0.25	dB
Extinction Ratio (PM Series Switch only)		18	25		dB
Polarization Mode Dispersion				0.2	ps
Switch Speed (Rise, Fall)			50	200	µs
Repetition Rate			2K		Hz
Durability		10 <sup>14</sup>			cycle
Optic Power Handling	Standard		300	500	mW
	High Power Series			2	W
Switch type		Solid-State Latching			
Operating Temperature		-5		70	°C
Storage Temperature		-40		85	°C
Fiber Type		SMF-28, Panda PM, or equivalent			
Package Dimension		53.5L x 38.3W x 8.5H			
		mm			

[1]. Agiltron can achieve same SPEC at L band  
 [2]. Measured without connectors.

## Features

- High Speed
- Non-Mechanical
- High Reliability
- Fail-Safe Latching
- Low Insertion Loss
- Rugged
- Compact
- Cost Effective
- Direct Low Voltage Drive

## Applications

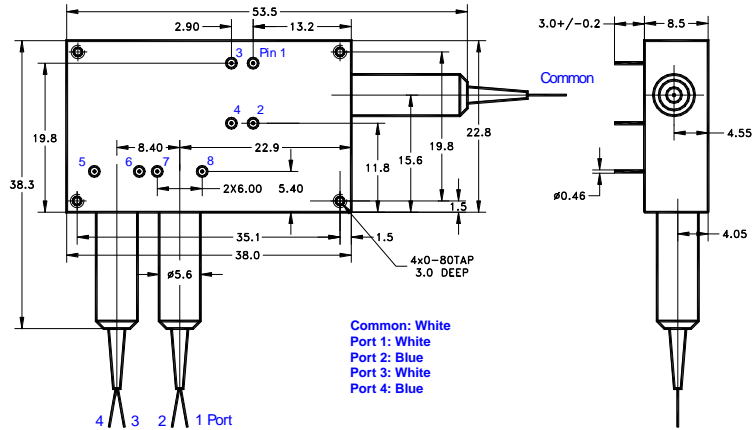
- Optical Signal Routing
- Network Protection
- Burst Switching
- Configurable Add/Drop
- Signal Monitoring
- Instrumentation



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## Mechanical Dimensions (Unit: mm)



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

## Electrical Driving Information

Each switching point is actuated by applying a voltage pulse. Applying one polarity pulse, one light path will be connected and latched to the position. Applying a reversed polarity pulse, another light path will be connected and latched to the position after pulse removed.

Parameter	Minimum	Typical	Maximum	Unit
Resistance (each group)	15	18	22	Ω
Switch Voltage	2.25	2.5	2.75	V
Pulse Duration	0.2	0.3	0.5	ms

Driving kit with USB and TTL interfaces and Windows™ GUI is available. We also offer RS232 interface as an option - please contact Agiltron sales.

## Bidirectional Series 1x4, or 4x1 Switch Driving Table

### Single Stage

Optical Path	Pin Group 1		Pin Group 2	
	Pin 1	2	3	4
Common ↔ Port 1	+ *	-	+	-
Common ↔ Port 2	-	+	-	+
Common ↔ Port 3	+	-	-	+
Common ↔ Port 4	-	+	+	-

\* "+": 2.25-2.75 V pulse, "-": Ground.

### Dual Stage

Optical Path	Pin Group 1		Pin Group 2		Pin Group 3		Pin Group 4	
	Pin 1	2	3	4	5	6	7	8
Common ↔ Port 1	+ *	-	+	-	-	+	+	-
Common ↔ Port 2	-	+	-	+	-	+	+	-
Common ↔ Port 3	+	-	-	+	+	-	-	+
Common ↔ Port 4	-	+	+	-	+	-	-	+

\* "+": 2.25-2.75 V pulse, "-": Ground.

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SM High Power Bidirectional, PM High Power Bidirectional)

## Unidirectional Series 1x4 Switch Driving Table

### Single Stage

Optical Path	Pin Group 1		Pin Group 2	
	Pin 1	2	3	4
Common → Port 1	+ *	-	+	-
Common → Port 2	-	+	-	+
Common → Port 3	+	-	-	+
Common → Port 4	-	+	+	-

\* "+": 2.25-2.75V pulse, "-": Ground.

### Dual Stage

Optical Path	Pin Group 1		Pin Group 2		Pin Group 3		Pin Group 4	
	Pin 1	2	3	4	5	6	7	8
Common → Port 1	+ *	-	+	-	-	+	+	-
Common → Port 2	-	+	-	+	-	+	+	-
Common → Port 3	+	-	-	+	+	-	-	+
Common → Port 4	-	+	+	-	+	-	-	+

\* "+": 2.25-2.75V pulse, "-": Ground.

## Unidirectional Series 4x1 Switch Driving Table

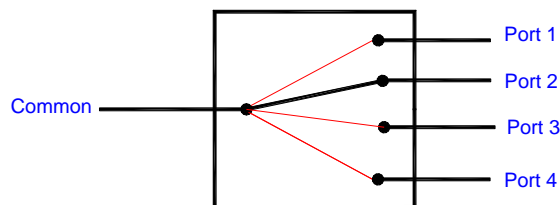
### Single Stage

Optical Path	Pin Group 1		Pin Group 2	
	Pin 1	2	3	4
Port 1 → Common	- *	+	-	+
Port 2 → Common	+	-	+	-
Port 3 → Common	-	+	+	-
Port 4 → Common	+	-	-	+

### Dual Stage

Optical Path	Pin Group 1		Pin Group 2		Pin Group 3		Pin Group 4	
	Pin 1	2	3	4	5	6	7	8
Port 1 → Common	- *	+	-	+	+	-	-	+
Port 2 → Common	+	-	+	-	+	-	-	+
Port 3 → Common	-	+	+	-	-	+	+	-
Port 4 → Common	+	-	-	+	-	+	+	-

## Functional Diagram



CL 1x4 Series Switch

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## Ordering Information

<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> - <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Type	Wavelength	Switch	Package	Fiber Type	Fiber Length	Connector	
CLSW <sup>[1]</sup>	1x4=14	1310=3	Single Stage=1	Special=0	SMF-28=1	Bare fiber=1	0.25m=1	None=1
CLPM <sup>[2]</sup>	4x1=41	1550=5	Dual Stage=2		Panda PM 250=B	900µm loose tube=3	0.5m=2	FC/PC=2
CLHP <sup>[3]</sup>	1x3=13	Special=0	Special=0		Special=0	Special=0	1.0m=3	FC/APC=3
CLBD <sup>[4]</sup>	3x1=31						Special=0	SC/PC=4
CLPH <sup>[5]</sup>	Special=00							SC/APC=5
CLHB <sup>[6]</sup>								ST/PC=6
CLPB <sup>[7]</sup>								LC=7
CPHB <sup>[8]</sup>								Duplex LC=8
								MTP=9
								Special=0

- [1]. **CLSW**: CrystaLatch Dual Stage 1x4 **SWITCH**.
- [2]. **CLPM**: CrystaLatch Dual Stage 1x4 **PM** Switch.
- [3]. **CLHP**: CrystaLatch Dual Stage 1x4 **High Power** Switch.
- [4]. **CLBD**: CrystaLatch Dual Stage 1x4 **BIDIRECTIONAL** Switch.
- [5]. **CLPH**: CrystaLatch Dual Stage 1x4 **PM High Power** Switch.
- [6]. **CLHB**: CrystaLatch Dual Stage 1x4 **High Power Bidirectional** Switch.
- [7]. **CLPB**: CrystaLatch Dual Stage 1x4 **PM Bidirectional** Switch.
- [8]. **CPHB**: CrystaLatch Dual Stage 1x4 **PM High Power Bidirectional** Switch.

