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CrystaLatch™ 1x6 Fiber Optic Reflection Switch for LIDAR Sensor Applications

(Single Mode, PM, SM High Power, PM High Power)

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

Product Description

This family of fiber optical switches uniquely provides key function for sensor and LIDAR applications. The CL Series 1x6 Series reflection switch directs a laser into a selected fiber among 6 output ports and at the same time collect the reflected signal into a dedicate sensor port. This magneto-optic proprietary configuration minimizes optical signal loss by eliminating the need for additional circulator or coupler. The switching is achieved using patented non-mechanical configurations with built-in circulator and activated via an electrical control signal. Moreover, it has latching function that preserves the selected optical path after the drive signal has been removed.

Agiltron non-mechanical CL fiber optic switch features low insertion loss, fast response time, high extinction ratio, and extremely high reliability and repeatability. It is designed to meet the most demanding switching requirements of continuous operation without wear-out, longevity without fail, and live operation under vibration/shock, as well as -40 C operation. Electronic driver is available for this series of switches.



The magneto-optical crystals used in the CL switches have no fatigue nor drift effect.

Performance Specifications

CL 1x6 Reflection Series Switch	Min	Typical	Max	Unit
Operation Wavelength [1]	1520	1550	1580	nm
	1295	1310	1325	nm
Insertion Loss [2]		1.2	2.0	dB
Cross Talk [2]	40	50		dB
Return Loss [2]	50	55		dB
PDL (Except PM Series Switch)		0.15	0.25	dB
Directivity [3]				
Extinction Ratio (PM Series Switch only)	18	25		dB
Polarization Mode Dispersion			0.2	ps
Optical Switching Speed (Rise, Fall)	5		10	µs
Repetition Rate		2K		Hz
Durability	10 ¹⁵			cycle
Optical Power Handling	High Power Series Switch	3	5	W
	Others		300	500
Operating Temperature [4]	-5		70	°C
Storage Temperature	-40		85	°C
Fiber Type	SMF-28 fiber, Panda PM fiber, or equivalent			
Package Dimension	72L x 37W x 7.8H			mm

[1]. Agiltron can achieve same SPEC at L band
 [2]. Measured without connectors.
 [3]. Defined as the optical power at the sensor port when light is launched into the input.
 [4]. Operating temperature -40-85°C version is available as special.

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

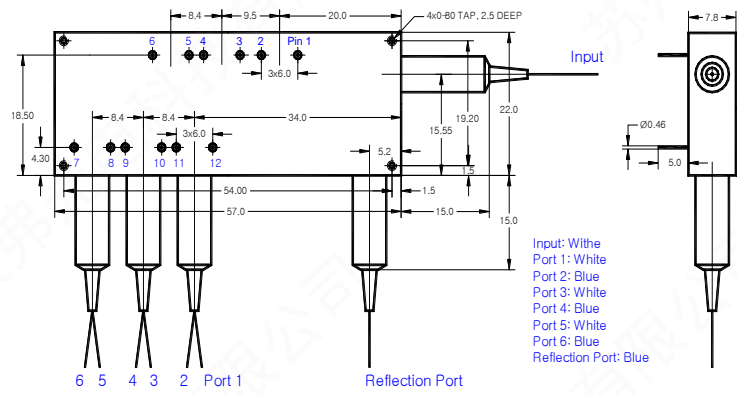


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 (Click here for latest revision)

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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

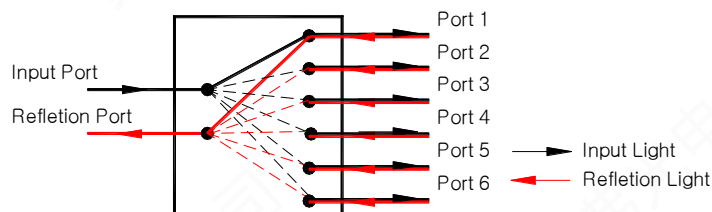
Driving kit with USB and TTL interfaces and Windows™ GUI is available. We also offer RS232 interface as an option - please contact Agiltron sales.

Electrical Driving Table

Optical Path	Pin Group 1		Pin Group 2		Pin Group 3		Pin Group 4		Pin Group 5		Pin Group 6	
	Pin 1	2	3	4	5	6	7	8	9	10	11	12
IN → P1 & P1 → R *	+ **	-	+	-	-	+	+	-	+	-	+	-
IN → P2 & P2 → R	-	+	-	+	-	+	+	-	+	-	+	-
IN → P3 & P3 → R	+	-	-	+	+	-	+	-	-	+	-	+
IN → P4 & P4 → R	-	+	+	-	+	-	+	-	-	+	-	+
IN → P5 & P5 → R	+	-	-	+	-	+	-	+	+	-	-	+
IN → P6 & P6 → R	-	+	+	-	-	+	-	+	+	-	-	+

* IN: Input port. P1: Port 1. R: Reflection Port. ** "+": 2.25-2.75 V pulse, "-": Ground.

Functional Diagram



CL 1x5, 1x6 PM High Power Reflection Switch



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Ordering Information

Prefix	Type	Wavelength	Switch	Package	Fiber Type	Fiber Cover	Fiber Length	Connector
CLRS- ^[1]	1x4 = 14	1310 = 3	Dual Stage ^[5] = 2	Standard=1	SMF-28=1	Bare fiber=1	0.25m=1	None = 1
CLPR- ^[2]	1x5 = 15	1550 = 5	Special = 0	-40~+85°C=A	PM 250=B	900um tube=3	0.5m=2	FC/PC = 2
CLHR- ^[3]	1x6 = 16	Special = 0		-40~+70°C=B	Special=0	Special=0	1.0m=3	FC/APC = 3
CPHR- ^[4]	Special = 00			-20~+85°C=C			Special=0	SC/PC = 4
				Special=0				SC/APC = 5
								ST/PC = 6
								LC/PC = 7
								Duplex LC = 8
								Special = 0

- [1]. **CLRS**: CrystaLatch Dual Stage 1x6 Reflection Switch.
- [2]. **CLPR**: CrystaLatch Dual Stage 1x6 PM Reflection Switch.
- [3]. **CLHR**: CrystaLatch Dual Stage 1x6 High Power Reflection Switch.
- [4]. **CPHR**: CrystaLatch Dual Stage 1x6 PM High Power Reflection Switch.
- [5]. Using two switching cores for high on/off ratio

