7-bit Solid State Series Variable Fiber Optical Time Delay

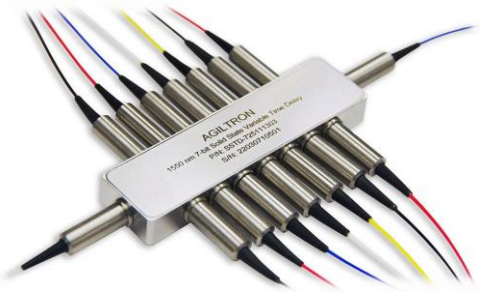
(patent pending)

Product Description

The 7-bit Solid State Series Fiber Optical Time Delay provides a variable time delay over a long range up to the millisecond. This is accomplished by selectively routing optical signals through N fiber segments whose lengths increase successively by a power of 2. Since each switching element allows the signal to either connect or bypass a fiber segment, a delay *T* may be inserted, which can take any value (in increments of *ΔT*) up to the maximum value *T*. This is achieved using a patent-pending non-mechanical configuration and activated via an electrical control signal.

Latching operation preserves the selected optical path after the drive signal has been removed. The solid-state configuration eliminates the need for mechanical movement and organic materials.

The device is designed to meet the most demanding switching requirements of ultra-high reliability and fast response time.



Features

- 4-Bit Resolution or more
- High Speed
- Non-Mechanical
- High Reliability
- Fail-Safe Latching
- Low Insertion Loss
- Low Power Consumption

Applications

- Phase-Array Antennas
- Instrumentation

Performance Specification

7-bit SS Time Delay		Min	Typical	Max	Unit
Wavelength Band		1520	1550	1580	nm
		1280	1310	1340	nm
Insertion Loss [1], [2]		2.5	2.8	3.5	dB
Cross Talk		22	28	35	dB
Polarization Dependent Loss (SM)		0.15	0.25	0.45	dB
Polarization Extinction Ratio (PM)		18	22	30	dB
Return Loss		50	55		dB
Shing Time (rise, fall)			50	200	μs
Repetition Rate				1	KHz
Delay Time Range		n		m	s
Fiber Segment Number		4		7	loop
Polarization Mode Dispersion			0.1	0.2	ps
Switch Type			Latching		
Operating Temperature		-5		+70	°C
Storage Temperature		-40		+85	°C
Optical Power Handling			300	500	mW
Fiber Type	SM	SMF-28, or equivalent			
	PM	PM1310/250, PM1550/250, or equivalent			
Fiber Length				1	m

[1]. The IL is for 4-bit Delay Line. IL Max value is 4.1 dB for 5-bit Delay Line, and 5.3 dB for 7-bit.
[2]. Excluding Connectors.

RoHS Compliant

Revised on 11/28/22

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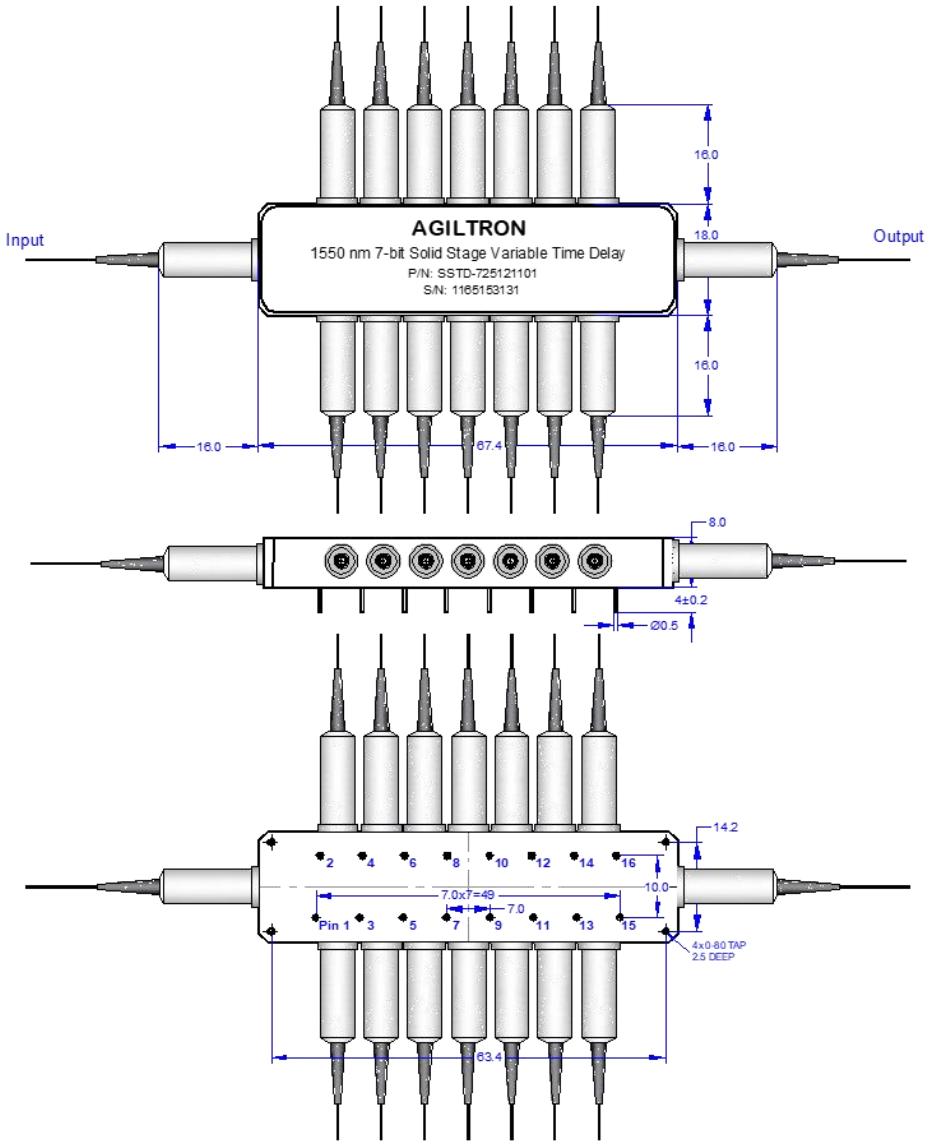
Mechanical Dimensions (Unit: mm)



Electrical Driving Requirements

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

*Over this value will damage the device.

[1]. Driving kit with USB or RS232 with Windows ™ GUI or TTL interfaces is available.
[2]. Driving table can be provided per request for the customers to design/build their own driving circuit.

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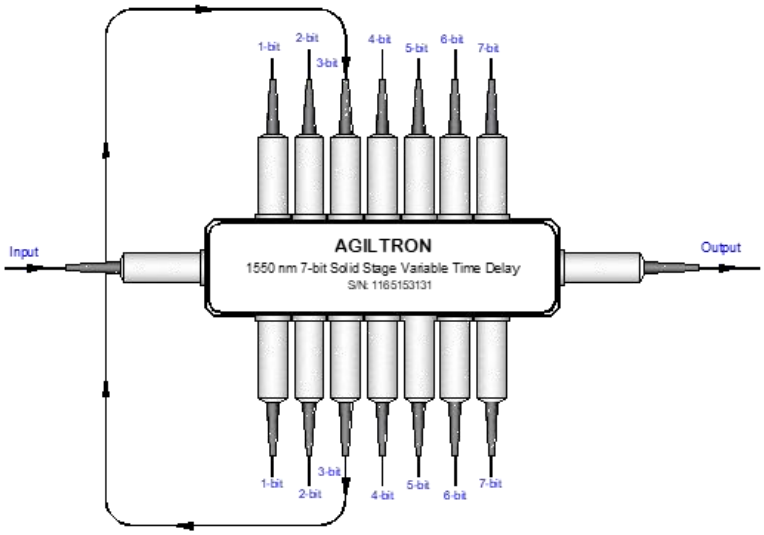
7-bit Time Delay Driving Table:

Switch Position	Pin Group 1		Pin Group 2		Pin Group 3		Pin Group 4		Pin Group 5		Pin Group 6		Pin Group 7		Pin Group 8	
	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9	Pin 10	Pin 11	Pin 12	Pin 13	Pin 14	Pin 15	Pin 16
Bypass	+	-	-	+	-	+	-	+	-	+	-	+	-	+	+	-
1-bit	-	+	+	-	-	+	-	+	-	+	-	+	-	+	+	-
2-bit	+	-	+	-	+	-	-	+	-	+	-	+	-	+	+	-
3-bit	+	-	-	+	+	-	+	-	-	+	-	+	-	+	+	-
4-bit	+	-	-	+	-	+	+	-	+	-	-	+	-	+	+	-
5-bit	+	-	-	+	-	+	-	+	+	-	+	-	-	+	+	-
6-bit	+	-	-	+	-	+	-	+	-	+	+	-	+	-	+	-
7-bit	+	-	-	+	-	+	-	+	-	+	-	+	+	-	-	+

Optical Path of 3-bit Diagram:



Ordering Information

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Prefix	**Type**	**Wavelength**	**Configuration**	**Package**	**Fiber Type**	**Fiber Cover**	**Delay Range**	**Connector**
SSTD-[1]	4-bit = 04 5-bit = 05 6-bit = 06 7-bit = 07 Special=00	1550 = 5 1310 = 3 Special = 0	Standard = 1 Special = 0	Standard = 1 Special = 0	SFM-28=1 PM1500=B PM1310=D Special = 0	Bare fiber=1 900 um tube=3 Special=0	Custom = 0	None=1 FC/PC=2 FC/APC=3 SC/PC=4 SC/APC=5 ST/PC=6 LC/PC=7 Special=0

[1]. **SSTD**: **S**olid **S**tate **T**ime **D**elay.

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