

Manual Varibel Fiber Optical Delay — Lockable

High Precision 0.5μm, 0 – 5 mm, SM, PM, MM



DATASHEET

[Return to the Webpage](#)



Features

- Low Cost
- Low Loss
- Fast
- Wide Range
- High Resolution
- High Reliability
- Easy to Use

Applications

- PMD Compensation
- OCT
- Interferometer
- Spectroscopy
- Lab use



The MMTD Series Manual Variable Optical Time Delay Line is designed for balancing interferometer arms. It features a highly stable moving stage with a locking mechanism, broad wavelength compatibility, and support for all fiber types (SM, MM, and PM). The device uses two custom, low-loss collimators: light from the input fiber is projected across a free-space gap into the output collimator. Variable optical delay is varied by adjusting this free-space distance, which is locked in place using a set screw once optimal delay is achieved. The static minimum delay is determined by the total fiber length, while the dynamic minimum delay is about 20 μm.

Specifications

Parameter	Min	Typical	Max	Unit
Operation Central Wavelength	500	1550	2000	nm
Wavelength Range		± 50		nm
Insertion Loss ^{[1] [2]}		0.4	1.2	dB
Return Loss ^[2]	55			dB
Loss Change		0.1	0.2	dB
PDL (SM Fiber)			0.2	dB
Polarization Extinction Ratio (PM Fiber)	18	22	40	dB
Delay Resolution	0.1	0.5		μm
Optical Power Handling		0.5 ^[4]	5	W
Operating Temperature	0		70	°C
Storage Temperature	-40		85	°C
Fiber Type	SM, PM, MM			

Notes:

[1]. Excludes connectors, Measured at 1550 nm

[2]. Tested with SM and PM fiber version only. For MM version, IL highly depends on CPR of light source and delay range, minimum RL 35dB.

[4]. For fiber core size >9 μm. For fiber core size <9 μm, the power handling reduces. High Power version available upon request

Equation to convert delay time to free space length:

$$T = L/C = L \text{ (m)} / (2.9996 \times 10^8 \text{ m/s})$$

Note: The specifications provided are for general applications with a cost-effective approach. If you need to narrow or expand the tolerance, coverage, limit, or qualifications, please [click this link](#):

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Rev 08/11/26

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Electrical Driving Requirement

USB and RS232 share a Micro-B interfaces and Windows™ GUI software. A wall pluggable 12 V DC power supply is provided.

Mechanical Dimensions (Unit: mm)

Ordering Information (Part Number)

Prefix	Type	Wavelength	Power	Fiber Type ^[1]	Fiber Length	Fiber Cover	Max Delay	Connector ^[2]
MMTD-	Regular = 1 Mini = 2	488 = 4 532 = 5 650 = 6 780 = 7 850 = 8 980 = 9 1060 = 1 1310 = 3 1550 = C 2000 = 2 830-1350 = D Special = 0	0.5W = 1 5W = 2 10W = 3	SMF-28 = 1 Hi1060 = B PM1550 = 5 780HP = 7 50/125 = M Special = 0	0.1 m = 1 0.25 m = 2 0.05 m = 5 Special = 0	0.9mm Tube = 1 Bare = 2	1mm = 1 5mm = 5 Special = 0	FC/PC = 2 FC/APC = 3 SC/PC = 4 SC/APC = 5 ST/PC = 6 LC/PC = 7 LC/APC = 8 LC/UPC = U Special = 0

[1]. Fiber Type Selection Table:

[2]. The default connector configuration uses fiber with 0.9 mm buffer protection. The connector cannot be installed directly onto bare fiber because the bare fiber is prone to damage during shipping. However, the connector can be assembled on bare fiber if a 3 cm protective loose tube is added for reinforcement. The customer may remove this protective tube after testing. The optical power handling of a standard connector is less than 0.5 W for SMF-28 fiber and decreases further for smaller-core fibers.

Fiber Type Selection Table

1	SMF-28	5	PM1550	M	MM 50/125μm
		D	PM1950	N	MM 62.5μm
		3	PM1310		
4	SM450	E	PM400		
A	SM1950	F	PM480		
6	SM600	G	PM630		
7	Hi780	H	PM850		
8	SM800	I	PM980		
9	SM980	J	PM780		
B	Hi1060	K	PM460		
C	SM400	L	PM405		

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Operation Manual:

The MDTD is a plug-and-play unit designed for ease of use. All accessories required to operate the unit are included in the shipping package. Follow the steps below to get started:

- 1.Power Supply** Plug the accompanying power supply into the MDTD unit.
- 2.Software Installation** Load the driving software from the provided memory disk onto your computer.
- 3.USB Connection** Use the provided USB cable to connect the MDTD to your computer.
- 4.Follow Instructions** Once connected, follow the instructions in the software to begin using the MDTD.