

# Motor Driven Variable Optical Delay

(SM, PM, MM, Bidirectional)



## DATASHEET



### Features

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

### Applications

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

The Motor Driven Variable Optical Time Delay features fast speed and high accuracy. It consists two collimators and a movable reflector controlled by a precision step motor. Light from an input fiber collimator projects into free space and is collected by an output fiber collimator. The distance the light travels in free space is varied by the movable reflector.

The device is conveniently controlled by a computer via a USB cable interface. A graphic control software is provided.

### Specifications

Parameter	Min	Typical	Max	Unit
Operation Central Wavelength	500	1550	2000	nm
Insertion Loss <sup>[1][2]</sup>	330ps	1.0	1.6	dB
	660ps	1.0	1.8	
	1200ps	1.5	2.8	
Return Loss <sup>[2]</sup>	55			dB
PDL <sup>[3]</sup>			0.2	dB
Max Speed <sup>[2]</sup>	330ps	~67		ps/s
	660ps	~130		
	1200ps	~240		
Repeatability		1	3	ps
Polarization Extinction Ratio <sup>[4]</sup>	18	22	40	dB
Delay Resolution		1		fs
Optical Power Handling		500 <sup>[5]</sup>		mW
Durability (Life cycle)	10 <sup>7</sup>			
Operating Temperature	0		70	°C
Storage Temperature	-40		85	°C
Fiber Type		SM, PM, MM		

Note:

- [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.
- [3]. For SMF version
- [4]. For PMF version
- [5]. High Power version available upon request

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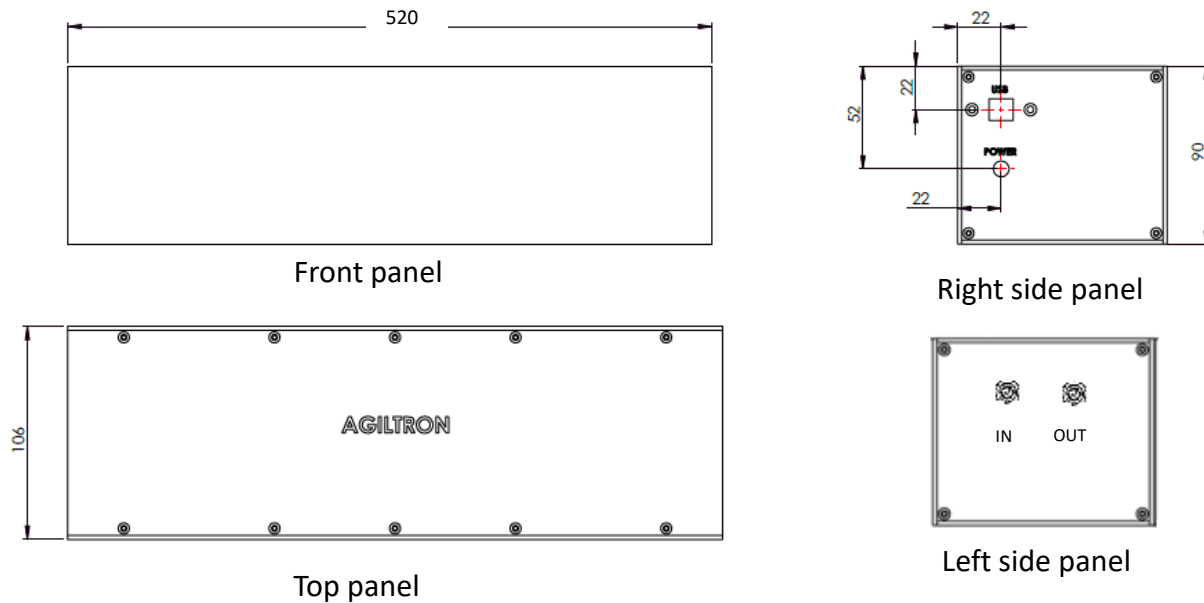


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### Electrical Driving Requirement

Motorized type has computer controlling kit with USB and RS232 interfaces and Windows™ GUI software.

### Mechanical Dimensions (Unit: mm) (1200ps version)



**Note: The shorter dimension of package is under development, please check it frequently.**

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

### Ordering Information

Prefix	Type	Wavelength	Minimum Step	Package	Fiber Type	Fiber cable*	Max Delay	Connector
MDTD-	Motorized=01	488=4 532=5 650=6 780=7 850=8 980=9 1060=1 1310=3 1550=C 2000=2 Special=0	8fs=1 Special=0	standard=1 special=0	SMF-28=1 Hi1060=2 PM1550=B 50/125=5 62.5/125=6 Special=0	Non=1 2mm jacket=2 3mm jacket=4 900um tube=3 Special=0	330ps=1 660ps=2 1200ps=3	FC/PC=2 FC/APC=3 SC/PC=4 SC/APC=5 ST/PC=6 LC/PC=7 LC/APC=8 Special=0

\* Default is connector on the box panel. Fiber cables are pair, each 1m length, both ends with same connector type. Use "0" for special need and describe all details clearly in order.

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## Delay Line Control (via Windows GUI):



### Control via Windows GUI:

1. Set Target Position(mm/pSec)  
Simply enter the exact number of position(mm) or delay time(pSec) in the text box or drag the slider. Then, click on “Move” button to move the device to target position.
2. Homing the device  
If the number is not correct, the device needs a homing calibration. Simply click on “Home” button.
3. Scan Function  
Drag the slider to the target position/delay time, then click on “Set Ref x”(x = 1,2). Ref x (x = 1,2) will be set.

“Goto Ref x” Button will allow you to move the device to Ref x.

You can decide the step length for this scan and delay dwell time for each step. Repetition times can also be set. Click on “Start Scan” will start current scan process. “Pause Scan” will pause current scan, and you can resume the scan after it being paused.

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### Delay Line Control (via UART command (in HEX))

#### Control via UART command (in HEX):

The baud rate setting is 9600-N-8-1.

1. Set Motor Stage Target Position

CMD: 0x01 0x14 <Pos highest byte> <Pos higher byte> <Pos lower byte> <Pos lowest byte>

RTN: 0x01 0x14 <Pos highest byte> <Pos higher byte> <Pos lower byte> <Pos lowest byte>

Example: 0x01 0x14 0x00 0x01 0x38 0x80 -> set device to 80000 position

For 330 ps device, the position range is 0-80000. 0 means relative 0 psec. 80000 means relative 333 psec.

For 660 ps device, the position range is 0-160000. 0 means relative 0 psec, 160000 means relative 666 ps.

For 1200 ps device, the position range is 0- 288000. 0 means relative 0 psec, 288000 means relative 1200 ps.

2. Read Motor Stage Target Position

CMD: 0x01 0x15 0x00 0x00 0x00 0x00

RTN: 0x01 0x15 <Pos highest byte> <Pos higher byte> <Pos lower byte> <Pos lowest byte>

3. Check Motor Stage Current Position

CMD: 0x01 0x16 0x00 0x00 0x00 0x00

RTN: 0x01 0x16 <CurP highest byte> <CurP higher byte> <CurP lower byte> <CurP lowest byte>

4. Homing Calibration

CMD: 0x01 0x20 0x00 0x00 0x00 0x00

RTN: 0x01 0x20 0x00 0x00 0x00 0x00

5. Check Homing Status

CMD: 0x01 0x21 0x00 0x00 0x00 0x00

RTN: 0x01 0x21 0x00 0x00 0x00 <Status Byte>

<Status Byte>: 0 - Homing complete, 1 - Homing incomplete