

## 488nm 0.5W Micro variable optical high speed delay line - motor driver



### ● Product Description

The MDTD Series Variable Optical Time Delay features a highly stable moving stage with a novel backlash prevention mechanism and incorporates a proprietary optical encoder to provide sub-micron repeatability, long delay range, low loss, high speed, and compatibility with all wavelengths and all types of fiber, including SM, MM, and PM. It consists of two specially designed low-loss collimators through which light from the input fiber is projected into free space, reflected by a movable retroreflector,

and collected by an output fiber collimator. Variable time delay is achieved by adjusting the distance the light travels in free space. A precision stepper motor with adjustable speed moves the retroreflector. Conveniently the device can be controlled via a computer using a USB cable interface, with graphical control software providing intuitive operation.

## ● Product features

Low cost、 Low loss 、 Fast 、 Wide range、 High resolution、 High reliability、  
Easy to use

## ● Part Number

MP-TDC-E-02-4-1-1-1-1-2

## ● Application area

PMD correction、 OCT、 Interferometer、 Spectroscopy、 Laboratory use

## ● Core parameters

Operation Center Wavelength	Optical Power Handling
488nm	0.5W

## ● General Parameters

Main Parameters:

Parameter		Min.	Type	Max.	Unit
Operation center wavelength		500	1550	2000	nm
Wavelength range			±50		nm
Insertion loss [1] [2]	330ps		1	1.6	
	660ps		1	1.8	
	1200ps		1.5	2.8	dB
	2200ps		5.5	7	
Return loss[2]		55			dB
Loss changes			0.3	0.5	dB
PDL (Single Mode Fiber)				0.2	dB
Max. Speed [3]	330ps		~67		
	660ps		~130		
	1200ps		~240		ps/s
	2200ps		~450		
Repeatability			1	3	ps
Polarization extinction ratio (polarization-maintaining fiber)		18	22	40	dB
Delay resolution			1		fs
Optical Power Handling			0.5 [4]	5	W
Durability (life cycle)		106			
Operating temperature		0		70	°C
Storage Temp		-40		85	°C
Optical fiber type		SM, PM, MM			

Notes:

[1] Excluding connectors, measured at 1550 nm

[2] Tested with SM and PM fiber versions only. For MM version, IL is highly

dependent on the CPR source of the light and delay range, Min. RL 35dB.

[3] Variable speed with GUI settings

[4] For core sizes >9 μm. For core sizes <9 μm, power handling capability is reduced. High power versions available on request.

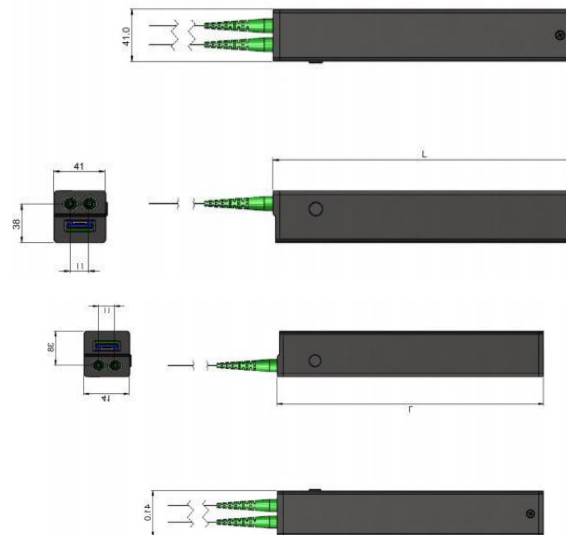
Equation to convert delay time to available space length:

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

Power drive requirements

USB and RS232 interfaces and Windows GUI software.

Mechanical dimensions (in mm) (1200ps version)



L=120mm 100ps L=150mm 330ps L=195mm 600ps L=250mm 1200ps L=450mm

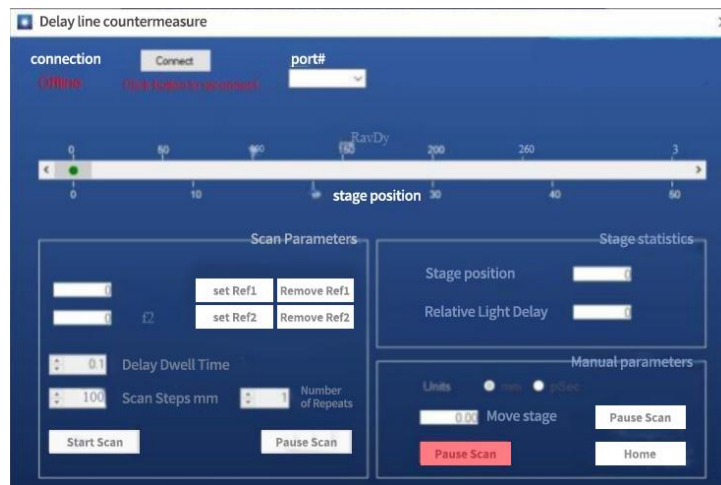
2200ps

**Order Info:**

	02							
	Type	WAVELENGTH	Min	Power	Fiber Type	Fiber Optic Cable	Maximum delay	Connector
MDT D	Small=02	488=4	8fs =1 1fs =2	0.5W =1 5W=2 10W=3	SMF-28	Non=1 900μm tube=3 3mm loose tube=4 Special =0	330ps =1 660ps =2 1200p s=3 2200p s=4 100ps =5	FC/PC=2
		532=5			=1			FC/APC=
		650=6			Hi1060=			3
		780=7			2			SC/PC=4
		850=8			PM1550			SC/APC=
		980=9			=B			5
		1060=1			50/125=			ST/PC=6
		1310=3			5			LC/PC=7
		1550=C			62.5/12			LC/APC=
		2000=2			5=6			8
		Special = 0			780HP=			LC/UPC=
					7			U
					Special			Special =
					= 0			0

By default, there are two connectors on the box. Fiber optic cables are in pairs, each 1m long, with the same connector type at both ends For special needs make "0" and describe all details clearly in the purchase order.

## Delay line control (via Windows GUI)



### Control via Windows GUI:

#### 1. Set Target Position (mm/pSec)

Simply enter the exact position number (mm) or delay time (pSec) in the text box or drag the slider. Then, click the "Move" button to move the device to the target position.

#### 2. Device Home

If the number is incorrect, the device needs to be calibrated for home. Just click the "Home" button.

#### 3. Scan Function

Drag the slider to the target position/delay time and click "Set Ref x" (x = 1,2).

The reference x (x = 1,2) will be set.

The "Go to Ref x" button will allow you to move the device to the reference x.

You can decide the step size of this scan and the delay time for each step. The number of repetitions can also be set. Clicking "Start Scan" will start the current scan process. "Pause Scan" will pause the current scan and you can resume the scan after pausing.

#### Delay Line Control (via UART Commands (Hex))

Control via UART commands (hex):

T Baud rate is set to 9600-N-8-1.

##### 1. Set motor stage target position

CMD: 0x01 0x14

For 330 ps devices, the position range is 0-80000. 0 means relative to 0 picoseconds. 80000 means relative to 333 picoseconds.

For 660 ps devices, the position range is 0-160000. 0 means relative 0 picoseconds, and 160000 means relative 666 picoseconds.

For 1200 ps devices, the position range is 0-288000. 0 means relative to 0 ps, and 288000 means relative to 1200 ps.



## 2. Read the motor platform target position

**Command:** 0x01 0x15 0x00 0x00 0x00 0x00

**RTN:** 0x01 0x15

## 3. C Check the current position of the motor stage

**Command:** 0x01 0x16 0x00 0x00 0x00 0x00

**RTN:** 0x01 0x16

## 4. H Home calibration

**Command:** 0x01 0x20 0x00 0x00 0x00 0x00

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

## 5. C Check homing status

**Command:** 0x01 0x21 0x00 0x00 0x00 0x00

**RTN:** 0x01 0x21 0x00 0x00 0x00