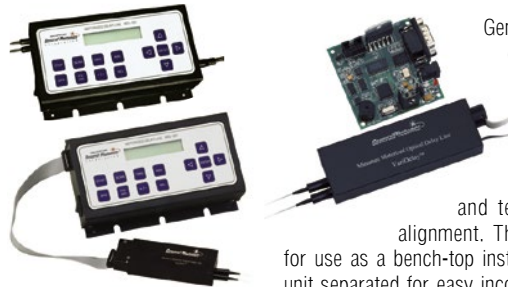


Timing/Delay Modules

**Motorized Variable Optical Delay Line – VariDelay™ II**



General Photonics' motorized variable optical delay line provides precision optical path length adjustment of up to 560 ps, single-pass. Driven by a DC motor with an integrated encoder, the MDL-002 has a resolution of less than 0.3µm (1 fs). In addition, its advanced motion design guarantees longevity for long-term continuous operation. Low insertion loss and high reliability make this device ideal for integration in optical coherence tomography (OCT) systems, network equipment and test instruments for precision optical path length control or timing alignment. The MDL-002 is available in three configurations: 1) an integrated unit for use as a bench-top instrument for laboratory applications, 2) with the optical head and control unit separated for easy incorporation into other equipment, and 3) an OEM version with a miniature controller board. All three versions can be remote controlled by a PC or a micro-processor through an RS-232 interface. The delay line is available with either single mode or PM fiber pigtails.

Specifications:

Operating Wavelength <sup>1</sup>	SM: 1260 to 1650 nm PM or double-pass: 1310 ± 50 or 1550 ± 50 nm	1060 ± 50nm
Optical Delay Range <sup>2</sup>	0 – 330 ps (single-pass model) 0 – 560 ps (single-pass model) 0 – 1120 ps (double-pass model)	0 – 330 ps (single-pass model) 0 – 560 ps (single-pass model)
Position Accuracy <sup>3</sup>	±3 µm (single-pass) ±6 µm (double-pass)	±3 µm (single-pass)
Position Repeatability <sup>3</sup>	±3 µm (single-pass) ±6 µm (double-pass)	±3 µm (single-pass)
Insertion Loss	1.0 dB nominal (single-pass) 1.5 dB nominal (double-pass)	1.5 dB nominal (single-pass)
Insertion Loss Variation	±0.3 dB over entire range for 330 ps models ±0.5 dB over entire range for 560 ps model ±0.7 dB over entire range for 1120 ps model	±0.3 dB over entire range for 330 ps models ±0.5 dB over entire range for 560 ps model
Optical Delay Resolution	0.3 µm or 1 fs per encoder count (single-pass) 0.6 µm or 2 fs per encoder count (double-pass)	
PDL	0.1 dB max for single-mode fiber	
Return Loss	50 dB	
Extinction Ratio	> 18 dB for PM model	
Optical Damage Power Threshold	300 mW	
Power Supply	12 VDC / 1A max.	
Control Mode	Panel keypad and RS-232 interface	
Display	2 x 16 character LCD	
Operating Temperature	0 °C to 40 °C	
Storage Temperature	-20 °C to 60 °C	
Fiber Type	SMF-28 or PM Panda fiber	HI1060 or PM 980 Panda fiber
Dimensions (Control Unit/Integrated Version)	330 ps model: 7" (L) × 4" (W) × 1.6" (H) 560 ps or 1120 ps models: 9" (L) × 4.4" (W) × 1.6" (H)	330 ps model: 7" (L) × 4" (W) × 1.6" (H) 560 ps model: 9" (L) × 4.4" (W) × 1.6" (H)
Dimensions (Optical Head)	330 ps model: 5.20" (L) × 1.46" (W) × 0.7" (H) 560 ps or 1120 ps models: 6.18" (L) × 1.46" (W) × 0.7" (H)	330 ps model: 5.20" (L) × 1.46" (W) × 0.7" (H) 560 ps model: 6.18" (L) × 1.46" (W) × 0.7" (H)
Dimensions (Mini Controller Board)	2.56" (L) × 2.56" (W) × 0.85" (H)	

Notes: Values in table are valid over a 1060 ± 50, 1310 ± 50 or 1550 ± 50nm range for a device without connectors.

1. Other wavelengths, also available.
2. The 1120 ps model is a double-pass device. Since input and output signals travel on the same pigtail, a circulator or PBS may be necessary to separate input and output signals for some applications. Double-pass versions not available for 1060nm.
3. Accuracy and repeatability specifications given for mechanical position of reflector at static position setting.

Timing/Delay Modules

## Motorized Variable Optical Delay Line – VariDelay™ II

Features:

- Compact
- High resolution
- Low backlash
- Low insertion loss
- High stability
- Highest delay to length ratio
- Long delay: more than 560 ps

Applications:

- Optical Coherence Tomography (OCT)
- Optical Fourier spectrum analysis
- Optical interferometry
- Delay generation and measurement
- Optical time division multiplexing (OTDM)
- Fiber sensors

Typical Performance Data:

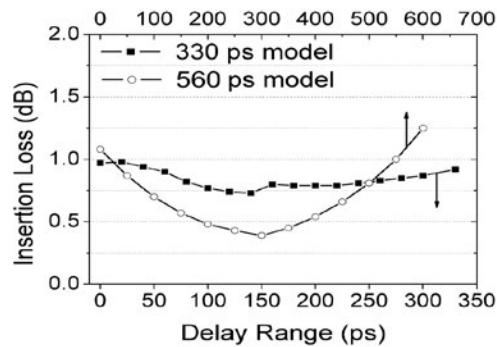
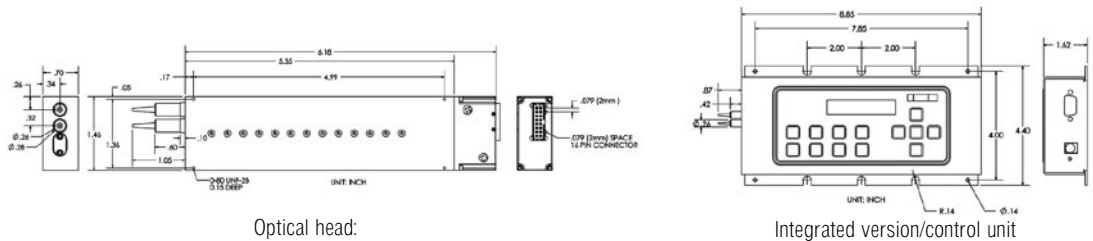


Figure 1. Insertion loss vs. optical delay.

Dimensions: (Representative drawings: 560 ps version, in inches)



Ordering Information:

MDL – 002 –  –   –   –   –   –

Configuration:	Wavelength:	Delay Range:	Fiber Type:	Connector Type:
I = integrated	10 = 1060 nm	33 = 330 ps	SS = SM	FC/PC, FC/APC
D = Remote head/	13 = 1310 nm	56 = 560 ps	PP = PM Panda	SC/PC, SC/APC or
standard controller	15 = 1550 nm	11 = 1120 ps		NC = no connectors
O = Remote head/	35 = 1310 & 1550 nm			Others specify
mini controller board				

**Configuration Notes:**

1. For SM pigtailed, the default configuration is 3mm jacketed. For PM pigtailed, the default configuration is 900µm loose tube jacketed.
2. Wavelength: 35 option (dual window 1310/1550nm) is available only for SM single-pass devices (330 and 560 ps). PM or double-pass devices are single-window (1310 or 1550nm) only.
3. Double-pass only available with SM fiber.
4. Double-pass not available for 1060nm.

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