**Miniature Motorized Variable Optical Delay Line - VariDelay™ II (MDL-003)**

General Photonics’ motorized variable optical delay line provides low cost, precision optical path length adjustment and delay scanning functionality. This addition to the MDL product line is specifically designed for OEM applications that require continuous scanning capability and a small footprint. The standard device has a delay range of 100 ps. An internal mirror can also be installed to cause light to double pass the device, doubling the delay range. A stepper motor and two position sensors ensure precise delay control. 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. A mini controller board is available as an accessory.

### Specifications:

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
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| Operating Wavelength | SM: 840 ± 50 nm, 1060 ± 50 nm, 1260 to 1650 nm  
PM: 840, 1060, 1310 or 1550 ± 50 nm |
| Optical Delay Range | 0 to 100 ps, single-pass |
| Optical Delay Resolution | 30 µm, single-pass at maximum speed |
| Optical Delay Accuracy | ±40 µm, single-pass at maximum speed |
| Optical Delay Repeatability | ±40 µm, single-pass at maximum speed |
| Insertion Loss | 1 dB |
| Insertion Loss Variation | ±0.3 dB over entire range |
| PDL | 0.15 dB for single mode fiber |
| Return Loss | 55 dB |
| Extinction Ratio | > 18 dB for PM model |
| Actuation Speed | 50 ps/s (single-pass) max. |
| Optical Damage Power Threshold | 100 mW |
| Electrical Interface | 2-phase stepper motor drive signal  
2 sensor connections |
| Operating Temperature | 0 to 50 ºC |
| Storage Temperature | -20 to 60 ºC |
| Fiber Type | 840nm: Hi780 or PM Panda  
1060nm: Hi1060 or PM Panda  
1310 and/or 1550nm: SMF-28 or PM Panda |
| Dimensions | 2” (L) x 1.4” (W) x 0.55” (H) |

### Notes:

1. Specifications in table apply for a single-pass device without connectors, measured over 1310 ± 50 nm or 1550 ± 50 nm at 23±5°C. The output pigtail can also be replaced with a Faraday mirror to create a double pass device with a total range of 200 ps. Specifications may be different for double pass devices or for wavelengths other than 1310 or 1550nm.
2. Other wavelengths available upon request. Contact General Photonics for details.
3. Double pass device has 200 ps delay range. 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 not available for 840 or 1060nm.

### Features:

- Compact
- Low insertion loss
- High stability
- High reliability
- Low cost

### Applications:

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

### Related Products:

- Motorized Delay Line (MDL-002)
- Manual Delay Lines (VDL-001, VDL-002, VDL-004)
- Components

### Tech Info:

- Optical Coherence Tomography Technologies

### FAQ:

- Delay Lines

### Dimensions (in inches):**

**Configuration Notes:**

- Wavelength: 35 option (dual window 1310/1550nm) is available only for SM single-pass devices. PM or double-pass devices are single-window (1310 or 1550nm) only.
- Double pass only available with SM fiber
- Double pass not available for 840 or 1060nm

**Figure 1. Mechanical dimensions**

**Driver board available**