**Binary Liquid Crystal Rotator**

An Optical Rotator is a two-state device used to rapidly switch between two orthogonal sites of linear polarization. One state has output linear polarization parallel to an input linear polarization state. This occurs when voltage is applied to the rotator. The other state has output polarization orthogonal to the input polarization and occurs when no voltage is applied.

Meadowlark Optics manufactures and sells liquid crystal (LC) based Optical Rotators for applications requiring active timing control of beam transmittance by using them in combination with high quality polarizers. Key features of our Optical Rotators include high-speed binary operation, high purity linear polarized output, and maximum extinction ratio performance. Since these devices are solid state – undesirable mechanical motion, associated noise, and vibration problems are eliminated.

Binary LC Rotators deliver optimum extinction ratio performance, often greater than 10,000:1 across the visible wavelength range, when used with high quality polarizers. Even higher extinction performance is achieved over narrower bandwidths or for single laser line applications. Up to 100% duty cycle operation is standard. This Rotator has a broad operating temperature range, designed to meet applications requiring low cost components with negligible impact on performance.

Key Features

- High polarization purity
- Silent, vibration-free
- Low-voltage operation
- Broad thermal range
- Faster switching speeds than LCVRs

**Liquid Crystal Suite**

- Variable Retarders
  - Liquid Crystal Variable Retarder
  - UV Variable Retarder
  - MWIR Variable Retarder
  - OEM LCVR

- Rotators
  - Achromatic High Speed Rotator
  - Binary Rotator
  - Polarization Rotator

- Shutters / Attenuators
  - Achromatic High Speed Shutter
  - High Contrast Shutter
  - Variable Attenuator

- Controllers
  - Analog Controller
  - FLC Controller
  - LC Digital Interface Controller
  - Temperature Controller
  - Two Channel High Voltage Controller
SPECIFICATIONS

<table>
<thead>
<tr>
<th>Retarder Material</th>
<th>Twisted Nematic liquid crystal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substrate Material</td>
<td>Optical quality synthetic fused silica</td>
</tr>
<tr>
<td>Wavelength Range</td>
<td>400 – 1800 nm (please specify)</td>
</tr>
<tr>
<td>Transmitted Wavefront Distortion</td>
<td>(\lambda/4) (P-V @ 633) (\lambda/16) (RMS @ 633)</td>
</tr>
<tr>
<td>Response Time (VIS)</td>
<td>(\leq 5) ms</td>
</tr>
<tr>
<td>Surface Quality</td>
<td>40 – 20 scratch-dig</td>
</tr>
<tr>
<td>Beam Deviation</td>
<td>2 arc min</td>
</tr>
<tr>
<td>Reflectance (per surface)</td>
<td>0.5% at normal incidence</td>
</tr>
<tr>
<td>Diameter Tolerance</td>
<td>(\pm 0.10) in.</td>
</tr>
<tr>
<td>Temperature Range</td>
<td>10°C to 60°C (Operating) (-40°C to 90°C (Storage))</td>
</tr>
<tr>
<td>Laser Damage Threshold</td>
<td>500 W/cm², CW (300) ml/cm², 10 ns, visible</td>
</tr>
</tbody>
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Reflective rotators are available on a custom basis.

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>Diameter in. (mm)</th>
<th>Clear Aperture in. (mm)</th>
<th>Thickness in. (mm)</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.00 (25.4 mm)</td>
<td>0.37 (9.4 mm)</td>
<td>1.23 (31.24 mm)</td>
<td>LTN – 100 – (\lambda)</td>
</tr>
<tr>
<td>2.00 (50.8 mm)</td>
<td>0.70 (17.8 mm)</td>
<td>0.75 (19.05 mm)</td>
<td>LTN – 200 – (\lambda)</td>
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Please specify one of the following spectral regions when placing your order:
- VIS: 450 – 700 nm
- IR 1: 650 – 950 nm
- IR 2: 900 – 1250 nm
- IR 3: 1200 – 1700 nm

sales@meadowlark.com
www.meadowlark.com