Diode Laser Modules

ULN-Series diode laser modules are designed for applications that require particularly low noise or mode-hop, noise-free operation. Sophisticated drive electronics are used to ensure low noise output. Typical RMS noise is 0.06% or better for detector bandwidth from 10 Hz to 10 MHz, with practically no warm-up time.

The ULN-Series features an alternative solution to the mode-hop problem. Rather than regulate temperature, a special modulation is used to force the laser into a multi-longitudinal mode.

While a normal laser will operate in a single-mode longitudinal or oscillate between two strong modes, the modulation creates several modes of lower intensity. As the laser temperature increases, these modes move like a caterpillar across the wavelength spectrum. The movement does not allow abrupt changes, so the system operates as if there were no mode-hops.

The result is low RMS noise (~0.06%), which is stable over changes in temperature and the life of the diode laser module.

- ULN stabilizes both power and noise during temperature changes (note that wavelength varies with the standard temperature coefficient of the diode, ~0.2 nm/°C).
- ULN controls noise over the lifetime of the laser and will not develop mode-hop noise as the laser ages.
- ULN does not change the spatial qualities of the laser beam, so the beam can be focused to the same spot size, profile and shape.

FEATURES
- Ultra-low noise (ULN)
- RMS noise <0.06% for bandwidths of 10 Hz to 10 MHz
- Circular beam
- No mode-hop noise
- No warm-up period
- Wavelength 635 nm with 5 mW
- Long lifetime

APPLICATIONS
- Genomics
- Particle Counting
- Flow Cytometry
- Confocal Microscopy
- Spectroscopy
**SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Specification</th>
<th>ULN 635 nm 5 mW</th>
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<tbody>
<tr>
<td>Wavelength (nm)</td>
<td>635 +7/-2</td>
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<tr>
<td>Power (mW)</td>
<td>5</td>
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<tr>
<td>CDRH Class</td>
<td>Class IIIb, Non-Conforming</td>
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<tr>
<td>IEC 60825-1</td>
<td>3b</td>
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<td>Spot Size (mm)</td>
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<tr>
<td>Divergence (mrad)</td>
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<tr>
<td>Laser Drive</td>
<td>Ultra-Low Noise (ULN)</td>
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<tr>
<td>Power Supply</td>
<td>Included (dual voltage)</td>
</tr>
<tr>
<td>Connector</td>
<td>5-pin DIN</td>
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<tr>
<td>Part Number</td>
<td>31-0144-000</td>
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</tbody>
</table>

**MECHANICAL SPECIFICATIONS**

**ULN**

- Front Diameter: 22.1 mm typical (0.87 in. typical)
- Front Diameter: 19.05 mm (0.75 in.)
- 135 mm (5.31 in.)
- 460 mm (18.11 in.)
- 146 mm (5.8 in.)
- 76 mm (3.0 in.)
- 43 mm (1.7 in.)
- 64 mm (2.5 in.)
- Safety Shutter: 4.8 mm (0.19 in.)
- Safety Shutter: 5.3 mm (0.21 in.)
- Safety Shutter: 15.4 mm (0.61 in.)

**ULN Power Supply**

- 146 mm (5.8 in.)
- 76 mm (3.0 in.)
- 64 mm (2.5 in.)
Variable Angle Diode Laser Mount

This simple mount acts as combined heat sink, electrical insulator and variable angle mount for 19.0 mm ULN lasers. The lasers are held firmly in a spherical-surface brass ring by two small set screws. This ring is clamped between two insulating blocks forming a “ball and socket” arrangement. Two socket-head screws can be loosened to allow easy angular adjustment of the module (±15° range) and quick, rigid locking in position.

MECHANICAL SPECIFICATIONS

ULN Variable Angle Mount

- Simple tip/tilt and lock in place mechanism
- Adjustable angle through about ±15 degrees