



## External Cavity Diode Laser ECD-003



The MOGLabs external cavity diode laser offers research quality at a teaching-lab price. Model ECD-003 is robust, stable, and insensitive to external vibrations. The performance is excellent when used with a MOGLabs Diode Laser Controller, with mode-hop-free scanning range of more than 10 GHz and linewidth below 100 kHz using a low-cost *uncoated* 780 nm consumer diode. Diode replacement and re-alignment are easily accomplished by the end-user.

### Features

- Wide mode-hop free scan range
- Narrow linewidth
- Fast piezo feedback
- Precision alignment controls
- Microwave RF modulation input
- Diode protection circuit and relay

### Benefits

- High-performance, low cost
- Stable, robust
- Low frequency noise
- High feedback bandwidth
- Use with MOGLabs external cavity diode laser controller, or your existing commercial or home-made electronics

### Applications

- Laser cooling and trapping
- Bose-Einstein condensation
- Quantum optics: squeezed light
- Electromagnetic transparency and slow light
- Time and frequency standards
- Laser spectroscopy
- Physics teaching labs

*Diode lasers for everyone*

# External Cavity Diode Laser

## Specifications ECD-003

### Wavelength/frequency

|                     |                                                             |
|---------------------|-------------------------------------------------------------|
| 780nm standard      | 50mW to 120mW output power, diode dependent                 |
| Linewidth           | Typically <300kHz FWHM                                      |
| RF modulation       | 2.5GHz bandwidth                                            |
| Grating             | Standard: 1800 l/mm gold coated                             |
| Coarse tuning range | ±5nm for single diode; 700nm to 860nm with different diodes |

### Optical

|                                   |                                                     |
|-----------------------------------|-----------------------------------------------------|
| Beam diameter (1/e <sup>2</sup> ) | 90mW diode: 3.8mm × 2mm, 150mW diode: 5.6mm × 1.8mm |
| Polarisation                      | Vertical linear 100:1 typical                       |

### Thermal

|                   |                                                           |
|-------------------|-----------------------------------------------------------|
| TEC               | ±14.5V 3.3A Q = 23W standard                              |
| Sensor            | NTC 10kΩ standard; AD590, 592 optional                    |
| Stability at base | ±1mK (controller dependent)                               |
| Cooling           | Water cooling connections optional (usually not required) |

### Sweep/scan

|                    |                                                           |
|--------------------|-----------------------------------------------------------|
| Scan range         | 25 GHz typical, with MOGLabs controller                   |
| Mode-hop free scan | 10 GHz typical, uncoated diode, with current feed-forward |
| Piezo              | 0 – 150V, 4.8µm, resonance at >1kHz with std grating      |
| Cavity length      | 1 – 3cm (5 – 15 GHz FSR) approx.                          |

### Electronics

|            |                                                           |
|------------|-----------------------------------------------------------|
| Protection | Relay, cover interlock connection, reverse diode          |
| Indicator  | Laser ON/OFF (LED)                                        |
| RF input   | 16MHz – 2.5GHz bias tee (lower cutoff optional)           |
| Connector  | MOGLabs DLC Diode Laser Controller (single cable connect) |

### Dimensions

|            |                              |
|------------|------------------------------|
| Dimensions | 122 x 94 x 70mm (LxWxH), 1kg |
|------------|------------------------------|

### Options

Fold mirror for fixed output beam direction; laser diode AR coating, wavelength and power; grating; scan range; modulation cutoff frequency; TEC size/rating. Please contact MOGLabs for further details.

