# MonoLux

## Tunable Quantum Cascade Laser System


**MonoLux Laser Head**

MonoLux is a wavelength tunable external grating cavity quantum cascade laser system consisting of one QCL. The system provides wavelength coverage of ± 5% around the center wavelength (broader tuning range available, optionally). The QCL and collimating optics are located in the laser head that is sealed for trouble free operation in real environments. MonoLux is available as a complete system consisting of the laser head and laptop based operating system ready to be turned on in customer's location.

The QCL is operated in a quasi-CW mode with 200-500 ns pulses with a repetition rate of ~500 kHz - 2 MHz giving a duty cycle of ~50 %. In this mode of operation, the average power output from a QCL exceeds 500 mW at the center of its tuning curve depending on the choice of center wavelength. MonoLux can also be operated in CW mode by choosing 100% duty cycle (option). The system is passively cooled with no fans, which makes for very quiet operation.

**MonoLux-AA**

| Tunable Quantum Cascade Laser | |
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| **Operation** | • QCW operation with the laser head at room temperature (50 ns-500 ns pulsed operation at a pulse repetition rate of 1 MHz-2 MHz)<br>• CW operation by selecting 100% duty cycle (optional) |
| **Wavelength** | • User specified center wavelength (AA)<br>• Available center wavelengths are 3.8 µm, 4.1 µm. 4.5 µm, 4.8 µm, 6.3 µm, 6.8 µm, 7.3 µm, 8.5 µm, 9.5 µm and 10.2 µm. |
| **Output spectrum** | • Tunable over the gain bandwidth of the QCL |
| **Tuning Speed** | • 100 ms for entire tuning range for the laser |
| **Tuning mode** | • Continuous and repeated scans over the entire tuning range<br>• Step and scan to any wavelength within the tuning range of the QCL (selected in the operating program on a laptop computer)<br>• Scan over selected tuning range with selected step size and selected scan speed |
| **Power output** | • Average power output of 500 mW at the center of each QCL tuning curve for a duty cycle of ~ 50% (wavelength dependent) |
| **Power Output Stability** | • ±3% pulse-to-pulse; ±2 % average power over hours |
| **Pulse trigger** | • Internal or external; In external mode any pulse repetition sequence can be generated within 50% maximum duty cycle |
| **Output linewidth** | • < 2 nm (<0.3 $cm^{-1}$) when operated in QCW mode |
| **Output beam** | • Collimated with beam divergence of < 5 mrad |
| **Output beam quality** | • Nearly diffraction limited ($TEM_{00}$) |
| **Wavelength Accuracy** | • Better than 0.3 $cm^{-1}$ |
| **Wavelength repeatability** | • ± 0.3 $cm^{-1}$ unidirectional |
| **Cooling** | • Passively cooled |
| **Guiding beam** | • Red 640nm, 4mW laser aligned with IR beams to assist optical arrangement (optional) |
| **Physical Details** | • Size: 12 cm (W), 4.5 cm (H), 13 cm (D)<br>• Weight: < 0.5 kg |
| **Computer Interface** | • USB |
| **Computer Requirements** | • Windows XP or later computer with USB 2.0 port<br>• Software controls laser operation and allows user to select scan mode for as well as enable/disable the laser |

| Laser Power Supply | |
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| **Laser supply** | • Standard 12-24 VDC computer power supply |