

Ultra-broadly tunable mid-IR external-cavity CW/Pulsed MIRcat™ laser system



PERFORMANCE SPECIFICATIONS³

| | |
|---------------------------------|---|
| Wavelength Availability: | Pulsed or CW tuning modules available with center wavelengths from <4 to >12 μm |
| MIRcat Configurations: | Select 1, 2, 3 or 4 standard or custom tuning modules – please inquire |
| Standard Configurations: | MIRcat-1400-PX-A (pulsed, 6.5–12.4 μm) ² MIRcat-1400-PX-B (pulsed, 5.5–11 μm) ² MIRcat-1400-PCX-B (CW/pulsed, 5.5–11 μm) ^{2,3} |

PULSED OPERATION¹

| | |
|-------------------------------|--|
| Output Peak Power: | Depends on module (e.g. >500 mW ² , module M1080-PX) |
| Linewidth: | $\leq 1 \text{ cm}^{-1}$ (FWHM) |
| Pulse Width: | 40 to 500 ns (20 ns increments) |
| Pulse Repetition Rate: | 0.1–100 kHz (0.1 kHz increments) |
| Duty Cycle: | Up to 5% |
| Triggering: | Internal & External Pulse, External Trigger |
| Pulse-Pulse Stability | <5% (pk-pk) |

CW OPERATIONS¹

| | |
|------------------------------|---|
| Output Average Power: | Depends on module (e.g. >100 mW ² , module M1095-PCX) |
| Linewidth: | $\leq 100 \text{ MHz}$ (FWHM) ² |

OTHER PARAMETERS

| | |
|------------------------------------|--|
| Wavelength Scan Types: | Uni- and Bi-directional sweeps; survey scans; program Start, Stop, Step, Pause |
| Beam Divergence: | <5 mrad (full angle, 1/e intensity) |
| Beam Pointing Stability: | <2 mrad up to 100 cm^{-1} tuning |
| Beam Quality: | TEM ₀₀ |
| Polarization: | Linear; Vertical, >100:1 ² |
| External Control Interface: | USB 2.0 ⁴ |
| Operating Temperature: | 15–30 °C |
| Cooling (pulsed): | Passive air |
| Cooling (CW): | Water |
| Dimensions (L x W x H): | 17.9" x 9.8" x 6.3"/45.5 x 24.9 x 16.0 cm |

¹ Requires selection of appropriate pulsed- or CW/pulsed-capable QCL tuning modules.

² Typical value. To request a specified value, please inquire.

³ All specifications are subject to change without notice. Unless stated otherwise, all specifications are defined at the peak of each tuning module gain curve.

⁴ Requires return to factory.

⁵ Ethernet control available – please inquire.

Ultra-broad tuning range from a single-box quantum cascade laser source in the important mid-IR “fingerprint” region.

Uniquely configurable for either pulsed or continuous wave (CW) operation¹, MIRcat provides a mid-IR tuning range of up to $\sim 800 \text{ cm}^{-1}$ ($\sim 6000 \text{ nm}$)² from a single box – one of the broadest tuning ranges of any quantum cascade laser (QCL) source commercially available. Incorporating up to four tunable laser modules in a single, sealed laser head, MIRcat is based on field-proven Daylight Solutions' technologies such as our widely tunable ÜberTuner™ lasers. A fully automated system, MIRcat switches effortlessly between its tuning modules, and produces a single high quality, highly collimated output beam. This attention to beam quality avoids the need for user beam re-alignment as MIRcat tunes.

MIRcat's modularity allows users to preselect one, two, three or four pulsed and/or CW tunable laser modules from an extensive library covering from <4 to >12 μm . Depending on modules selected, MIRcat can be factory configured to: provide ultra-broad and/or gapless tuning; focus on one spectral region; or address multiple regions spread across a wide wavelength range. This flexibility allows users to optimize their mid-IR wavelength coverage based on their application requirements and budget. Users can also upgrade, adding or changing tuning modules as their requirements evolve.⁴

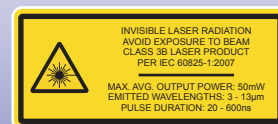
A true one-box system with an integrated controller and hands-free, maintenance-free operation, MIRcat delivers uncompromised performance in application-critical parameters such as: high output power; superb beam pointing stability and mode quality; and narrow linewidths. Taking mid-IR QCL systems to new price: performance levels, MIRcat has—as standard—all the features it needs to be the heart of your measurement system. Supplied with a PC software user interface, users have flexible control over: set-point wavelengths; wavelength scans; output power (and, in pulsed operation, pulse width, duty cycle, repetition rate and triggering modes).

MIRcat brings new capabilities and agility to a broad range of applications, including: spectroscopic imaging; standoff explosive detection; hyperspectral imaging for medical diagnosis; microscopy; spectroscopy; and food safety and contamination detection. Solid, liquid, and gas phase spectroscopy and imaging measurements are now easier, faster and more cost-effective than ever before.

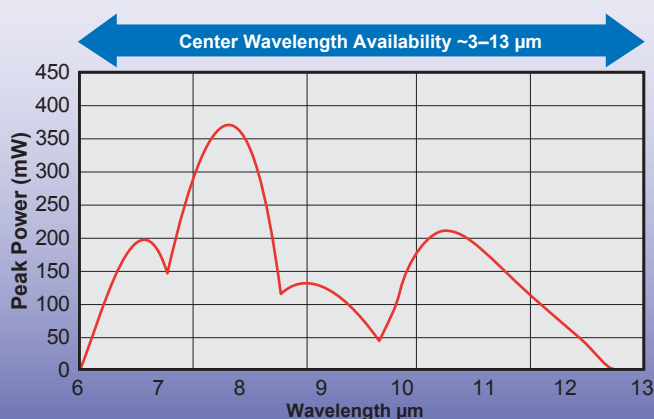
Daylight Solutions: The Source for All Applications in the Mid-IR

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Typical tuning curve. Example shown: MIRcat-1400-PX-A.