

Block's next generation Quantum Cascade Laser modules have been redesigned to deliver 6x power increase, orders of magnitude tighter thermal and temporal stability, and powerful electronics with unique pulse design capabilities. All of this is delivered in the industry's smallest form factor package. Configurations include the LaserTune-S enclosed system for turnkey benchtop applications, and the sQCL component module for OEM integration. With new power efficient and compact control electronics, the system provides the ultimate in flexible programming options from WN sweeps, steps, or holding, and dynamic pulse lengths and duty cycles which enable you to actively manage average power at each WN. We are adding new wavelength range options regularly so that there is an optimal sQCL for every set of application requirements. The following data summarizes the optical and mechanical specifications of this system.

Product Highlights

- Plug-and-play benchtop operation
- Widely tunable over a selectable subset of $800 - 1710 \text{ cm}^{-1}$
- Superior stability (thermal & temporal)
- High duty cycle options (increased avg. power)
- Flexible trajectory creation & customization
- Dynamic duty cycle adjustment
- WN sweeps, step functions, and static WNs
- No active external cooling required
- Windows GUI for turnkey operation in minutes

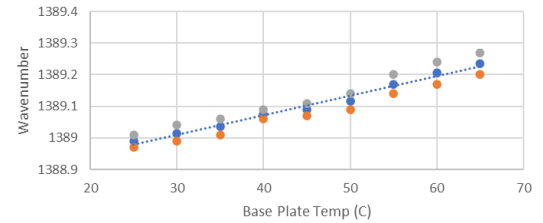


LaserTune-S for turnkey benchtop use

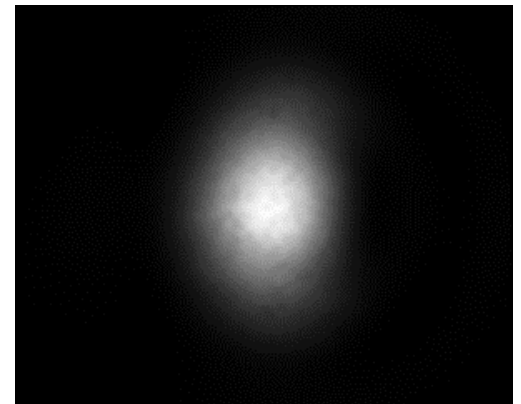
Provided with the laser of your choice, this compact instrument enables turnkey OEM evaluation, or a reliable benchtop tool for researchers. With customizable waveform programming and trigger-In/Out interface, this module seamlessly integrates with your experimental setup.

Optical Specifications

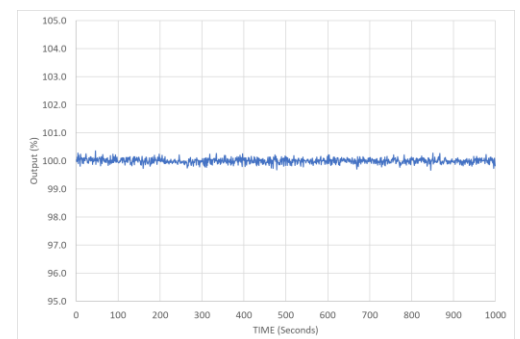
Laser Rating (IEC 60825)	Class 3B
Spectral Linewidth	$<2\text{ cm}^{-1}$ (typical)
Spectral Accuracy / Repeatability	$<2\text{ cm}^{-1} / <\pm 0.2\text{ cm}^{-1}$ (typical)
Pulse Power	Up to 500 mW range dependent, Wavenumber dependent, 30-150ns pulse widths
Average Power	Up to 75 mW (15% Duty), range dependent, wavenumber dependent
Pulse to Pulse Stability	Stdev $< 1.5\%$ pulse-to-pulse (typical)
Average Power Stability	$< \pm 0.1\%$ average over 1 hour (at 25C)
Beam Quality	TEM00 (nominal)
Beam Diameter	2 x 4mm, collimated output
Beam Divergence	$< 5\text{ mrad}$
Pointing Stability	$< \pm 1\text{ mrad}$ standard, tighter pointing stability available on request
Polarization	Vertically polarized; 100:1 extinction
Wavenumber Stability	$< \pm 0.2\text{ WN}$ over 1 hour (at 25C)
Power vs Temperature Stability	$< \pm 0.01\%$ per $^{\circ}\text{C}$ (typ. 10-65C)
WN vs Temperature Stability	$< 0.01\text{ WN}$ per $^{\circ}\text{C}$ (10-65 C)



Temperature Stability of 0.006WN/°C



Infrared image of TEM00 laser output



Temporal variability $< 0.15\%$

Performance specifications are supported by extensive lab testing.

Application note with test details is available upon request.

Electrical Specifications

Power Requirements	100 - 240 VAC, ~50/60 Hz, 10 W (typ.)
Control Interface	Windows GUI
Laser Control (mini-USB)	Trajectory generator program [Provided]
Analog Pulse Control (BNC)	Internal Trigger – with trigger sync out External Trigger – 2.5-3 V _{in} for initiation of trajectory operation
Pulse Width	30 – 150 ns; 10 ns resolution
Pulse Repetition Frequency	Up to 1 MHz
Duty Cycle Max.	8-15%, range dependent
Wall Power Conversion Efficiency	0.3% wall to laser output (5% Duty) [Electronics + Laser efficiency] 2% electronics to laser output (10% Duty) [laser conversion efficiency]
Programming/Control Circuit	Tethered circuit supplies power conditioning, programming interface, serial control, thermal management, trigger in/out, and safety interlock.

Physical Specifications

Dimensions	236 x 169 x 45 mm
Weight	1 kg
Temp Range, Operating	10°C to >40°C
Temp Range, Storage	-10°C to 55°C
Humidity Range, Operating	0 – 90% Rh, non-condensing
Cooling Requirements	Heat management internal to the laser package is provided with standard control electronics. Integrated fan for heat management.

Mechanical Envelope

Front



Rear

