



gem

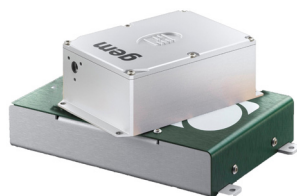
High specification OEM CW lasers



Laser QUANTUM

A Novanta Company

- 473 nm, 532 nm, 561 nm, 660 nm & 671 nm lasers
- Exceptional lifetimes
- Internet connectivity and optimisation
- Long full specification warranty
- Designed for easy OEM integration



Overview

The **gem** range is a compact series of lasers designed for easy OEM integration. With a wide power range and multiple wavelength offerings, the **gem** is ideal for system designers wanting a reliable, robust laser with excellent beam quality. The **gem** lasers are high specification single transverse mode CW lasers, ideal for many applications such as Raman and fluorescence spectroscopy, DNA sequencing, cell sorting and super-resolution microscopy. Our pump diodes are specified as having a MTTF of >400,000 hours at full power, but Laser Quantum de-rates them to further increase their lifetime. This gives the **gem** industry leading lifetimes that allow it to be treated as a black box; to be installed and forgotten (Fig. 1).

The **gem** family is controlled by an smd12 intelligent controller that provides an interface using the RS232 port, allowing the **gem** to be operated through simple commands from LabView, DOS or a DOS emulator. The smd12 also monitors component temperatures, automatically maintains laser output power and provides diagnostic analysis.

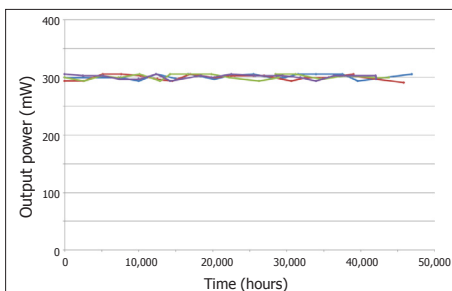


Fig. 1 Output power from 4 **gem** lasers kept in Laser Quantum test facility, showing stable output over 45,000 hours, with minimal increase in required diode current.

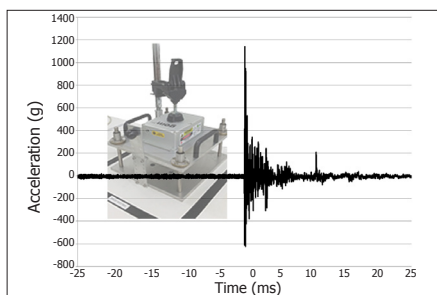


Fig. 2 Accelerometer trace showing the 1200 g shock experienced by all Laser Quantum lasers prior to testing.



Fibre coupling: Like most of Laser Quantum lasers, the **gem** is available with multi or single mode fibre delivery options which allows the beam to be delivered to the point of need.



The **gem** laser range features an intelligent control unit that allows easy setting and monitoring of the laser parameters. Incorporating PowerLoQ™ technology, the **gem** lasers show extreme power stability over long periods of use.



Every **gem** laser has been subjected to a 1200 g drop-test (Fig. 2) to check that all components are correctly fitted prior to its extended 300 hour test period. This rigorous testing regime ensures long operational lifetimes.

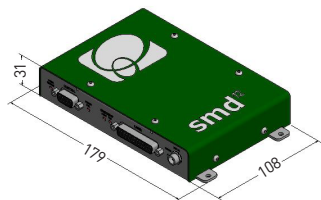
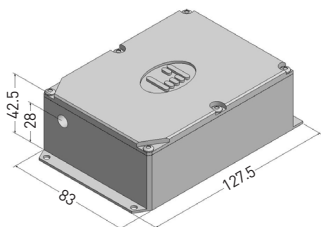


The **gem** can be used with the RemoteApp™ software that allows the laser to be controlled locally, over the internet and connected to the Laser Quantum support team for monitoring laser performance, diagnosing opportunities for and carrying out laser optimisation.



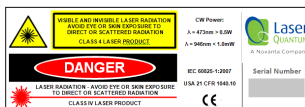
Available in a range of wavelengths and powers, the **gem** family lasers are designed for integration into instruments as a fit-and-forget laser source, with exceptionally long operation lifetimes.

Dimensions (mm)



Other information

- Weight: 0.75 kg
- Umbilical length: 1.5 m
- Cooling options available
- System can be modulated
- Vertical polarisation is available on request
- Fibre coupling available
- LabView drivers available
- 2 years unlimited hours warranty for scientific users



Drawings are for illustrative purposes only, please contact Laser Quantum for complete engineer's drawings.

Specifications*

	gem 473	gem 532	gem 561	gem 660	gem 671
Wavelength	473 nm	532 nm	561 nm	660 nm	671 nm
Power	50 mW to 500 mW	50 mW to 2000 mW	50 mW to 500mW	50 mW to 1000 mW	50 mW to 750 mW
Beam diameter ¹	0.9 mm ± 0.2 mm	0.9 mm ± 0.1 mm	1.0 mm ± 0.2 mm	0.75 mm ± 0.15 mm	0.75 mm ± 0.15 mm
Spatial Mode	TEM00	TEM00	TEM00	TEM00	TEM00
Ellipticity	<1:1.2	<1:1.2	<1:1.2	<1:1.2	<1:1.2
Bandwidth	40 GHz	30 GHz	40 GHz	30 GHz	30 GHz
Divergence	<1.5 mrad	<0.8 mrad	<1 mrad	<1.5 mrad	<1.5 mrad
M-Squared	<1.2	<1.1	<1.2	<1.2	<1.2
Power stability (RMS) ²	<1.0 %	<0.8 %	<1.0 %	<1.0 %	<1.0 %
Noise (RMS)	<1.0 %	<0.8 %	<1.5 %	<0.6 %	<0.6 %
Noise bandwidth	10 Hz to 10 kHz	10 Hz to 6 MHz	10 Hz to 10 kHz	10 Hz to 10 kHz	10 Hz to 10 kHz
Beam Pointing stability ³	<10 urad/°C	<10 urad/°C	<10 urad/°C	<10 urad/°C	<10 urad/°C
Polarisation ratio	>100:1	>100:1	>100:1	>100:1	>100:1
Polarisation direction ⁴	horizontal	horizontal	horizontal	horizontal	horizontal
Coherence length	~7.5 mm	~1 cm	~7.5 mm	~1 cm	~1 cm
Beam angle ⁵	<1 mrad	<1 mrad	<1 mrad	<1 mrad	<1 mrad
Operating temperature	15 to 40 °C	15 to 40 °C	15 to 40 °C	15 to 40 °C	15 to 40 °C

* Laser Quantum operates a continuous improvement programme which can result in specifications being improved without notice.

¹ Beam diameter defined as the average of major and minor 1/e² beam size measured at 25 cm from exit port, at specified power.

² Test duration >100 hrs at constant temperature.

³ Measured over 36 hrs at 22 to 28 °C.

⁴ Vertical polarisation is available upon request.

⁵ Tolerance relative to head orientation.

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