Quantas
Q1-1064

DIODE PUMPED AIR-COOLED Q-SWITCHED Nd:YAG LASER

FEATURES

- Up to **32 mJ** pulse energy at **1064 nm**
- **Air cooled** – no liquids inside
- Short pulse duration **< 8 ns**
- Weight is **< 5 kg** incl. power supply
- Variable up to **50 Hz** repetition rate
- Build-in sync pulse generator for triggering of user equipment
- Remote control via build-in **Ethernet** interface
- Optional 2nd, 3rd, 4th or 5th harmonic generators
- Optional attenuator for fundamental wavelength
- Optional fiber coupled output
- **OEM** version is available
- Guaranteed **> 1 Gshot** lifetime

APPLICATIONS

- Light Induced Breakdown Spectroscopy (LIBS)
- Laser ablation
- Time-of-Flight Spectroscopy (TOFS)
- Light Induced Fluorescence (LIF) spectroscopy
- Flash photolysis
- Matrix Assisted Laser Desorption/Ionization (MALDI)
- Pulsed Light Deposition (PLD)
- Light Detection and Ranging (LIDAR)
- Remote sensing
- TFT-LCD repair
- Particle Image Velocimetry (PIV)

Quantas is diode pumped, air-cooled, Q-switched laser designed for wide range of applications that require low pulse repetition rate and high peak power pulses (Q1D model produces ~5 MW peak power). Due good thermal properties of Nd:YAG crystal Q1-1064 can operate at higher pulse repetition rates in comparison to Q1-1053. Laser can produce up to 30 mJ at 20 Hz repetition rate or up to 10 mJ at 50 Hz repetition rate.

Typical applications are Light Induced Breakdown Spectroscopy (LIBS), Light Induced Fluorescence Spectroscopy (LIF), laser ablation and remote sensing.

Less than 8 ns pulse duration allows efficient fundamental wavelength conversion to higher harmonics with shortest wavelength available of 213 nm. Wavelength extensions into infrared range are available by request.

Quantas is completely air cooled laser due its excellent wall-plug efficiency. Liquids are not used for heat transfer, as result, maintenance associated with regular replacements of cooling liquid and/or cleaning of cooling system is not required.

Low jitter triggering pulses for user equipment are available with up to 300 µs lead in internal triggering mode. If required, laser pulsing can be externally triggered from delay generator, allowing operation in single-shot or variable pulse repetition modes.

Laser controller has Ethernet interface for convenient monitoring and control from personal computer.

Quantum Light Instruments

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SPECIFICATIONS [1]

MODEL	Quantas-1064 Q1A	Quantas-1064 Q1B	Quantas-1064 Q1C	Quantas-1064 Q1D
Wavelength	1064 nm [2]			
Pulse energy	4 mJ	10 mJ	18 / 16 mJ [3]	32 / 30 mJ [3]
Typical pulse duration	< 8 ns [4]			
Pulse to pulse energy stability [5]	< 1 % RMS	< 0.7 % RMS		
Power drift	± 3.0 % [6]			
Pulse repetition rate [7]				
Min	single shot			
Max	10 Hz	10, 20 or 50 Hz	10 or 20 Hz	10 or 20 Hz
Beam profile	nearly TEM_{00}		bell-shaped, > 75 % fit to Gaussian	
Beam divergence [8]	< 3 mrad	< 2 mrad	< 1.5 mrad	
Polarization	linear, horizontal at 1064 nm			
Typical beam diameter, [9]	1.2 mm	1.5 mm	2 mm	2.5 mm
Jitter	N/A	< 1 ns RMS [10]		

OPTIONAL HARMONICS GENERATOR MODULE [11]

Pulse energy				
532 nm	1.6 mJ	5 mJ	9 / 8 mJ	16 / 15 mJ
355 nm	0.8 mJ	3 mJ	5.5 / 5 mJ	9.5 / 9 mJ
266 nm	0.4 mJ	1.5 mJ	3 / 2.5 mJ	5 / 4 mJ
213 nm	0.1 mJ	0.5 mJ	1.2 / 1 mJ	2 / 1.6 mJ

OPTIONAL ATTENUATOR [12]

Wavelength, nm	1064 nm, 532 nm, 355 nm
Attenuation range	5 – 95 %

OPTIONAL FIBER COUPLED OUTPUT [13]

Wavelength	1064 or 532 nm
Max output pulse energy	up to 7 mJ [14]

DIMENSIONS

Laser head (W×L×H)	113 × 230 × 112 mm³
Harmonics generator module (W×L×H)	113 × 242 × 112 mm³
Controller unit (W×L×H)	85 × 165 × 50 mm³
Power adapter, typical (W×L×H)	50 × 125 × 32 mm³

OPERATING REQUIREMENTS

Cooling requirements	air cooled
Ambient temperature	15 – 30 °C
Relative humidity	10 – 80 % (non-condensing)
Mains voltage	90 – 230 V AC, single phase, 47 – 63 Hz [15]
Power consumption	< 30 W

[1] *The parameters marked typical are not specifications. They are indications of typical performance and might vary unit-to-unit. Unless stated otherwise all specifications are measured at 1064 nm and 10 Hz pulse repetition rate.*

[2] *1053 nm output wavelength models are available. See Q1-1053 model leaflet.*

[3] *First number is for 10 Hz, second – for 20 Hz pulse repetition rate.*

[4] *FWHM level at 1064 nm. Shorter pulse duration is available by request. Inquire for detailed specifications.*

[5] *Averaged from 500 pulses.*

[6] *Over 8 hour period after 20 minutes of warm-up when ambient temperature variation is less than ±2 °C.*

[7] *Factory-set pulse repetition rate is fixed at max repetition rate. Single-shot or variable pulse repetition rate is possible when laser is externally triggered. Higher repetition rates are available, please inquire for details.*

[8] *Full angle measured at $1/e^2$ level.*

[9] *Beam diameter is measured 20 cm from laser output at $1/e^2$ level.*

[10] *In respect to Q-switch triggering edge of pulse.*

[11] *Harmonics generator module is stand-alone unit optimized for specified output wavelength. Inquire for details if multiple wavelength output is needed.*

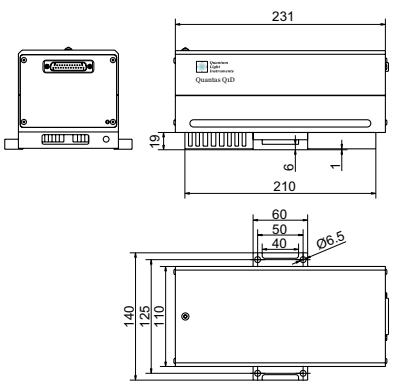
[12] *External Motorized Variable Attenuator. Please inquire for attenuator build-in into harmonics generator module.*

[13] *Fiber coupler is build-in into harmonics generator module. Please inquire for details.*

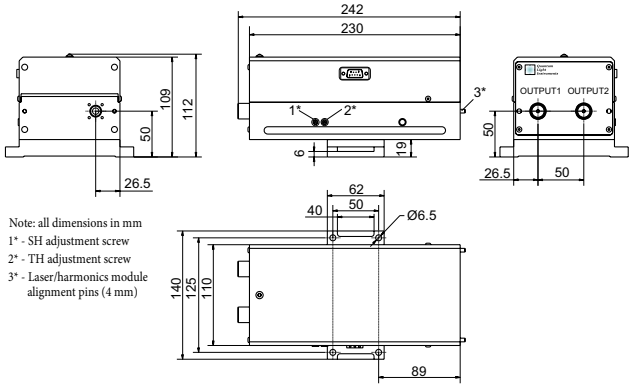
[14] *For fiber core diameter of 550 µm. Smaller or larger core fibers are available, inquire for specifications.*

[15] *Laser can be powered from appropriate 12 V DC power source. Inquire for details.*

DRAWINGS



Laser head dimensions



Harmonic generator module dimensions

Quantum Light Instruments

Quantum Light Instruments Ltd.
Mokslininku 6A
LT-08412, Vilnius, Lithuania

Phone: +370 5 250 3717
Fax: +370 5 250 3716
Email: sales@qlinstruments.com

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