VisUV

Picosecond Laser in UV, Green, Yellow, and Orange

Broad Pulse (~ 0. 5 ns)

- NEW High coherent VisUV HC (with coherent length > 85% of temporal pulse length), at 532 nm
- Pulse width ~ 0.5 ns (FWHM)

Narrow pulse (< 85 ps)

- Available wavelengths 266, 280, 295, 355, 488, 515, 532, 560, 590 nm
- Pulse width < 85 ps (FWHM)

Specification applies to Narrow and Broad pulse:

- Digitial interface, can be controlled via USB, Sepia PDL 828 (with dedicated module SEM 828) and RS232
- Average output power from sub mW to 750 mW (depending on wavelength)
- Repetition rate from single shot up to 80 MHz, external or internal triggering
- Collimated output, optional fiber coupling

Applications

- Time-resolved fluorescence spectroscopy/microscopy (FLIM, FRET, FCS)
- Stimulated Emission Depletion Microscopy (STED)
- Biochemical analytics
- Diffuse Optical Tomography (DOT)
- Quantum optics
- LIDAR, Ranging
- 3D polymerization

The VisUV laser is a versatile and flexible platform based on a Master Oscillator Fiber Amplifier (MOFA) concept with frequency conversion. The master oscillator generates infrared picosecond pulses at 1064 nm with variable repetition rates up to 80 MHz using the proven gain-switching techniques from PicoQuant. The output of this seed laser is directly connected to a multi-stage fiber amplifier, which boosts the output from the seed laser by several dB while maintaining the other characteristics of the seed laser beam like the emission wavelength, polarization and the pulse width.

Compact stand alone device

The VisUV is a stand alone device featuring a special design optimized for maximum heat dissipation.
While the classic VisUV laser modules were manually controlled through a series of switches and dials on the device's front panel, this new generation of modules can now be easily controlled via a variety of interfaces. The VisUV can be connected to a PC via USB interface or (optionally) to a Sepia PDL 828 laser driver through a PicoQuant proprietary interface. In both cases, the VisUV can be fully controlled via an intuitive graphical user interface (GUI) running under Windows. Additionally, the VisUV features am RS232 interface for serial connection.
The VisUV laser module includes all driving functions required for laser operation, such as choice of repetition rate, intensity and trigger source.

Flexible wavelength configuration

The high pulse energies of the amplified 1064 nm infrared laser permit efficient wavelength conversions. In that way it is possible to generate picosecond pulses at 266, 280, 295, 355, 532 nm with average optical power values ranging from sub mW up to 750 mW depending on the wavelength and power version.

Any wavelength is available individually or in combination with one or two other wavelengths. Each wavelength is emitted from a separate beam output equipped with an individual shutter.

Flexible repetition rate

The VisUV can be operated at 12 different internally selectable repetition rates between 31.25 kHz and 80 MHz and can also be triggered externally by TTL or NIM signals at any repetition rate between single shot and 80 MHz.

Excellent beam quality

The VisUV features nearly perfectly circular and gaussian shaped beam profiles (TEM00) which can be specified as a value of $M^2 < 1.1$ and $M^2 < 1.2$ at 532 nm and 355 nm, respectively.

Wavelengths

Type (VisUV-)	**Wavelength** [nm]	**Pulse** (FWHM) [ps]	**Max avg. power** [mW]	**Divergence** [mrad]	**Beam diameter** [mm]	**Beam quality**
Multicolor modules						
266-355-532[1]	266 (± 1)[2]	< 85	> 2.0	< 2	1.0 ± 0.2	$M^2 < 1.1$ (vertical) $M^2 < 1.5$ (horizontal)
	355 (± 1)		> 5.0	< 0.5	1.5 ± 0.2	$M^2 < 1.2$ (typ. ~ 1.1), TEM_{00}
	532 (± 2)		> 250	< 0.5	2.1 ± 0.2	$M^2 < 1.1$ (typ. ~ 1.02), TEM_{00}
280-560[3]	280 (± 1)[1]	< 85	> 1.0	< 2	1.0 ± 0.2	$M^2 < 1.1$ (vertical) $M^2 < 1.5$ (horizontal)
	561 (± 1)		> 150	< 0.5	2.1 ± 0.2	$M^2 < 1.1$ (typ. ~ 1.02), TEM_{00}
295-590[3]	295 (± 1)[1]	< 85	> 0.5	< 2	1.0 ± 0.2	$M^2 < 1.1$ (vertical) $M^2 < 1.5$ (horizontal)
	589 (± 1)		> 60	< 0.5	2.1 ± 0.2	$M^2 < 1.1$ (typ. ~ 1.02), TEM_{00}
Single color modules						
266[1]	266 (± 1)[2]	< 85	> 2.0	< 2	1.0 ± 0.2	$M^2 < 1.1$ (vertical) $M^2 < 1.5$ (horizontal)
266-MIC[3]	266 (± 1)	< 85	> 1.0	< 0.5	1.5 ± 0.2	$M^2 < 1.2$ (typ. ~ 1.1), TEM_{00}
355[3]	355 (± 1)	< 85	> 10	< 0.5	1.5 ± 0.2	$M^2 < 1.2$ (typ. ~ 1.1), TEM_{00}
488[3]	488 (± 1)	< 60	> 50	< 1	1.0 ± 0.2	$M^2 < 1.1$ (typ. ~ 1.02), TEM_{00}
532[1]	532 (± 2)	< 85	> 300	< 0.5	2.1 ± 0.2	$M^2 < 1.1$ (typ.~ 1.02), TEM_{00}
532-HC[1.4]	532 (± 2)	Typ. 0.4 ns	> 750	< 0.5	2.1 ± 0.2	$M^2 < 1.1$ (typ.~ 1.02), TEM_{00}
560[3]	561 (± 1)	< 85	> 50	< 1	2.0 ± 0.3	$M^2 < 1.1$ (typ.~ 1.02), TEM_{00}

1 this module is a class 4 laser product
2 Limited collimation range. low power version with improved beam quality is available on demand
3 this module is a class 3b laser product
4 coherence length >85% of optical pulse width (FWHM) typical: 90-95%.

These tables are updated on a regular basis based on data of recently manufactured laser heads. Other specifications such as shorter pulse widths or higher powers than listed might be possible depening on the performance of diodes on stock. Please contact us for more information. All measurements shown may be subject to a 10 % callibration error. Each laser head undergoes an extensive burn-in test to ensure long-term stability and is shipped with a comprehensive set of test data. This test data is kept in our database, which already holds records of more than 18 years.

Specifications

Optical output	
Available wavelength	266 to 590 nm
Spectral width	<< 1 nm
Polarization Extinction Ratio (PER)	> 1:300 (> 25 dB)
Power stability (12 hours) (ΔT (ambient) < 0.5 K)	< 3 % rms
Other optical specs (power, pulse, beam shape)	see wavelengths table
Repetition rates	
Internal	
Range	user selectable: 80, 40, 20, 10, 5 or 2.5 MHz (80 MHz base frequency) 1000, 500, 250, 125, 62.5 or 31.25 kHz (1 MHz base frequency)
External via NIM input	
Range	< 1 Hz to 80 MHz
Trigger level	fixed trigger level at - 400 mV
Connector	NIM-CAMAC
External via TTL input	
Range	< 1 Hz to 80 MHz
Amplitude	- 5 to + 5 V (maximum limits)
Trigger level	adjustable between -1 and +1 V
Connector	BNC
Synchronization output	
Amplitude	< - 800 mV into 50 Ohms (NIM)
Connector	SMA
Timing	synchronous to the pulse repetition rate
Delays	
Trigger in (NIM) to sync out	typ. 9 ± 1 ns
Trigger in (NIM) to optical out	typ. 80 ns
Sync out to optical out	typ. 70 ns
For multiple optical outputs: Max time delay between different output pulses	< 1 ns
USB interface	
Connector	USB Type-C 3.0
USB version	2.0
Compatibility	PicoQuant Laser Driver Software under Windows™ 10
RS232 interface	
Connector	Sub-D9 female
Baud rate	115200
Data	8 bit
Parity	none
Stop	1 bit

Sepia PDL 828 interface	
Connector	LEMO, PicoQuant proprietary interface to connect to dedicated Sepia Extention Module SEM 828
Compatibility	PicoQuant Laser Driver Software under Windows™ 10
Gating	
Connector	SMA female
Remote Interlock	
Connector	4 pin LEMO EGG.00.304.CLL female
Dimensions	
Size (l × w × h)	352 × 336 × 82.5 mm
Weight	6.5 to 9 kg [1]
Operation	
Temperature range	10-35 °C
Maximum power consumption	100 to 250 VAC, 50/60 Hz, max 130 Watts

[1] Single beam versions typ. 6.5 kg, multi-beam versions up to 9 kg

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