Prima

3-Color Gain-Switched Picosecond Laser

- NEW Three colors can be selected at visible wavelength 375, 405, 450, 485, 515, 640 nm
- Compact, stand-alone
- Pulsed and CW operation, fast CW switching
- Suitable for measuring fluorescence lifetime (ns) and photo-luminescence lifetime (µs - ms)
- Triggerable internally and externally, up to 200 MHz
- Fully computer controlled

Applications

- Materials science and chemical research
- Life science
- Photoluminescence and fluorescence lifetime measurements
- Quantum yield measurements
- Time-resolved microscopy and single molecule detection (FLIM, FRET, PIE-FRET, FCS)

Prima offers full flexibility, enabling you to perform time-resolved or steady-state measurements at 3 visible wavelengths. Fast CW switching is a smart solution for measuring longer lifetimes in the µs to ms range. It is especially efficient for materials with a poor luminescence quantum yield. The pulsed mode can be driven either internally at selected repetition rates between 1 kHz and 200 MHz or externally, from single shot up to 200 MHz. Moreover, you can combine Prima with other laser diode heads to create even more sophisticated excitation patterns, such as Burst, Pulse Interleaved Excitation (PIE), or Alternative Laser Excitation (ALEX).

Specifications

Optical output	
Available wavelength[1]	375, 405, 450, 485, 515, 640 nm
Polarization	linear, vertical
Polarization Extinction Ratio (PER)	typ. > 30:1 (> 15 dB)
Power stability (12 hours) (ΔT (ambient) < 0.5 K)	< 3 % rms
Average beam dimension[2]	1.0 ± 0.30 mm
Average beam circularity	> 0.3
Transversale mode M[1]	< 1.5
Multi-Mode fiber coupling efficiency	> 70%

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 depending 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.

Repetition rates	
Internal	
Range	User selectable 1 kHz to 200 MHz 1000 increments of 1 kHz from 1 to 999 kHz 200 increments of 1 MHz from 1 to 200 MHz
External	
Range	single shot to 200 MHz
Trigger level	-1V ... +1V into 50 Ohm
Trigger voltage	-3V to +5V into 50 Ohm
Jitter	< 12 ps (rms)
Connector	SMA
Synchronization output	
Amplitude	< -800 mV into 50 Ohm (NIM)
Connector	SMA
Gating	
Rise / Fall Time	< 3 ns
ON Time (or inverted: OFF Time)	freely adjustable from < 10 ns to 1 ms
OFF Time (or inverted: ON Time)	freely adjustable factor from 1 to 255 of ON (or OFF) Time
Impedance	10 kOhms with pull-up 50 Ohms with pull-down
Connector	SMA
Dimension	
Dimensions (W X H X L) mm	75 x 83 x 140 mm
Weight	1 kg
Operation	
Temperature range	10 – 35 °C
Humidity range	< 80 % (non condensing)
Maximum power consumption	< 30 W
Interface	
PC Interface	USB 2.0
Connector	USB-C
Operating system	Windows™ 10 and 11

[1] Typical value in Pulsed mode. A slight shift to longer wavelengths in CW mode.
[2] Measured at 1 m distance from laser aperture

Wavelengths

Wavelength (± 10) [nm]	Pulse width[1] (FWHM) [ps] @ 80 MHz	avg. power Narrow Pulse [mW] @ 80 MHz	avg. power[2] Broad Pulse [mW] @ 80 MHz	avg. power[2] Broad Pulse [mW] @ 200 MHz	avg. power CW [mW]
375	< 120	1.0	3.5	10	20
405	< 80	1.5	4.0	10	50
450	< 130	1.0	3.5	10	50
485	< 130	1.5	3.5	10	50
515	< 170	1.5	4.0	10	50
640	< 100	2.0	4.5	10	50

[1] Shortest pulse width at Narrow Pulse operation mode
Pulses are deconvoluted with 30 ps detection IRF. Shorter pulse widths are available on demand.
[2] A pulse broadening up to 500 ps FWHM is possible at maximum intensity setting

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