FemtoLux 3

Microjoule Class Femtosecond Fiber Laser

FEATURES

- *Up to 3 W output power*
- *300 fs ... 5 ps tunable pulse duration*
- *Up to 2 μJ/pulse and 10 μJ/burst*
- *Excelent beam quality M^2 < 1.2*
- *Individual pulse control*
- *Burst shape control*
- *Passive cooling (convective)*
- *24/7 operation*

APPLICATIONS

- *Marking and structuring*
- *Micromachining*
- *Ophtalmologic surgery*
- *Photopolymerization*
- *Biological Imaging*
- *Pumping femtosecond OPO/OPA*

FemtoLux 3 is a modern industrial femtosecond laser aimed for micromachining, engraving and ophthalmologic surgery applications. Laser delivers up to 3 W of average power and up to 2 μJ femtosecond pulse energy. *FemtoLux 3* is a flexible platform which allows to optimize output parameters for the desired process. The repetition rate as well as the output power can be easily changed with integrated pulse picker. With burst mode enabled *FemtoLux 3* can generate bursts of pulses with energy above 10 μJ with burst shape controlled in real time via analog input. Pulse duration can also be programed up to 5 ps.

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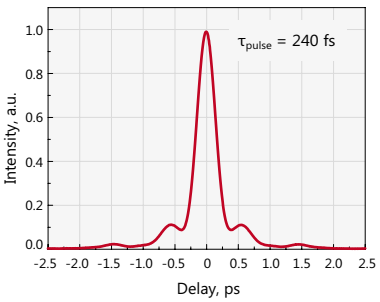
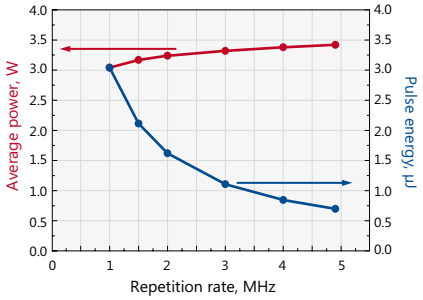
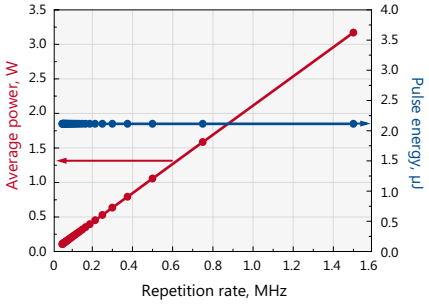
PERFORMANCE



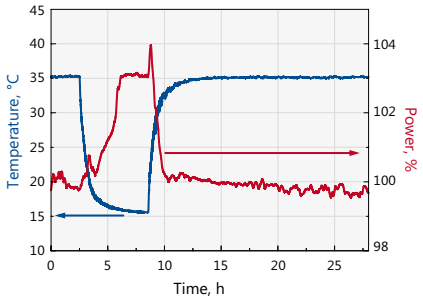
Typical FemtoLux3 laser output pulse autocorrelation function at 2 µJ pulse energy. Calculated pulse duration is 240 fs.



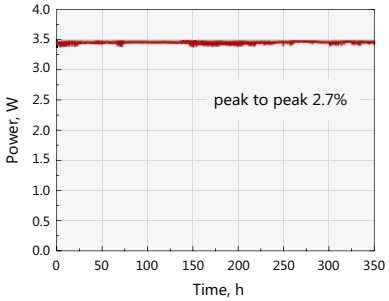
Typical dependence of output power and pulse energy of FemtoLux 3 laser when changing internal repetition rate of the laser.



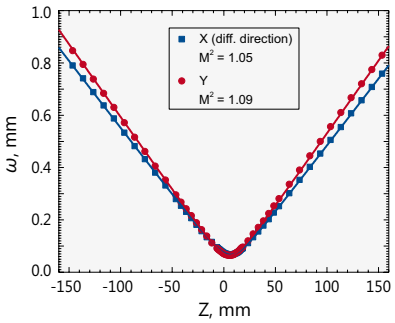
Typical dependence of output power and pulse energy of FemtoLux 3 laser when repetition rate is reduced by pulse picker. Internal repetition rate of the laser in this case is 1.5 MHz.



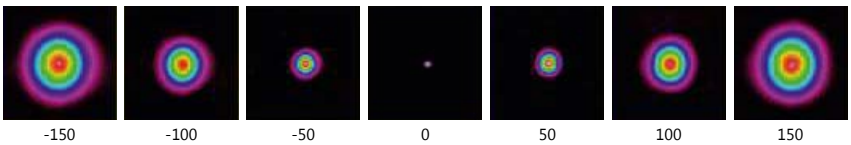
Typical average output power (normalized) dependance on environment temperature.



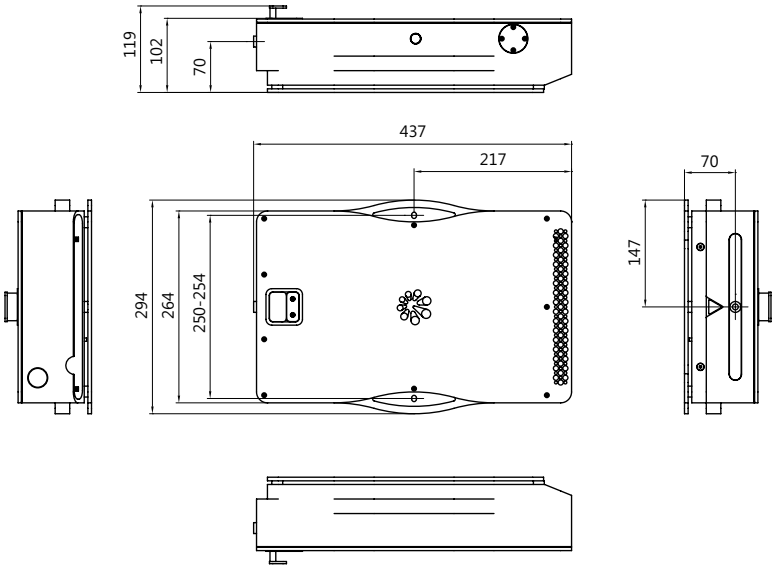
Typical long term average output power stability under constant environmental conditions.



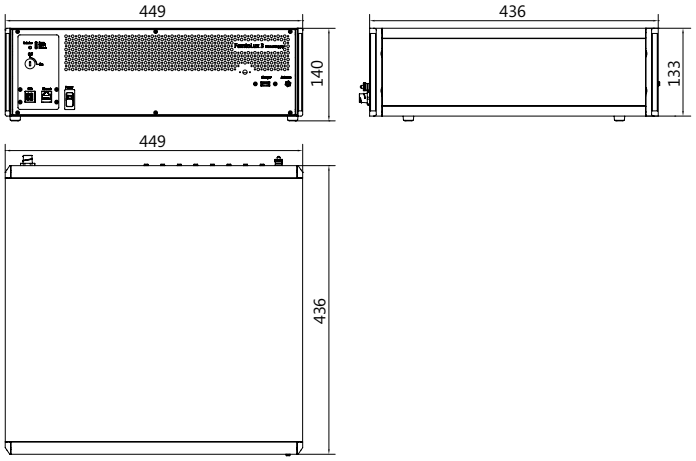
Beam profiles along propagation axis



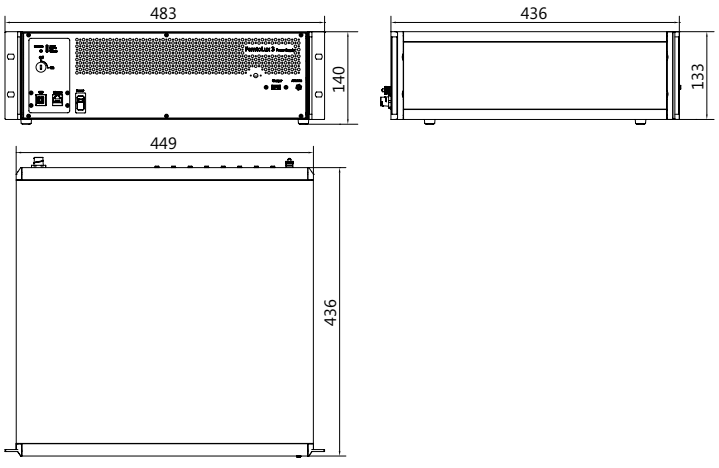
DRAWINGS



Outline drawing of FemtoLux 3 laser head



Outline drawing of FemtoLux 3 stand-alone control unit



Outline drawing of FemtoLux 3 19" rack mountable control unit

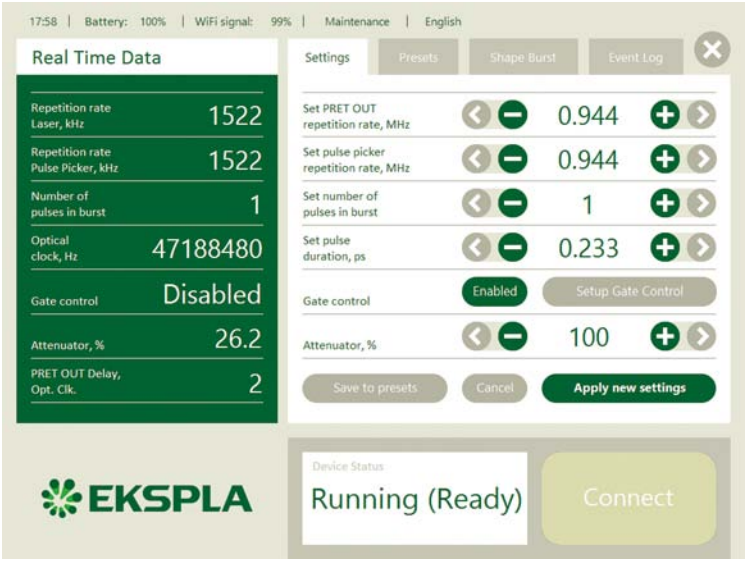
FemtoLux 3

SPECIFICATIONS

Model [1]	FemtoLux 3
Central wavelength	1030 ± 2 nm
Min pulse duration (FWHM)	< 300 fs
Pulse duration control	300 fs ... 5 ps
Average output power [2]	> 3 W
Average power stability [3]	< ±2 % peak to peak
Max pulse energy	> 2 µJ
Pulse energy standard deviation [4]	< 2 %
Output beam diameter (at $1/e^2$)	1.8 ± 0.2 mm
Beam quality	M^2 < 1.2
Power attenuation	0 – 100 % by software or via analog input
Laser pulse repetition rate (PRR_L) [5]	1 – 5 MHz
Pulse repetition rate after pulse picker	PRR = PRR_L / N, N=1, 2, 3, ... , min 10 kHz
External pulse gating	via TTL input
Burst mode [6]	1 – 10 pulses
Max burst energy	>10 µJ
Burst shape control	via analog input
Laser head dimensions	437 × 294 × 119 mm
Control unit dimensions	449 × 436 × 140 mm (stand-alone) or 483 × 436 × 140 mm (19" rack mountable)
Umbilical length	5 ± 0.5 m
Cooling	passive (convective)
Operating conditions	15 – 30 °C, humidity – not condensing

1) Due to continuous improvement all specifications are subject to change without notice.
2) At pulse repetition rate 1.5 MHz or higher.
3) In bandwidth bellow 1 Hz during 24 h operation under constant environmental conditions.
4) In 1 MHz – 0.1 Hz bandwidth.
5) When pulse picker is set to transmit every pulse.
6) Time interval between the pulses is about 20 ns.

SOFTWARE



Example of FemtoLux 3 control software