FemtoLux 3

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*
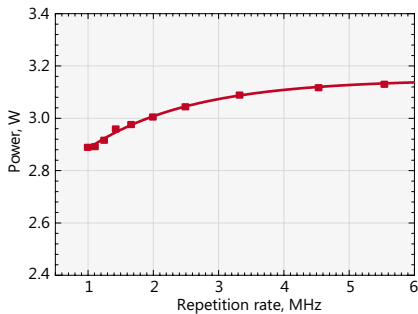- ▶ *Biological Imaging*
- ▶ *Pumping femtosecond OPO/OPA*

FemtoLux 3 is a modern femtosecond fiber laser aimed for micromachining, surface texturing and ophthalmologic surgery applications. Our new FemtoLux 3 laser delivers up to 3 W of average power and up to 2 µJ femtosecond pulse energy. Thanks to fiber technology and sophisticated compressor design the laser features excellent beam quality, which remains unchanged under various environmental conditions.

The FemtoLux 3 is also a flexible platform which allows optimization output parameters for the desired process. It has implemented multiple features which help to optimize radiation parameters for a particular process. The repetition rate of the pulses can be seamlessly changed by integrated frequency divider, which also enables to generate bursts of femtosecond pulses spaced by about 20 ns with burst energy above 10 µJ. The FemtoLux 3 laser can generate variable burst shapes either pre-programed or controlled in real time from graphic user interface. An integrated pulse picker enables the user to operate the laser in a gated mode including pulse on demand operation. It also allows the user to smoothly attenuate the output power of the laser with high dynamical range which is very useful for beam aligning and diagnostics.

Another valuable feature is the pulse duration control which can be performed from the software in the range of 300 fs and 5 ps. Both positive and negative chirp signs are available. Beam stability is excellent (<20 µrad) when the pulse duration is changed. Useful software options include calibration of pulse duration, which automatically tunes the system to obtain the shortest pulse duration if necessary.

The FemtoLux 3 is an energy-efficient laser because of its passively cooled optical head. The laser does not require a water chiller or heat exchanger and all its control electronics fit into a standard 3U 19-inch rack. This makes it one of the most compact lasers in the class.

Each FemtoLux 3 laser produced at Ekspla passes strict quality control test and inspection procedures. Every single unit is checked for vibration resistance, operationally tested at different environment temperature and humidity, as well as subjected to high temperature (up to 70 °C) thermo-cycling. Prior to shipment, Ekspla performs extensive testing to verify multiple external and internal laser parameters to ensure the lasers are meeting their technical requirements.

❊ EKSPLA

FemtoLux 3

SPECIFICATIONS [1]

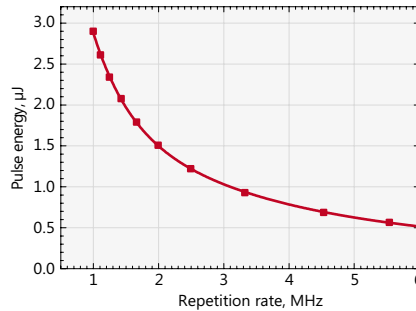| Model	FemtoLux3
Central wavelength	1030 nm
Min pulse duration	< 300 fs
Pulse duration control	300 fs ... 5 ps
Average output power	3 W
M^2	< 1.2
Laser repetition rate (PRR_L) [2]	1 – 5 MHz
Pulse repetition rate after pulse picker [3]	$PRR = PRR_L / N$, N=1, 2, 3, ..., 10^6
Pulse energy	2 µJ
Burst mode [4]	up to 10 pulses
Burst energy	up to 10 µJ
Burst shape control	internal [5] or external [6]
Laser head dimensions	400 × 267 × 105 mm
Control unit dimensions	483 × 436 × 140 mm (19" rack)
Cooling	passive (convective)

[1] Due to continuous improvement all specifications are subject to change without notice.

[2] When pulse picker is set to transmit every pulse.

[3] At fixed laser repetition rate.

[4] Time interval between the pulses is about 20 ns.

[5] Using provided software for burst shape control (slow control).

[6] By user provided signal using analog input (real time).

DANGER

VISIBLE AND/OR INVISIBLE LASER RADIATION
AVOID EYE OR SKIN EXPOSURE TO DIRECT
REFLECTED OR SCATTERED RADIATION

Yb:Fiber 1030 nm
Max. 2 µJ, power 3W, pulse 300 fs
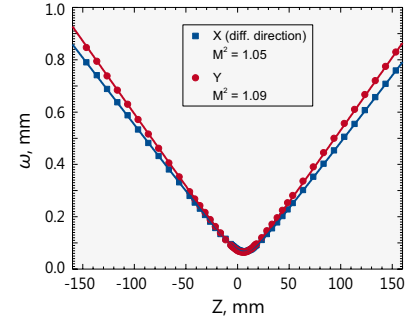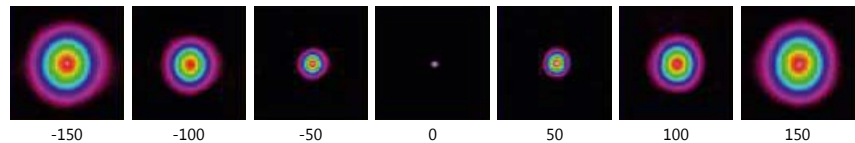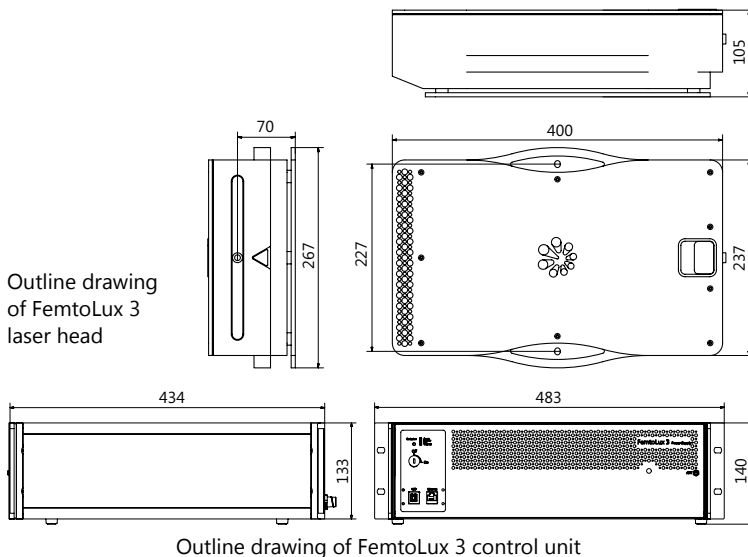**CLASS IV LASER PRODUCT**

PERFORMANCE

Typical output power

Typical pulse energy

Beam profiles along propagation axis

DRAWINGS

Outline drawing of FemtoLux 3 laser head

Outline drawing of FemtoLux 3 control unit
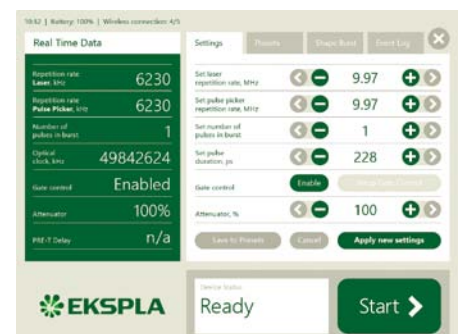
SOFTWARE

Example of FemtoLux 3 control software