INDUSTRIAL

FemtoFiber ultra NIR

FemtoFiber ultra NIR (780 nm / > 500 mW)

High-power ultrafast Erbium fiber laser system

The FemtoFiber ultra NIR is the first of TOPTICA's third generation fiber lasers. It provides pulses centered at 780 nm with a duration below 150 fs and a repetition rate of 80 MHz. The system reaches an average power of more than 500 mW due to its completely revised system architecture, utilizing double-clad pumping into large mode area fibers.

The pulses are generated using a SESAM-mode locked ring fiber oscillator (patented design), followed by a high-power fiber amplifier. For reaching highest reliability levels, only polarization-maintaining, Erbium-doped fibers are used. The oscillator and amplifier generate pulses at a fundamental wavelength of 1560 nm. The amplifier output is converted to a wavelength of 780 nm using a frequency-doubling stage. Due to the high efficiency of the frequency-conversion, more than 500 mW average power is available at the 780 nm free-space output. All of this is integrated in a unit with a footprint of 20 x 38 cm². The laser system is easily controlled via Ethernet. A simple graphics user interface (GUI) enables user-friendly access to all laser parameters.

The FemtoFiber ultra NIR shares the advantages of TOPTICA's previous ultrafast fiber laser generations. It is a compact laser system and works reliable just after a push-button start. No water-cooling is required since a simple air-cooling is sufficient for a stable operation of the system. It is a cost-effective and compact laser system that provides femtosecond pulses with high average power in the near-infrared with an excellent beam quality. It is a great solution for applications in nonlinear microscopy like effective two-photon excitation of fluorescent proteins and SHG based contrast mechanisms.

Applications

- 2-Photon polymerization
- SHG imaging and microscopy
- Multiphoton excitation
- Semicon inspection

Key Features

- SESAM mode-locked ring fiber oscillator
- Patented design (US 8,457,164)
- High-power fiber amplifier
- Polarization maintaining fibers only
- Highly-efficient frequency doubling to 780 nm
- Compact air-cooled system

TOPTICA PHOTONICS

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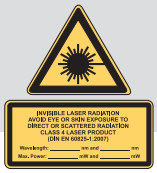
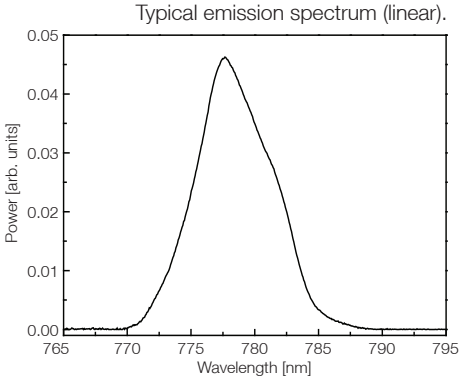


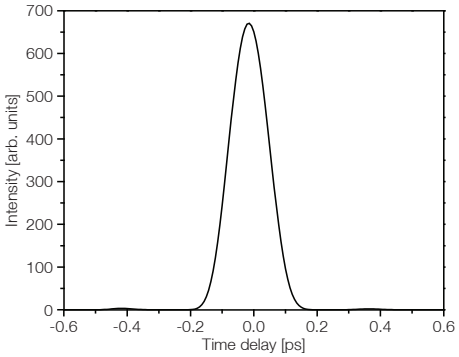
Laser Specifications*	
Center wavelength	780 nm
Laser output power	> 500 mW
Pulse width	< 150 fs
Repetition rate	80 MHz
Beam quality	TEM_{00}, $M^2 < 1.2$
Beam size ($1/e^2$)	Ø 1.2 mm ($1/e^2$) typ.
Beam divergence	< 1 mrad
Linear polarization	> 95% (horizontal)
Optical interface	Free space
PC Interface	Ethernet
Environment temperature	19 - 25 °C (operating) 0 - 40 °C (storage and transport) non-condensing
Power consumption	< 350 W
Dimensions laser head (H x W x D)	111 x 200 x 380 mm³
Dimensions electronics (H x W x D)	154 x 340 x 380 mm³ (incl. stand) (3U/HE, horizontal pitch 63 HP/TE)
Power supply	100 - 240 V AC, 45-63 Hz
Weight laser head	approx. 15 kg

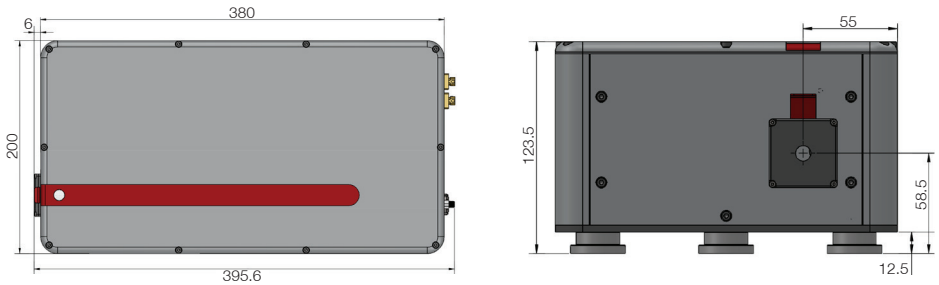
*) Subject to change without notice

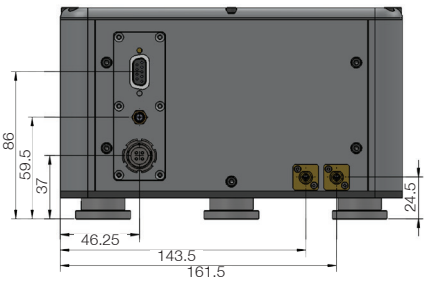
Typical emission spectrum (linear).



Retrieved pulse shape with typ. 99% of power in main peak

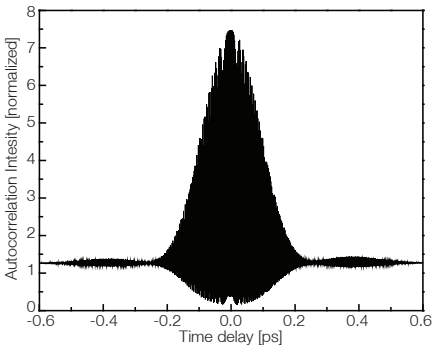






Dimensions subject to change without notice

Autocorrelation pulse width < 150 fs (gaussian fit)



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LGA InterCert Zertifiziertes QM-System ISO 9001:2008

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