

FemtoFiber ultra 920

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High Power Ultrafast Fiber Laser

The FemtoFiber ultra 920 is a new and unique member of TOPTICA's third generation fiber lasers. It provides pulses centered at 920 nm with a duration of typical below 100 fs and a repetition rate of 80 MHz. The system reaches an average power of more than 1 W which is a record-breaking achievement in conjunction with the short pulses at same time. The pulses are generated using a SESAM-mode locked ring-type Erbium-based fiber oscillator (patented design), followed by a patent-pending high-power fiber amplifier. For reaching highest reliability levels, only polarization-maintaining fibers are used in the signal path.

The FemtoFiber ultra 920 provides a small laser head with a footprint of 23 x 15.5 cm². The laser head is designed to ensure minimum heat dissipation to its environment and therefore provides also highest stability for beam pointing. For more flexibility, the design also allows mounting the laser head into an integrators environment, even under various orientations (vertical/horizontal/...). The laser system comes with an 19"-type standard rack (3 units height) control and supply unit which is connected via detachable fiber and electronic lines of typ. 2 meters length.

The system is controlled either manually by a simple emission push-button operation and also provides all necessary safety

features complying with the latest laser safety regulations. Furthermore, the laser system can also be remote-controlled via Ethernet or USB. A simple graphics user interface (GUI) enables user-friendly access to all laser parameters.

The FemtoFiber ultra 920 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, simple forced air convection cooling of the control/supply unit is sufficient for 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.

The laser system is a great solution for applications in non-linear microscopy like two-photon excitation of fluorescent proteins and SHG based contrast mechanisms. With the emission wavelength of 920nm it provides highest power for especially green and yellow fluorescent protein markers (GFP, YFP) commonly used e.g. in neurosciences and other laser-related biophotonic disciplines. It perfectly closes the wavelength gap in between the already existing FemtoFiber ultra systems at 780 and 1050 nm.



Applications

- SHG imaging and microscopy
- Multiphoton excitation
- Advanced microscopy techniques
- Neuroscience
- Semicon inspection

Key Features

- SESAM mode-locked ring fiber oscillator
- Patented and patent pending design (US 8,457,164)
- Unique approach with < 100 fs pulses at > 1 W
- Polarization maintaining fibers only
- „Cold“ and Compact laser head design
- Optimized system design for OEM integration
- Air-cooled system
- Excellent price-performance point
- 24 VDC power supply
- < 150 W power consumption

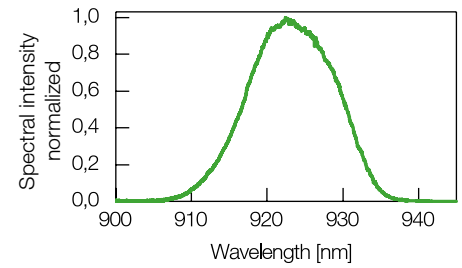




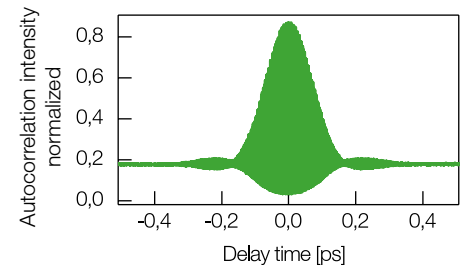
Laser Specifications*	
Center wavelengt	920 nm
Laser output power	> 1 W
Pulse width	< 100 fs**
Repetition rate	80 MHz
Beam quality	TEM ₀₀ , M ² < 1.2
Beam size (1/e ²)	Ø 1.0 mm (1 / e ²) typ.
Beam divergence	< 1 mrad
Linear polarization	> 95 % (vertical)
Optical interface	Free space
Environment temperature and humidity	19 - 25 °C (operating) 0 - 40 °C (storage and transport) non-condensing
Power consumption	< 150 W
Dimensions laser head (H x W x D)	77 x 155 x 230 mm ³
Dimensions laser supply unit (H x W x D)	134 x 483 x 600 mm ³
Weight laser head approx.	< 4 kg
Weight laser supply unit	< 20 kg
Power supply	24 V DC (AC power supply optionally included)

*) Subject to change without notice

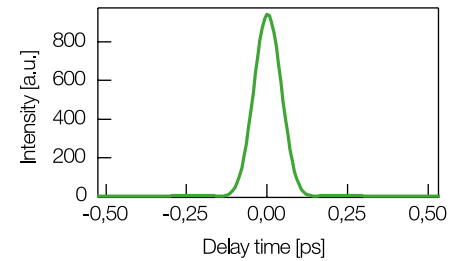
**) sech² fit



Typical emission spectrum (linear)



Interferometric autocorrelation



Retrieved pulse shape with typ. 99% in main peak

Technical drawings not available yet