



PRESS RELEASE

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European XFEL GmbH and Onefive collaborate on the development and commissioning of an all-fiber front-end system.

Regensdorf, Switzerland – [Onefive GmbH](#) and the Laser Group of European XFEL, an X-ray free-electron laser in the Hamburg area that recently started commissioning, have successfully joined their expertise in the development and commissioning of an all-fiber front-end as part of a unique laser system for experiments at the new research facility [1].

The [European XFEL GmbH](#) is developing high power burst mode femtosecond pump-probe lasers to be used for experiments in combination with the facility's X-ray beams [2]. The ultrashort, high-intensity X-ray laser pulses available at the facility will enable studies of ultrafast processes in solids, gas-phase, chemical and biomolecular structures, and extreme states of matter down to the atomic level. Its pump-probe lasers will typically activate samples, followed by probing with the X-ray pulses. These laser sources rely on very high-power and high-energy sub-picosecond pulses at 1- μm wavelength, arranged in low duty cycle burst patterns. At the heart of the European XFEL pump-probe laser design lies a fully optical fiber based front-end laser system. This new laser system, the [Origami – 10 XP Dual Burst](#), is highly specialized and has been customized by Onefive to the unique requirements of the pump-probe laser.

Onefive brought in its expertise in low-noise ultrafast laser physics, advanced packaging, industrial-grade manufacturing and systematic testing to build this all-fiber laser system. This laser system is seeded with an ultra-low noise femtosecond laser at 1- μm with consecutive pulse picking and amplification. It provides dual output ports for multiple beamlines for simultaneously providing the seed and pump line for a noncollinear optical parametrical amplifier. It is bursted with flexible burst time and can provide burst-to-burst variable repetition rate while keeping other parameters constant. It can be completely remote controlled, is integrated in the European XFEL software environment and the laser head is entirely passively air-cooled for low vibration and excellent beam pointing stability.

Onefive lasers are designed and qualified for 24/7 operation under harsh environments. A focused product development approach provides a dust-sealed, maintenance-free small footprint product with reliable turn-key operation at a competitive price throughout the complete product fleet. Please visit our webpage to discover our capabilities of ultrafast, industrial lasers: www.onefive.com

References:

- [1] M. Pergament et al., "[Versatile optical laser system for experiments at the European X-ray free-electron laser facility](#)", Opt. Express., Vol. 24, No. 26, 29349-29359, 2016
- [2] http://www.xfel.eu/news/2016/versatile_optical_laser_will_enable_innovative_experiments/

About Onefive GmbH:

Founded in 2005, Onefive GmbH is dedicated to innovation of the emerging OEM ultrafast laser market by introducing a novel generation of advanced laser modules. The lasers rely on a unique packaging technology allowing for combination of compactness, stability, efficiency and a high ease of use. Onefive's sealed laser packages guarantee reliable 24/7 operation without degradation of performance. The areas of application range from medical and biological applications, environmental to homeland security applications, sensing, material processing and R&D. Onefive is strongly committed to bringing ultrafast laser technology solutions with industrial-grade performance and reliability.



Fig. 1: The air-cooled [Origami - 10 XP Dual Burst](#) laser featuring the dual output for simultaneous seeding and pumping of a non-collinear optical parametric amplifier installed at the European XFEL.

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