



**ROBUST.
RELIABLE.
READY-TO-USE.**

Femtosecond Fiber Lasers Portfolio Overview

Developed to meet highest expectations

Tracing its origin to worlds first commercial supplier of optical frequency-combs, Menlo Systems has been leveraging innovation in ultrastable laser technology for over 20 years. As a result, today we offer a portfolio of femtosecond fiber lasers with unprecedented phase-noise performance based on our proprietary **figure 9[®]** mode locking technology^{1,2} – meeting scientific precision and with industrial robustness.

Robust. Reliable. Ready to use.

Core of **figure 9[®]** is an all polarization-maintaining fiber design, efficiently decoupling the laser cavity from perturbations such as vibrations and temperature variation. The technology contains no critical or life time limiting components, such as degradable optics. Whether designed to serve science or industry, our femtosecond fiber lasers share exceptional performance:

■ **Robust.**

A single well-defined mode lock state guarantees robust self-start and mode locked operation within seconds – even in harshest environments.

■ **Reliable.**

Reproducible laser performance You can rely on even after thousands of on-off turns– with excellent power stability, pulse-to-pulse repeatability, and unsurpassed relative intensity noise (RIN).

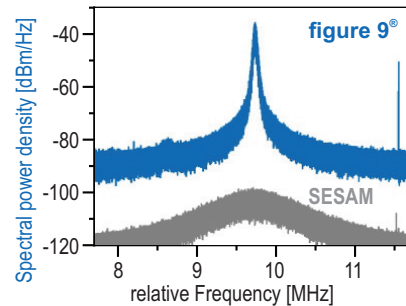
■ **Ready to use.**

After installation with the switch of a key, our lasers are maintenance-free and thermally managed without any external cooling.

[1] Patents EP 2637265 A1 / CN 103311780 A / US 8873601 B2

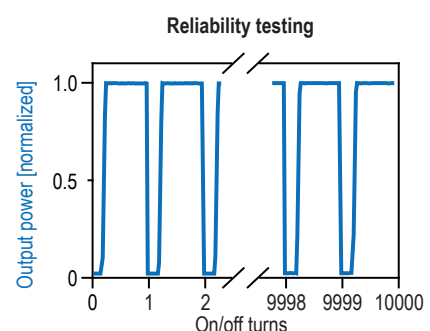
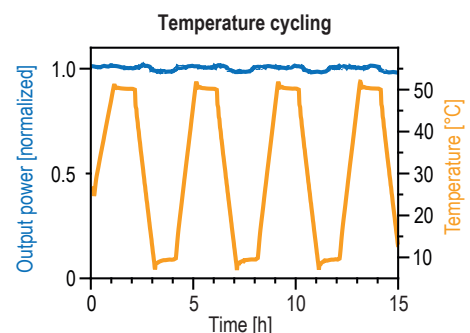
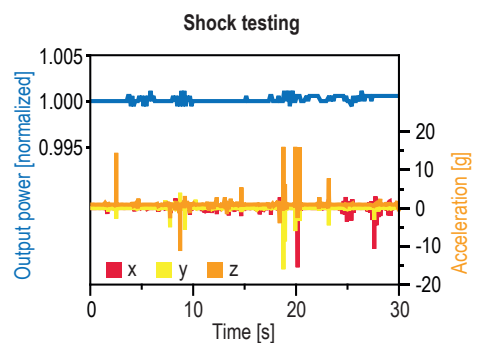
[2] W. Hänsel et. al., Appl. Phys. B (2017) 123:41

[3] N. Raabe et. al., Optics Lett. (2017), Vol. 42, No. 6, 1068



Top: Exceptionally low noise - Carrier-envelope (CE) beat note measurements proof unsurpassed phase noise performance of Menlo Systems figure 9[®] mode locking technology 3.

Bottom: Put to the test - Output power stability of Menlo Systems ELMO Series





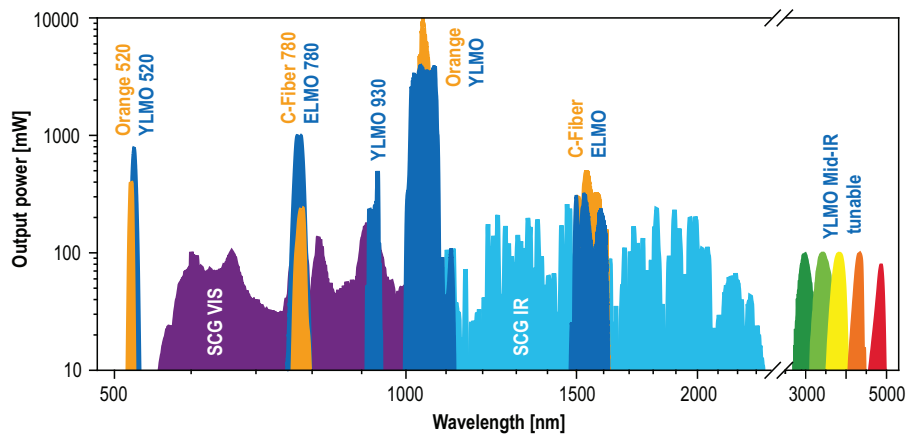
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MenloSystems

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Exceptional performance for science and industry

Whether THz generation, multiphoton approaches in microscopy and 3D nano-printing, state-of-the-art spectroscopy, seeding of amplifiers, or generation of optical frequency combs – we have Your application covered with a femtosecond fiber laser portfolio that perfectly aligns to scientific as well as industrial/OEM settings.



Ready for Synchronization Scientific Series C-Fiber and Orange

- Customized repetition rates with optional intracavity actuators for repetition rate tuning, synchronization, and carrier envelope phase (CEP) stabilization at exceptionally low intrinsic phase noise
- Complete synchronization solutions including optimized electronics to provide timing jitter on the attosecond level
- Asynchronous Optical Sampling (ASOPS) with multi-color lasers
- Optional multi-color outputs and seed ports



Ready for integration Industrial Series ELMO and YLMO

- Excellent cost-performance ratio and low cost of ownership through reduced complexity, use of standard telecom components, and Telcordia qualified pump diodes – all ready for 24/7 operation
- Ultra-compact designs
- Fast and easy OEM integration through modular concept and fiber coupled interconnects
- Quickly adaptable options like dispersion pre-compensation, multiple amplifier seeding, pulse picking and fast amplitude modulation



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