

# OSE

## Optical Sampling Engine with Two Femtosecond Fiber Lasers

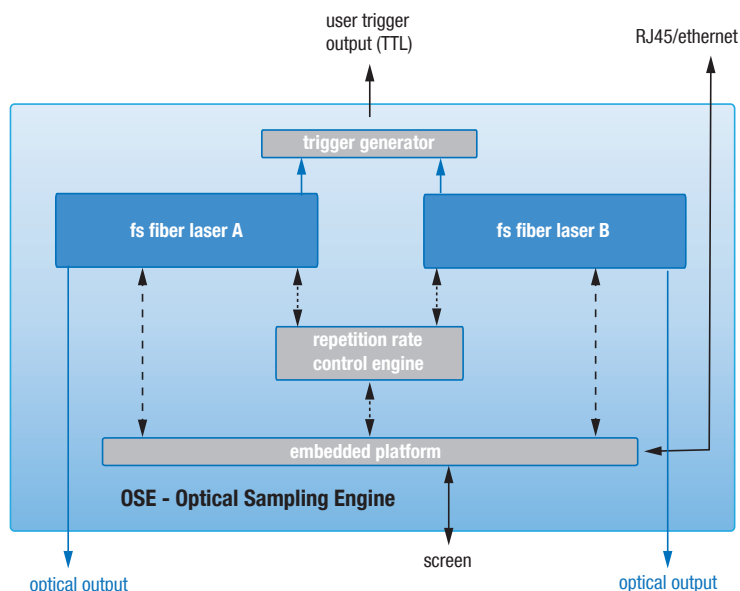


In time-resolved measurements, an ultrafast pulse triggers a reaction and a second pulse takes a snapshot of the induced change. By shifting the arrival time of the probe pulse with respect to the pump pulse the stimulated process can be followed in time.

The OSE is a one-of-a-kind compact Optical Sampling Engine that includes two femtosecond Erbium fiber lasers, synchronized with a high-accuracy phase-locking electronics. It allows for high-speed scanning over many nanoseconds of time delay without a mechanical delay line. In just 19" 3U, it features a fully automated turn-key asynchronous optical sampling system (ASOPS).

The ultrafast lasers delivering the pump and probe pulses are locked together at a tunable repetition rate difference. An optically generated TTL trigger output is integrated for triggering customer data acquisition devices. Due to its modular design, the OSE is the most versatile dual laser system on the market: Additional external modules are retrofittable, to provide higher powers, customized spectra and pulse lengths. The underlying proprietary technology based on figure 9<sup>®</sup> lasers is well-suited even for demanding environments.

### SCHEMATIC SETUP



# MenloSystems

### KEY SPECIFICATIONS

- Synchronized Dual Laser System
- Time Measurement Window 10 ns (pulse-to-pulse)
- Repetition Rate 100 MHz
- Central Wavelength 1560 nm
- Pulse Width <90 fs

### APPLICATIONS

- THz Time-Domain Spectroscopy
- THz Frequency Comb Spectroscopy
- Photo Acoustics
- High-Resolution Frequency Domain Spectroscopy
- Transient Absorption Spectroscopy
- Material Characterization

### FEATURES

- High-speed Electronic Sampling
- Full Automation
- LAN-Interface (full Remote Control)
- 10 MHz Internal Reference
- Ultrafast Repetition Rate Actuator
- No Moving Mechanical Components
- Fiber-coupled Optical Outputs (PM)

### OPTIONS

- **VARIO**  
**User-Defined Repetition Rate**  
Factory-set; possible values 50, 62.5, 100, 125 MHz
- **MULTIBRANCH**  
**Additional Seed Ports**  
Seeding of multiple amplifiers with optional subsequent frequency conversion to cover multiple wavelengths
- External Amplifiers
- Rack- and Table-Mounted Extensions

## Optical Sampling Engine

### COMPLETE SOLUTION:

The turn-key, fully hands-off optical setup is integrated into a 19" 3U rack, and offers unprecedented compactness. The embedded platform ensures automatic laser stabilization. Changes of the operation mode can be done through the front screen, or be remote control over network by a browser-based graphical user interface. For convenience, the system offers a TTL trigger signal. Additionally, the OSE can provide additional outputs as a seed to pump external amplifiers.

### SPECIFICATIONS

Repetition Rate	100 MHz
Repetition Rate Offset Tuning Range	$\Delta f = -10 \text{ kHz} \dots +10 \text{ kHz}$ , in steps of $10^{-5} \text{ Hz}$
Time Measurement Window	10 ns*
Data Point Increment **	1 ps @ 10 kHz, 0.1 fs @ 1 Hz
RMS Timing Jitter [0.1 Hz - 500 kHz]	<150 fs
RF Reference	external or internal 10 MHz reference

### SPECIFICATIONS LASERHEADS

Wavelength	1560 nm
Average Output Power	>100 mW (from each laser)
Output Ports	fiber-coupled FC/APC
Pulse Length	<90 fs after 1 m PM fiber
Trigger Signal	TTL level at offset frequency, <10 ns rise time

\*Scales with the repetition rate. \*\*Scales with the ratio of the repetition rate offset and the repetition rate squared ( $\Delta f/f_r^2$ ).

### REQUIREMENTS

Operating Voltage	110/115/230 VAC
Frequency	50 to 60 Hz
Power Consumption	<100 W
Cooling Requirements	none
Operating Temperature	$22 \pm 5 \text{ }^\circ\text{C}$
Optical Unit Dimensions/Weight	19" x 3U, 17 kg

### ORDERING INFORMATION

Product Code	OSE
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Please call for pricing. Specifications are subject to change without notice. Custom modifications are available, please inquire.



Invisible laser radiation  
avoid exposure to beam  
Class 4 laser

