

EXALOS Swept Sources

Applications

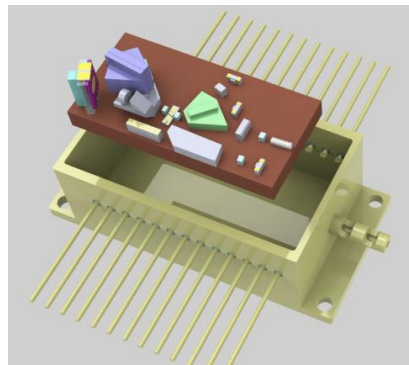
- Optical Coherence Tomography
- Biomedical Imaging
- Spectroscopy
- Industrial Metrology
- Optical Sensing

Product Features

- Wavelength-flexible free-space external cavity laser architecture
- Widest wavelength selection (840nm, 1060nm, 1220nm, 1310nm, 1550nm – other wavelengths upon request)
- Ultra-wide sweep range (150nm @ 1310nm; 200nm @ 1550nm)
- Large variety of sweep rates (DC, 2 kHz, 20 kHz, 50 kHz, 100 kHz, 150 kHz – other sweep rates upon request)
- High output power (up to 15mW @ 840nm; up to 40mW @ 1310nm)
- Long coherence lengths (6mm to 25mm, depending on speed and sweep range)
- Compact OEM module in 3.5" HDD format
- Analog k-clock output
- Single-mode or PM fiber output
- Remote control through USB or digital & analog input signals
- Minimum operating temperature range +5°C to +40°C

Description

The EXALOS swept source technology is based on a (longitudinal multi-mode) external cavity laser architecture that is built with a resonant MEMS scanner, a high-performance diffraction grating, an EXALOS broadband semiconductor gain chip and an automated hybrid optical assembly platform that EXALOS has developed over the past decade, allowing an unprecedented alignment accuracy and the realization of complex optical assemblies like high-performance laser cavities.



The entire laser cavity is realized inside a miniaturized swept source optical module (SSOM) that is integrated with drive electronics in an ultra-compact 3.5" HDD format for either vertical or horizontal mounting inside a console or imaging system.

EXALOS is currently offering the widest wavelength range of swept sources on the market. The free-space architecture allows for realizing tunable lasers at wavelengths ranging from 390 nm to 2000 nm or beyond, depending on the gain chip technology. The LEGO®-like assembly concept allows for rapid prototyping and for a high degree of custom swept sources in order to address a wide range of applications.



The rapid wavelength tuning is realized with electro-static resonant MEMS scanners that are performing a harmonic oscillation when driven in their mechanical resonance, resulting in a deterministic and highly-repeatable bidirectional wavelength scanning, as shown in the illustration below. The sweep speed or the corresponding k-clock is typically varying by a factor of 2-3 over the wavelength range of interest. The loss of axial resolution is less than 2% by omitting the turning points of the laser (shaded areas).

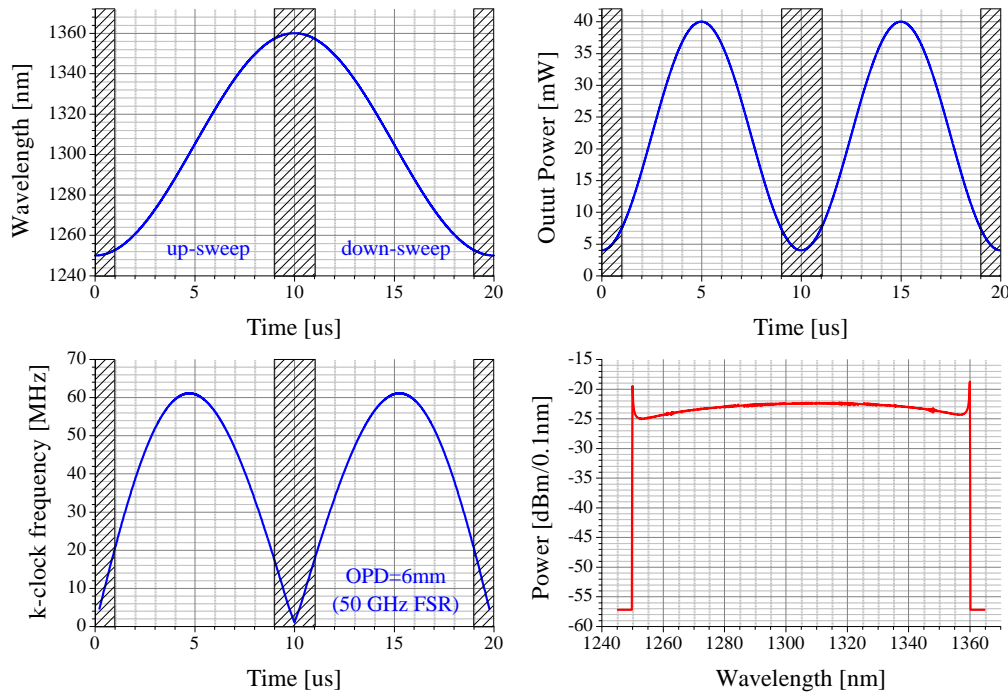


Illustration of a 100-kHz bidirectional swept source with a sweep range of 1250-1360 nm and an average output power of 22 mW. The shaded areas indicate periods of time that may not be used for OCT imaging, i.e. the non-shaded areas represent the actual sampling periods with an 80% duty cycle.

(Marcus Duelk, Kevin Hsu: "SLEDs and Swept Source Laser Technology for OCT". Springer International Publishing Switzerland 2015, W. Drexler, J.G. Fujimoto (eds.), Optical Coherence Tomography, doi 10.1007/978-3-319-06419-2_19)

EXALOS is specializing on broadband swept sources with slow-to-medium sweep rates at a large variety of wavelengths. A list of standard swept sources is given in the table below. Other swept lasers with faster or slower sweep rates, wider sweep ranges, higher output powers or other wavelengths can be realized upon request. Please contact Sales at EXALOS for more information.

Wavelength	Product Code	Sweep Rate	Sweep Range	Coh. Length	Power
850nm	ETL390001-00	DC	60 nm	7 mm	7 mW
	ESM340018-00	20 kHz	60 nm	7 mm	7 mW
1050nm	ESM340020-00	50 kHz	90 nm	8 mm	15 mW
1220nm	ESM340010-00	2 kHz	80 nm	8 mm	12 mW
1310nm	ESM340012-00	20 kHz	150 nm	6 mm	25 mW
	ESM340016-00	20 kHz	110 nm	8 mm	25 mW
1550nm	ESM340019-00	2 kHz	110 nm	6 mm	15 mW