

Swept Wavelength Laser | s3



Description

The Micron Optics s3 is a Swept Wavelength Laser module that provides linear sweep in optical frequency and has customizable tuning ranges.

To facilitate system integration, the laser module also provides triggering signals corresponding to the sweep signal, calibration comb frequency, and user designated wavelengths. The flexibility of the s3 makes it very useful for OEM applications in bio-medical and industrial imaging, optical frequency domain ranging, as well as optical sensing and spectroscopy.

Swept laser scanning at 1 KHz over 80 nm, centered at 1550 nm

Applications

Optical Frequency Domain Imaging (OFDI)

The basic OFDI system consists of 3 functional blocks: the swept source, the acquisition system, and the imaging probe formed by the Michelson interferometer. In addition to near linear sweep, the s3 also provides sync trigger, wavelength marker, and real-time uniform-frequency sampling clock to facilitate signal acquisition and system synchronization. This alleviates the need for recalibration via post processing.

Spectrally Encoded Confocal Microscopy (SECM)

Swept spectrum from s3 is transmitted through the distal diffraction grating and objective lens, and converted to a line scanning spot across the sample. The reflected optical signal is focused back through the optical fiber and detected remotely. Spatial information along the sample is decoded by measuring the spectrum of light, thereby enabling confocal microscopy without a mechanical scanner at the distal end of the probe.

Chromatic Confocal Microscopy (CCM)

The s3 swept wavelength output is imaged by a chromatically dispersive lens into a fast scanning axial spot illuminating into the sample. The reflected optical signal is focused back through the optical fiber and detected remotely to enable high resolution non contact 3D surface metrology including roughness characterization and surface flaw detection.

Key Features

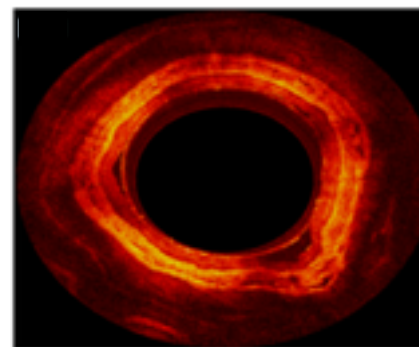
Custom OEM configurations wavelength range, tuning speed, linewidth

1 kHz sweep frequency

Linearized sweep

High resolution

Compact, rugged, portable



J. Xi, et al., "Flexible miniature compound lens design for high-resolution optical coherence tomography (OCT) balloon imaging catheter," J. Biomed. Opt., Vol. 13, 060502

Swept Wavelength Laser | s3



Optical Properties

	s3
Sweep range	80 nm @ 1550 nm
Scan frequency	1 KHz
Duty cycle ¹	75%
Frequency sweep non-linearity ²	<1%
Dynamic linewidth	typical 50 pm
Maximum optical output power ^{3,4}	8 mW
Optical output isolation	30 dB
Wavelength markers	User defined starting & ending wavelengths
Optical connectors	FC/APC or E2000

Electrical Properties

Scan waveform	Triangle
Sync signal	TTL
Electrical connector	SMA or QMA
Input voltage	7 - 36 VDC, AC/DC converter included (100~240 VAC, 47~63 Hz)

Physical Properties

Dimension; Weight	122 mm x 267 mm x 135 mm; 2.5 kg
Operating temperature; Humidity	5 to 50 degrees C; < 80%, non-condensing
Storage temperature; Humidity	-20 to 70 degrees C; < 95%, non-condensing

Special OEM Options

Sweep range	40 to 160 nm
Optical source	Unpolarized
Dynamic linewidth	10 to 100 pm
Scan frequency	1 Hz to 2 KHz
Wavelength markers	Customized

Notes

¹ Controlled sweep range (e.g. 80nm) swept in 75% of total sweep time.

² Dependent on sweep duty cycle. P-scan specification.

³ Time averaged total power.

⁴ The s3 Swept Wavelength Laser is a Class 3B laser device as defined by IEC 60825-1, Edition 2.0 2007-03, Safety of Laser Products, and FDA Title 21, Code of Federal Regulations (Subchapter J, Radiological Health), except for deviations pursuant to Laser Notice No. 50, dated June 24th, 2007.