OCTANE - 860

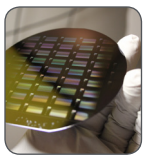
Optical Coherence Tomography
Advanced Nanophotonic Engine

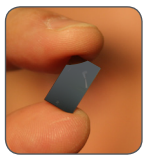
Equivalent free-space optical performance in a low-cost, scalable, ultra-stable package

Overcome bulk limitations of conventional optics with the first nanophotonic spectrometer system for OCT

Tornado's OCTANE-860 spectrometer uses integrated optics as its optical core and delivers free-space optical performance in a miniaturized package.

Engineered for OEM production.



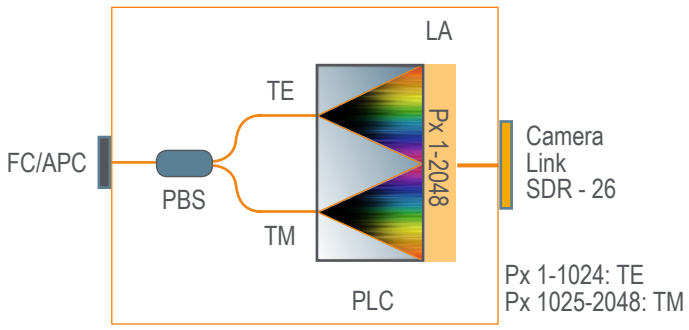


The OCTANE Advantages

- Flexible center wavelength & spectral range
- No moving parts/never requires alignment
- Thermal and vibrational insensitivity
- Turn-key OCT spectrometer
- High-volume production
- Single-mode fiber input
- Small form factor
- Low cost

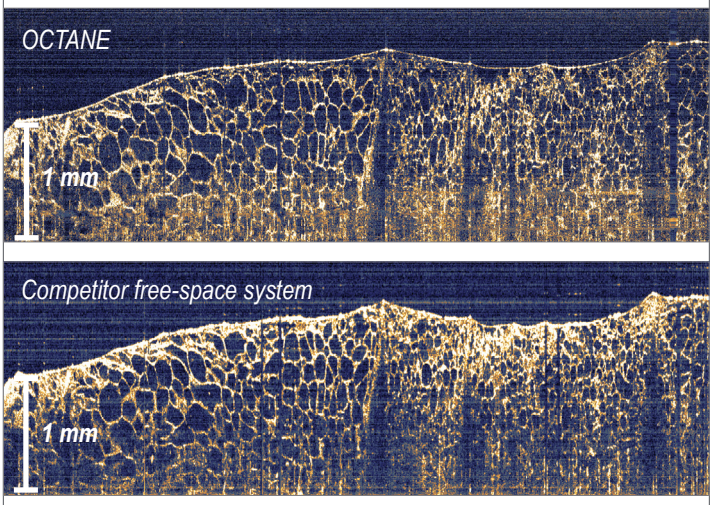
OCTANE-860 contains a polarization beam splitter (PBS) connected to two dispersive elements on a planar lightwave circuit (PLC) chip. The first 1024 pixels of the linear array (LA) read out the TE polarization, and the second 1024 read out the orthogonal TM polarization.

FUNCTIONAL SCHEMATIC



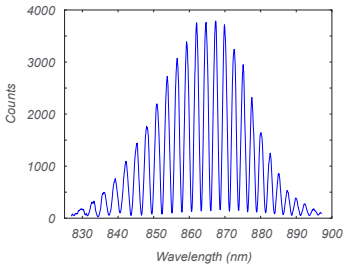
Schematic showing functionality inside the OCTANE-860 spectrometer.

IMAGE RESULTS

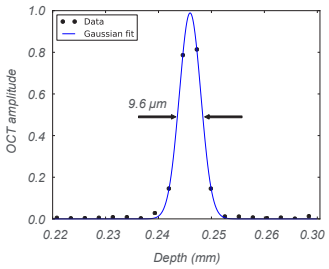


OCTANE-860 delivers images comparable to free-space competitors at a fraction of the size, weight, and cost.

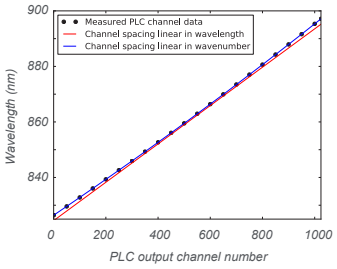
Performance Characteristics



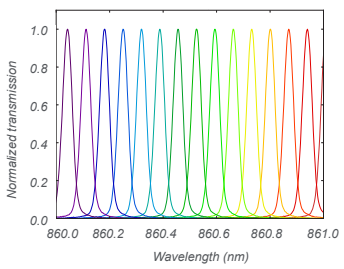
Raw spectrometer output



OCT axial resolution



PLC Center wavelengths; output pixels equally spaced in wavenumber or frequency



PLC channel spectra; normalized chip output transmission

Optical Performance	
Center Wavelength	860 nm
Measurement Bandwidth	70 nm (825 - 895 nm)
Max. Input Bandwidth	90 nm (815 - 905 nm)
Dispersion	0.068 nm/pix at 860 nm
Output Spacing	Equal in wavenumber
Pixel Count	1024 per polarization

Detector Performance *	
Max. A/D Resolution	12 bit
Max. Line Readout Rate	80 kHz
Temporal Dark Noise (RMS)	1.5 DN (typical), 4 DN (max.)
Dynamic Range	69 dB
Quantum Efficiency at 800 nm	61%
Quantum Efficiency at 900 nm	30%

System Specifications	
Input	Single-mode, FC/APC
Output	Camera Link Base, SDR-26 mini connector
Integration Time	2 us min., 53.6 sec max.
Power Supply	Power over Camera Link (PoCL)
Frame Grabber	National Instruments PCIe-1433 or equiv.
Dimensions	8.5 x 11.5 x 2.5 cm (3.3 x 4.5 x 1.0 in)
Weight	310 g (10.9 oz)

Typical OCT Characteristics	
OCT Max. Imaging Depth	2.7 mm (air), 2.0 mm (tissue)
OCT axial resolution	9.6 um (air), 7.0 um (tissue)

* reported by the manufacturer