STS Series OEM Microspectrometer

Amazing Full-Spectrum Performance in a Tiny Footprint

The STS introduces a family of compact, low-cost spectrometers that's ideal for embedding into OEM devices. At just 40 mm x 42 mm x 24 mm (1.6" x 1.7" x 0.9"), the STS provides full spectral analysis with low stray light, high signal to noise ratio and optical resolution of ~1.5 nm (FWHM) – remarkable performance for a spectrometer that size. The STS is an especially attractive option for high-intensity applications such as LED characterization and absorbance/transmission measurements, yet versatile enough for an extensive range of spectral sensing requirements.

Key Features

Full Spectral Analysis in a Small Footprint
CMOS-based unit is less than 50 mm (2") square, weighs just 68 g (2.4 oz.)

Ideal for OEM Devices
Compact unit available at low cost and reproducible in large production quantities

Remarkable Performance
Meets or exceeds optical resolution, stability, sensitivity and other performance criteria associated with larger, more expensive spectrometers

Built-in Shutter
Convenient feature for making dark measurements

Physical	
Dimensions:	40 mm x 42 mm x 24 mm
Weight:	68 g (2.4 oz.), incl. 0.5 m 400 µm fiber
Operating temperature:	0-50 °C, 5 °C change/hour ramp
Storage temperature:	-20 to +75 °C
Detector	
Detector type:	ELIS1024, 1024 pixel linear CMOS
Detector range:	200-1100 nm (uncoated)
Pixels/size:	1024, 7.8 x 125 µm
Pixel well depth:	800,000 e-
Optical Bench	
Design:	Crossed Czerny Turner, focal length 28 mm
Entrance aperture:	Shaped aperture
Gratings:	600 l/mm
Fiber optic connector:	Fixed
Quantum efficiency:	60% (@ 675 nm)
Spectroscopic	
Wavelength range:	VIS (350-800 nm), NIR (650-1100 nm)
Optical resolution:	1.2-1.4 nm FWHM (w/15 µm slit)
Signal-to-noise ratio:	2000:1 (maximum signal)
A/D resolution:	14 bits
Dark noise:	<3 counts RMS
Dynamic range:	$6x10^7$ (system, 10s maximum integration)
Integration time:	1 ms-10 s
Corrected linearity:	0.5% max deviation from best fit line (10-90% saturation)
Max dark current:	75 counts/second
Electronics	
Power consumption:	0.75 W
Power options:	USB or GPIO port
Data transfer speed:	USB full speed
Acquisition time:	75 scans/second
Connector:	Micro-USB
Inputs/Outputs:	GPIO
Breakout box:	Available
Trigger modes:	3 modes
Strobe functions:	Single/Continuous
Gated delay feature:	Yes
Computer Requirements	
Computer interface:	USB 2.0, RS-232
Operating systems:	Any supported by OmniDriver/SeaBreeze or RS-232
Compliance	
CE mark:	Yes
RoHS:	Yes
Software	
Operating software:	SpectraSuite support (extra)
Dev. software:	OmniDriver/SeaBreeze driver support

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Robust Optical Bench Design

At the heart of the STS is a CMOS detector in a crossed Czerny Turner optical bench. The bench is distinguished by custom-molded collimating and focusing mirrors and a 600 lines/mm groove density grating that projects spectra onto the detector.

The unit achieves significantly better optical resolution and produces less stray light than most filter-based and other spectrometers of its size. In addition, the STS is available with a built-in shutter for making dark measurements much simpler than manually blocking the light or turning off/on your light source.

STS takes advantage of recent advances in CMOS detectors that elevate optoelectronic performance and improve system reproducibility. It uses a 1024-element ELIS-1024 linear image sensor that's responsive from 200-1100 nm and has great sensitivity (6.74V/lux-second typical). This new generation of CMOS detectors offers excellent performance with great value.

STS Options

We offer STS models for 350-800 nm (STS-VIS) and 650-1100 nm (STS-NIR) applications; a UV model is in development. Each unit has a fixed optical bench configuration, although users can select from slit sizes ranging from 15 µm to 200 µm.

The device also has a 0.5 m length optical fiber (200 µm or 400 µm diameter) that's fixed to the STS entrance aperture to optimize signal collection efficiency. The STS is fully operational in SpectraSuite spectroscopy software – including the shutter control. Software is priced separately.

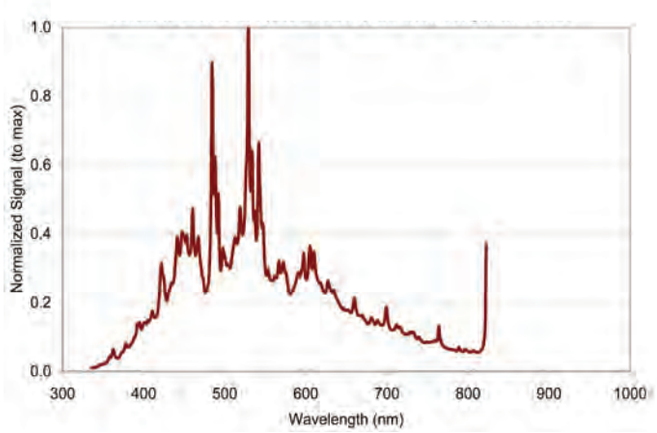
Markets and Applications

The STS is conceived as a low-cost, high-performance spectrometer for OEM and high-volume applications where one or more wavelengths are being monitored and customers seek a highly reproducible result. Life sciences, medical diagnostics, solid state lighting and environmental analysis are among the industries where STS is an attractive alternative to filter-based optical sensing systems and other microspectrometers.

STS has very good optical resolution, wavelength and thermal stability, making it a great choice for LED and light source characterization, as well as absorbance/transmission measurements in process and other industries.

Sample Results with STS OEM Microspectrometer

Spectral Output of Xenon Flash Lamp



Spectral Emission Lines of Mercury Argon Source