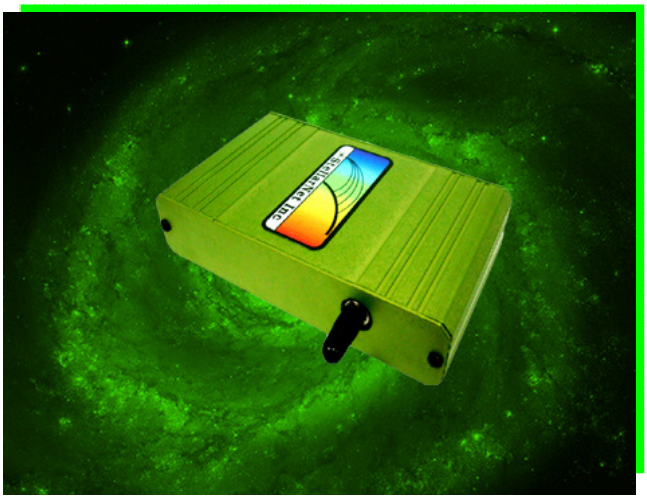
Roemerstr. 67 | 82205 Gilching/Germany | Phone: +49 8105 77940 | E-mail: info@si-gmbh.de | Web: www.si-gmbh.de

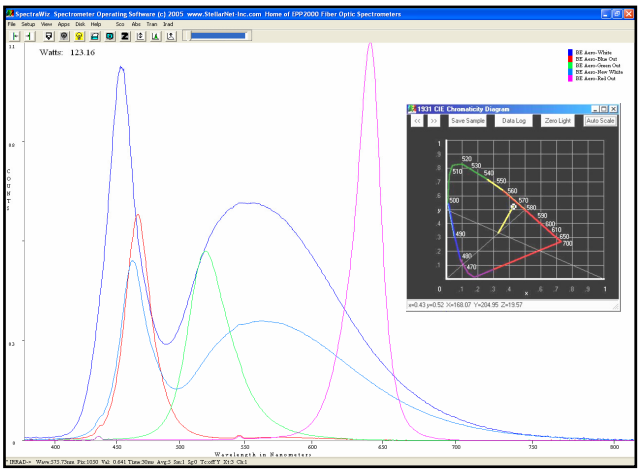
GREEN-Wave Miniature Fiber Optic Spectrometers for VIS-NIR & OEM

The GREEN-Wave Spectrometers are fiber optic coupled instruments with a wide selection of models for measurements in 350-1100nm wavelength range.

Each instrument contains a USB2 interface with integrated memory buffer to provide instantaneous spectral image from the highly sensitive CCD detector with 2048 elements. Various models offer a choice of grating range and slit resolutions.

A single strand fiber optic cable or probe assembly delivers input via standard SMA 905 fiber optic connector with a choice of cable lengths. The spectrograph optics are exceptionally robust in a vibration tolerant modular design, with no moving parts. The detachable spectrograph assembly and





GREEN-Wave LED Spectra

control electronics are protected inside a rugged metal enclosure, suitable for portable, process, and lab applications. Several units may be daisy-chained using a standard USB hub allowing simple configurations for dual and multi-beam applications in chemistry, SpectroRadiometry, solar, and CIELAB color measurement.

The SpectraWiz software is included to accurately measure light emissions such as LED, Laser, plasma, solar, xenon, and others along with absolute intensities. Additional measurements include sample color reflectance, transmission, chemical absorption and concentration. Applications include SpectroRadiometry (NIST traceable intensities & LED xy chromaticty), SpectroColorimetry (CIELAB L* a* b*), SpectroChemistry reaction time-series analysis, UVabc monitors, Spectral-ID of elemental plasma emissions, and more.

Specifications		GREEN-Wave Spectrometers	
Dynamic range:	2000:1 with 6 decades	Dimensions:	1x3x5 inch = 25x75x125mm
Optical resolution:	see model table - to 0.2nm	Weight::	14 ounces
Detector type:	CCD - 2048 pixels	Power consumption:	< 100 mA via USB port
Detector range:	350 -1100nm	Interface:	USB2 or USB2 Hub
Pixel size:	14 x 200um	Detector Integration:	1ms to 5 seconds - no TEC
Diffraction Gratings:	Holographic & Ruled	Slit size options:	14, 25, 50, 100, 200um
Grating g/mm:	300, 600,1200,1800, 2400	Stray light:	<.1% at 435nm;<.05% at 600nm
Spectrograph:	f/4, SymX-Czerny–Turner	Fiber optic input:	SMA905 0.22na single fiber
Order sorting filters:	Integrated & High Pass	Operating systems:	Win9x, XP, Vista, Win7
Signal to noise:	400:1	Software included:	SpectraWiz program & apps
Digitizer:	16-bit	Also free programs for:	LabView,Excel+VBA,Delphi

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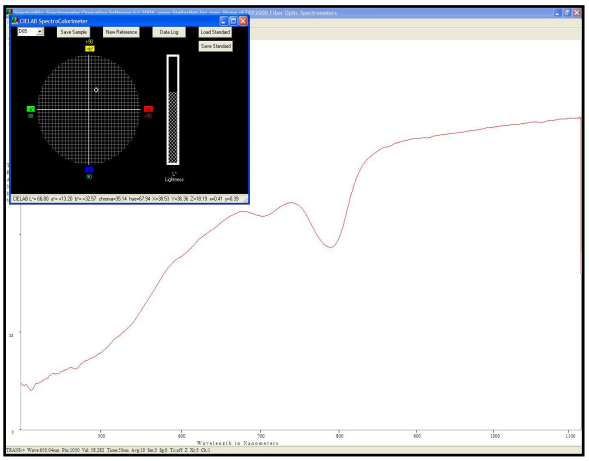
Additional measurement applications include emission wavelength monitoring /characterization of tunable lasers or LED's and other sources such as elemental emissions from plasma. Also Bragg grating technology enables optical sensing of several conditions such as temperature, pressure, and stress/strain (such as found in roadway bridges, tall building, or aircraft even wings).

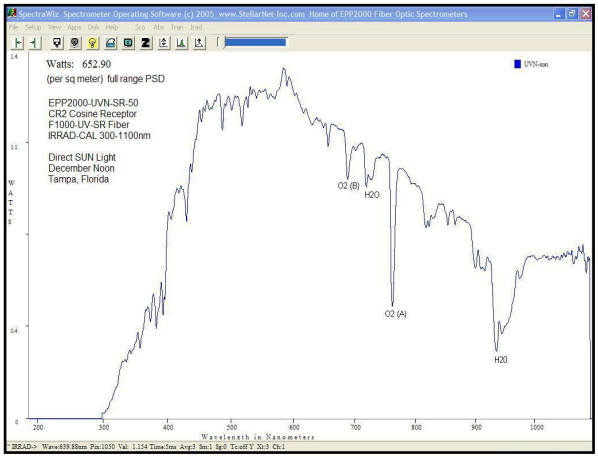
Thin film thickness measurements also can be made using sample specular reflectance. The small size and weight makes the GREEN-Wave spectrometers perfect for a variety of portable measurement applications.

GREEN-Wave Spectrometer Configurations			**Predicted Slit Resolving Resolutions**				
Model	Wavelength Range in nm	Grating g/mm	Slit-200 nm res.	Slit-100 nm res.	Slit-50 nm res.	Slit-25 nm res.	Slit-14 nm res.
VIS	350-1100	600	6.0	3.2	1.6	1.00	0.80
NIR	500-1100	600	6.0	3.2	1.6	1.00	0.80
NIR2	600-1000	1200	3.0	1.6	0.8	0.50	0.40
NIR2b	785-1150	1200	3.0	1.6	0.8	0.50	0.40
NIR3	550-840	1800	2.2	1.2	0.6	0.35	0.28
NIR3b	680-935	1800	2.2	1.2	0.6	0.35	0.28
NIR4	500-700	2400	1.5	0.8	0.4	0.25	0.20
NIR4b	600-800	2400	1.5	0.8	0.4	0.25	0.20

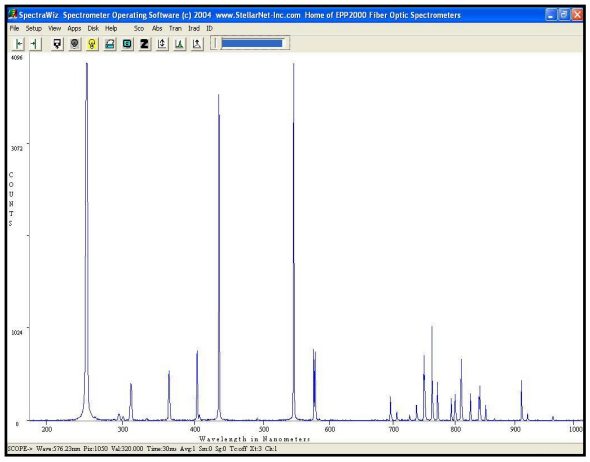
Note: DLENS optics to enhance sensitivity using 600/1000um fiber, or external TTL trigger, or UV ranges below 350nm are upgrades available only for BLUE-Wave spectrometers.



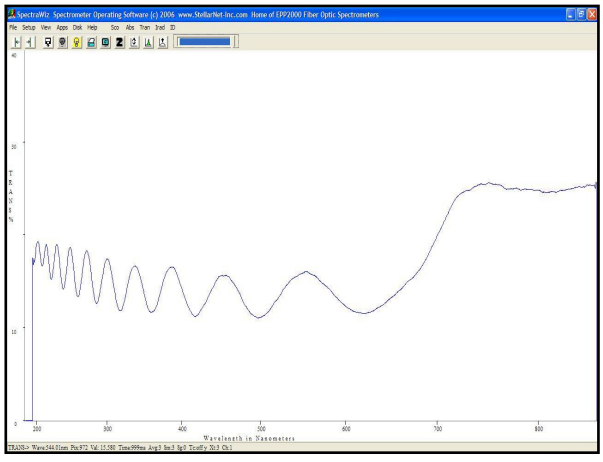
Transmission spectrum of yellow liquid



Irradiance spectrum of sunlight



Emission spectra of mercury+argon gas



Reflectance spectrum of a thin film