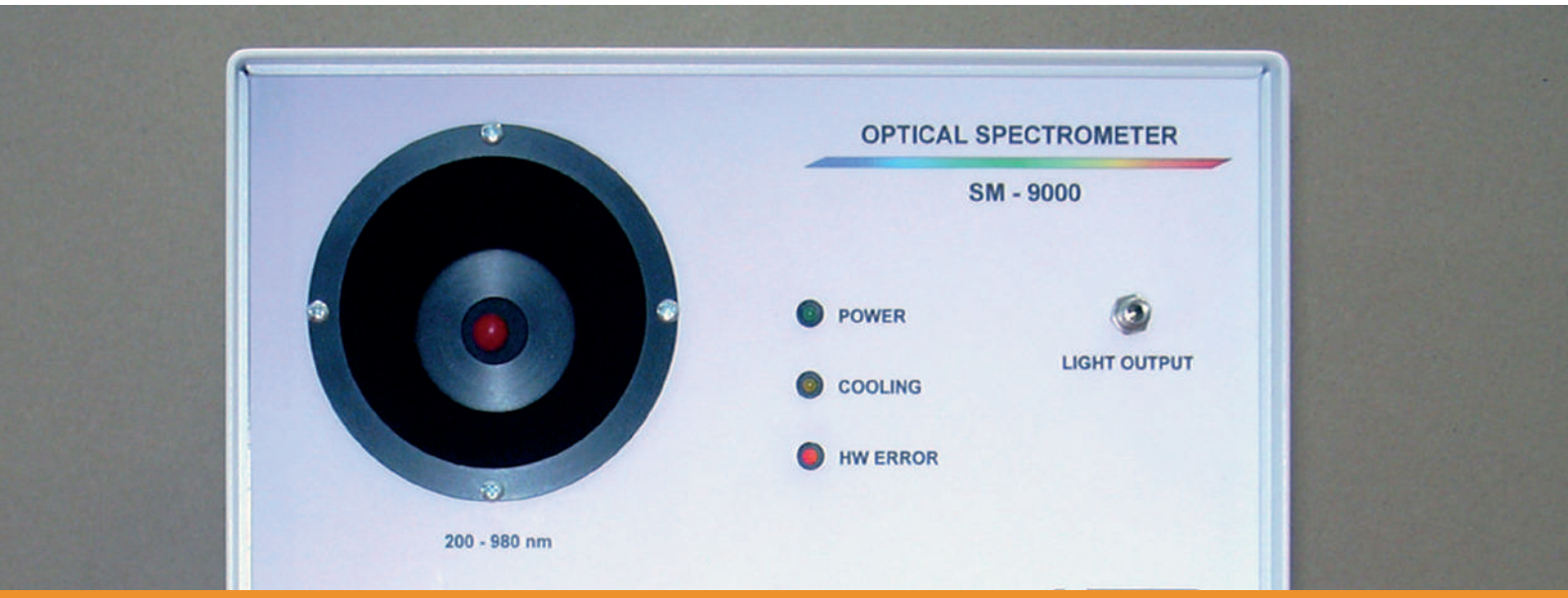
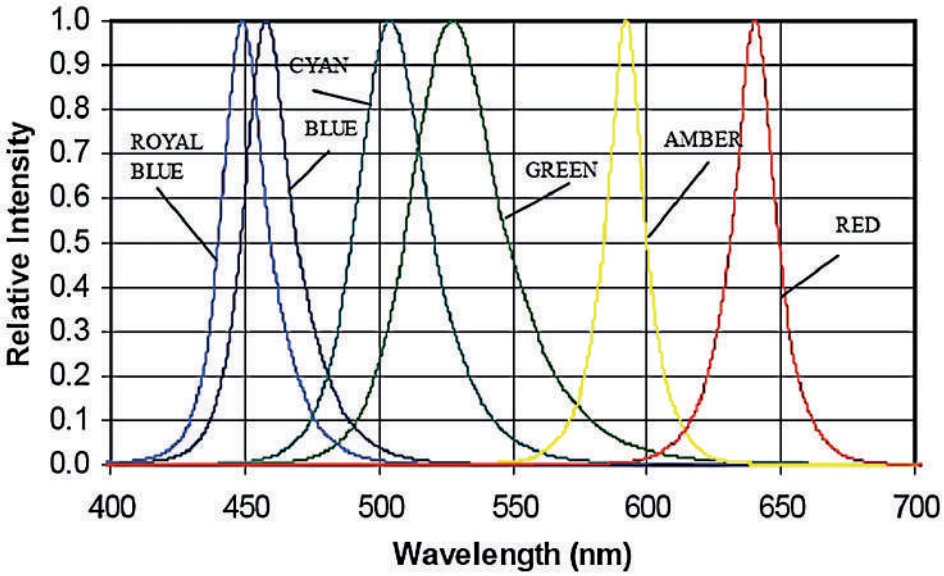


Spectrometer SM 9000

The **Spectrometer SM 9000** is used for high-resolution and high-sensitivity measurements in fiber optic spectroscopy applications in the UV/VIS to NIR range. It can be used as a stand-alone instrument or as an optional enhancement of other PSI instruments for precise analysis of the spectral curves (irradiance, absorption, emission). Very high sensitivity and thermal stability of the instrument allows measuring fluorescence emission spectra of individual cells when combined with our µ-FluorCam device. The spectra can be measured in the range from UV (200 nm) to NIR (980 nm) with resolution of 3.5 nm (FWHM). Fast recording can capture as many as 300 spectra per second (external trigger input) with data resolution of 16 bits.

APPLICATIONS

- Precise irradiance spectra measurements
- Fluorescence emission spectra measurements
- Spectrally Resolved Fluorescence Induction



KEY FEATURES

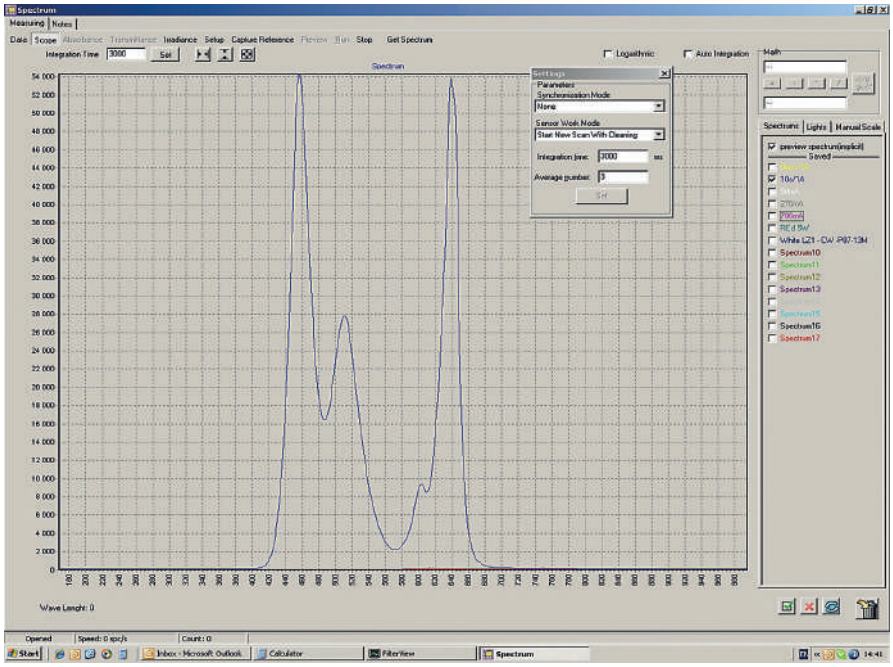
- Very high sensitivity and thermal stability
- Suitable for microspectrophotometry
- Sensors individually spectrally calibrated with Hg-Ar-lamp for high accuracy measurements
- Dark signal subtraction
- Robust and modular design
- Very low temperature – induced drift
- Multicolor LED light source as optional accessory
- Spectrum v. 2.0 software for spectra presentation and acquisition control
- Variable exposure time, from 3 milliseconds to minutes.
- connection with PSI FluorCams and Fluorometers for synchronization of measured spectra with light flashes

SPECTROMETER MEASURES

- transmittance
- absorbance
- irradiance
- fluorescence spectra

SOFTWARE CONTROL

- online data presentation as transmittance / absorbance /scope graphs
- reference signal acquisition
- button click / external trigger acquisition control
- LED light source color and intensity control



TECHNICAL SPECIFICATION

- **Optical Entrance:** diameter 0.5 NA = 0.22 mounted in SMA--coupling, dismountable
- **Entrance Slit:** 70×1,400 µm (optical entrance)
- **Grating:** Flat-field correction
- **Spectral Range:** 200–980 nm
- **Wavelength Accuracy Absolute:** < 0.5 nm
- **Reproducibility:** < 0.1 nm
- **Temperature – Induced Drift:** < 0.01 nm/K
- **Spectral Distance of Pixel:** $\Delta\lambda$ pixel ≈0.8 nm
- **FWHM (Full Width Half Maximum):** $\Delta\lambda$ < 3–4 nm (UV-NIR Version)
- **Straylight:** 0.1 % measured at 340 nm with deuterium lamp (transmission of $NaNO_2$ solution, 50 g/l, 1 cm)
- **CCD Array:** Thermoelectrically cooled Hamamatsu S 7031
- **Number of Pixels:** 1,044×64
- **Dimensions of Pixels:** 24×24 mm^2
- **System Data:** 16 Bit A/D conversion
- **Noise:** 2–4 count standard deviation

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