

FLS1000

PHOTOLUMINESCENCE SPECTROMETER



A COMPLETE LUMINESCENCE LABORATORY IN ONE INSTRUMENT

The FLS1000 sets the standard in both steady state and time-resolved photoluminescence spectroscopy for both fundamental research and routine laboratory applications.

The system is a modular fluorescence and phosphorescence spectrometer for measuring spectra from the ultraviolet (UV) to the mid-infrared spectral range, and lifetimes spanning from picoseconds to seconds. All of this can be achieved through various upgrade routes.

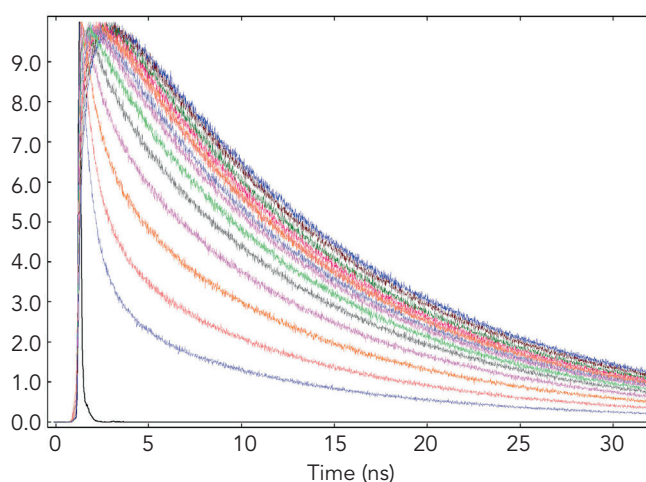
Whether you are studying photophysics, photochemistry, biophysics, biochemistry, material or life sciences, the FLS1000 will enable you to reliably and accurately measure luminescence spectra and kinetics using state-of-the-art sources, detectors, acquisition techniques, quality optics and precision mechanics. The large sample chamber will house practically any type of sample accessory.

High sensitivity is a prerequisite for measurements of low sample concentrations, small sample volumes or low sample quantum yields. The instrument's ultimate sensitivity of $>35,000:1$ for the standard water Raman measurement is unmatched in the industry.

Thanks to Edinburgh Instruments' proprietary electronics modules and intuitive, award winning, all-in-one operating software, Fluoracle®, the FLS1000 is incredibly easy to operate.

KEY FEATURES

- Complete modular construction enables maximum flexibility and upgradability.
- Industry leading sensitivity $\text{SNR} > 35,000:1$
- Unrivalled spectral coverage from the deep UV to the mid-IR up to 5,500 nm
- 325 mm focal length monochromator performance for high spectral resolution and excellent stray light rejection
- Multiple light sources, detectors, single or double monochromators are available - upgrade at anytime
- State-of-the-art Fluoracle® software package for data acquisition, analysis and presentation



Lifetime Measurements

System	Spectral	Phosphorescence Lifetime	Fluorescence Lifetime
Mode of Operation	Single Photon Counting	<ul style="list-style-type: none"> Time-Resolved Single Photon Counting (Multi-Channel Scaling - MCS) 	<ul style="list-style-type: none"> Time-Correlated Single Photon Counting (TCSPC)
Lifetime Range	Milliseconds to hours	10 ns – 50 s *	5 ps – 10 μ s *
Sensitivity (water Raman)	>35,000:1 **	n/a	n/a

* source and detector dependent

** standard water Raman measurement conditions: λ_{ex} = 350 nm, $\Delta\lambda_{ex}$ = $\Delta\lambda_{em}$ = 5 nm, step size = 1 nm, integration time = 1 s, λ_{peak} = 397 nm, noise measured at 450 nm and calculation based on the SQRT method

Monochromators	
Type	Czerny-Turner with 'plug and play' triple grating turret
Focal Length	325 mm (double monochromators: 2 x 325 mm)
Stray Light Rejection	1:10 ⁻⁵ (single), 1:10 ⁻¹⁰ (double)
Gratings	Mounted to triple grating turret
Accuracy	\pm 0.2 nm *
Minimum Step Size	0.01 nm *
Options	Spectrographs available for operations of CCDs and diode array detectors

* grating dependent

Excitation Sources			
Type	450W Ozone-free Xenon Arc Lamp	Microsecond Flashlamp	Picosecond Pulsed Diode Lasers (EPLs) and Pulsed LEDs (ELEDs)
Spectral Range	230 nm – >1000 nm	200 nm – >1000 nm	Discrete wavelengths between 250 nm – 980 nm
Pulse Width	n/a	1 μ s – 2 μ s	from 60 ps
Options	Ozone generating lamp with range 200 nm - >1000 nm	Low to medium repetition rate pulsed lasers	Nanosecond Flashlamp 200 nm – >400 nm pulse width <1 ns

Detectors					
Photomultiplier	PMT-900	PMT-1010	PMT-1400 / -1700	HS-PMT	MCP-PMT
Spectral Range	185 nm – 900 nm	300 nm – 1010 nm	300 nm – 1700 nm	230 nm – 870 nm	200 nm – 850 nm
Dark Count Rate	<50 cps (-20 °C)	<100 cps (-20 °C)	<200 kcps (-80 °C)	<100 cps (0 °C)	<50 cps (-20 °C)
Response Width	600 ps	600 ps	800 ps	200 ps	<25 ps
Options	A wide variety of other photomultipliers and analogue detectors are available up to 5,500 nm				

Fluoracle Software	
Operating System	Windows™ platforms
Data Manipulation	Mathematical smoothing, integration, differentiation, 2D and 3D graphics, contour plots, chromaticity, quantum yields, multi-exponential deconvolution, lifetime analysis
Options	FAST - Advanced Fluorescence Lifetime Software which includes: lifetime distributions, batch analysis, global analysis, advanced anisotropy analysis, FRET analysis, stretched exponential analysis, micellar quenching and Förster kinetics



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