

fluoroSENS - fluorimeter



Versatile bench-top fluorimeter

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The fluoroSENS is a versatile bench-top fluorimeter with single photon counting sensitivity and an excellent water Raman signal-to-noise ratio. It combines measurements of both high performance steady state fluorescence spectra and time resolved phosphorescence decays. The fluoroSENS is a fully integrated, computer controlled single photon counting fluorimeter with comprehensive optional accessories.

The light source is a highly stabilised Xenon arc lamp with an optical stability better than 0.1% with an auto-start facility in instrument power ON.

The excitation and emission monochromators are designed for high optical throughput and each has a triple grating turret for flexible choice of gratings. This allows the instrument to be optimised for several spectral ranges depending upon customer requirements. Each monochromator is also fitted with continuously variable bilateral knife edge slits allowing spectral pass band from 0.1nm to 10mm.

FluoroSENS is fitted with several key spectroscopy features as standard. These include a reference photodiode detector for corrected excitation spectra, corrected emission channel, integrated order sorting filter wheel and filters as well as an optical attenuator to allow signal optimisation.

As standard the large sample chamber is designed with high light gathering optics to utilise as much of the sample signal as possible. AS standard the fluoroSENS comes with a single cuvette holder on a positioning stage to ensure sample and signal optimisation. Optional samples holders include for example: temperature controlled options, four cell motorised turret, front face sample holder for solid or power samples, magnetic stirrer, optical fibre adapters and a motorised 96 well plate reader.

Each fluoroSENS uses a single photon sensitive photomultiplier detector. This detector can be exchanged for different spectral ranges to ensure complete optimisation to customer needs. Optional NIR detectors are also available.

The fluoroSENS uses a new class leading data acquisition system that provides all signal collection in the one board. This includes a 100M counts per second photon counting module as well as low noise 16 bit analogue-to-digital detectors for sample temperature sensing and the reference detectors.

Uniquely, fluoroSENS offers a transmission detector as a sample chamber option to allow the measurement of sample transmission simultaneously with the fluorescence emission or excitation measurements. This allows the user to directly monitor sample photo-bleaching or aggregation etc that might otherwise invalidate the fluorescence measurement.

The system software contains all of the control, data collection, and analysis functions to make high quality fluorescence measurements. It has the option to save all experimental parameters and to define a quick load measurement function. This function permits routine measurements to be set-up and stored for repeat use. Full flexibility is offered to edit these functions.

Spectral functions provided as standard include:

Exc, Em, and Synchronous Spectra
 Anisotropy
 Ex-Em Mapping, Synchronous Mapping Spectra
 2D, 3D, and contour plotting
 Spectral Arithmetic, Normalisation, Smoothing, Differentiation, Integration, Spectral Conversion, Anisotropy Analysis (incl. G-factor correction), etc
 Comprehensive export facilities for the data and the graphical presentations

The fluoroSENS also has a flexible range of upgrade paths that include:

pulsed Xe lamp for phosphorescence spectra and lifetimes
 Silicon photo-diode transmission detector
 Low temperature sample options including nitrogen and helium cryostats
 stop-flow accessory
 optical fibres for remote sensing applications
 96 well plate reader accessory

SPECIFICATIONS

Optical Configuration	Right angle geometry, optical accessories for other geometries
Excitation Source	150W continuous Xenon Arc Lamp, Ozone Free 200 to 2600nm spectral range
	XYZ bulb, rear mirror and lamp focus adjustments – factory pre-aligned Monochromators XYZ bulb, rear mirror and lamp focus adjustments – factory pre-aligned
Monochromators	Czerny- Turner design 300mm focal length Triple grating turret as standard Motorised continuously variable knife edge slits from 10µm to 3mm, as standard Stray Light performance 1:105 Excitation Monochromator – blaze @ 300nm, 1200g/mm Emission Monochromator – blaze @ 500nm, 1200g/mm
Detector	185 – 670nm, blue sensitive singel photon counting photomultiplier. Dark count rate <100cps at room temperature 185 – 870nm, red sensitive singel photon counting photomultiplier. Dark count rate <2000cps at room temperature 185 – 1000nm, large area calirated Silicon Photodiode reference detector Optional InGaAs, InAs, InSb emission detectors
Data Aquisition	100M counts per second photon counting system 4 x 16 bit, 1Ms/s digitisers for analogue detectors and sample temperature monitor flexible user I/O port
Software	Operating System – WINDOWS® Exc, Em, Synchronous, Anisotropy, Ex-Em Mapping, Synchronous Mapping Spectra, 2D, 3D, and contour plotting Spectral Arithmetic, Normalisation, Smoothing, Differentiation, Integration, Spectral Conversion, Anisotropy Analysis (incl. G-factor correction)
Sensitivity	Water Raman signal-to-noise ration > 2500:1

Excitation wavelength – 350nm, spectral bandwidth – 5nm,
Integration Time = 1s
