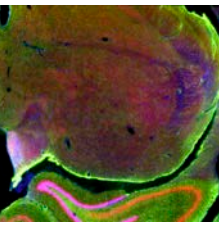
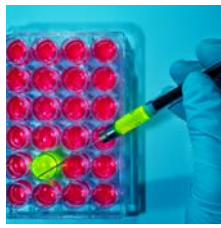
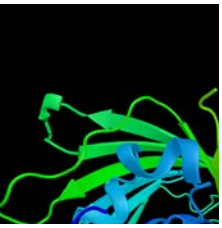
HORIBA
Scientific

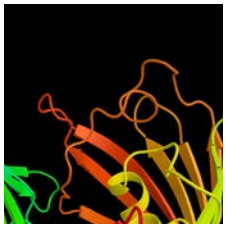


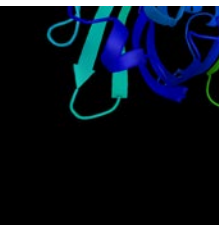
FluoroMax® Plus

Sensitive, Flexible, Trusted Spectrofluorometer









High End Research
Performance with
Benchtop Convenience

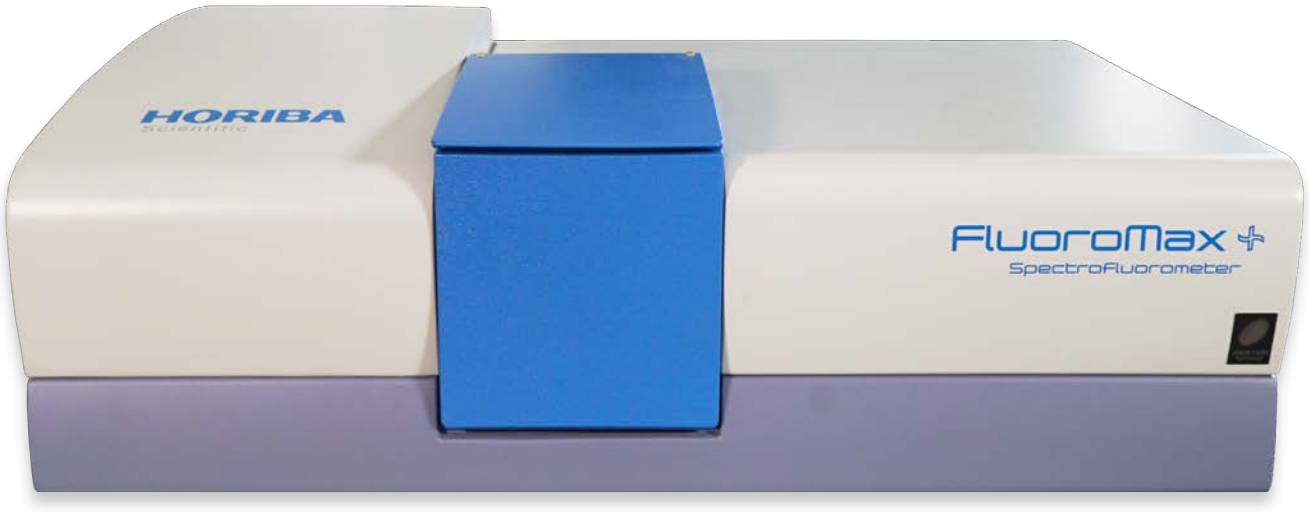
fluoromax.com

JOBIN YVON
Technology

FluoroMax® Plus

5th Generation of the

World-renowned FluoroMax Benchtop Spectrofluorometer
30 years of innovation and improvement...



FluoroMax Plus Series
30 years of innovation and improvement

The FluoroMax® Plus Series is the culmination of decades of HORIBA's industry-leading experience in development of the highest level of spectrofluorometer performance in a convenient, affordable, easy-to-use benchtop model. The FluoroMax Plus, with its exquisite, optically perfect, all reflective optics, combined with photon counting detection, and multitude of accessories, provides the best sensitivity and versatility of any tabletop spectrofluorometer.

The FluoroMax Plus can be enhanced to suit a broad range of luminescence experiments, with a variety of optional accessories to expand capabilities and performance, as follows.

- An affordable LN-cooled NIR InGaAs detector for spectral detection to 1,700 nm
- Enhanced TCSPC fluorescence lifetime detectors for very short (down to 25 ps) lifetime measurements
- Extended NIR PMTs for spectral and TCSPC detection to 1,700 nm
- PLQY integrating spheres
- Phosphorescence pulsed light source and detection
- Automated microwell plate reader for high sample throughput
- Fluorescence microscopy, including PL mapping

The FluoroMax Plus is ideal for measuring solid and liquid samples, with high throughput screening, cryogenic or elevated temperatures, absolute quantum yields, microliter volumes, stopped flow mixing or titration, and even micron scale measurements using microscopes. With the most extensive list of accessories, the FluoroMax Plus offers unparalleled flexibility to meet all of your lab's experimental needs.

Future Ready
All accessories can be added to your system at any time as your needs change, or funds become available.

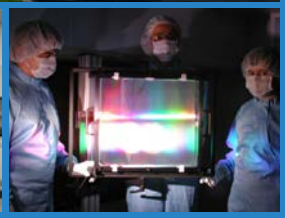
- Research Level Performance
- Enhanced Modularity
- Perfect for any Application!

With thousands operating in universities and research labs around the world, the FluoroMax Plus is considered the reference benchtop spectrofluorometer. The FluoroMax Series has proven itself to be perfect for demanding steady state, time-resolved, TCSPC, PLQY and NIR luminescence needs.

The new FluoroMax Plus is manufactured at HORIBA's brand new, state of the art, 132,000 square foot facility in Piscataway, New Jersey, featuring the highest quality manufacturing processes and efficiencies.

The FluoroMax Plus is the instrument you can trust for your most demanding steady state, time-resolved, TCSPC, PLQY and NIR luminescence needs.

Made in the USA



Performance by design

Maximizing Signal, Minimizing Noise

It can be confusing to compare the sensitivity of one instrument with another, considering the multiple specifications and differing definitions that exist. Rest assured that the FluoroMax Plus offers the highest sensitivity available in a benchtop spectrofluorometer.

Sensitivity of a spectrofluorometer is sometimes reported as a minimum measurable concentration of a fluorophore (commonly Fluorescein), or the signal-to-noise ratio (S/N) of the Raman scattering peak of water. Most companies opt for the second method to report sensitivity, as it is a more easily verified number, especially since ultrapure water is readily available around the world. Unfortunately, however, this specification can be confusing since two calculation methods prevail in the industry: First Standard Deviation (FSD) and Root Mean Square (RMS). The FSD method is only applicable to photon counting fluorometers, and the RMS method is equally applicable for analog or photon counting fluorometers.

The FluoroMax Plus is a photon counting spectrofluorometer that offers far superior sensitivity to analog-based PMT fluorometers. Consequently, the HORIBA fluorescence group quotes the water Raman S/N using the FSD method to specify sensitivity.

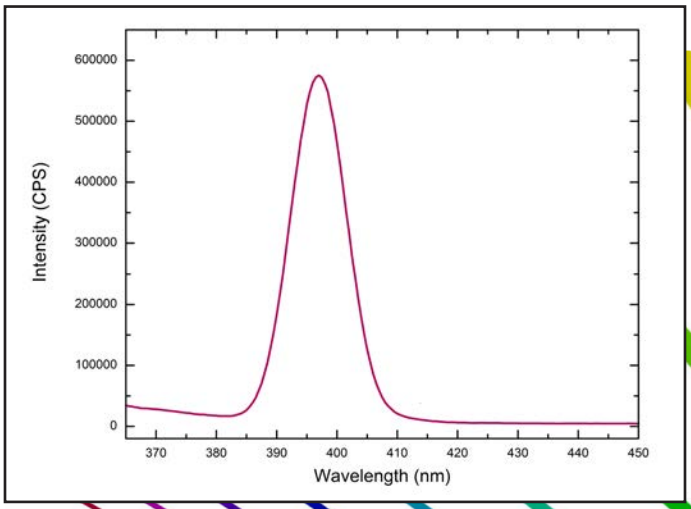
The FSD signal-to-noise ratio formula is shown below.

$$\frac{S}{N} = \frac{S_{397\,\mathrm{nm}} - S_{450\,\mathrm{nm}}}{\sqrt{S_{450\,\mathrm{nm}}}}$$

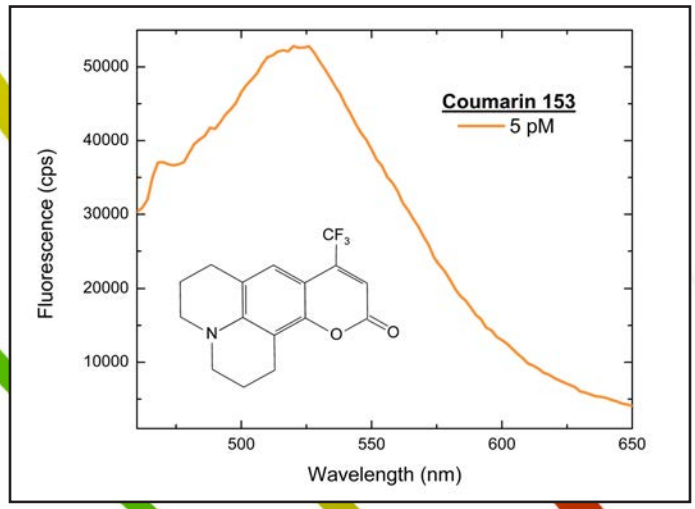
The peak signal is measured at the water Raman peak intensity at 397 nm (for 350 nm excitation) and the noise in a region where no Raman emission is present (450 nm). Acquisition parameters for the FluoroMax Plus water Raman standard measurments are as follows:

Excitation: 350 nm with 5 nm bandpass
Emission scan: 365–455 nm with 5 nm bandpass
Emission wavelength step interval: 0.5 nm
Integration time per step: 1 second
Single emission scan: (no repeats)
No smoothing of data points
No optical filters of any kind

The Raman band of ultrapure water was measured with FluoroMax Plus in a standard 1 cm quartz cuvette. HORIBA qualifies its instruments with the signal to noise ratio based on the First Standard Deviation (FSD) of light from its standard Xenon lamp source.

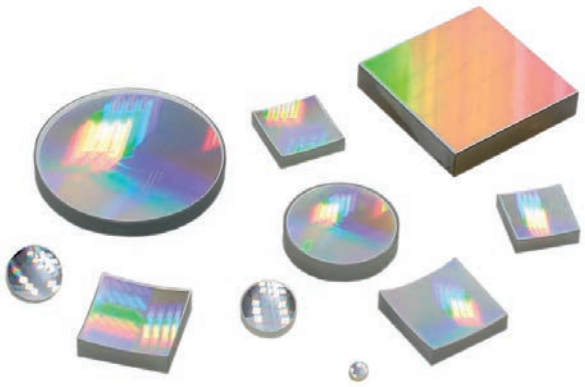


Coumarin 153 was serially diluted to a concentration of 5.0 pM in Ethanol. The spectrum shown represents the subtraction of fluorescence data from a blank to remove solvent background and Raman scatter.



HORIBA Quality Optics

No matter how you measure it, the FluoroMax Plus has always been the most sensitive benchtop spectrofluorometer commercially available. This is the result of an optimized design, including the use of all reflective optics, photon counting detection, and the reduction of stray light by the use of our world famous HORIBA Jobin Yvon (JY) quality gratings and optical elements.

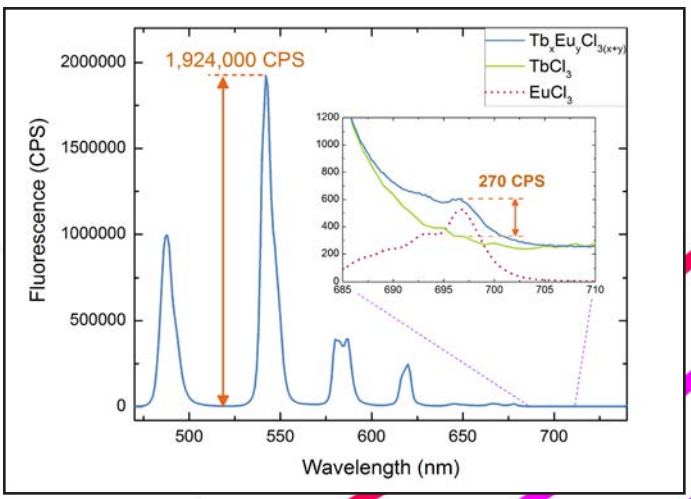


Measure Smaller Samples, Detect Smaller Changes

Big discoveries come from small changes
Don't let your research get lost in the noise. Using the most sensitive fluorometer means having confidence in small changes in your data—the same small changes that drive curiosity and new discoveries.

Dilute and small volume samples
Higher sensitivity also means you can measure more dilute samples, or need less sample to begin with. Given the cost and effort often required for sample preparation, this means you save both time and money.

Spectrum of a mixture of terbium chloride and europium chloride in ultrapure water. The inset is a zoomed view of the spectrum showing the very weak europium chloride peak measured in the same scan as the extremely strong terbium chloride peaks recorded in the same measurement. The spectra of pure terbium chloride and pure europium chloride are also shown in the zoomed in view for reference.



Sensitivity Means Speed

The real limit on how rapidly you can acquire data is not how fast you can physically scan the monochromator grating, but how long you have to measure at each wavelength to get an acceptable signal-to-noise. The higher sensitivity of the FluoroMax Plus means that not only can you measure weaker samples, but also that you can actually measure them faster than by using lower sensitivity fluorometers. If speed of acquisition is really important to you, be sure to compare the speed and quality of spectra of the FluoroMax Plus on your particular sample.

Dynamic Range

Fortunately not all fluorescence samples are weak. Some samples are quite strong. But some are both, which creates a challenge to measure the strong and the weak peaks in the same scan. With an intra-spectral range of over 6 orders of magnitude, even wildly varying multi-component spectra are easily measured in one scan. Not only does this save time, but it is essential for kinetics studies when one cannot afford to repeat a measurement at different integration times to keep all peaks within range.

Enhanced measurements

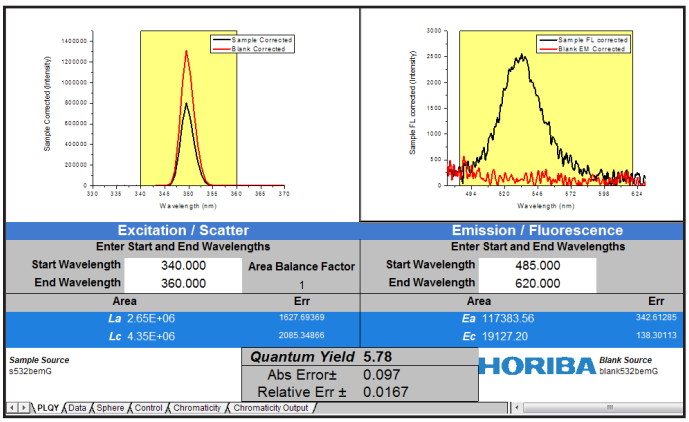
Absolute Quantum Yield Measurements

Quantum yield is one of the most important parameters that characterize photoluminescence of materials. Photoluminescence Quantum Yield (PLQY) measurements are critical for a broad range of applications, including new material development, photovoltaics and the development of new fluorescence probes. The quantum yield of a molecule or material is defined as the number of photons emitted as a fraction of the number of photons absorbed. With thousands of PLQY citations around the world, HORIBA has long been recognized for its superior performance of PLQY for the most demanding applications.

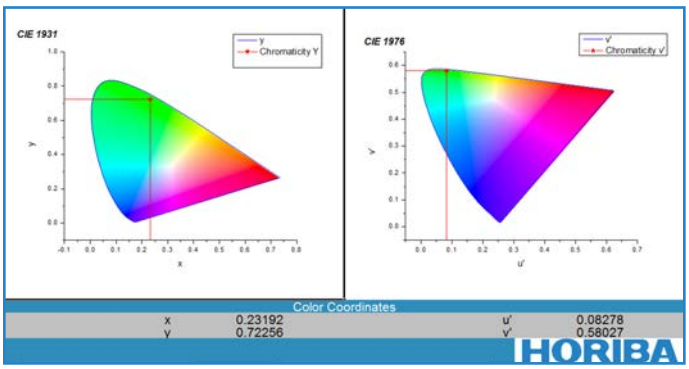
The QuantaPhi-2 is a new internal photoluminescence quantum yield (PLQY) and CIE measurement sample tray accessory. It includes an all-reflective sphere into which a sample is placed. The measurement of the sample, and of a non-fluorescent blank, allows for the direct measurement of the quantum yield of a solid, powder or solution sample.

QuantaPhi-2 features a large, 121 mm internal diameter Spectralon® integrating sphere with excellent reflectivity from 250 to 2500 nm. This is an internal slide-in, tray-mounted integrating sphere and includes a bottom mounted cup holder for powders and solids as well as a cuvette holder for samples in solution..

Other specialty integrating spheres can be provided.



High precision absolute quantum yield characterization of a quantum dot sample enabled by the QuantaPhi-2 integrating sphere accessory.



FluoroMax software also automatically generates colorimetric CIE 1931 and 1976 values for your sample.

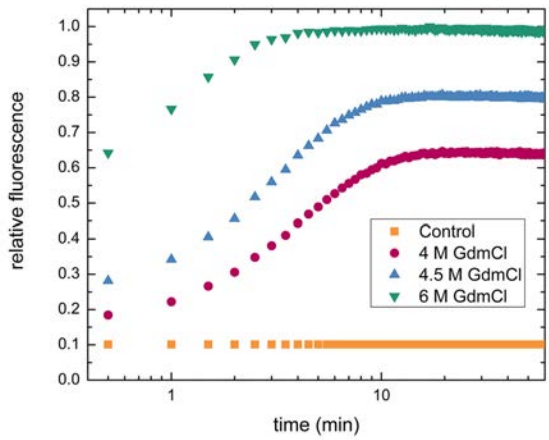
QuantaPhi-2
shown with bottom loading sample tray for powders and solids

Replacement Spectralon sample cup and coverslip

Cuvetter Holder

Kinetics

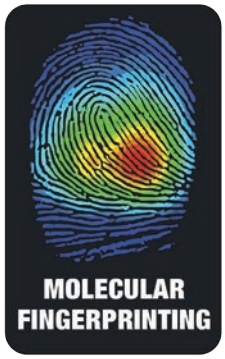
Measuring temporal variations in fluorescence spectra can yield information beyond that available from single time point measurements. For example, monitoring protein stability and folding in controlled solution conditions is crucial for developing targets for structure-based medicines. The FluoroMax Plus Series lets you measure dynamics on a scale from milliseconds to hours.



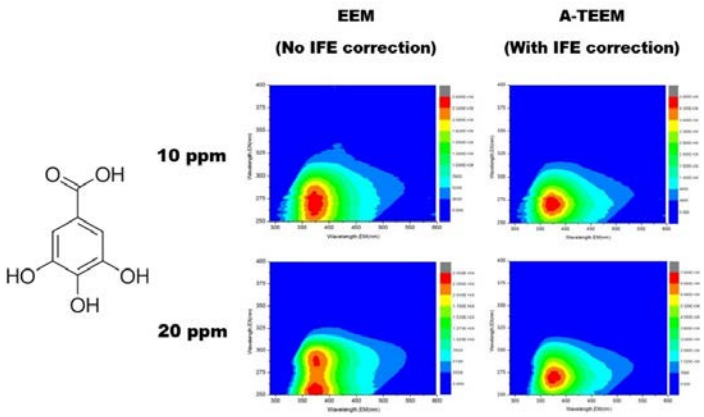
Kinetics of lysozyme dissolved in several concentrations of the chaotrope, guanidinium hydrochloride, monitored by measuring native tryptophan fluorescence simultaneously for 1 hour in a multi-sample changer. Data corrected for photobleaching using a control sample.

Absorbance/Transmittance Accessory

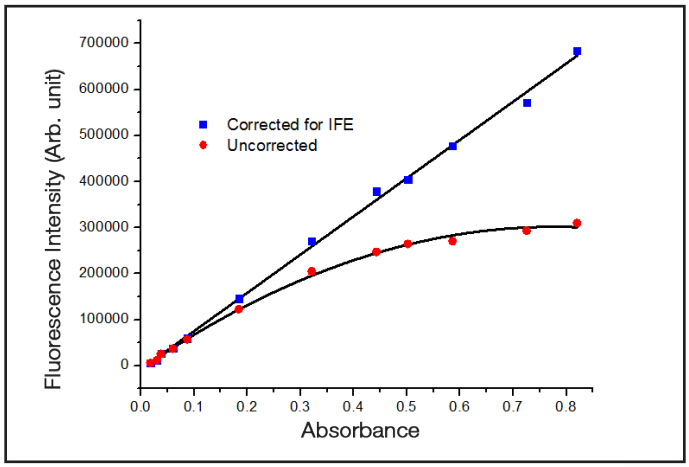
Add absorbance to your fluorescence measurement.



Featuring IFE Correction
With the addition of an absorbance accessory, the FluoroMax Plus can correct an Excitation Emission Matrix (EEM) for the inner filter effect (IFE) to provide a true molecular fingerprint of a sample. IFE limits the linearity of the fluorescence signal at higher sample concentrations due to primary and secondary re-absorption of fluorescence. IFE correction is essential for accurate chemometric component analysis which can be accomplished with third party software analysis tools.



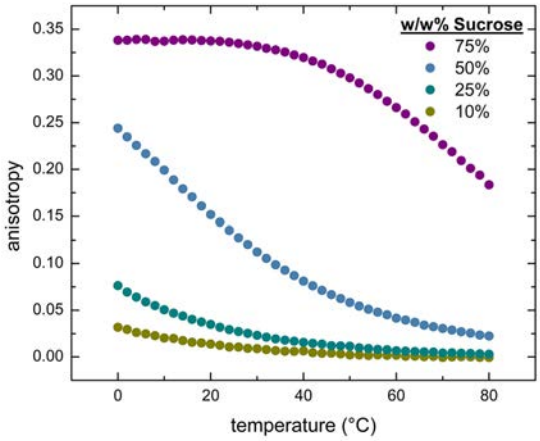
EEMs collected on FluoroMax Plus of gallic acid at two different concentrations, with, and without, absorbance corrections. The EEMs collected on the left are the uncorrected EEM fingerprint. The Absorbance Transmission Excitation Emission Matrices (A-TEEM™) collected on the right is corrected for inner filter effects. The bottom left EEM at 20 ppm, clearly shows a distortion due to IFE, but the A-TEEM on the bottom right is the same as the fingerprint, at the slightly lower concentration of 10 ppm.



The fluorescence intensity of a compound loses linearity at higher concentrations. Shown is the ability of inner filter effect corrections to extend the linear dynamic range of fluorescein detection to much higher concentrations than traditional fluorometers that cannot correct for IFE.

Polarization

Adding optional polarizers to a FluoroMax Plus allows you to study molecular rotation. This indirect measure of the local viscosity gives information on sample aggregation, structural changes, molecular binding, and other mechanisms. The FluoroMax Plus polarizers are Glan-Thompson prisms, providing the highest efficiency across the whole wavelength range from the UV to the NIR.



Fluorescein dissolved in four aqueous solutions of sucrose. With increased solution temperature, viscosity decreases, yielding faster rotation times and correspondingly lower anisotropies. Similarly, anisotropy is an excellent tool for understanding changes in macromolecule shape, as well as molecular binding.

Technologies and applications

The FluoroMax Plus covers the broadest range of luminescence research.

Materials Research • Earth Sciences • C

hemistry • Food Science • Life Sciences

TCSPC

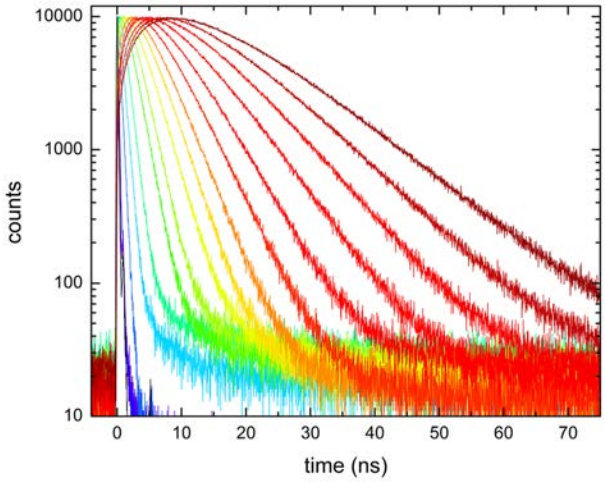
Take Your Measurements to the Next Dimension with Fluorescence Lifetimes

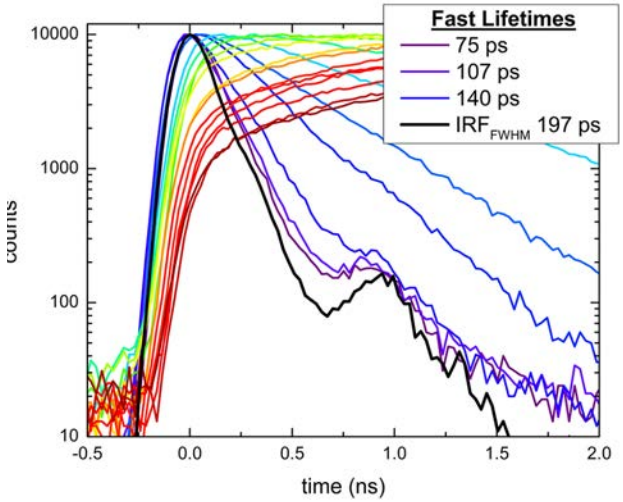
Time Correlated Single Photon Counting

Add lifetime measurement to any FluoroMax Plus with the DeltaTime™ TCSPC accessory. Working in the time domain removes the confounding influences of concentration and photobleaching. With its industry-leading true 100 MHz system operation, DeltaTime offers TCSPC acquisition rates, with fast decays being acquired in mere milliseconds, allowing for TCSPC lifetime kinetics of fast reactions. Its crystal-locked timing circuits never require recalibration. Select from our current catalog of over 70 compact pulsed light sources, with more being added all the time. And once you get your data, powerful analysis software lets you choose among 9 fitting models.

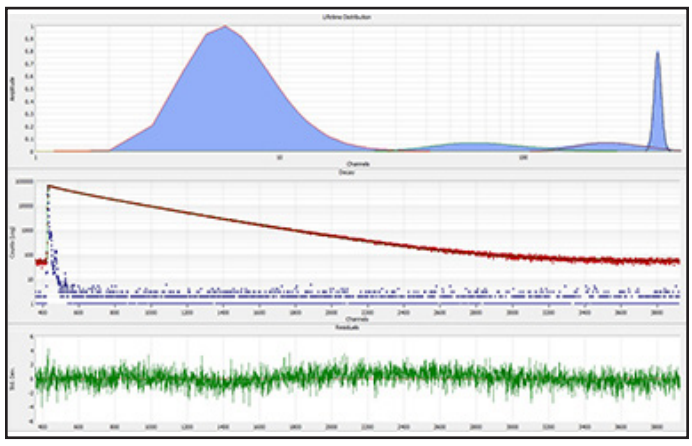
Unique TCSPC Benefits

- 40 years of experience in TCSPC innovation
- Industry-leading true 100 MHz system operation
- TCSPC decay acquired in the blink of an eye
- TCSPC lifetimes kinetics acquisition time up to 1,000 decays per second
- Lifetimes from 25 ps to seconds
- True plug and play sources do not require recalibration switching from one to the other
- Unique SpectraLED LED series for highest efficiency phosphorescence measurements
- TCSPC lifetimes, anisotropy, TRES, and kinetics.
- Robust data, independent of concentration and photobleaching

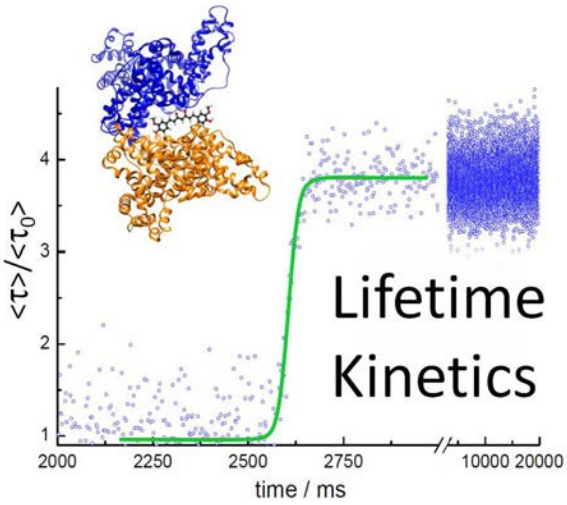




Lifetimes of rhodamine 6G in methanol measured using optional ultrafast PPD detector. At high concentrations, self-quenching results from homodimers and trimers formation. Lifetimes as short as 75 ps are seen, as well as homo-FRET at lower concentrations.



Non-extensive distribution fits: 1,8-ANS exists in free solution and partitions into several disparate environments in bovine serum albumin. Within each environment, a distribution of states exists with a corresponding distribution of lifetimes. FluoroMax software not only offers standard discrete exponential fitting, but also several energy transfer and distribution models, including the proprietary non-extensive distribution shown here.

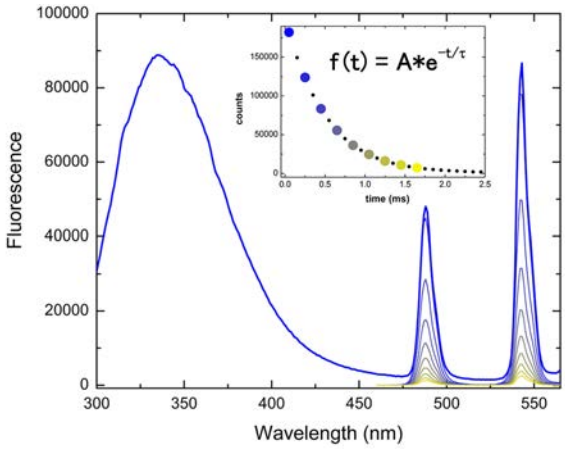


Sample photobleaching corrupts kinetic data by adding an exponential term. Lifetimes are more robust than steady state intensities. To support rapid kinetics, the FluoroMax is capable of measuring a complete lifetime decay in as little as every 10 ms. Example shown is the binding of curcumin to serum albumin.

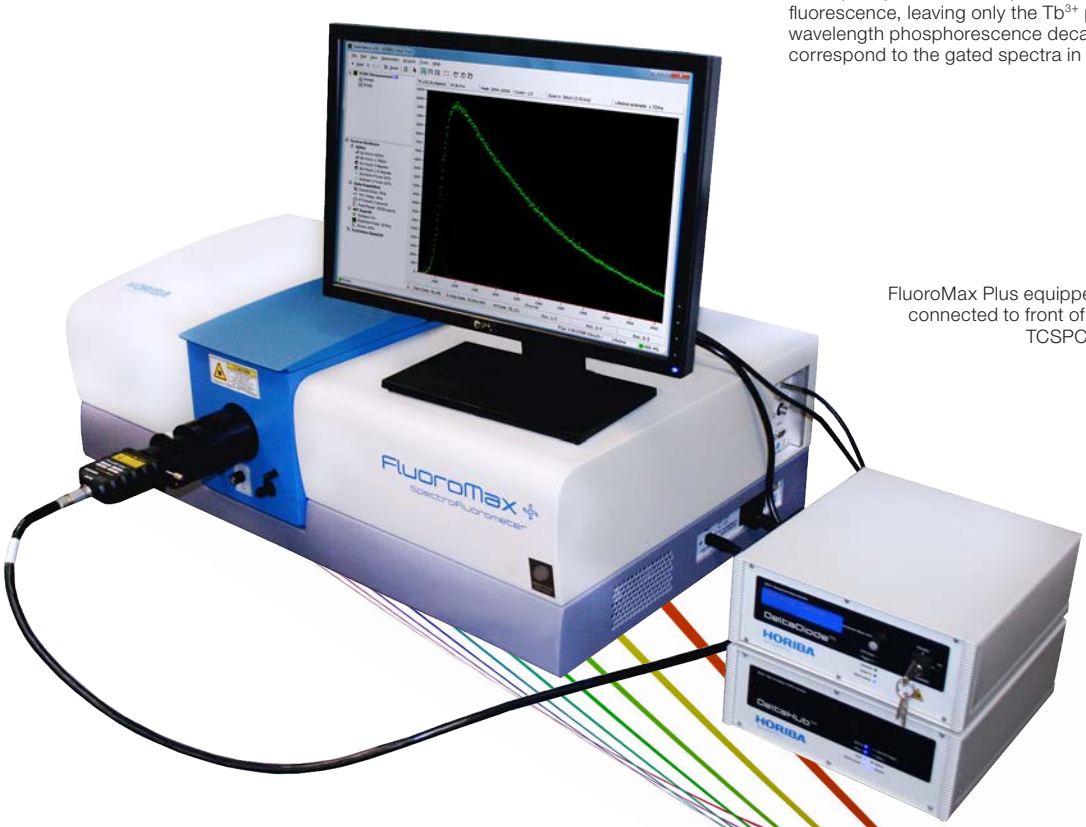
Phosphorescence

Measure phosphorescence spectra, or phosphorescence lifetimes from microseconds to seconds

The FluoroMax Plus “P” versions add an optional pulsed xenon flash lamp, enabling lifetime measurements down to 10 µs with no additional electronics or detectors. Ideal for measuring lanthanide-tagged samples or rare earth phosphors used in a variety of applications.



Complex solutions like this mixture of bovine serum albumin (BSA) and terbium chloride can be challenging to interpret. Using the pulsed light source of the phosphorescence option allows you to temporally “gate out” the BSA fluorescence, leaving only the Tb^{3+} phosphorescence. Inset shows the single wavelength phosphorescence decay of Tb^{3+} in this mixture; colored circles correspond to the gated spectra in the main figure.



FluoroMax Plus equipped with 100 MHz DeltaDiode, connected to front of sample compartment and TCSPC electronics.

Enhanced Phosphorescence with SpectraLED LED Sources

HORIBA SpectraLED sources can also be optionally selected to enhance phosphorescence lifetime measurements. They are fixed wavelength sources that connect to the front of the FluoroMax Plus sample compartment to illuminate directly on the sample. Compared to a pulsed xenon lamp, all SpectraLED sources have the benefit of operating at higher repetition rates for faster acquisitions, and at varying pulse durations, all under software control. For example, with a SpectraLED set to the shortest pulse duration, the FluoroMax Plus can measure shorter phosphorescence lifetimes. A SpectraLED can also be set to have a very long pulse duration to enhance the sensitivity of longer phosphorescence lifetime samples.

Extend the spectral or lifetime range of your FluoroMax Plus

In addition to all the standard capabilities of the FluoroMax Plus, the system allows you to add a second detector on the emission monochromator, as well as a dual grating turret for extended NIR wavelength detection. The second detector is fully automated with a computer-controlled slit, detector flipping mirror and dual grating turret selection.

The standard PMT detector in the FluoroMax Plus detects from 185 to 900 nm and can be used for spectral measurements, or with the addition of TCSPC accessories, fluorescence lifetime measurements. However, you can replace that standard PMT with a NIR-extended PMT that covers the range from 185 to 980 nm. This option does not require the addition of a second detector port being added to the emission monochromator.

The unique all reflective optics design of the FluoroMax Plus always focuses all wavelengths of light to the same precise point.

This is not true of lens-based spectrofluorometers. Lenses introduce chromatic aberrations, which means that different wavelengths of light are focused through a lens to different points. This phenomenon gets much worse at farther and farther wavelengths, so when you want to work out to 1,700 nm with an extended NIR detector, you really want to be sure you have an all-reflective instrument. *Only the HORIBA FluoroMax Plus provides this optimized performance at all wavelengths, even in the NIR.*

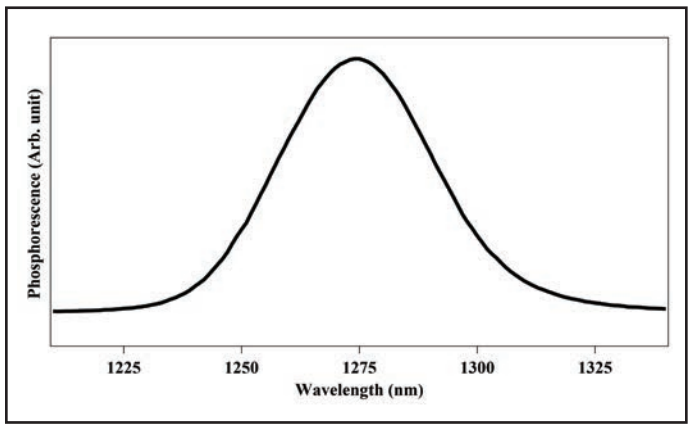
Available FluoroMax Plus Second Detectors

• Extended NIR:

LN-Cooled InGaAs Detector: This is an excellent affordable alternative for spectral detection from 800 to 1,700 nm

Cooled-NIR PMT: A broad range photomultiplier for spectral, TCSPC and phosphorescence detection from 200 to 1,010 nm

Deep-cooled NIR PMT: Deep-cooled NIR PMTs for spectral, TCSPC and phosphorescence detection. Choose from enhanced 950 to 1,400 nm, or 950 to 1,700 nm options



Phosphorescence spectrum of singlet oxygen generated by rose bengal in methanol demonstrates the exquisite sensitivity of the FluoroMax Plus equipped with LN-cooled IGA detector.

• ENHANCED TCSPC for Ultra Short Lifetimes:

PPD and HPPD Detectors for Shorter Lifetime Detection.
The standard FluoroMax Plus PMT detector can be used for collection of steady state spectra, TCSPC fluorescence lifetime detection down to 130-150 ps, and gated phosphorescence detection. However, HORIBA offers our optional PPD and HPPD TCSPC detectors which allow for the ability to measure TCSPC fluorescence lifetimes as short as 25 picoseconds.

Additional Gratings for Dual-Grating Turret

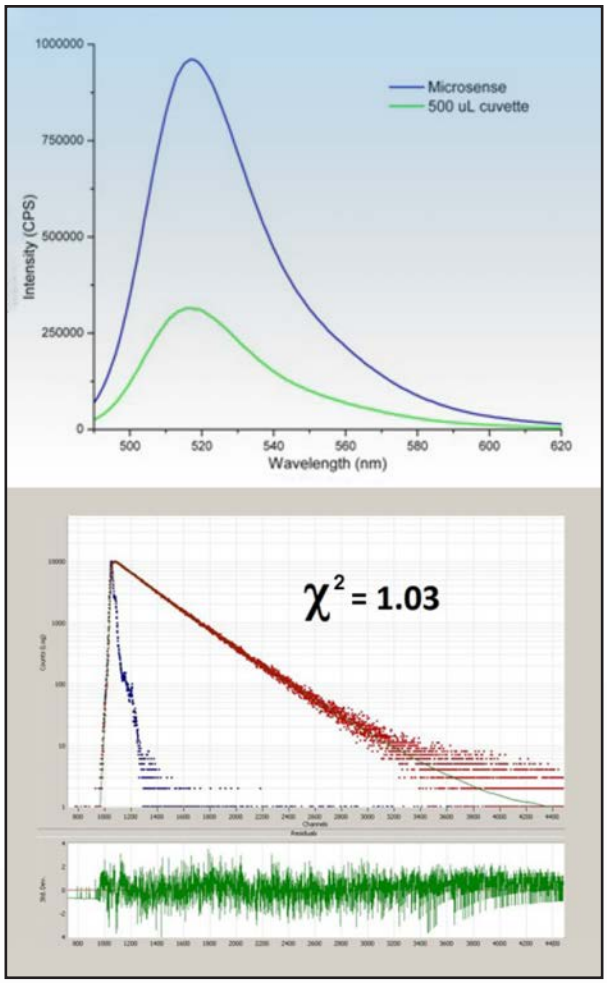
- 1200 grooves/mm blazed at 500 nm
- 600 grooves/mm blazed at 1 µm, gold coated for optimized NIR response
- Other gratings available on request.

Accessories

Microvolumes

Measure ultra-low sample volumes with easy sample recovery.

HORIBA's Microsense, the most advanced microliter accessory on the market, is designed to get cuvette-quality steady state or lifetime data from just 1-5 µL of sample.



Using the Microsense, 5 µL of AlexaFluor 488 labeled IgG is enough to get steady state or TCSPC data with FluoroMax Plus.

Avoiding dilution and nearly total sample recovery minimizes the waste of samples, while preserving measurement sensitivity. Based on all quartz optics, Microsense is compatible with UV to NIR measurements.

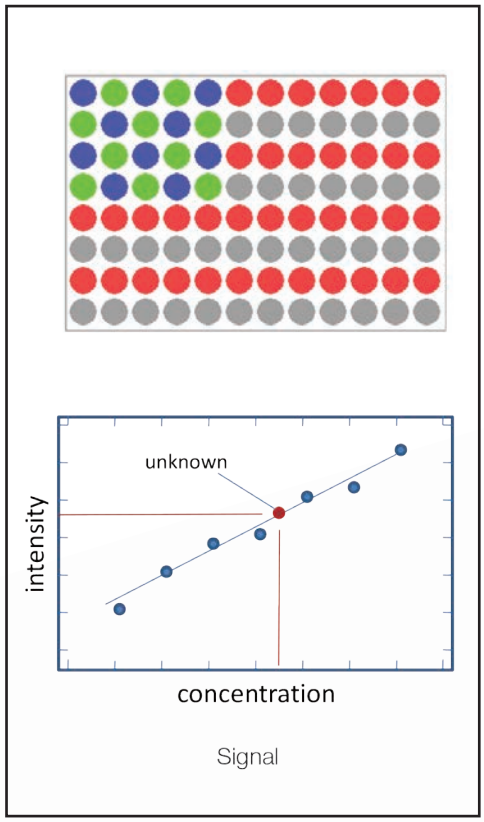
Microplate High Throughput Accessory

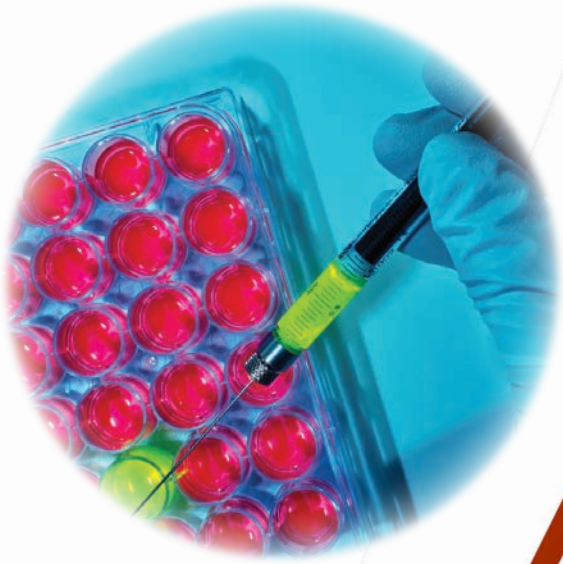
Maximize your throughput

Search for "hits" or automate measurements of a large number of samples.

The MicroMax 384 accessory lets you automate your measurements for high throughput data collection.

Based on standard well plates, MicroMax Plus saves you time and money by automating spectral, kinetics, single point, and time-resolved measurements on anywhere from 6 to 384 samples at a time. FluoroMax Plus software includes calibration curve routines for simple quantification of your results.





Full Spectral Microscopy

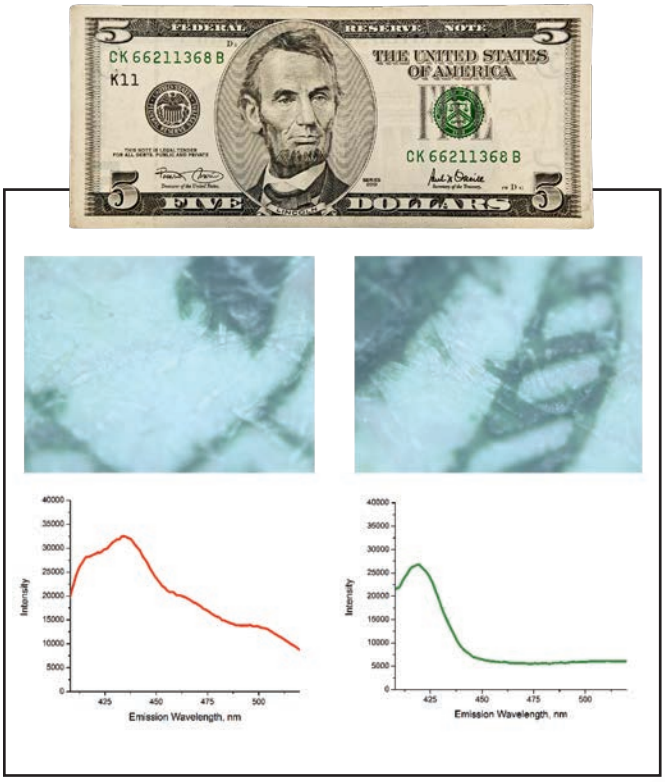
All FluoroMax Plus systems can be fiber-coupled to virtually any upright or inverted fluorescence microscope. Our microscope coupling allows you to go beyond simple filter-based fluorescence microscopy to full spectral analysis of spatially varying, or extremely small volume samples.

Couple a microscope to a FluoroMax Plus and:

- Measure a complete spectrum of a sample as small as 1 µm
- Get spectra from as little as a few molecules of sample
- Perform localized FRET measurements

Add an automated stage and camera, and:

- Create complete spatial/spectral maps
- Perform repetitive QC characterization of structured samples like photovoltaics



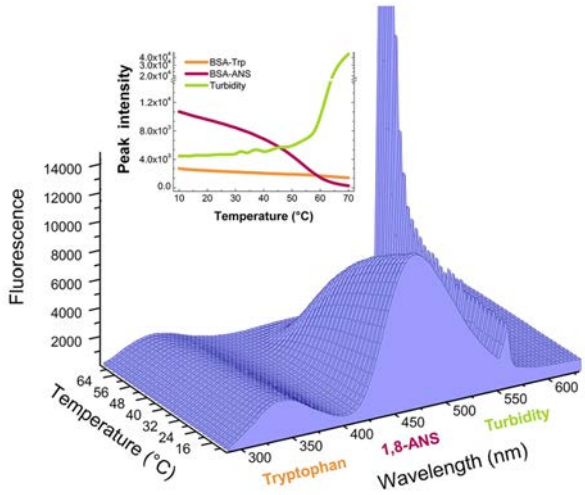
Data from a real and forged US five dollar bill. Fluorescence imaging shows no obvious differences. However it is easy to spectrally distinguish the real from the fake bill.

Peltier-based Heated/Cooled Cuvette Holders

Rapid temperature control in single or multiple cuvette models with built-in magnetic stirring.

Precise temperature control for precise data on your protein folding, micellization, solubility, conformation, phase, and rotational transitions.

Rapidly vary sample temperature over a range of -25 to 105° C (-40 to 150° C optional). FluoroMax software also simplifies automating temperature dependence measurements, including complex ramps and profiles.



Thermal unfolding of bovine serum albumin in PBS and 1,8-ANS followed using three observables: The quenching of intrinsic tryptophan fluorescence by water, the quenching of the 1,8-ANS, and the increased 2nd order scattered light which repots turbidity from protein aggregation.

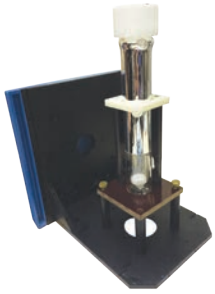
Temperature Bath

An alternative to Peltier-based units for fixing a temperature without the need for variable temperature control, such as clamping biological sample temperature. Better precision (0.01° C), range (-25 to 100° C) and long term stability, but with much slower temperature ramping.

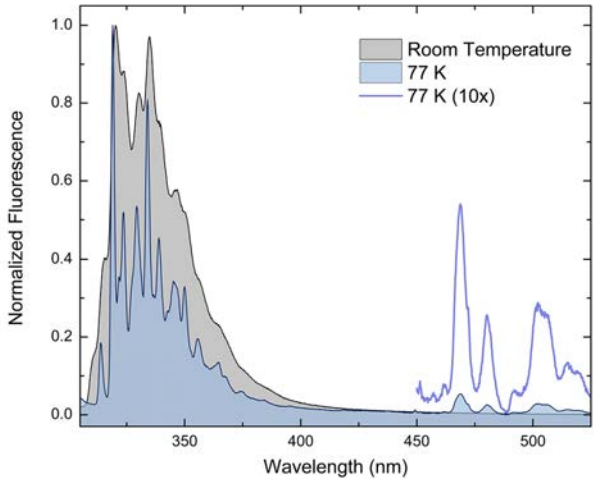
Optional LN_2 and He Cryostats

For greater temperature range and sample type flexibility, the FluoroMax Plus supports various cryostats offering temperature control down to 4 K.

Economic LN Temperature Dewar Accessory



Cryogenic temperatures enable measurements of fine structure, enhanced phosphorescence, and rare conformations/states often not possible at room temperature. This low cost accessory readily permits measurements of liquid or solid samples at 77° K.



Temperature can add thermal broadening to fluorescence spectra and increase phosphorescence quenching. Spectra of naphthalene dissolved in methanol measured at room temperature (298° K) and in a liquid nitrogen dewar accessory (77° K). The low temperature spectrum reveals rich vibrational structure and longer wavelength phosphorescence. Phosphorescence peaks are also shown magnified 10x for clarity.

Other Accessories

The FluoroMax Plus Series includes the most comprehensive line of accessories that enable researchers to extend the utility of their instrument to as many experiments as possible. The following is a partial list of accessories available, in addition to those previously discussed.

- Solid sample holder designed for viewing front-face fluorescence of thin films, powders, pellets, paper, fibers, or microscopic slides. Variable alignment angle
- 2 and 4 position thermostated sample holder with magnetic stirring bar
- 4-position sample holder with magnetic stirring bar
- Auto-titrator (injector) dual syringe, dual valve
- Hi-tech SFA-20 stopped flow, rapid kinetics accessory
- Fiber-optic probe, bifurcated, randomized, which is ideal for samples which cannot fit inside a standard sample chamber (requires fiber adapter)
- Sealed water standard in scratch-proof housing for water Raman S/N verification
- Emission correction factor kit
- Excitation correction factor kit
- Purge port, quartz windows for sample compartment for use with nitrogen purging.
- Up conversion laser accessories
- 250 µl reduced volume cell
- 500 µl cuvette 5x5 mm
- 20 µl HPLC flowcell

FluorEssence™ software

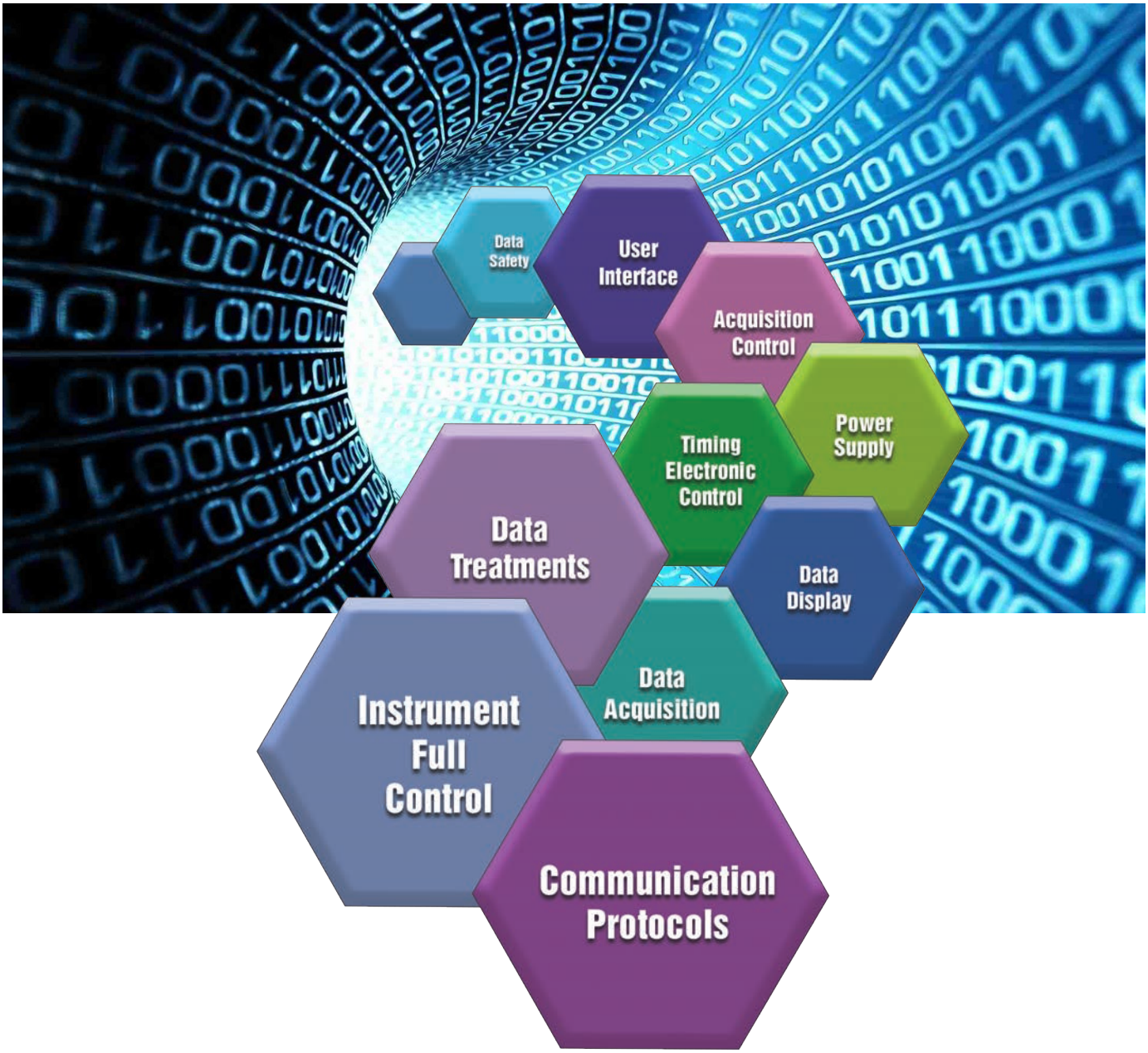
Simple enough for the occasional user but powerful for the most elaborate experiments.

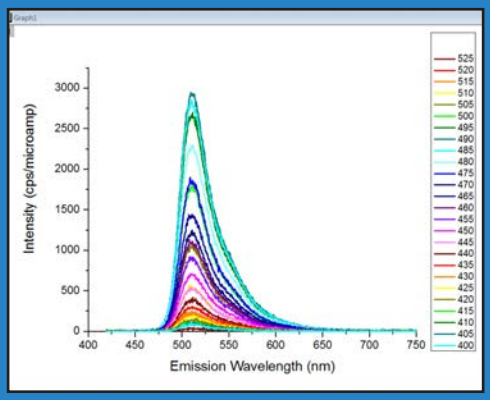
Fluorescence software that works like you do:

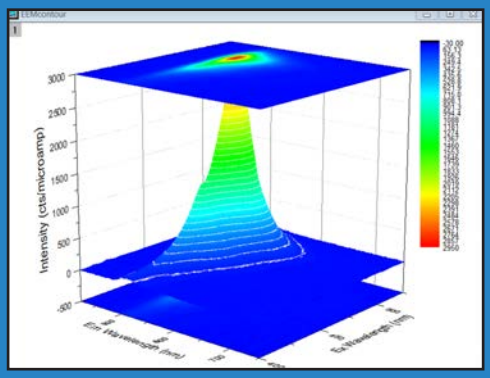
- Efficiently develop your experimental method, and then save it for future use
- Data collection, analysis and report generation are easily streamlined
- Full software control of accessories
- Automate repetitive experiments with a built-in batch mode
- All instrument calibration parameters are automatically applied per method

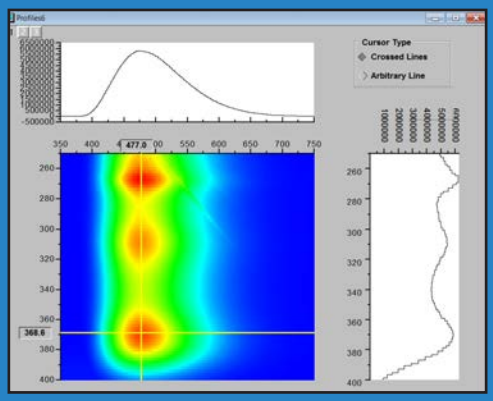
Of course, all experimental parameters are always saved along with the data file for comparison with previously collected data.

Convert data to answers
Powerful processing and data management tools of OriginPro, the most used data treatment software in scientific labs. Allows for immediate export to other computers.









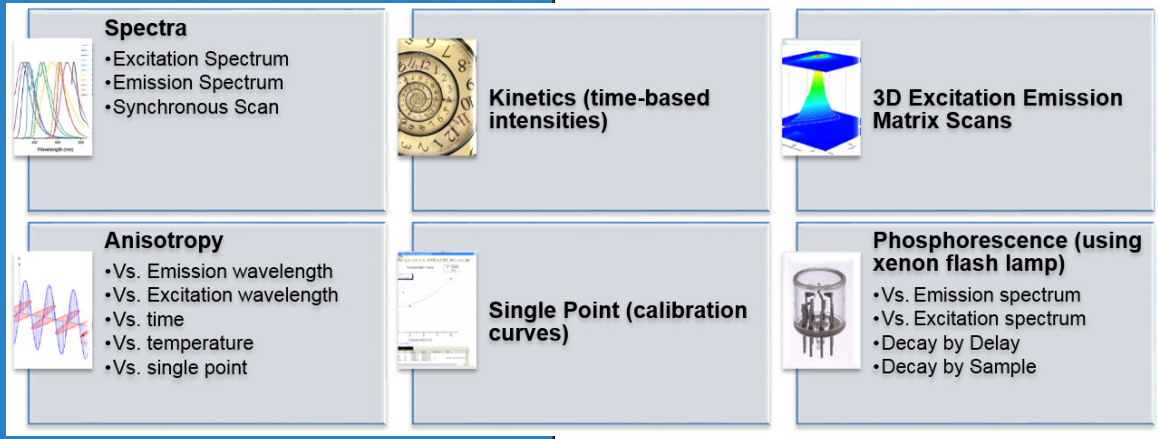
Experiment:

- Spectra: Excitation, emission and synchronous spectrum
- Kinetics: Time-based intensities
- 3D Excitation Emission Matrix scan (EEM)
- Anisotropy vs. emission, excitation wavelength vs. time, vs. temperature vs. single point
- Single point
- Phosphorescence vs. emission or excitation, help decay acquisition
- Lifetime options:
  - LIfetime decay
  - Anistrophy decay (up to 5 exponential)
  - TRES
  - MCS lifetime (phosphorescence)
  - Global analysis

A complete library of video tutorials to help get you started.

Features:

- Data views in workbook formats, keeping graphs, tables and notes together for each experiment
- Zooming and scaling
- Contour maps and profiles from 3D plots
- Peak finding
- Integrate, differentiate, or fit fluorescence data to Gaussian, Lorentzian, and custom curves
- Standard arithmetic
- 3D perspective
- Smoothing
- Deconvolution
- Excitation/emission correction
- Interpolation and extrapolation
- Blank subtraction
- Normalization
- PLQY calculator wizard (for use with Quanta-φ™ accessory)



FluoroMax Plus specfications

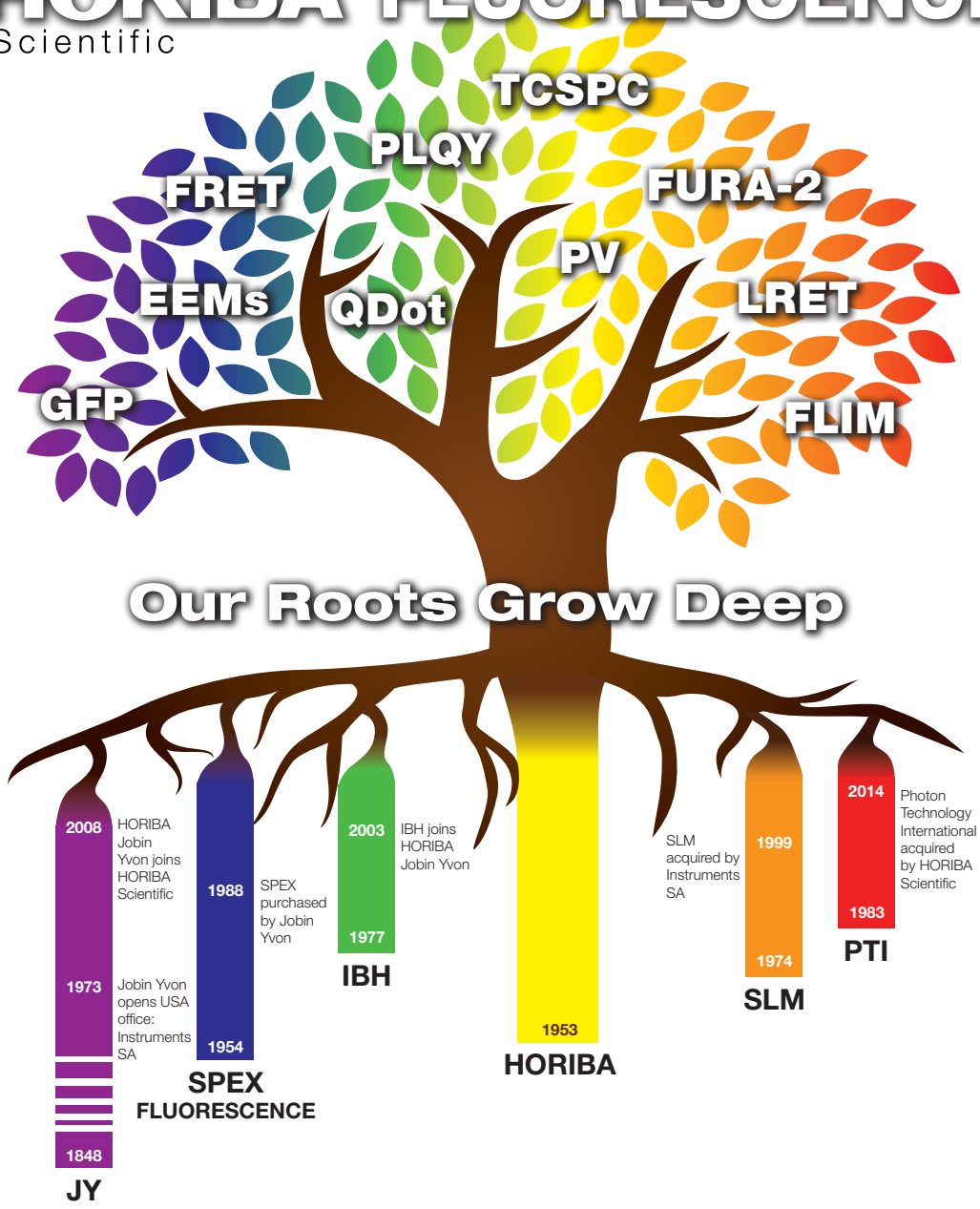
Optics	All reflective optics for high sensitivity at all wavelengths and for microsamples
Source	150 W CW ozone-free xenon arc lamp
Monochromators	Czerny-Turner design with plane gratings for optimized focus at all wavelengths and minimum stray light
Excitation Grating	1200 groove/mm blazed at 330 nm
Emission Grating	1200 groove/mm blazed at 500 nm
Optional Second NIR Grating	600 groove/mm blazed at 1 µm, gold coated, on a computer-controlled turret
Bandpass	0 to 29 nm, continuously adjustable
Wavelength Accuracy	± 0.5 nm
Integration Time	1 ms to 160 s
Base Detector	Photomultiplier R928P, 185 to 900 nm, air-cooled and stabilized
Reference Detector	UV-enhanced silicon photodiode
Standard Filter Holders for Excitation and Emission Path	2” square filters can be added for any specific use
Water Raman S/N	10,000:1 FSD method
Steady State Reaction Kinetics Acquisition Rate	1 KHz to 0.02 Hz
Dimensions	83 cm (w) x 28 cm (h) x 48 cm (d)
Weight	34 kg
Optional Extended NIR Base Detector	Photomultiplier R13456, 185 to 980 nm, air-cooled and stabilized
Optional Cooled NIR PMT Detector	200 nm to 1050 nm
Optional Cooled Extended NIR PMT Detector	950 nm to 1700 nm
Optional Extended LN-cooled NIR InGaAs Detector	800 to 1700 nm spectral detection
Optional Transmission Detector	UV-enhanced silicon photodiode
Optional Pulsed Xenon Lamp for Phosphorescence	10 Watt (software controlled from 0.03 to 25 Hz)
Optional Automated Plate Reader	96 or 384 well plates
Optional Integrating Spheres for PLQY	Easy, quick change of either internal 80 mm diameter sphere, or external 150 mm sphere

Lifetime Options	
TCSPC:	
Lifetime Range with Standard PMT Detector	<150 ps to 1 s
Lifetime Range with Optional Fast PPD Detector and HPPD Detectors	<25 ps to 1 s (PPD) <5 ps (HPPD)
Instrument Response Function (IRF) with Optional PPD and HPPD Detectors	PPD <200 ps HPPD ~50 ps
Transit Time Spread (TTS) with Optional PPD detector	<180 ps typical at 405 nm
Repetition Rate of Laser Diodes with Optional DeltaDiode lasers	100 MHz to 10 KHz
TCSPC Electronics Dead Time	10 ns
TCSPC Lifetime Kinetics Acquisition Time	1 ms
TCSPC Lifetime Kinetics Acquisition Rate	Up to 1,000 TCSPC decays per second
Phosphorescence Lifetime Range with SpectraLED Phosphorescence Source	<10 µs tp 10 s

Family of fluorescence systems

HORIBA FLUORESCENCE

Scientific



fluoromax.com
info.sci@horiba.com

HORIBA Scientific

France: HORIBA Jobin Yvon S.A.S., 16-18 rue du Canal, 91165 Longjumeau cedex - Tel. +33 (0)1 69 74 72 00 - Fax. +33 (0)1 69 09 07 21 - Email: info-sci.fr@horiba.com
USA: HORIBA Instruments Inc., 20 Knightsbridge Road, Piscataway, NJ 08854 - Tel. +1 732 494 8660 - Fax. +1 732 549 5125 - Email: info-sci.us@horiba.com
Japan: HORIBA Ltd., 2 Miyanohigashi, Kisshoin, Minami-ku, Kyoto 601-8510 - Tel. +81(75)313-8121 - Fax. +81(75)321-8312 - Email: info@horiba.co.jp
Germany: HORIBA Jobin Yvon GmbH, Neuhofstrasse 9, 64625 Bensheim - Tel. +49 (0) 6251 8475 0 - Fax. +49 (0) 6251 8475 20 - Email: info-sci.de@horiba.com
Italy: HORIBA Jobin Yvon Srl., Viale Luca Gaurico 209 - 00143 Roma - Tel. +39 06 51 59 22 1 - Fax. ++39 06 51 96 43 34 - Email: info-sci.it@horiba.com
UK: HORIBA UK Ltd., Kyoto Close, Moulton Park, Northampton, NN3 6FL - Tel. +44 (0)1604 542 500 - Fax. 44 (0)1604 542 699 - Email: info-sci.uk@horiba.com
China: HORIBA (China) Trading Co. Ltd., Unit D 1F, Bldg A, Srynnex International Park, No. 1068 West Tianshan Road, Shanghai 200335 - Tel. +86 (0)21 6289 6060 - Fax. +86 (0)21 6289 5553 Email: info-sci.cn@horiba.com
Singapore: HORIBA Instruments (Singapore) Pte Ltd. 3 Changi Business Park Vista #01-01 AkzoNobel House 486051 Singapore - Tel. +65 (0)6 745 8300 - Fax. +65 (0)6 745 8155
Taiwan: HORIBA Taiwan Inc., 8F-8, No.38, Taiyuan St., Zhubei City, Hsinchu County 30265 - Tel. +886 3 5600606 - Fax. +886 3 5600550 - Email: info-sci.tw@horiba.com
India: HORIBA India Private Limited Bangalore Office No.55, 12th Main, Behind BDA Complex, 6th sector, HSR Layout, Bangalore South, 560102 Bangalore Tel. +91 80 41273637
Brazil: HORIBA Instruments Brasil Ltda., Rua Presbítero Plínio Alves de Souza, 645, Loteamento Polo Multivias Bairro Jardim Ermida II, Jundiai São Paulo CEP 13.212-181 Tel. +55 (0)11 2923 5400 Fax. +55 (0)11 2923 5490 - Email: infocientifica.br@horiba.com
Other: Tel. +33 (0)1 69 74 72 00 - Email: info.sci@horiba.com