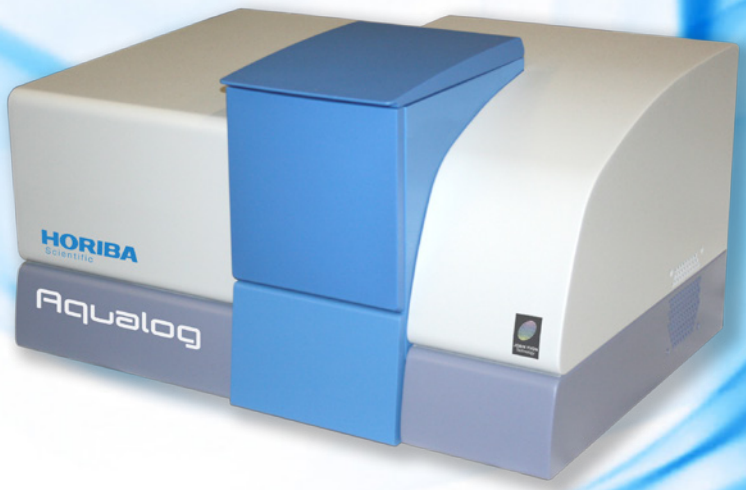
HORIBA
Scientific



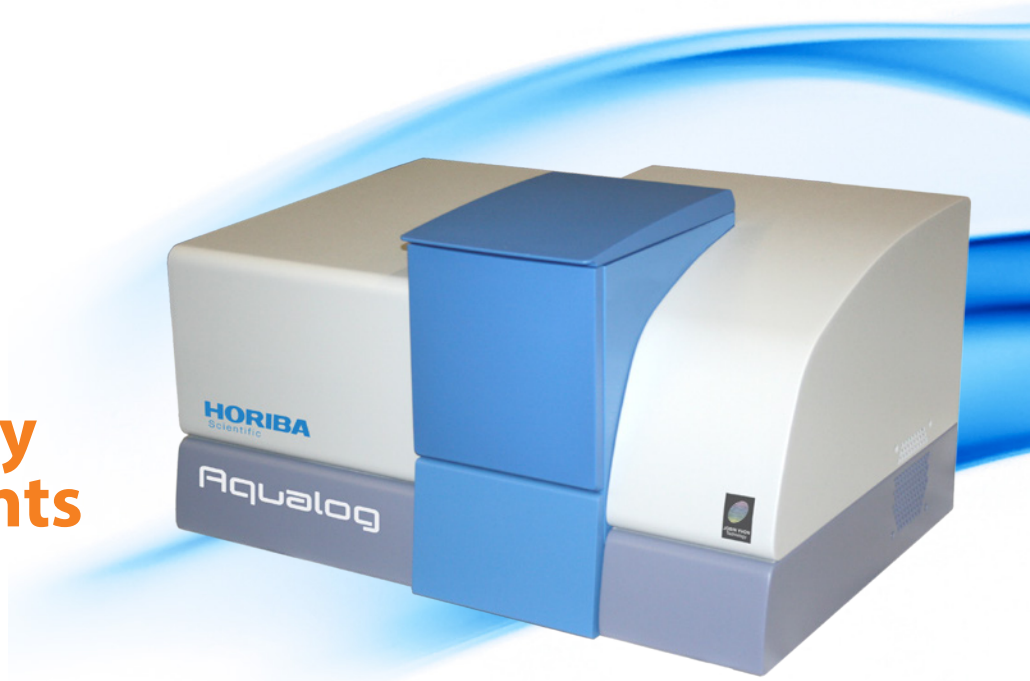
Aqualog

——Water Quality Measurements Made Easy

ELEMENTAL ANALYSIS
FLUORESCENCE
GRATINGS & OEM SPECTROMETERS
OPTICAL COMPONENTS
PARTICLE CHARACTERIZATION
RAMAN
SPECTROSCOPIC ELLIPSOMETRY
SPR IMAGING

JOBIN YVON Technology

HORIBA Scientific



Water quality measurements made easy

The only simultaneous absorbance and fluorescence system for water quality analysis!

The new Aqualog is the only instrument to simultaneously measure both absorbance spectra and fluorescence Excitation-Emission Matrices. EEMs are acquired up to 100 times faster than with other instruments. Dedicated software automates traceable Quinine Sulfate Unit calibration and correction of inner-filter effects and Rayleigh and Raman scattering lines, enabling rapid export to multivariate modeling programs including our partner, Solo, by Eigenvector Research, Inc.

Hardware features

- The only true simultaneous absorbance-fluorescence system available
- TE-cooled CCD fluorescence emission detector for rapid data-acquisition up to 100 times faster than any other benchtop fluorometer
- Corrected UV-VIS absorbance detection path for stability and accuracy
- Double-grating excitation monochromator for superior stray light rejection
- Matching bandpass for absorbance and fluorescence spectra
- Automatic sample changer option (2- or 4-position)
- Compatible with flow cells and titrator

Full suite of performance validation tests

- NIST Fluorescence Standard Reference Materials for spectral calibration and correction (SRMs: 2940, 2941, 2942, 2943)
- Starna® Standard Reference Material for Quinine Sulfate Fluorescence Emission Spectral Correction (RM-QS00)
- NIST Absorbance Standard Reference Materials for Ultraviolet-Visible Spectrophotometry (SRM 931g)
- Starna® Standard Reference Materials for Ultraviolet-Visible Spectrophotometry (RM-06HLKI)
- Water Raman signal-to-noise evaluation

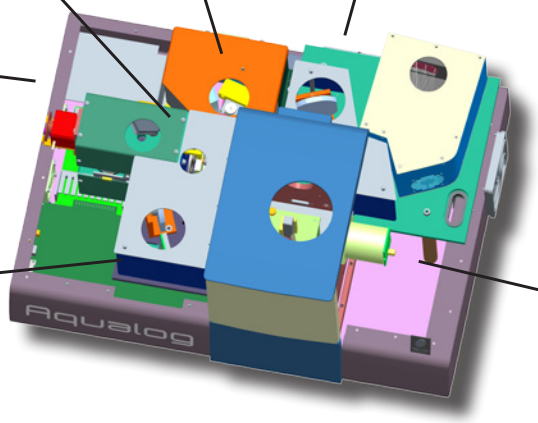
Filter wheel for automatic order-sorting

150 W vertically mounted xenon source

Fully achromatic coupling optics

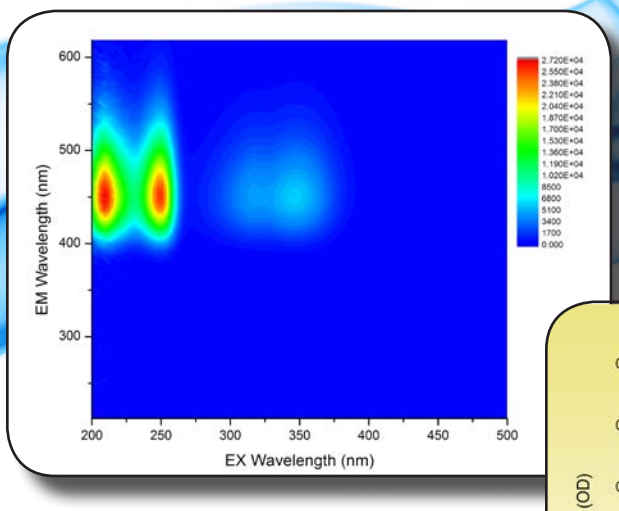
Aberration-corrected emission spectrograph with TE-cooled CCD for rapid emission measurements

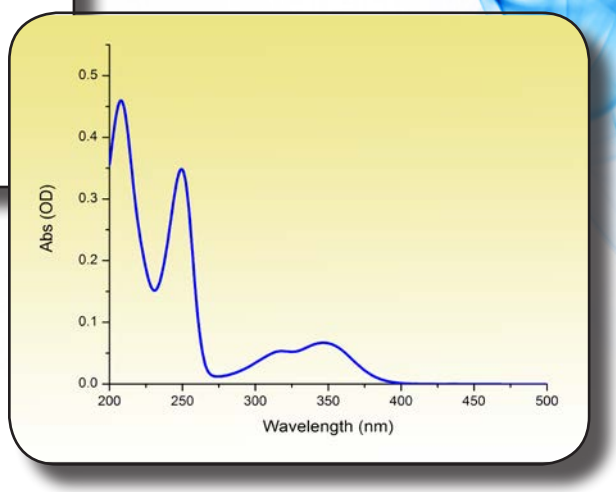
Aberration-corrected double-grating excitation monochromator for low stray-light performance



Reference detector to correct both absorbance and fluorescence detector signals

Absorbance detector for simultaneous excitation and emission data-acquisition





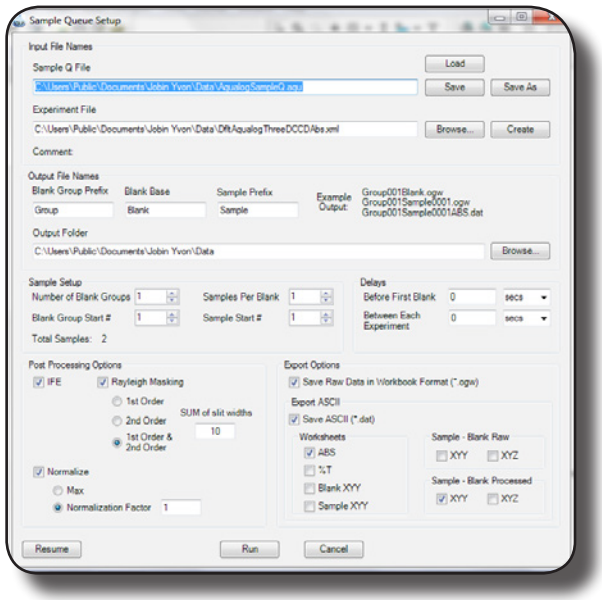
Excitation-Emission Matrices and absorption spectra from 200 nm!

Software Features

- Optimized experiment set-up menus minimize user configuration time
- Complete NIST-traceable corrected fluorescence spectra automatically generated
- Spectral and kinetic analysis tools for both absorbance and fluorescence data
- Methods and batch protocols for automating multiple sample measurement

Experimental Menu

- Absorbance spectra
- Absorbance kinetics
- Fluorescence emission spectra
- Fluorescence emission spectra kinetics
- Combined fluorescence emission spectra and absorbance kinetics
- Fluorescence excitation-emission matrices (EEMs)
- Combined excitation-emission matrices and absorbance spectra
- Trigger-enabling
- Sample Queue tool for collection of continuous EEMs plus absorbance spectra, correction, and export for up to 1000 samples without interruption. Compatible with multi-position sample changers, operation of flow-through cells and autosamplers. Automated generation of component identification and quantification tables using Eigenvector's Solo Predictor package!



Built-in Tools for EEM Analysis

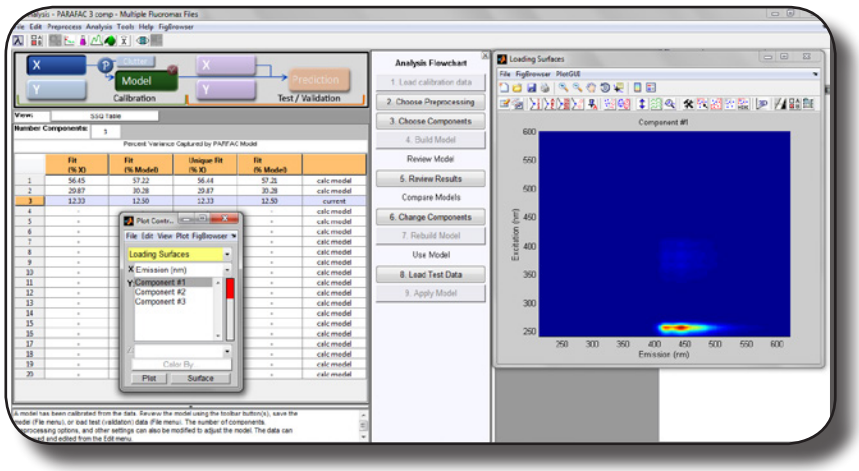
- Correction of inner-filter effects
- Rayleigh-masking of first and second orders
- Normalization (Quinine Sulfate Units or Raman scattering units)
- Multivariate analysis, including PARAFAC (parallel factor analysis)
- Batch export of EEMs
- 2-Dimensional excitation and emission extraction of spectral profiles from EEMs

Multivariate Analyses with Our Partner, Eigenvector

Save hours of data processing with the combined power of HORIBA Scientific's new Aqualog® and Eigenvector's Solo software! Simply import your fully corrected excitation-emission matrix (EEM) data directly from the HORIBA Scientific Aqualog® into Eigenvector's Solo software to rapidly perform PARAFAC and many other multivariate analyses pertinent to colored dissolved organic matter (CDOM).

The Aqualog® package performs all necessary spectral corrections. Quickly assemble EEMs into convenient DataSet objects to easily manage labels, axis scales, and classes, and include or exclude data from the analysis with a simple click.

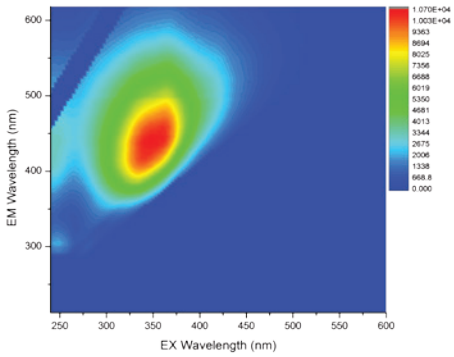
Solo provides the graphical interfaces to quickly manage and analyze EEM data, create and apply models, and interpret results.

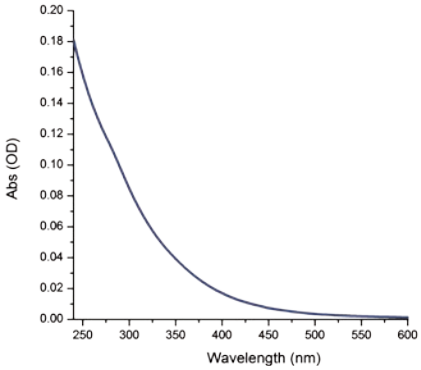


Solo
Stand Alone Chemometrics Software

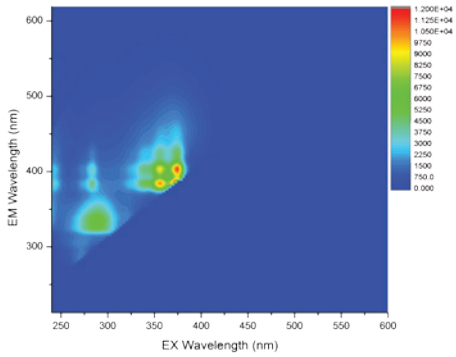
Aqualog Water Quality Applications

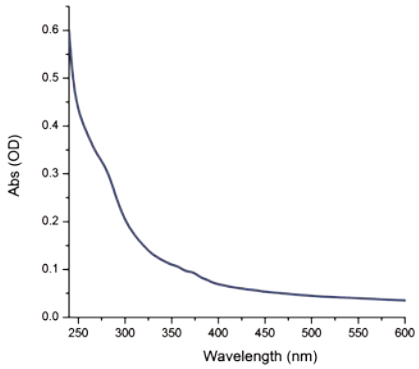
CDOM





Oils and PAHs



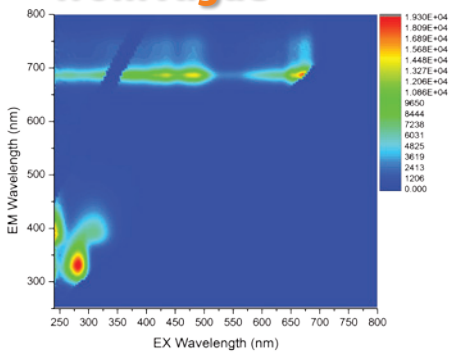


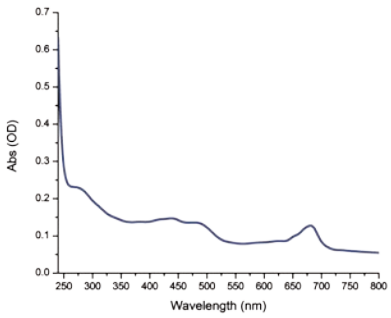
Measure the full UV to NIR spectrum of water contaminants

Ideal for quantitative hydrologic studies with tracer dyes, using:

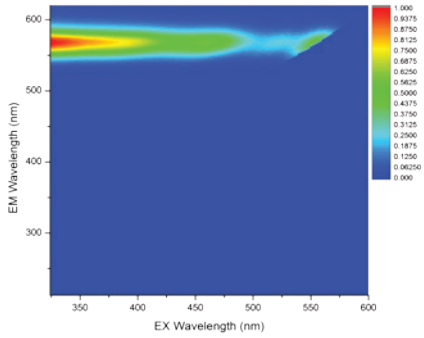
- **Resazurin-resorufin**
- **Fluorescein**
- **Rhodamine**
- **Pyranine**

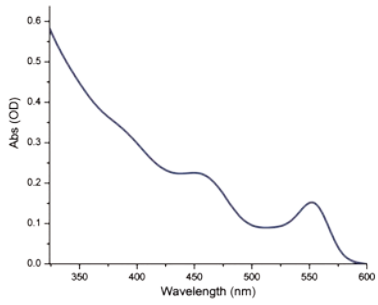
Chlorophyll from Algae





Quantum Dots





CDOM applications:

- **Membrane fouling**
  (microfiltration, reverse osmosis)
- **Microbial and algal activity**
- **Carbon fate and cycling activity**

Fluorescence Hardware Specifications

Parameter	Specification	
Choice of light source	Standard: 150 W ozone-free vertically mounted xenon arc lamp	Extended-UV: 150 W vertically mounted xenon arc lamp
Excitation range	230 nm to upper limit of emission detector	200 nm to upper limit of emission detector
Excitation bandpass	5 nm	
Excitation monochromator	Subtractive double monochromator	
Excitation gratings	1200 gr/mm; 250 nm blaze	
Excitation wavelength accuracy	±1 nm	

Choice of detector	UV-Visible	Red-extended
Emission range	250–620 nm	250–800 nm
Emission grating	405 gr/mm; 250 nm blaze	285 gr/mm; 350 nm blaze
Hardware pixel-binning	0.41, 0.82, 1.64, 3.28 nm/pixel	0.58, 1.16, 2.32, 3.64 nm/pixel
Emission bandpass	5 nm	
Emission spectrograph	Fixed, aberration-corrected 140 mm focal length	
Emission detector	TE-cooled back-illuminated CCD	
Emission integration time	5 ms minimum	
CCD gain options	2.25 e^-/cts in high gain, 4.5 e^-/cts in medium gain, 9 e^-/cts in low gain	
Sensitivity	Water-Raman SNR > 20 000:1 (RMS method) (350 nm excitation, 30 s integration)	
Weight	33 kg (72 lbs)	
Dimensions	L × W × H (618 × 435 × 336 mm); (24″ × 17″ × 13″)	

Absorbance Hardware Specifications

Parameter	Specification
Scanning range	200–800 nm (UV lamp) 230–800 nm (Standard lamp)
Bandpass	5 nm
Slew speed	Maximum 500 nm/s
Optical system	Corrected single-beam
Detector	Si photodiode
Wavelength accuracy	±1 nm
Wavelength repeatability	+/– 0.5 nm
Photometric accuracy	±0.01 AU from 0 to 2 A
Photometric stability	<0.002 AU per h
Photometric repeatability	+/– 0.002 AU (0 to 1 AU)
Stray light	<1% measured with KI standard

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