



# FLUORESCENCE THAT OUTSHINES EXPECTATIONS



FL 6500<sup>™</sup> and FL 8500<sup>™</sup> Fluorescence Spectrometers

# WHEN DISCOVERY COMES TO LIGHT

## The Complete Fluorescence Solution

Looking for high-performing, simple-to-operate instruments that help your lab achieve fast, accurate results? Our latest fluorescence spectrometers truly deliver.

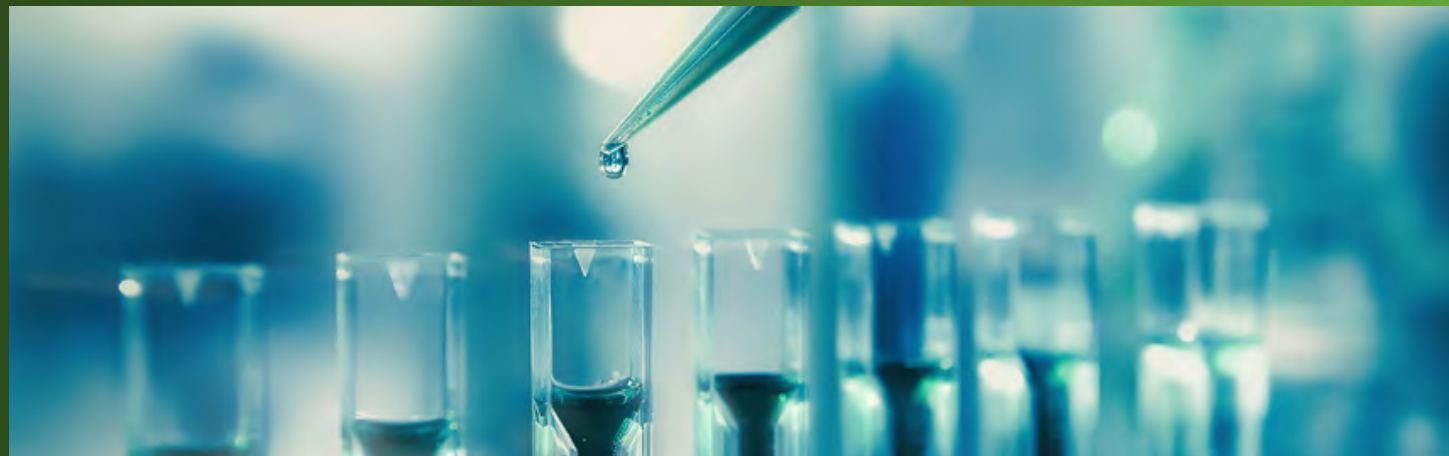
Designed to maximize productivity, the **FL 6500™** and **FL 8500™** use interchangeable, plug-and-play accessories, intuitive software that mirrors your laboratory workflow, and support and services that validate your equipment and ensure standard compliance regulations are met.

Whether you're looking for a pulsed lamp or a continuous source, we provide both solutions, allowing you to tackle application challenges that come your way.



FL 6500 and the FL 8500 Fluorescence Spectrometers  
Spectrum FL Software

# DISCOVERY ILLUMINATED



For biotech and life science researchers, fluorescence spectroscopy is a fast, accurate method of analyzing samples. For your most sensitive samples, the **FL 6500** fluorescence spectrometer provides adjustable peak power for greater dynamic range. The high-energy pulsed Xenon light source enables you to get the most accurate results without photobleaching your sample.

The beauty of the **FL 6500** system is that it allows you to analyze even the smallest samples, such as proteins or enzymes, without destroying them. Using our microvolume cuvettes, the fluorescence is minimal and the results are precise.

Both **FL 6500** and **FL 8500** systems can be used to measure kinetic assays. In as little as a few minutes to a few hours, it can help in understanding complex biological processes. The intuitive software includes a kinetics module that contains calculations that help to understand the mechanics of enzyme inhibition and provide a number of different plot formats to facilitate analysis and data presentation.

The **FL 6500** system offers maximum performance in several different biological applications, including:

- Nucleic acid studies, such as DNA and RNA quantitation
- Protein studies, including quantitation and protein denaturation
- Enzyme kinetics, such as slow kinetics, rapid mixing experiments, and inhibition studies
- Clinical applications, like characterization of porphyrins
- Cellular studies, including measurement of intracellular ions

# TESTING FOR A BRIGHTER FUTURE

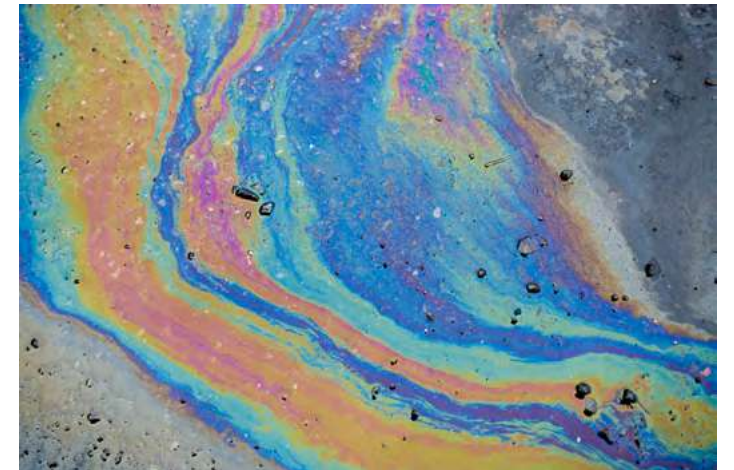
Click on each photo for more about how our spectrometers are used every day.

For industrial analysis, such as dye, tracing, and printing manufacturing and R&D; agricultural and environmental analysis; and analysis of LEDs, solar cells, and organic electroluminescent materials, our two fluorescence spectrometers offer accurate results quickly.

The **FL 6500** system provides a high-energy pulsed Xenon light source that prevents photobleaching and preserves the integrity of your sample. The **FL 8500** system offers a continuous-wave excitation source that's best for testing diluted or small samples.

## Investigating Oil Spills

Oil spills are a global risk to environmental and human health. Our **FL 6500** system provides a fingerprint of the oil and compares the spectra of possible sources. The technique analyzes environmental samples in fresh water or seawater to identify the type of oil involved and include or exclude a suspected source of contamination.



Industrial



# TESTING FOR A BRIGHTER FUTURE

Click on each photo for more about how our spectrometers are used every day.

For industrial analysis, such as dye, tracing, and printing manufacturing and R&D; agricultural and environmental analysis; and analysis of LEDs, solar cells, and organic electroluminescent materials, our two fluorescence spectrometers offer accurate results quickly.

The **FL 6500** system provides a high-energy pulsed Xenon light source that prevents photobleaching and preserves the integrity of your sample. The **FL 8500** system offers a continuous-wave excitation source that's best for testing diluted or small samples.

## Discovering Excess Aluminum in Water

Aluminum found in tap water can occur naturally or result from construction, automotive, aircraft, electric, or food packaging industries. Too much aluminum can be harmful and make people sick. Each country has a restricted level of aluminum allowed in tap water, and our **FL 8500** system is used to make sure those values remain within range.



Industrial

# TESTING FOR A BRIGHTER FUTURE

Click on each photo for more about how our spectrometers are used every day.

For industrial analysis, such as dye, tracing, and printing manufacturing and R&D; agricultural and environmental analysis; and analysis of LEDs, solar cells, and organic electroluminescent materials, our two fluorescence spectrometers offer accurate results quickly.

The **FL 6500** system provides a high-energy pulsed Xenon light source that prevents photobleaching and preserves the integrity of your sample. The **FL 8500** system offers a continuous-wave excitation source that's best for testing diluted or small samples.

## Increasing the Brightness of Products

The **FL 6500** is preferred when analyzing optical brightening agents (OBAs), dyes that are commonly used to increase the perceived whiteness and brightness of products such as paper, textiles, and detergents. These compounds absorb light in the UV-visible region of the electromagnetic spectrum and reemit the light as fluorescence in the blue-violet region of the visible spectrum. This results in a whiter appearance.



Industrial

# THE LIGHT THAT GUIDES YOU



International pharmaceutical standards are important to safeguarding drug quality and making medicine accessible to the public. Pharmaceutical laboratories have three chief concerns: remaining compliant, validating performance, and functioning properly from day to day. We've developed our **FL 6500** and **FL 8500** fluorescence spectrometers to work seamlessly with intuitive software that helps you meet standard guidelines and regulations.

Our **Enhanced Security (ES) software** helps labs maintain Title 21 CFR Part 11 compliance and adhere to stringent data integrity requirements, preventing you from incurring costly fines and downtime.

[Click on the chief concerns for more information.](#)

21 CFR Part 11 Compliance

## 21 CFR Part 11 Compliance

You need an experienced, trusted vendor to confidently achieve compliance with CFR. After all, you know your lab's workflow best and can determine how compliance fits into your day-to-day operations. Our **Spectrum FL Enhanced Security (ES) software** works with your lab, so you can meet 21 CFR technical requirements without sacrificing productivity.

Pharmaceutical

# THE LIGHT THAT GUIDES YOU



International pharmaceutical standards are important to safeguarding drug quality and making medicine accessible to the public. Pharmaceutical laboratories have three chief concerns: remaining compliant, validating performance, and functioning properly from day to day. We've developed our **FL 6500** and **FL 8500** fluorescence spectrometers to work seamlessly with intuitive software that helps you meet standard guidelines and regulations.

Our **Enhanced Security (ES) software** helps labs maintain Title 21 CFR Part 11 compliance and adhere to stringent data integrity requirements, preventing you from incurring costly fines and downtime.

[Click on the chief concerns for more information.](#)

Validation

## Validation

The U.S. Pharmacopoeia USP <853> method gives guidelines for measuring the performance of fluorescence spectrometers. The **Spectrum FL software** used in the **FL 6500** and **FL 8500** has intuitive validation modules that are used to test key specifications, such as raman band peak position, emission wavelength accuracy, excitation wavelength reproducibility, and more. The user-friendly modules guide you through the process, step by step, and allow you to run only the checks you want at any given time.

Pharmaceutical



# THE LIGHT THAT GUIDES YOU



International pharmaceutical standards are important to safeguarding drug quality and making medicine accessible to the public. Pharmaceutical laboratories have three chief concerns: remaining compliant, validating performance, and functioning properly from day to day. We've developed our **FL 6500** and **FL 8500** fluorescence spectrometers to work seamlessly with intuitive software that helps you meet standard guidelines and regulations.

Our **Enhanced Security (ES) software** helps labs maintain Title 21 CFR Part 11 compliance and adhere to stringent data integrity requirements, preventing you from incurring costly fines and downtime.

[Click on the chief concerns for more information.](#)

Support

## Support

From instrument qualification to software assurance to remote monitoring, OneSource® Laboratory Services can provide the service and support you need to stay compliant and keep your lab running smoothly every step of the way.



Pharmaceutical

# SHINE A LIGHT ON INNOVATION

[Click on the examples for more information.](#)

Advanced materials is not just about making newer, better products; it's also about their effect on human health and the environment. Whether you're determining how the pesticides used in spraying crops end up in our water sources, or simply verifying the identity of currency, fluorescence spectroscopy is at the center of your research.

And, as a global leader in nanomaterial analysis, we offer an array of analytical instrumentation that provides clean, rapid analysis of even the most challenging organic, carbonaceous, and hybrid nanomaterials.

## Testing for Pesticides in Water

How *do* pesticides find their way into our water sources? Our **FL 8500** can find out. Scientists measure the efficiency of crop-spraying techniques by spraying an ecologically friendly fluorescent dye and measuring the amount of fluorescence that's been deposited. As long as the compound of interest fluoresces or can be tagged with a fluorescent molecule, it can be analyzed.



# SHINE A LIGHT ON INNOVATION

[Click on the examples for more information.](#)

Advanced materials is not just about making newer, better products; it's also about their effect on human health and the environment. Whether you're determining how the pesticides used in spraying crops end up in our water sources, or simply verifying the identity of currency, fluorescence spectroscopy is at the center of your research.

And, as a global leader in nanomaterial analysis, we offer an array of analytical instrumentation that provides clean, rapid analysis of even the most challenging organic, carbonaceous, and hybrid nanomaterials.

## Measuring Anticounterfeiting Features in Banknotes

Counterfeit currency costs governments and businesses vast amounts of time and money every year. A simple fluorescence test using our high-sensitivity **FL 8500** can be used to verify the identity of currency through the security thread and the background fluorescence of the bill. Fluorescence is also used in drivers' licenses and other security cards to prevent counterfeiting.



# SHINE A LIGHT ON INNOVATION

[Click on the examples for more information.](#)

Advanced materials is not just about making newer, better products; it's also about their effect on human health and the environment. Whether you're determining how the pesticides used in spraying crops end up in our water sources, or simply verifying the identity of currency, fluorescence spectroscopy is at the center of your research.

And, as a global leader in nanomaterial analysis, we offer an array of analytical instrumentation that provides clean, rapid analysis of even the most challenging organic, carbonaceous, and hybrid nanomaterials.

## Assessing the Efficiency of Protective Clothing

Chemical protective clothing (CPC) such as cotton work shirts, work pants, and nonwoven garments is recommended for pesticide sprayers to limit their exposure to chemicals. Our **FL 8500** can help determine CPC performance by measuring fluorescent tracer deposition on skin surfaces beneath garments with a video imaging analysis instrument (VITAE system) and by alpha-cellulose patches placed outside and beneath the garments.





# LIGHT THE WAY TO LEARNING

[Click on the examples for more information.](#)

From teaching labs to research experiments, academics everywhere are benefiting from fluorescence spectroscopy. Whether you're determining the amount of quinine in tonic water or showcasing absolute quantum yield using our integrated sphere, the **FL 6500** and **FL 8500** are beneficial teaching tools in any academic lab.

We work closely with academic institutions around the world to help them reach their analysis goals, which can cross both sample types and markets.

## Studying Histamine in Fish

Histamine levels rise in fish when the food is attacked by bacteria. That can result in an unpleasant burning sensation and can cause anaphylactic shock if eaten. With the help of fluorescence and our **FL 8500**, histamine levels can be properly measured for safety.



# LIGHT THE WAY TO LEARNING

[Click on the examples for more information.](#)

From teaching labs to research experiments, academics everywhere are benefiting from fluorescence spectroscopy. Whether you're determining the amount of quinine in tonic water or showcasing absolute quantum yield using our integrated sphere, the **FL 6500** and **FL 8500** are beneficial teaching tools in any academic lab.

We work closely with academic institutions around the world to help them reach their analysis goals, which can cross both sample types and markets.

## Determining Whisky's Authenticity

As whisky becomes more popular, food adulterers are concocting cheap blends and selling them as single-malt scotches. Luckily, our **FL 8500** can help detect the fakes by using colored dyes to compare different drinks.





# FL 6500

## Pulse Fluorescence Spectrometer

### Adjustable Power Settings

With the unique **FL 6500**, the power is literally in your hands. Adjust the setting to optimize dynamic range and protect your sample – **20 kW, 40 kW, 80 kW, and 120 kW** – you're in control. How's *that* for innovative?

Built for bioresearch, including cell biology, molecular biology, immunology, enzymology, protein analysis, and thin coatings, this groundbreaking technology boasts unique features and benefits such as:

- A pulse Xenon lamp and user-defined power settings that increase dynamic range
- Better resolution that increases the number of spectral peaks that can be resolved, improving identification and qualification
- Faster scan speeds that support greater productivity
- Protection from photobleaching

And since it only occupies 66 cm (26 in.) of bench space, you can get the most out of your work area and maximize your productivity.

FL 6500

Solution

# FL 8500

## Continuous Wave Fluorescence Spectrometer

This innovative technology is made for material characterization; industrial dye, tracing, and printing manufacturing and R&D; agricultural and environmental analysis; analysis of LEDs, solar cells, and organic electroluminescent materials. Its unique features and benefits include:

- Continuous wave excitation
- High-sensitivity measurements at scan speeds of up to 60,000 nanometers per minute
- Accurate measurements of diluted and/or small sample amounts
- High-quality results the first time and every time

The **FL 8500** is preferred when photobleaching isn't a concern. And, like the **FL 6500**, it only occupies 66 cm (26 in.) of bench space, freeing up room in your lab.



### Power at the Speed of Light

The **FL 8500** uses a high performance **photomultiplier tube (PMT) detector, 150-watt Xenon lamp, and our optics**, which enables rapid scans, high sensitivity over wide wavelength range, increasing productivity, and capabilities.

FL 8500

Solution



# Accessories as Versatile as Your Lab

Simple, intuitive, adaptable – our interchangeable, plug-and-play accessories make the **FL 6500** and **FL 8500** truly remarkable instruments. The accessories are automatically recognized by the software, minimizing downtime between changes and giving you more time to test.

Our convenient accessories – from the one-sample single cell holder to the 384-well microplate reader – are flexible enough to handle virtually any type of sample. The best part is that you don't have to purchase all 26 accessories at once. Start with the ones you need now, and add more as your applications expand.

## Integrating Sphere

Measure absolute quantum yield for liquid and solid samples with our integrating sphere. When used with either the **FL 6500** or **FL 8500**, you can achieve flexibility even with low absorbency and low quantum yield samples.



## Absorbance Module

This straightforward, simple-to-use accessory enables you to perform rapid measurements in the ultraviolet-visible region.



## Microplate Reader

For DNA quantitation, enzyme-linked assays, protein measurements, cell viability testing, and drug research and testing, our microplate reader can be fitted with a 96- or 384-well plate, allowing for high-throughput screening.

Accessories

Solution

# ACCESSORIZE TO SUIT YOUR LAB

Explore our full list of accessories that have been specially designed to work with both the **FL 6500** and the **FL 8500** spectrometers.



## Single-Cell Holder

Hold a singular sample in a multitude of volumes.



## UV-Vis Automated Polarizer

Measure the polarization of your sample via the filter wheel.



## Four-Position Multicell Water-Jacket Holder

Temperature control a water bath. Hold up to four samples.



## Single-Cell Water-Jacket Holder

Temperature control a water bath to keep your sample at an ideal temperature.



## Manual Polarizer Holder

Manually perform polarization and isotopy measurements at multiple angles.



## Four-Position Multicell Water-Jacket Holder with Stirrer

Temperature control a water bath while stirring your solution. Hold up to four samples.



## Single-Cell Water-Jacket Holder with Stirrer

Temperature control a water bath while stirring your solution.



## Manual Rapid Mixing Accessory

Monitor kinetic reactions in solution with this stopped-flow technique.



## Single-Cell Peltier Holder

Use when precise temperature is necessary.



## Microcell Holder

Analyze small amounts of sample (as low as 10 uL) in multiple volumes.



## Rapid Mixing Accessory with Pneumatic Drive

Monitor kinetics reactions in solutions by stopped-flow technique.



## Four-Position Multicell Peltier Holder

Use when precise temperature is necessary.



## Microcell Water-Jacket Holder with Stirrer

Analyze small amounts of sample (as low as 10 uL) via our water-jacket feature.



## Rapid Mixing Accessory Cover

Use with Rapid-Mixing Accessory with Pneumatic Drive.



## Microplate Reader

Measure samples in 96- or 384-well plate.



## Solid-Sample Holder

Analyze powders, films, paper, plastics, and more.



## Absorbance Module

Calculate rapid absorbance measurements in the ultraviolet region.



## Fast Filter (excluding filters)

Analyze rapid intracellular ion movements into and out of cells.



## Variable-Angle Solid-Sample Holder

Analyze powders, films, paper, plastics, and more.



## Fiber Optic Probe

Measure sensitive samples and run experiments outside of the instrument.



## Autosipper (with front plate and FL flow cell)

Use for liquid sampling.



## Precision Cell for Powder Sample

Use with Solid-Sample Holder or Variable-Angle Solid-Sample Holder.



## Integrating Sphere

Measure absolute quantum yield for liquid and solid samples with low absorbance or low quantum yield.



## S10 Autosampler

Automate standard and sample introduction for instrument calibration and sample analysis.



## Vis Automated Polarizer

Measure the polarization of your sample via the filter wheel.



## Four-Position Multicell Holder

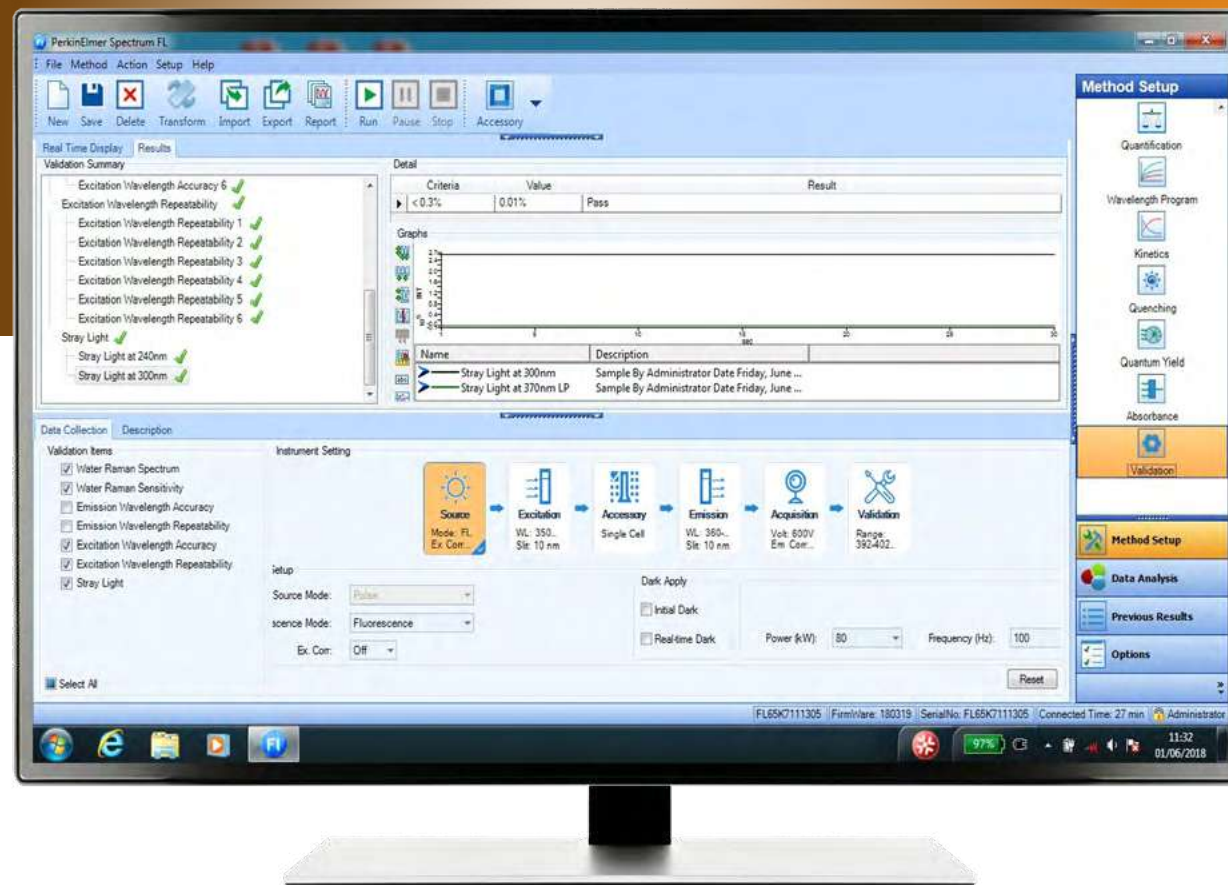
Hold up to four samples in a multitude of volumes.

# Software That's Simple

Now you can have a full suite of molecular spectroscopy instruments with corresponding software functionality right at your fingertips. Spectrum FL ES data acquisition and analysis software is 21 CFR part 11 technical compliant, encompassing data security, access control, data integrity, and audit trailing features, including user-defined electronic signature points and customizable signature reasons.

The software mirrors your laboratory workflow to streamline method development and get you from lamp warm-up to accurate results in minutes. Similar to Spectrum 10, our simple-to-use, intuitive software features:

- Easy-to-build methods that can be run on a daily basis by chemists or technicians
- A user-friendly interface with step-by-step instructions that guide you through your sample run
- Ability to read LS 45 and LS 55 data files, as well as UV WinLab data files



Software

Solution

# Software That's Simple

We say our software is intuitive – that means it enables you to create methods, run the instrument, and analyze the data quickly and easily.

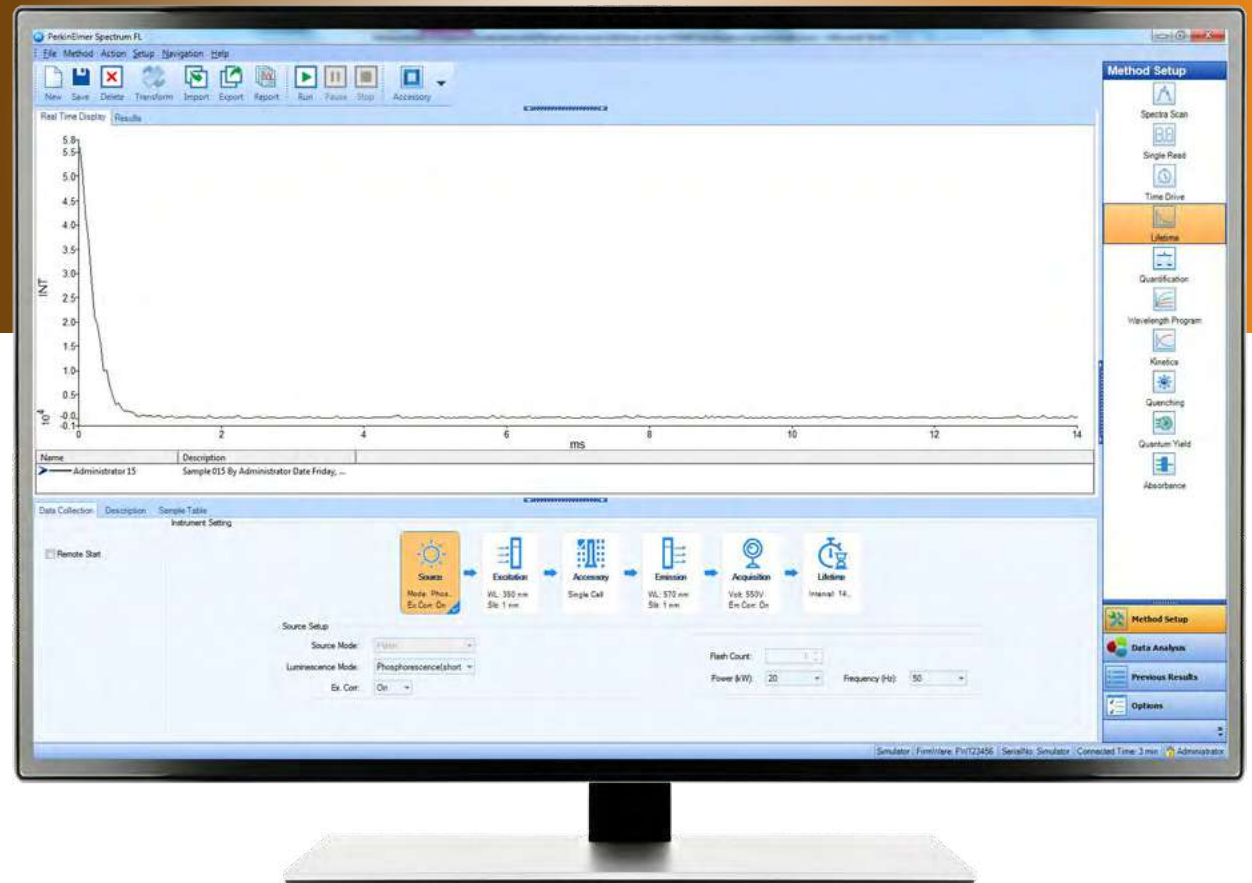
The following are main modes in which the software works:

Fluorescence	Single Read	3D Synchronous Scan
Phosphorescence	Pre-Scan	Synchronous Scan
Luminescence	Validation	

The following are featured data analysis tools:

Spectra Scan	Kinetics	Lifetime
3D-Spectra Scan	Intracellular Ion Concentration	Absorbance
Quantification	Quantum Yield	Validation
Anisotropy/Polarization	Quenching	Service Utility
Time Drive	Wavelength Program	Sample Table

Additional software benefits include the readability of FLWinLab and UVWinLab data files, and accessory auto recognition.



Software

Solution



# Compliance

## That Works With Your Workflow



Achieving regulatory compliance is important for your day-to-day lab productivity. From ensuring the quality performance of your instrument to making sure your software runs to specification, OneSource® Laboratory Services ensures that your equipment meets the standards of operation and safety.

Click on these services to learn more.

► Instrument Qualification

### Instrument Qualification

When it comes to installing and maintaining your instruments, OneSource Laboratory Services can qualify your equipment, ensuring standard compliance regulations are met and providing installation qualification and operational qualification (IQ/OQ) peace of mind. OneSource offers both automated and traditional paper qualification methods. Standard recommended OQ protocols can be customized to fit your specifications.

### Automated Qualification

The universal operational qualification (UOQ) is designed to streamline documentation across all lab instruments, regardless of manufacturer. Benefits include:

- Simplified OQ with uniform reports
- Existing data acquisition system
- Automation
- Encrypted secure reporting

### Traditional Paper Qualification

For total lab efficiency, this qualification method ensures consistent, reliable, accurate data with instrument qualification services. Benefits include:

- Qualification protocols using calibration standards
- Applications-based custom protocol development
- Execution of customer developed protocols
- IQ/OQ/PQ protocols library

Compliance / Service & Support

Solution

# Compliance

## That Works With Your Workflow



Achieving regulatory compliance is important for your day-to-day lab productivity. From ensuring the quality performance of your instrument to making sure your software runs to specification, OneSource® Laboratory Services ensures that your equipment meets the standards of operation and safety.

Click on these services to learn more.

► Software Qualification

► Radian™ Remote Monitoring Service

### Software Qualification

OneSource also provides several IQ/OQ offerings for software qualification and the assurance that instrument data is reliable and consistent for the highest quality results. Your lab can benefit from the features included in all enhanced security (ES) software including:

- Integration with your workflow
- Customizable methods and permissions
- Ensured validation
- Electronic records and reports that can't be falsified



Compliance / Service & Support

Solution

# Compliance

## That Works With Your Workflow



Achieving regulatory compliance is important for your day-to-day lab productivity. From ensuring the quality performance of your instrument to making sure your software runs to specification, OneSource® Laboratory Services ensures that your equipment meets the standards of operation and safety.

Click on these services to learn more.

► Radian™ Remote Monitoring Service

### Increase Uptime with Built-in Remote Monitoring

Avoid the high costs incurred with system downtime and failures with **Radian™ remote monitoring service**. With Radian, you benefit from real-time monitoring of your system's diagnostic parameters. When something is out of spec, OneSource service engineers can diagnose the issue remotely and solve it faster. If an onsite visit is required, our specialists know what's needed before they arrive, enabling faster resolution time.



Compliance / Service & Support

Solution

**PerkinElmer, Inc.**  
940 Winter Street  
Waltham, MA 02451 USA  
P: (800) 762-4000 or  
(+1) 203-925-4602  
**[www.perkinelmer.com](http://www.perkinelmer.com)**

For a complete listing of our global offices, visit [www.perkinelmer.com/ContactUs](http://www.perkinelmer.com/ContactUs)

Copyright ©2018, PerkinElmer, Inc. All rights reserved. PerkinElmer® is a registered trademark of PerkinElmer, Inc. All other trademarks are the property of their respective owners.