Lumilux 5100

Fluorescence Spectrometer

The SCINCO Lumilux 5100 fluorescence spectrometer offers unparalleled sensitivity for precise and accurate measurements.

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Illuminate Your Science

The SCINCO Lumilux 5100 fluorescence spectrometer offers unparalleled sensitivity for precise and accurate measurements. Elevate your analysis to a new level of clarity with its industry-leading 0.5 nm spectral bandwidth for both emission and excitation measurements.

Our extensive line of accessories enables you to build a complete laboratory system, while the LuxMaster software empowers you to move seamlessly from data acquisition to results reporting.

Lumilux 5100

Fluorescence Spectrometer

From life sciences to materials, photophysics to quantitative analysis, the Lumilux 5100 fluorescence spectrometer is designed to provide the research-quality data you need at scan speeds of up to 60,000 nm/min.
Designed and manufactured to the highest standards, it offers both high sensitivity and throughput in a rugged and reliable system.

The resourceful SCINCO LuxMaster software makes data acquisition, analysis and reporting straightforward. With features such as fluorescence, chemi/bio luminescence, and phosphorescence measurements, simultaneous excitation and emission spectra using two independent monochromators, and various sample measurement modes (Prescan, Spectra Scan, Kinetics, Lifetime, Quantification, Single Read, and Synchronous Scan), you can quickly move from spectra to answers.

Our software's auto-recognition feature allows you to easily switch between a wide range of optional accessories without any downtime, increasing sample throughput and productivity. Qualification documentation is also available to assist with instrument qualification.

We understand that your laboratory requires more than just an instrument, which is why we offer a complete fluorescence system that includes software and various accessories to create a flexible instrument for shared research laboratories or a dedicated QA/QC.

A Complete System

High-Resolution System

The Lumilux 5100 uses 20 cm focal length monochromators to deliver a narrow, 0.5 nm spectral bandwidth for high resolution measurements. Its independent excitation and emission monochromators provide efficient acquisition of both spectra, as well as synchronous scan capabilities.

Fast Scanning Drive

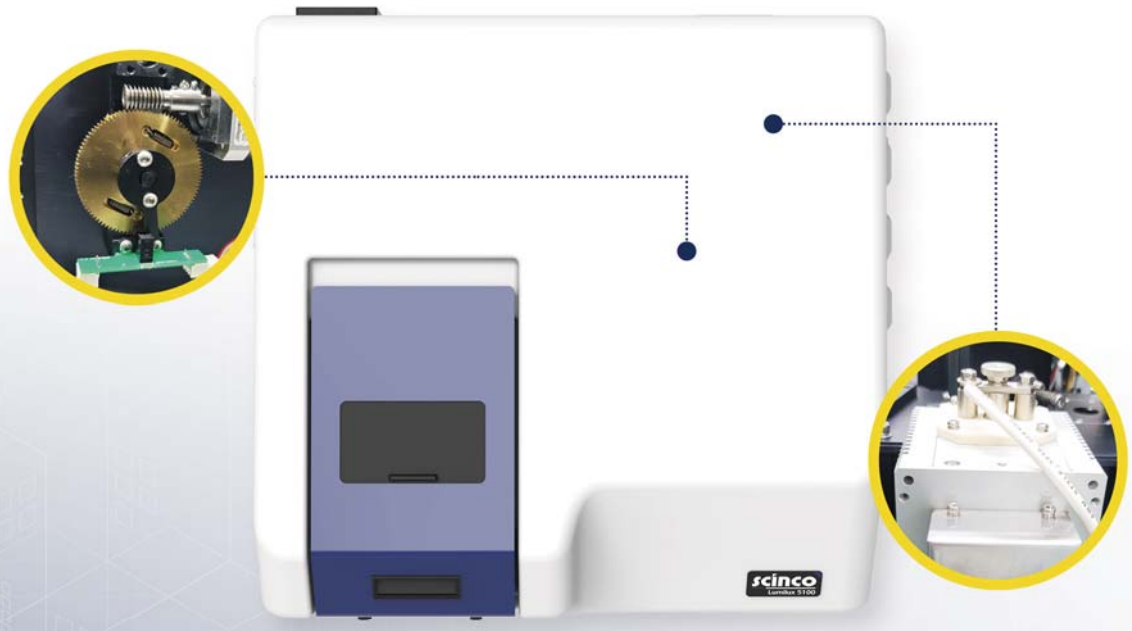
Acquire data at speeds up to 60,000 nm/min with the precision wavelength drive of our fluorescence spectrometer. Streamline synchronous and 3D experiments to maximize your sample throughput.

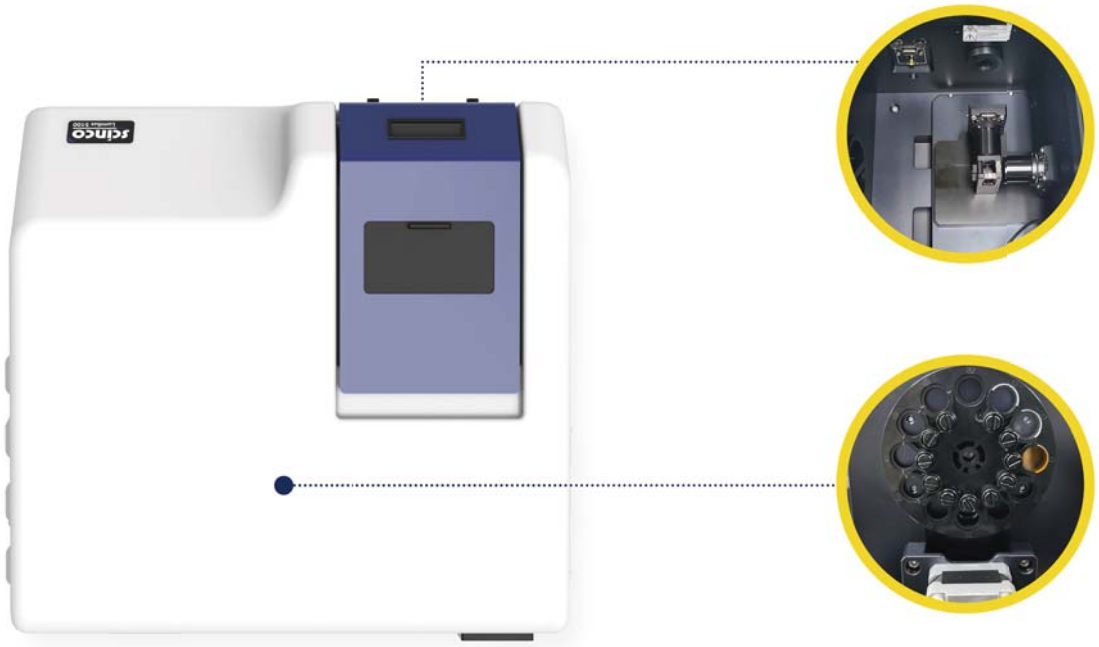
Variable Spectral Bandwidth

Match the resolution you need with the compound you are analyzing by selecting the appropriate spectral bandwidth for your measurement. Choose from 0.5, 1.0, 2.5, 5.0, 10, or 20 nm bandwidths for both excitation and emission monochromators.

Powerful Illumination

Experience consistent and intense illumination throughout the full wavelength range, from UV to near-IR, with the ozone-free 150 W Xenon lamp.





Customizable Filters

Easily customize your measurements with the automated 12-slot filter wheels that accept standard 12.5 mm round filters. Longpass filters are included to block excitation and scattered light, ensuring high spectral purity. The system comes with standard 290, 370, and 530 nm excitation filters, and 320, 430, and 515 nm emission filters, but additional filters and polarizers can be easily added to suit your specific measurement needs.

Horizontal Beam Geometry

Our fluorescence spectrometer features a horizontal beam geometry that provides optimum excitation to deliver the maximum fluorescence signal. Accurate measurements can be made with only 5 uL sample.

Large Sample Compartment

The Lumilux 5100's large sample compartment easily accommodates accessories for temperature control, multi-cell holders, integrating sphere, microplate reader, and polarization accessories. This allows you to customize the system to suit your specific applications and obtain the expected results from a high-resolution spectrometer.

Sensitive Detector

The Lumilux 5100 features a high-performance R-928 PMT detector with an extended measurement range of 190 to 900 nm, providing unparalleled sensitivity for the analysis of near-IR dyes, chlorophyll, or phthalocyanine compounds.

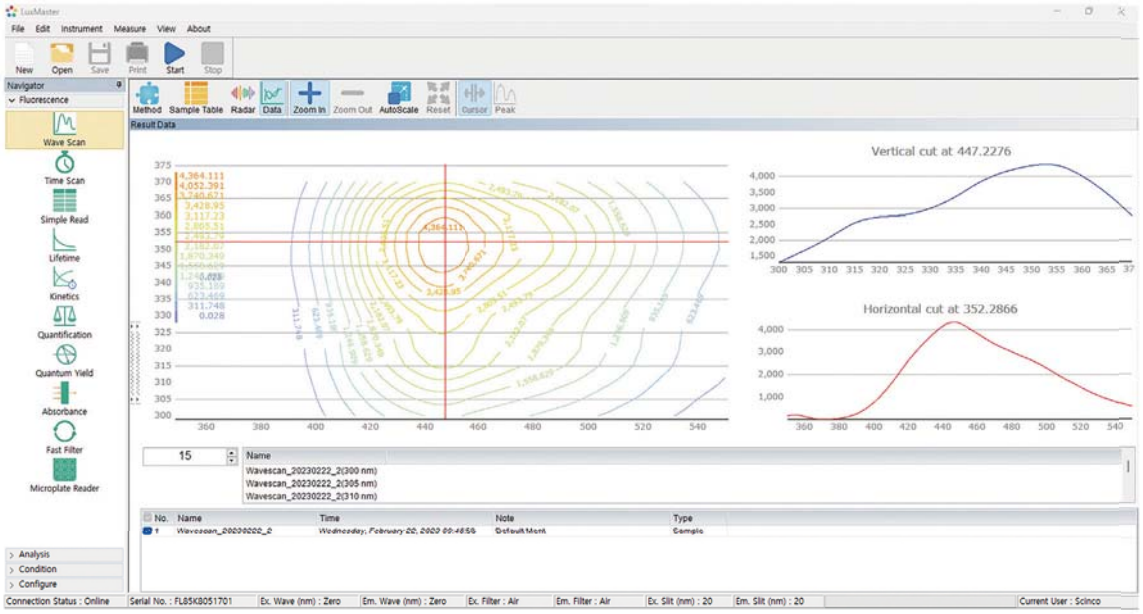
Powerful Software

LuxMaster

The LuxMaster software provides comprehensive control over the Lumilux 5100 fluorescence spectrometer and its accessories. With integrated data acquisition and post-run spectral analysis, system validation, and diagnostic testing, LuxMaster offers a seamless platform for all your fluorescence measurements. The intuitive method setting allows you to easily configure measurement parameters, and the full suite of data processing tools enables in-depth analysis of your results. Moreover, LuxMaster allows for customization of reports, making it easy and effective to share your findings with others.

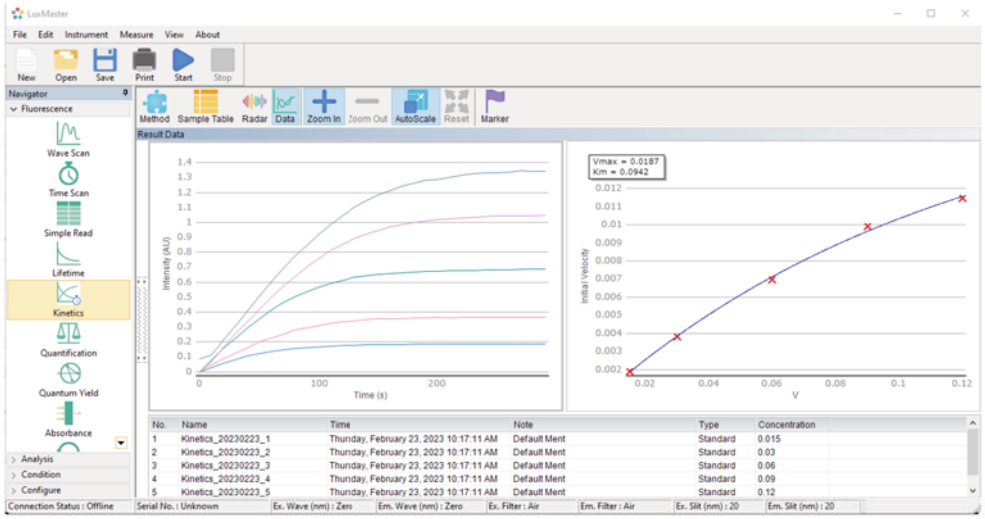
Wave Scan

· Full spectrum display (190 – 900 nm)
· Measurement of fluorescence, phosphorescence, and bioluminescence
· Analysis of mixtures with synchronous mode
· Automatic or manual identification of up to 50 peaks or valleys
· 3D scan mode for in-depth analysis of excitation and emission spectra



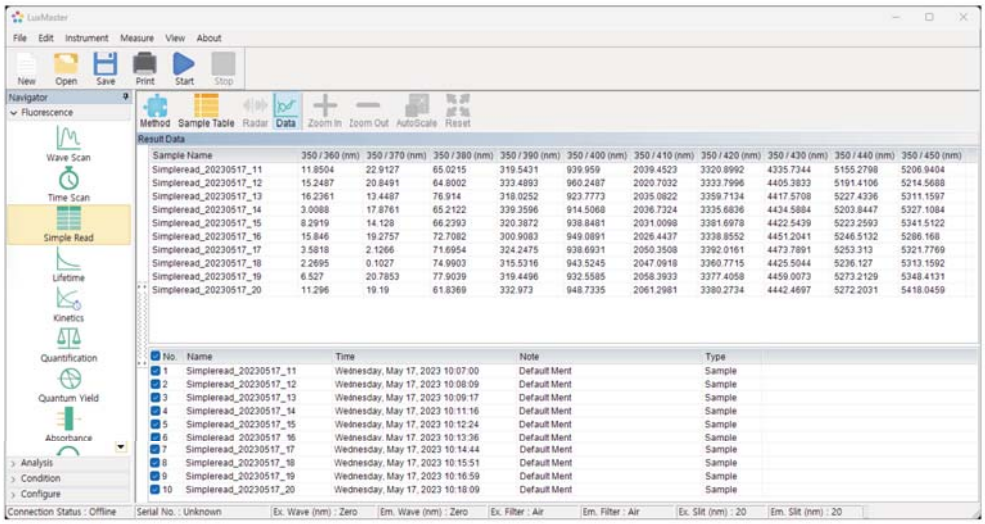
Time Scan / Lifetime / Kinetics

- **Time Scan** : Time-based analysis for studying dynamic changes in fluorescence signals over time
- **Lifetime** : Automatic calculation of phosphorescence lifetime of samples
- **Kinetics** : · Analysis of reaction rates using various kinetic models such as Initial Rate, Zero Order, First Order, and Delta AU
  - · Measure reaction rate of enzyme-catalyzed reactions based on substrate concentration for studying enzyme kinetics
  - · Calculation of Km and Vmax from each plot for determining enzyme parameters
  - · Offer various analysis models such as Michaelis-Menten, Lineweaver-Burk, Hanes-Woolf, and Eadie-Hofstee for comprehensive kinetic analysis



Simple Read

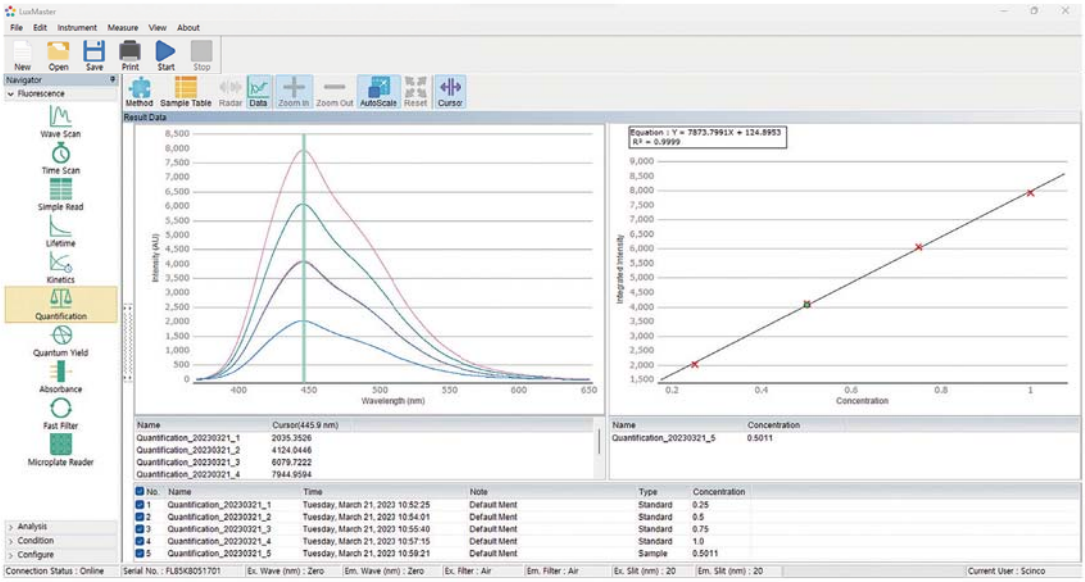
· Quick and easy measurement at selected wavelengths for rapid data acquisition



Powerful Software

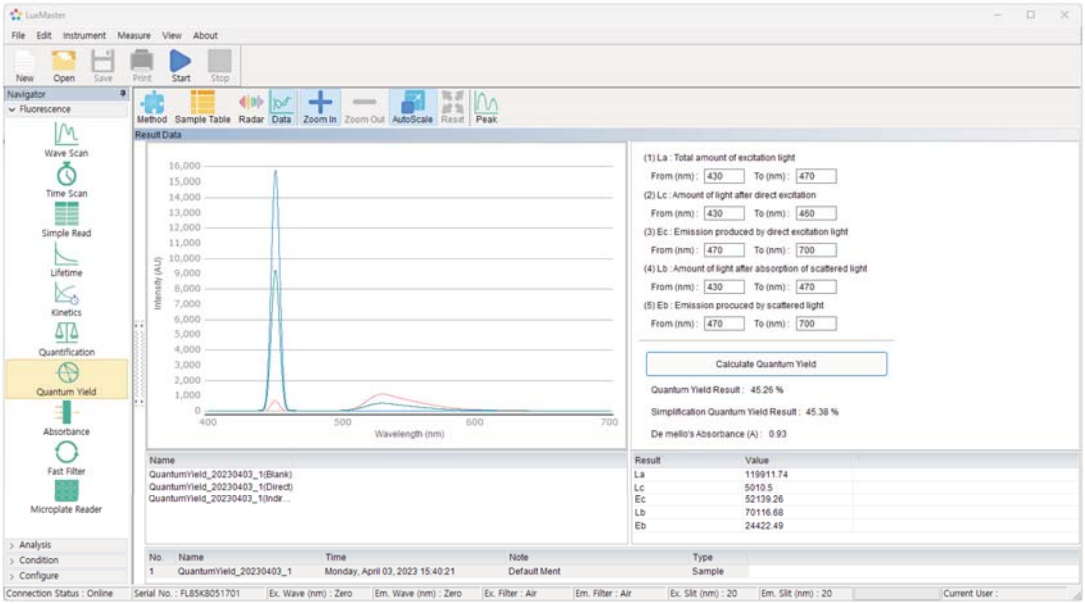
Quantification

· Selectable wavelength or scan method
· Provide options for first, second, and third-order curve fitting to data for accurate quantification
· Automatically calculate the concentration of unknown samples
· Ability to change the wavelength for creating a calibration curve after measuring standard samples



Quantum Yield

· Measure absolute quantum yield of samples
· Automatically calculate quantum yield
· Recalculate quantum yield data by loading the saved data
· Offer valuable insights into the quantum efficiency of samples for various applications, such as material characterization, chemical analysis, and biological research

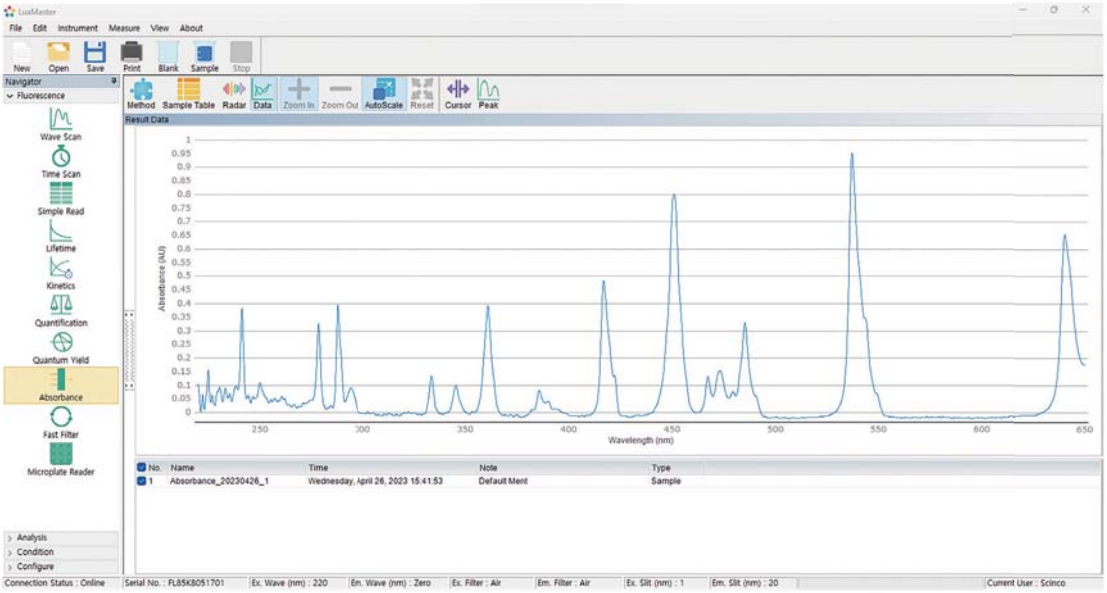


Absorbance

· Selectable wavelength or scan method

· Wavelength mode : Measure absorbance at a selected wavelength, allowing for quick and specific measurements

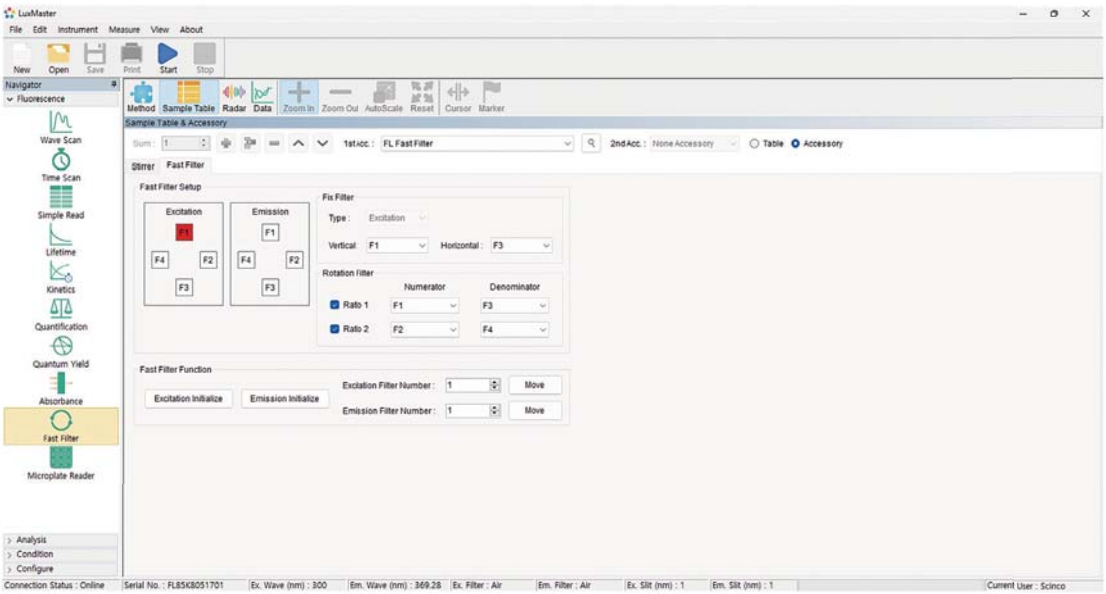
· Scan mode : Display complete absorbance spectrum across the full wavelength range of 190 - 900 nm



Fast Filter

· Enable rapid acquisition of ratiometric data using the Fast Filter accessory, allowing for real-time monitoring of intracellular ion concentrations, such as Ca^{2+} and Mg^{2+}

· Polarization and anisotropy measurements providing valuable insights into the structure and dynamics of fluorescent molecules

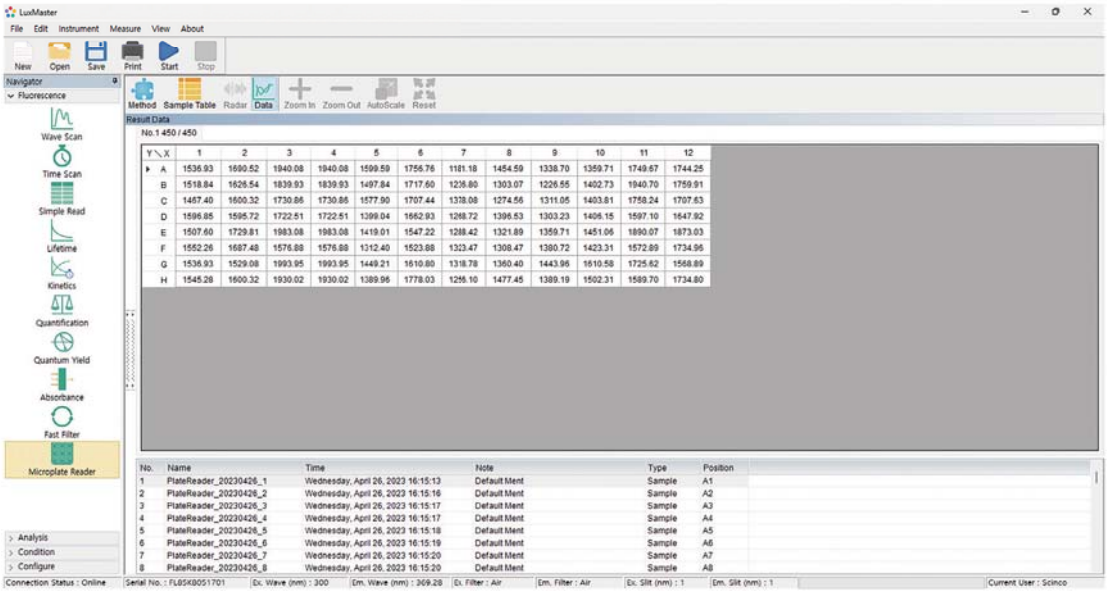


Powerful Software

Microplate Reader

· Compatible with various types of microplates, including 96-well and 384-well formats, offering versatility for different experimental needs

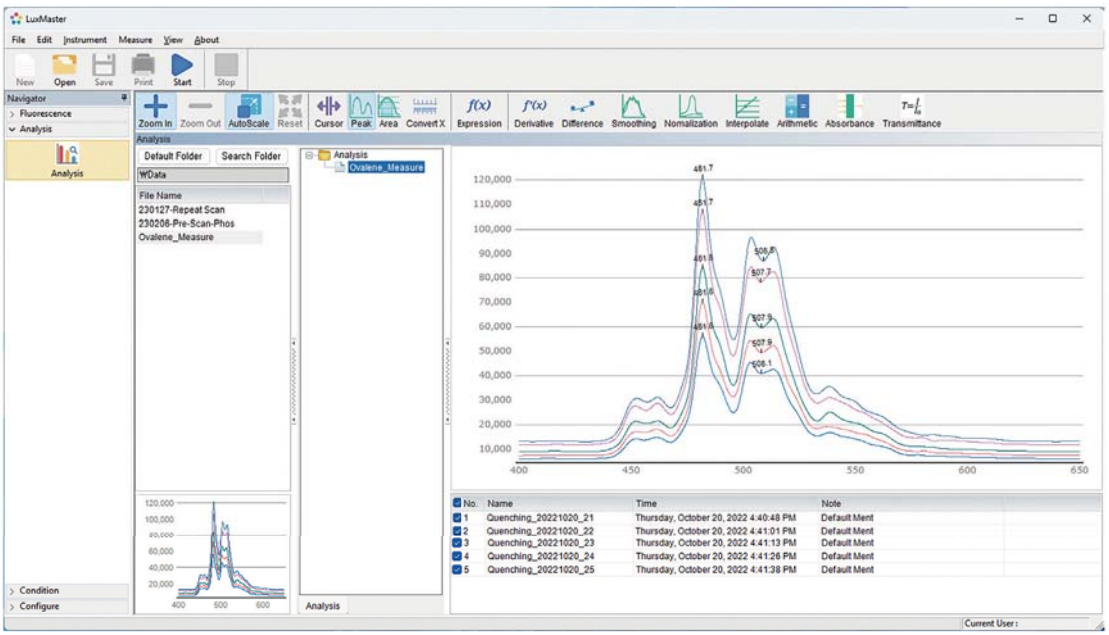
· Provide precise temperature control of the sample through a thermostatic accessory, allowing for temperature-sensitive assays and experiments



Analysis

· Enable users to input custom equations to evaluate data

· Provide calculation of peaks, valleys, and areas of interest in the acquired data



Condition

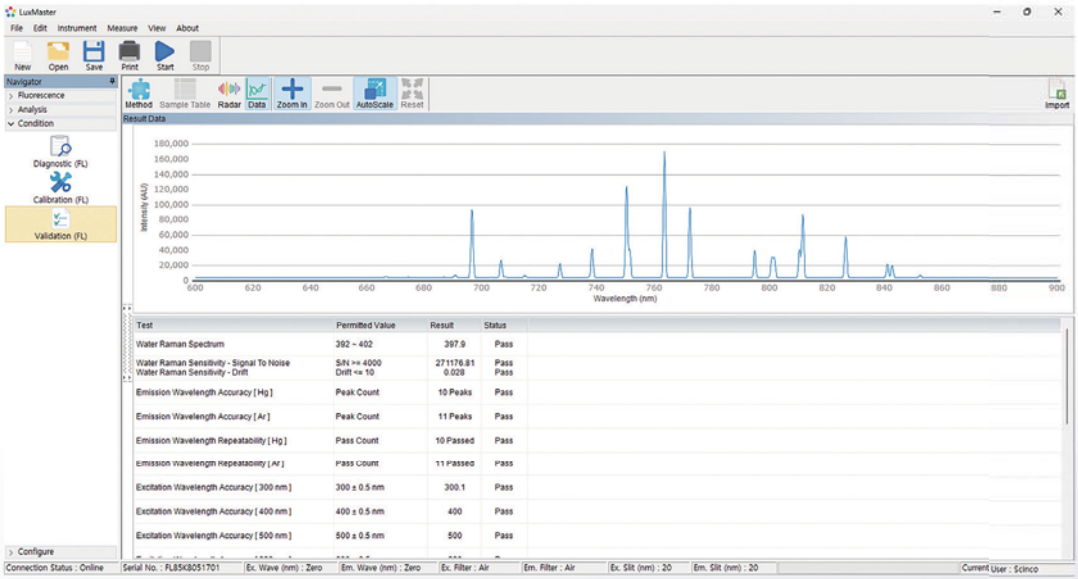
Diagnostic / Validation

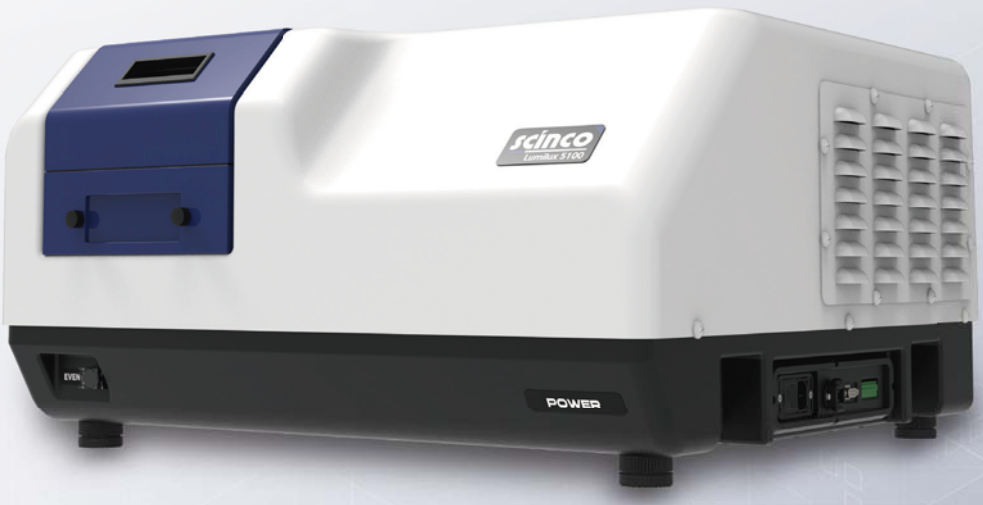
· Diagnostic

Equipment status can be periodically checked through simple measurements

· Validation

- The Validation Wizard in the Validation Software for LuxMaster can verify the instrument performance
- The 4Q document covers the Design, Installation, Operation and Performance Qualification
- Various tests such as Water Raman, Sensitivity, Wavelength Accuracy, Wavelength Repeatability, and Stray Light Test can be performed





Various Accessories

The Lumilux 5100 has a broad range of accessories to support various applications.

Single Cell

FL Single Cell Holder

Water Jacketed
FL Single Cell Holder

Water Jacketed FL Single
Cell Holder w/ Stir

The single cell holder can accommodate standard cuvettes /
cells with dimensions of 12.5 x 12.5 mm.
Optional temperature control through a water bath, as well as stirring, is available.

4 Pos Multi-Cell

4 Pos FL Multi-Cell Holder

4 Pos Water Jacketed
FL Multi-Cell Holder

4 Pos Water Jacketed
FL Multi-Cell w/ Stir

Accommodate up to 4 cuvettes / cells simultaneously and is controlled
through the LuxMaster software.
Optional temperature control through a water bath, as well as stirring, is available.

Micro Cell

FL Micro Cell Holder

Water Jacketed FL Micro Cell Holder w/ Stir

Micro Cells

Adjustable micro cell holder (8.5 mm to 15 mm center/z height of cell) used with microcell cuvettes allows to measure the volume as low as 5 ul.
Optional temperature control through a water bath, as well as stirring, is available.

Peltier Accessory

Peltier Temp. Controller

FL Single Cell Peltier Holder

4 Pos FL Multi-Cell Peltier Holder

FL Peltier Powder Sampling Accessory

Deliver the power of Peltier temperature control for extreme temperature accuracy and reproducibility from -5 to 100 °C. Temperature probe accessories allow you to monitor temperature in two cuvettes during measurement.

Various Accessories

The Lumilux 5100 has a broad range of accessories to support various applications.

Solid Sample Holder

FL Solid Sample Holder

FL Variable Angle Solid Sample Holder

FL Precision Cell for Powder Sample

Useful for the measurement of high-concentration liquid, powders, films, paper, plastic samples, etc. Optional Quartz Powder Cell is available.

Allow for complete 360 degree rotation and enables the measurement of high-concentrated liquid, powders, films, paper, plastic samples, etc. Optional Quartz Powder Cell is available.

Microplate Reader

Microplate Reader

Microplate Reader Cover

Microplate Reader Thermostatic Accessory

Enable high-throughput screening of proteins and enzymes with 96 or 384 well plates on the Microplate Reader. Optional temperature control through a water bath and Microplate Reader Thermostatic Accessory is available.

Rapid Mixing Accessory

Rapid Mixing Accessory

Rapid Mixing Accessory w / Pneumatic Drive

The Lumilux 5100 enables the measurement of reaction kinetics in solution using the stopped-flow technique, with its 20 microsecond data acquisition time providing accurate kinetic data. The pneumatic drive allows for push-button operation and ensures high accuracy for zero time measurements.

FL Integrating Sphere

Enable measurement of absolute quantum yield for liquid and powder samples.

FL Absorbance Module

The photo diode detector mounted on the accessory enables measurement of sample absorbance in the UV-Vis range.

Various Accessories

The Lumilux 5100 has a broad range of accessories to support various applications.

Fast Filter

FL Fast Filter

FURA-2 Filters : Excitation: 340/380 nm, Emission: 510 nm

INDO-1 Filters : Excitation: 351 nm, Emission: 400/480 nm

Wire Grid Polarizer VIS or UV-VIS Range

Used for fast data acquisition in the biochemical studies, such as intracellular ion concentration calculation using various ion probes (FURA-2, INDO-1, etc.). Additionally, polarization and anisotropic applications are available by mounting polarizers on the accessory.

Polarizer Accessory

UV-Vis/Vis Automated Polarizer FL

FL Manual Polarizer Holder

Useful for measuring polarization and anisotropy, the instrument offers the option of using either automated polarizer filters that can be easily installed in the inner filter wheel or a manual polarizer accessory.

FL Fiber Optic Probe

Well-suited for the measurement of liquid and powder samples and is commonly used for process and on-line monitoring applications.

FL Low Temperature Sampling Accessory

Allow for the measurement of fluorescence and phosphorescence at cryogenic temperatures using liquid nitrogen.

FL Auto Sipper

Provide complete software control for automation of liquid sampling.

Wide Range of Applications

Fluorescence measurements provide valuable insights into molecular properties and behavior through a spectroscopic window. The SCINCO Lumilux 5100 fluorescence spectrometer offers exceptional sensitivity and high resolution for accurate and reliable performance in both research and routine laboratory analysis. The Lumilux 5100 is suitable for a wide range of applications, meeting the demands of various scientific fields.

Material Characterization

- Analysis of fluorescence characteristics of organic and inorganic materials
- Development of versatile materials using Quantum Dots
- Study of the excitation and emission spectra of LED, OLEDs, and high-intensity fluorescence for displays
- Characterization of nanoparticles and nanostructures

Analytical Chemistry

- Identification and detection of fluorescence materials
- Analysis of chemical reactions
- Verification of characteristics in the excited state
- Measurement of quantum yield and phosphorescence lifetime

Life science

- Basic research on biological reactions
- Quantification of DNA, RNA, and proteins
- Enzyme activation analysis
- Investigation of protein-DNA/RNA interactions using polarization, FRET, BRET, etc.
- Measurement of intracellular ion concentration using various ion probes (FURA-2, INDO-1, etc.)

Pharmaceutical

- Analysis of structural information of chromosomes
- Morphological research of the viruses
- In vivo mechanism and concentration distribution tracing of antibiotics

Environment

- Quantification of fluorescence whitening agents
- Distribution analysis of organic compounds in water samples
- Highly sensitive detection and distinction of organic and inorganic toxic materials in air, water, soil, and other environmental samples
- Characterization of crude oils and Polycyclic Aromatic Hydrocarbons (PAHs) present in water, soil, seawater, and other environmental samples
- Measurement of chlorophyll a and b
- Determination of aluminum concentration in water samples

Foods

- Assess food quality and nutrient conditions in the agriculture and food industries
- Measure histamine levels for food safety confirmation
- Quantify vitamin concentration in food

Others

- Qualifying the spreading condition of paint, polymer, fluorescence brightening agent, etc.
- Identifying counterfeit currency, passport, driver licenses, etc.

Specifications

Lumilux 5100	
Light Source	150 W Xenon-Arc Lamp
Detector	Photodiode for reference PMT for Excitation and Emission Spectrum
Monochromator	1,200 grooves/mm
Slit Width	0.5, 1, 2.5, 5, 10, 20 nm
Wavelength Range	190 - 900 nm for Excitation and Emission
Wavelength Accuracy	≤ ±0.5 nm
Wavelength Repeatability	≤ 0.2 nm
Wavelength Scan Speed	Max. 60,000 nm/min
Sensitivity	4000 : 1 (RMS) 1000 : 1 (Peak to Peak)
Interface	USB
Dimensions	66 (W) x 64 (D) x 36 (H) cm
Weight	approx. 47 Kg
Power Requirements	100 - 240 V at 50/60 Hz

Computer Requirements

LuxMaster	
Processor	Intel® Core i3 CPU or faster processor
RAM	At least 4GB
Communication	USB Port
Operating System	Microsoft® Windows 10 or 11

Warranty

One-year full warranty provided for the complete system

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