Innovation is What We Do at ISS

SpectralFLIM 320

Parallel 320-Channel Spectral FastFLIM

The ISS SpectralFLIM 320 combines ultra-fast parallel digital FLIM acquisition with high-resolution spectral imaging to capture spectral and fluorescence lifetime information at every pixel. Unbiased phasor analysis enables confident identification and quantification of fluorescent species, providing deeper insights into complex biological systems.

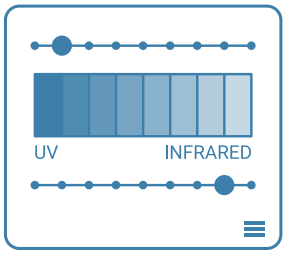
The ISS SpectralFLIM 320 delivers simultaneous spectral and fluorescence lifetime imaging across 320 parallel detection channels, enabling researchers to confidently distinguish spectrally overlapping fluorophores, quantify multiple fluorescent species, and monitor dynamic biological processes in real time. Fast, unbiased, and optimized for complex multiplexed imaging, SpectralFLIM transforms multidimensional fluorescence data into clear, quantitative insights.

By adding spectral (λ) and fluorescence lifetime (τ) information to the traditional confocal imaging dimensions (x, y, z, c, t, p), SpectralFLIM creates a comprehensive eight-dimensional (8D) dataset that provides deeper characterization of biological and materials samples than conventional imaging alone.

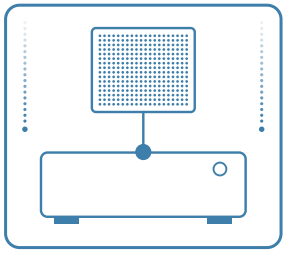
The system combines a precision diffraction grating, 320 avalanche photodiode (APD) detectors, high-speed signal processing electronics, and USB 3.0 data acquisition to capture fluorescence with 1 nm spectral resolution per channel. The parallel detection architecture supports photon count rates up to 140 Mcps with 12.5 Mcps per spectral channel, ensuring exceptional sensitivity and acquisition speed for demanding imaging applications.

Integrated phasor and spectral phasor analysis provide rapid, model-free visualization and quantitative interpretation of complex spectral lifetime datasets, helping researchers extract meaningful biological and materials insights with greater confidence.

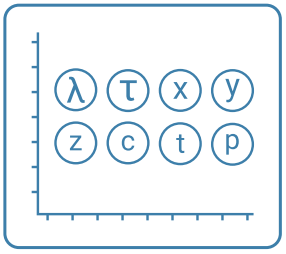
320 PARALLEL CHANNEL DETECTION
Increase imaging speed and throughput while tailoring spectral resolution to your application. Choose full spectral resolution or binning to 160, 64, or 32 channels for more accurate and reliable fluorescence lifetime analysis.



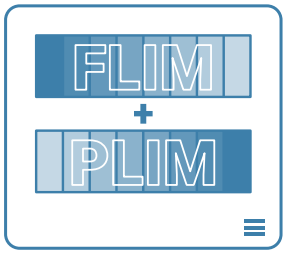
FLEXIBLE SPECTRUM RANGE
Flexible UV, visible, and near-infrared spectral tuning allows researchers to easily switch between wavelength ranges for a wide variety of fluorescence investigations.



ADD-ON MODULE
Easily integrates with ISS Alba STED, Alba v5, Q2, PL1, Evident (Olympus), Zeiss, and Nikon confocal systems, providing a simple upgrade path for existing confocal microscopes.



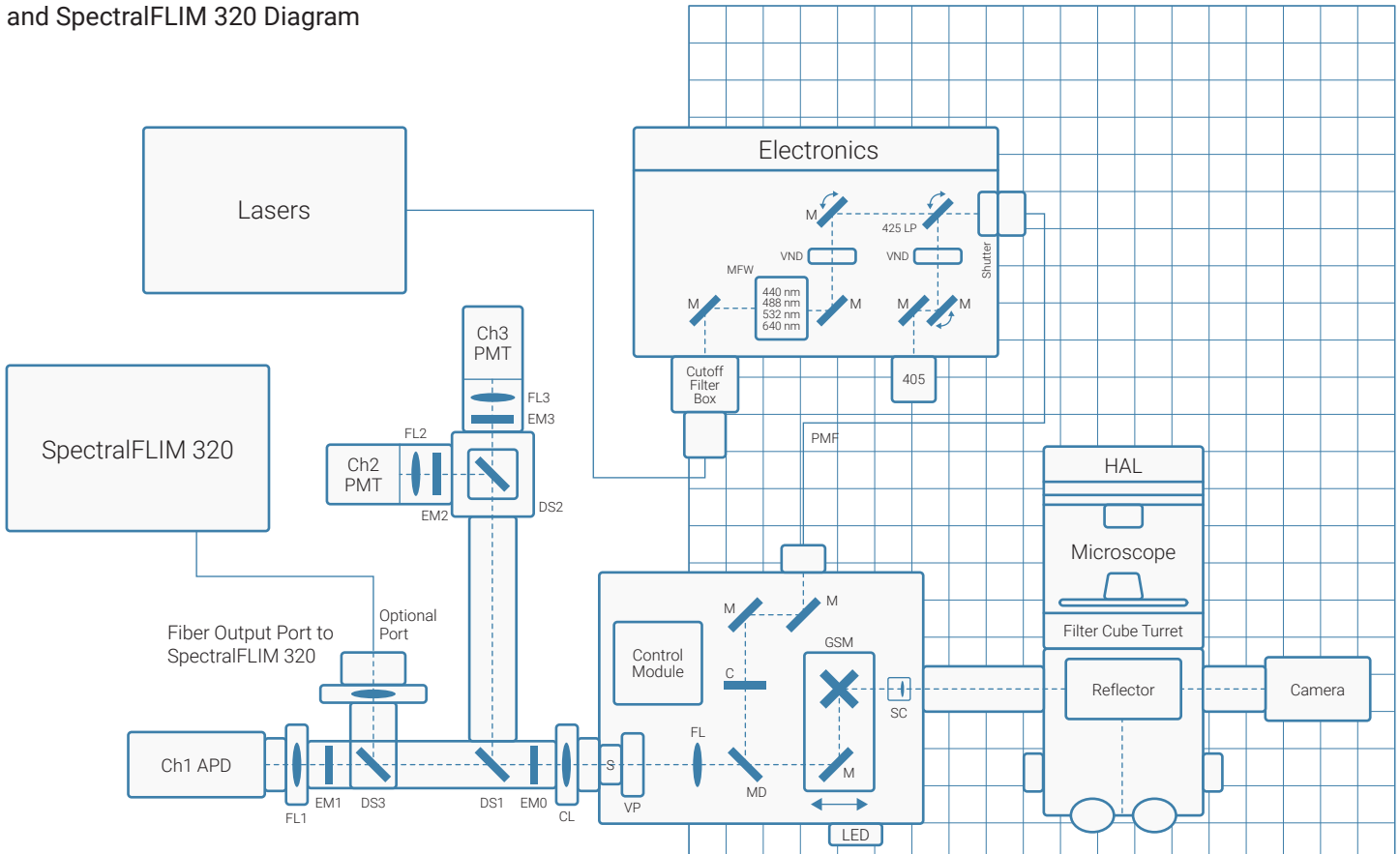
EIGHT-DIMENSIONAL (8D) INTEGRATED DATA ANALYSIS
Combine spatial, temporal, spectral, and fluorescence lifetime information into a single integrated dataset for comprehensive visualization and quantitative analysis.



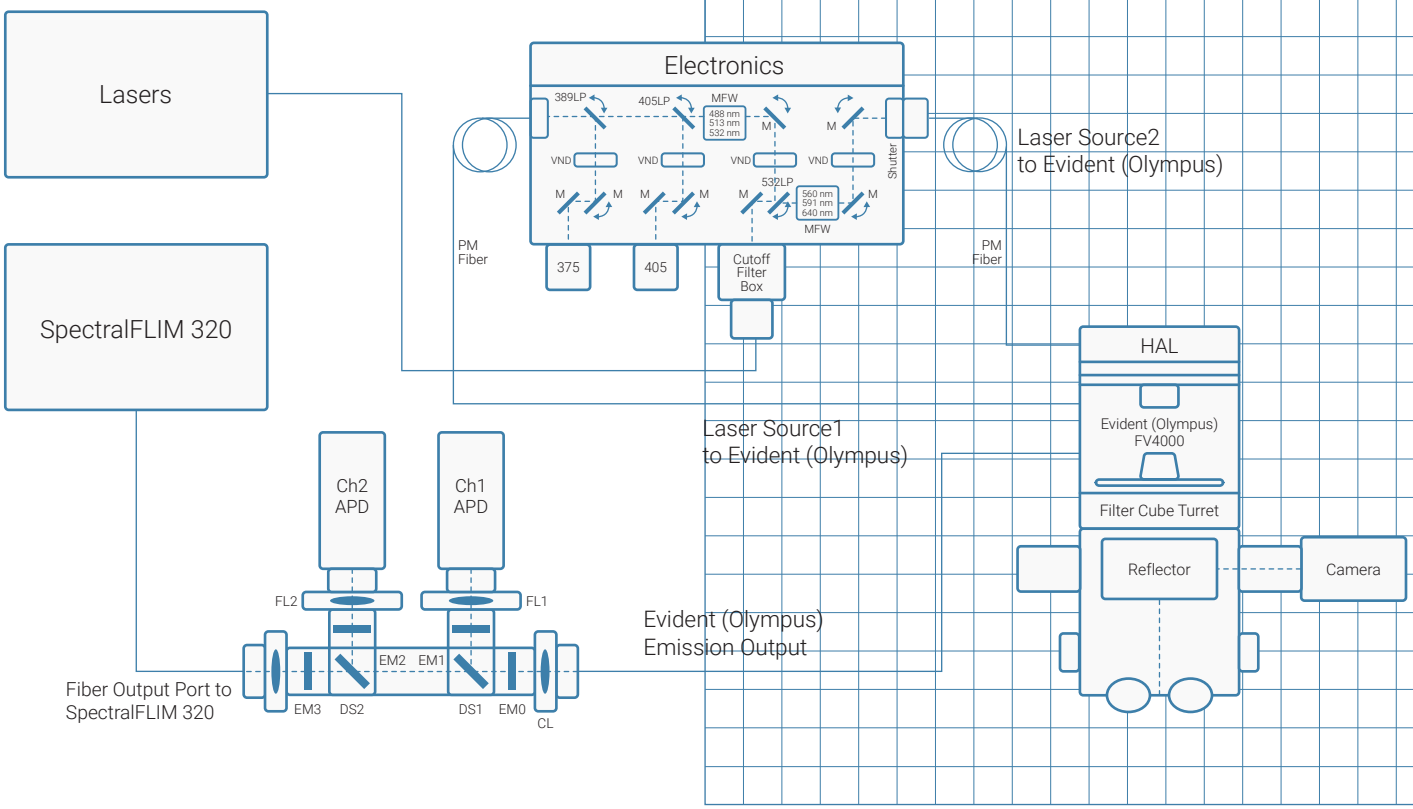
FLIM & PLIM SPECTRUM
Measure fluorescence and phosphorescence lifetimes from 12.5 ns to 1 ms, providing exceptional flexibility for diverse materials science and chemical research applications.

FOR MORE INFORMATION OR TO REQUEST A QUOTE PLEASE CONTACT US AT: ISS@ISS.COM

Q2 and SpectralFLIM 320 Diagram



Evident (Olympus) FV4000 and SpectralFLIM 320 Diagram



Instrument Specifications

320-Channel Linear Array APDs Characteristics

- **Array Size:** 320 x 1 Channels
- **Detection Wavelength Range:** 400 - 950 nm
- **Peak Detection Probability:** 50% @ 520 nm
- **Time Resolution in Time Tagging Mode:** 20 ps

Spectrograph and Fiber Diameter

- **Groove Density (grooves/mm):** 1200
- **Linear Dispersion (nm/mm):** 34.6
- **Spectral Width (nm):** 320 (adjustable between 400 nm to 950 nm)
- **Fiber Input Diameter:** 100 µm

320-Channel Parallel Data Acquisition Characteristics

- **Number of Independent Data Acquisition Channels:** 320
- **Data Transfer:** 2 x USB 3.0
- **Decay Times Measurement Range:** 20 ps - 1 ms
- **External Laser CLK Synchronization:** 80 MHz – 1 KHz (LVTTL / TTL, 50 Ω)
- **Image Scanning Synchronization:** Pixel/Line/Frame Clock Inputs
- **Raw Data Size:** 32 bits
- **Raw Data File:** Hybrid 8-Dimension Bit-Packed Photon Event Structure
- **Median Dark Count Rate:** < 250 cps
- **Maximum Channel Count Rate:** 12.5 M cps
- **Maximum Photon Throughput (time tagging mode):** 140 M cps

Unit Specifications

- Dimensions: 22 x 12 x 22 cm
- Weight: 4 kg
- Operating Voltage: 100 - 220 VAC, 50/60 Hz
- Operating Ambient Temperature: 18 - 30 °C
- Humidity: < 40%

Instrument Compatibility

- ISS (Alba STED, Alba v5, Q2, PL1)
- Evident (Olympus) FV Series
- Nikon
- Zeiss LSM Series

References

Characterization of a time-resolved spectral detector for spectral fluorescence lifetime imaging with the parallel 16-channel FastFLIM and the phasor analysis
Yuansheng Sun, Trung Duc Nguyen, Yuan-I Chen, Ulas C. Coskun, Shih-Chu Liao, Hsin-Chih Yeh
Proceedings Volume 12384, Multiphoton Microscopy in the Biomedical Sciences XXIII; 1238408 (2023)
https://doi.org/10.1117/12.2656271

Phasor S-FLIM: a new paradigm for fast and robust spectral fluorescence lifetime imaging
Lorenzo Scipioni, Alessandro Rossetta, Giulia Tedeschi & Enrico Gratton
Nature Methods, 18(5), pp. 542-550, 2021, Apr. doi: 10.1038/s41592-021-01108-4

ISS™ focus and discover
1602 Newton Drive
Champaign, IL 61822 USA
Phone: 888-359-8681
iss@iss.com
www.iss.com

All trademarks and logos are the property of their respective owners.
© 2026 ISS, Inc.
All Rights Reserved