HALCYONE Fire

Femtosecond Fluorescence Spectrometer

Ultrafast SYSTEMS

Spectrometers for Cutting Edge Photoscience

Fluorescence Spectral Range: 270-1600 nm

Fully Automated Hands Free Design

HALCYONE Fire is a femtosecond fluorescence spectrometer designed to work with an amplified femtosecond laser or a femtosecond oscillator. A complete turnkey system, Halcyone Fire measures fluorescence lifetimes with femtosecond time resolution and our standard 8 nanosecond time window. The time window is extendable to ms and beyond with the time-correlated single photon counting (TCSPC) extension. Halcyone Fire is available with two detector options: single wavelength PMT and multi-wavelength CCD. At any time the Halycone Fire's detector can be upgraded to include the other detector option to extend the capabilities of the instrument.

FEATURES

- 2-unit design with the optical bench isolated from the electronics and detectors.
- Advanced user-friendly LabVIEW based software for instrument control and data acquisition
- Broad fluorescence spectral range
- Unprecedented degree of automation:
  - Automated optical delay line alignment (Smart Delay Line™)
  - Automated pump beam alignment
  - Automated switching between UV, VIS, and NIR fluorescence spectral ranges
- 8 ns built-in time window (extendible to milliseconds with the TCSPC add-on)
- Parabolic reflectors for probe management ensure uniform focusing of all wavelengths
- Fiber coupled detectors external to the main housing
- Optional computer controlled filter wheel for varying pump energy, etc.
- Magnetically stirred sample holder. Easily interchangeable with optional XY rastering sample holder

SPECIFICATIONS

Time window

8 ns	Time window can be extended beyond 8 ns with the TCSPC add-on.

Temporal resolution

The instrument response function (IRF) of Halcyone Fire is determined by several factors, such as the laser pulse duration, non-linear crystal length, and sample cuvette thickness. A typical IRF of Halcyone Fire is ~250 fs.

Detectors

Thermoelectrically cooled CCD camera (1024 x 255 pixels) with fiber coupled spectrograph.

Single photon counting PMT with a fiber coupled monochromator.

Dimensions

Optical bench	W24" x L36" x H10" - W610 x L915 x H250 mm
Electronics rack	W21" x L24" x H27" - W534 x L610 x H686 mm

Supported laser repetition rate

1 kHz - 100 MHz

Fluorescence spectral range

UV	270-400 nm
VIS	400-800 nm
NIR	800-1600 nm

Customizable

Customizations include but are not limited to integration of cryostats and magnets.

TCSPC add-on

Temporal resolution	100 ps
Fluorescence Spectral range	270-1600 nm
Time Window	ms and beyond

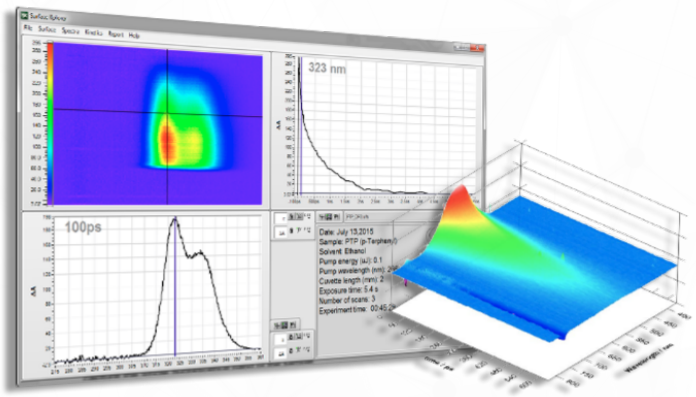
The add-on consists of a monochromator with a fast single photon counting detector and the necessary electronics. It seamlessly integrates with the optical bench and utilizes the same optical set-up used for fluorescence upconversion.

SOFTWARE

Unprecedented Degree of Experiment Automation

Halcyone Fire features versatile and user-friendly LabVIEW based software for instrument control and data acquisition. The software allows for full experiment automation, so no input from the user is required for the whole experiment duration. The software is also very user-friendly and versatile:

- Supports a PMT detector with a computer-controlled monochromator.
- Supports a CCD detector with a high throughput spectrograph.
- Takes into account the pump and fluorescence wavelengths and automatically adjusts the computer controlled non-linear crystal's angle.
- Automated alignment of the optical delay line.
- Computer controlled switching between UV, VIS, and NIR fluorescence spectral ranges.
- Supports computer controlled translating sample holder.
- Supports pump beam shutter.
- Supports motorized filter wheel for automated pump intensity control.
- Saves every individual kinetic scan, so if experiment is aborted (due to laser fluctuations, power outages, etc.) all previous scans are not lost.
- Threshold adjusted automatic probe intensity spike rejection - advanced setting which collects data points again if the probe is not stable.
- API (Application Programming Interface) for HALCYONE Fire is provided for further experiment customization and integration with external applications.



Surface Xplorer - Data Analysis Software

The SURFACE XPLORER software is designed to save you a lot of time analyzing your transient absorption/emission data. These data sets come in a form of a 3D surface and are usually quite large. When processed with third-party software they require a great deal of manual copying and pasting in order to display particular spectra/kinetics, perform non-linear fitting or simply remove bad data points. This can be very time consuming!

sales@ultrafastsystems.com
+1-941-360-2161

Ultrafast SYSTEMS

Spectrometers for Cutting Edge Photoscience