

MicroTime 100



Upright Time-Resolved Confocal Fluorescence Microscope

- Complete microscope with laser coupling module
- Laser wavelengths from 375 nm to 810 nm
- Multiple detector options
- Upright microscope base
- XY-scanning Piezo stage for 2D-lifetime imaging
- Wide range scanner with a scan range up to several cm (on special request)



Applications

- Lifetime mapping
- Time-resolved microscopy in biology and chemistry
- Semiconductor wafer testing and analysis
- Materials research
- Cell biology and Fluorescence Lifetime Imaging (FLIM)
- Fluorescence Correlation Spectroscopy (FCS)

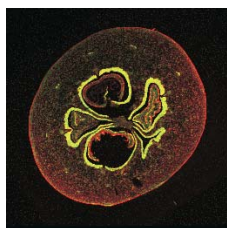
Upright Time-resolved Fluorescence Microscope

The time-resolved microscope MicroTime 100 contains the complete optics and electronics for recording fluorescence decays in small volumes by means of Time-Correlated Single Photon Counting (TCSPC). The system is based on a conventional upright microscope body. With the MicroTime 100, decay times down to some picoseconds can be resolved. The system allows operation at laser repetition rates as high as 84 MHz and count rates up to several million counts/sec.

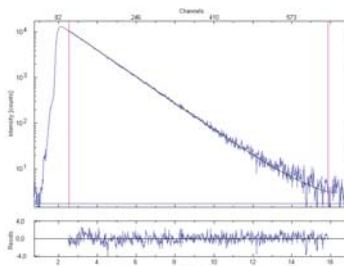
A laser coupling module with sophisticated beam shaping and focusing optics allows the use of external pulsed diode lasers. The system is designed to be used with the picosecond diode lasers of the LDH Series. Standard dichroic filter blocks are utilized to guide the light onto the sample and to filter out the fluorescence light. Standard PMT modules or SPAD detectors can be provided in a single or dual channel detector configuration. All data acquisition as well as analysis functions of the MicroTime 100 are controlled by the SymPhoTime software.

Further available is an inverse microscope, the MicroTime 200, with up to 4 detection channels for simultaneous detection of either polarization anisotropy or multicolor experiments.

Measurement Example



Fluorescence lifetime image of a young pome of pyrus malus, 8 × 8 mm, excitation at 470 nm with LDH picosecond diode laser, detected emission > 500 nm, 40x objective, 300 × 300 pixel



Time-resolved fluorescence lifetime measurement of Cy5 in Ethylene Glycol on a glass substrate. Excitation at 635 nm with LDH picosecond diode laser, 20 MHz repetition rate. The plot shows the sample decay (blue) and the fitted decay (black). The recovered fluorescence lifetime is 1.5 ns.

Options

High precision piezo scanning table, wide range scanner with centimeter scanning range, photomultiplier, hybrid photomultiplier or Single Photon Avalanche Diode (SPAD) detectors

Specifications

Excitation Sources

Picosecond diode laser wavelengths . . . 375 - 510 nm, 530 nm, 635 - 810 nm
 Repetition rate up to 40 MHz, (optional 80 MHz)



Detectors

Type PMT (PMA Series) SPAD (PDM Series). SPAD (τ-SPAD)
 Spectral range¹⁾ 185 - 650 nm . . 185 - 820 nm 400 - 1000 nm 400 - 1000 nm
 Dark counts (at 20°C, typ. value) < 50 cps < 900 cps < 250 cps < 100 cps
 Instrument Response Function²⁾ typ. 200 ps typ. 200 ps typ. 50 ps typ. 400 ps

Data Acquisition

Type PicoHarp 300
 Time resolution (bin width) 4 ps
 Dead time < 95 ns
 Time channels per curve up to 65536
 Discriminator level, zero cross adjust . . . software adjustable
 Collection time 1 ms to 10 h

Scanning (optional)

Type high precision
 Range 80 × 80 μm
 Positioning accuracy < 10 nm

Operation & Electrical

PC requirements PC Pentium Class, 2 GHz, 1024 MB memory with Windows™ XP/Vista/7
 Power requirements 220/240 or 110/120 VAC, 50/60 Hz

Dimensions

Microscope unit 320 × 600 × 600 mm (w × d × h)

1) other detectors and cooling available upon request, 2) IRF @ λ = 650 nm

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