

MicroTime 200

A Versatile, Highly Customizable Microscopic Platform for Time-Resolved Microscopy.

- Complete confocal system with excitation unit, inverted microscope body and highly customizable optical unit from deep UV to NIR
- Streamlined, “hands-on” operation offering full control over the instrument
- Turn-key diode lasers for multicolor excitation from 375 to 980 nm
- Up to 4 truly parallel detection channels using application-optimized detection with SPADs, PMTs or Hybrid-PMTs. TCSPC electronics with < 650 ps dead time per channel and 5 ps time bins
- Two optional exit ports for additional hardware like FlexLambda (compact wavelength selection unit), spectrographs, super-conducting nanowire detectors or other home-built options
- Additional excitation ports for coupling extra lasers
- Correlative measurements with Optical Tweezers or AFM
- Integration with a cryostat
- FLIMbee galvo scanner for high scanning speed or objective scanning imaging for highest sensitivity
- Widerange scanner for scanning and positioning in the cm range
- STED add-on for high resolution
- SymPhoTime 64: advanced software for data acquisition and analysis

Core Methodologies

- Single molecule FRET (burst and time trace analysis)
- Fluorescence lifetime imaging (FLIM)
- Fluorescence correlation spectroscopy (FCS)
- FLIM-FRET
- Anisotropy imaging
- Time-resolved photoluminescence
- Antibunching

Application Areas

- Dynamic structural biology
- Cell environmental sensing
- Characterizing functional nanovesicles
- Studying chemical reactions at the single molecule level
- Semiconductor research, solar cells research, LED/OLED research
- Nanomaterials
- Polymer research



Specifications

Excitation	
	1 - 8 lasers with choice of wavelengths from 375 - 980 nm, up to 2 additional ports for coupling external lasers
Individual laser operation modes	pulsed and Continuous Wave (CW) (continuous mode availability depends on the laser model)
Repetition rates	1 - 40 MHz, for specific wavelengths up to 80 MHz (lower repetition rates are available via the SEPIA dedicated software)
Laser driver	8 channel Sepia PDL 828 L
Supported multi-line operation	Pulsed Interleaved Excitation (PIE) or simultaneous emission modes Custom Patterns via the SEPIA dedicated software available

Microscope	
	inverted Olympus IX73 body
Objective types	UPLSAPO 60x PlanApochromat, NA 1.2, water immersion, 400 - 900 nm UPLSAPO 100x PlanApochromat, NA 1.4, oil immersion, 400 - 850 nm other oil immersion, apochromatic correction, air spaced, IR-enhanced or long working distance objectives available
Observation modes	confocal, transmission optional: epi-widefield illumination, Differential Interferometric Contrast (DIC)
Oculars	Yes
Camera	Optional CCD camera at the left side port
Sample holder	Multi-functional sample holder compatible with several standard sizes of microscope coverslips and petri dishes

Detection		
Common detector*	SPAD	PMA Hybrid - 40
Types	SPCM-AQRH	
Spectral range	400 - 1000 nm	300 - 720 nm
Dark counts (at 20 °C, typ. value)	< 250 cps	< 300 cps
Typical photon detection efficiency	50 % at 550 nm 70 % at 650 nm	40 % at 500 nm
Timing response	200 - 400 ps (depending on wavelength)	< 120 ps



Scanning Options	
FLIMbee XY galvo scanner	Min. pixel dwell time: 0.5 μ s, Min. pixel size: 17 nm (60x objective) Up to 5.2 frames per second for a 512 x 512 pixel image Max. scan field: 200 x 200 μ m (60x objective)
XY objective scanning	Min. pixel dwell time: 0.2 ms Min. pixel size: 1 nm (independent of objective) Max. scan field: 80 x 80 μ m (independent of objective)
Piezo-based Z-scanning	Min. step size: 50 nm Overall range: 100 μ m
Wide range scanning	Overall range: 54 mm x 99 mm Max speed: 100 mm/second Positioning repeatability < 0.4 μ m in X < 0.6 μ m in Y

Data Acquisition			
	based on Time-Correlated Single Photon Counting (TCSPC) in Time-Tagged Time-resolved (TTTR) measurement mode in T3 and T2 modes		
TCSPC units	MultiHarp 150 P (standard option)	PicoHarp 330	HydraHarp 500 S
Time resolution (bin width)	5 ps	1 ps	1 ps
Dead time	< 650 ps	< 680 ps for edge trigger, 4.2 ns with CFD	< 680 ps for edge trigger, 6.8 ns with CFD
Timing precision	28 ps rms	3 ps rms typ.	3.5 ps rms typ.
Number of available detector inputs	8	Up to 4	Up to 8

Software	
Operating software	SymPhoTime 64 for acquisition and analysis offering multiple options for FLIM, FCS and time trace analysis
Operating system	Windows 11

General Info	
Operating environment	Room temperature range 15 - 25 $^{\circ}$ C Room temperature stability \pm 1.5 $^{\circ}$ C (recommended) Room humidity < 60 %
Optical table (minimum dimensions)	1200 x 680 (for up to 2 detectors) 1500 x 680 (for up to 4 detectors)
Power consumption	6 A at 230 V AC (typ. EU) 20 A at 110 V AC (typ. USA)
Operating voltage	115 or 230 V AC
Altitude	Guaranteed performance up to 2000 m above sea level

* Other types are available upon request.



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