FluoMic

Compact upright widefield photoluminescence microscope

- Widefield (time-resolved) photoluminescence microscope
- Based on time-correlated single photon counting (TCSPC)
- Lifetime detection range of a few ps to several ms with ps timing resolution
- Broad excitation wavelengths from 375 – 1060 nm
- Detection range 400 nm up to 1700 nm
- Easy data acquisition and powerful analysis with EasyTau 2 and SymPhoTime 64 softwares

Applications

- Semiconductor wafer testing and analysis
- Investigating solar cell materials and perovskites
- Studying minerals and crystals
- Analysing polymers and composites
- Characterizing LED materials and displays

In many cases, characterizing materials such as semiconductors or solar cells requires measuring their photophysical properties at various points with spatial resolution. Depending on the sample, scanning over a large sample area is often interesting, next to point measurements at various sites.
The FluoMic provides a fast, easy, and reliable way to measure steady-state (from UV to NIR) and time-resolved (from ps to ms) luminescence with micrometer spatial resolution.
Thank to its pre-aligned optical fibers, pulsed and cw laser light sources can be used to excite a sample at the microscope. In combination with FlexWave and SymPhoTime 64, steady-state PL spectra as well as wavelength selected decays and even TRES spectra can be measured from a small area (down to 2 µm) with FluoMic.
It is available with various microscope stands (e.g., the Olympus BX43, BX53(-P), BX63 and even BXFM).

Specifications

Microscope stands a				
Olympus	**BX43**	**BX53-P**	**BX63**	**BXFM**
Type	Upright, manual	Upright, manual	Upright, auto.	Upright, manual
Illumination	Transmission, Side-on Epi-Fluorescence	Transmission, Polarization Epi-Fluorescence	Transmission, Epi-Fluorescence	Epi-Fluorescence
Camera [a]	CMOS, 1280x1060 Pixel, Vis - NIR	CMOS, 1280x1060 Pixel, Vis - NIR	CMOS, 1280x1060 Pixel, Vis - NIR	CMOS, 1280x1060 Pixel, Vis - NIR
Dimensions (base unit) (w × d × h)	400 x 600 x 600 mm	400 x 600 x 600 mm	400 x 600 x 600 mm	400 x 600 x 600 mm
Weight (base unit) [b]	15 kg	20 kg	25 kg	20 kg
Objectives [a]				
Olympus	**10x**	**20x**	**40x**	**100x**
Magnification	10x	20x	40x	100x
Numeric aperture	0.40	0.40	0.65	0.90
Working distance	3.10 mm	1.20 mm	0.60 mm	1.00 mm
Spot size (excitation)[c] typ.	120 µm	60 µm	30 µm	12 µm
Spot size (emission) [c] typ.	20 µm	10 µm	5 µm	2 µm
Excitation sources				
Light source	**Laser Diode Heads (LDH Series)**		**ps Laser Module (Prima/Unico)**	
Wavelength range	375 – 1060 nm		405, 450, 488, 515, 640 nm	
Pulse width range	< 40 – 200 ps, up to 6,000 ps		< 85 up to < 170 ps	
Repetition rate	1 Hz up to 100 MHz		1 kHz up to 200 MHz	
Operation modes	Pulsed, cw and burst mode		Pulsed, cw and fast switched cw mode	
Detectors [a]				
PMT based	**PMA-C 175**	**PMA-C 192**	**NIR-PMT 1400**	
Spectral range	230 – 700 nm	230 – 920 nm	900 – 1400 nm	
Dark counts (at 20°C)	< 50 cps	< 1,100 cps	< 10,000 cps [d]	
TTS (FWHM)	< 180 ps	< 180 ps	< 370 ps	
Recom. max. count rate	< 5.0 MHz	< 5.0 MHz	<1.5 MHz	
PMT Hybrid	**PMA Hybrid-07**	**PMA Hybrid-40**	**PMA Hybrid-50**	
Spectral range	220 – 850 nm	300 – 720 nm	< 370 – 920 nm	
Dark counts (at 20°C)	< 150 cps	< 150 cps	< 600 cps	
TTS (FWHM)	< 50 ps	< 250 ps	< 160 ps	
Recom. max. count rate	< 80 MHz [e]			
SPAD based	**MPD**	**Excelitas**	**InGaAs MPD**	
Spectral range	< 400 – 1000 nm	< 400 – 1060 nm	< 850 – 1700 nm	
Dark counts (at 20°C)	< 100 cps	< 100 cps	< 400 cps	
TTS (FWHM)	< 50 ps (typ. < 35 ps)	< 250 ps (typ.)	< 50 ps (typ. < 35 ps)	
Recom. max. count rate	< 10.0 MHz	< 35 MHz	< 10.0 MHz	

TCSPC electronics				
TCSPC device	**PicoHarp 330**	**MultiHarp 150 4P**	**MultiHarp 150 4N**	**TimeHarp 260 Pico**
Number of channels	1 + 4[f]	1 + 4	1 + 4	1 + 2
Min. bin width	1 ps	5 ps	80 ps	25 ps / 2.50 ns (MCS)
Max. number of time bins	65,536	65,536	65,536	32,768
Full scale time range	65.5 ns - 550 ms	327 ns – 2.74 s	5.24 µs – 22.0 s	819 ns - 170 s (MCS)
Interface	USB 3.0	USB 3.0	USB 3.0	PCIe 2.0 x1
Scanning (optional)[g]				
Scanner	**Widerange scanner**	**Widerange scanner**	**Objective scanner**	
Type	XY Piezo widerange	XY Piezo widerange	XY Piezo obective	
Range	75 x 75 mm	25 x 25 mm	80 x 80 x 80 µm	
Min. step size	100 nm	75 nm	1 nm	
Positioning accuracy	600 nm	300 nm	10 nm	
Coupling (optional)				
Type	FlexWave	FluoTime 250	FluoTime 300	
Operation conditions				
PC requirements	Quad-core CPU > 3 GHz, RAM min. 4 GB			
Operation system	Windows™ 10/11			
Software	EasyTau 2		SymPhoTime 64	
Power requirements	220/240 or 110/120 VAC, 50/60 Hz			
Table	BX43: regular	BX53: regular	BX63: regular	BXFM: opt. Breadboard
Housing	available on request			

[a] Others on request

[b] Without breadboard and housing

[c] In combination with 200 µm multi-mosw fiber

[d] Values provided by Hamamatsu

[e] With cw excitation

[f] Upgradeable

[g] Not for BX63 available

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