

# Olympus cellSens



Installed 2015. Inverse widefield microscope unit with solid state LED light source and filter sets to image all conventional dyes. TIRF (405/488/561 nm) and single-point FRAP option (405 nm). Equipped with a 4 Megapixel sCMOS camera for fast high-resolution imaging, sensitive EM-CCD for TIRF and low-light applications, or color CMOS camera. Motorized stage for 5D-data acquisition, full environmental control for long-term live imaging. Microfluidics device for mammalian cells, yeast and bacteria. (Last update July 2021)

## Frame

Olympus IX-83, inverse, fully motorized, ZDC2 z-drift compensator (hardware autofocus)

## Objectives

Type	Working Distance (mm)	ZDC	
		Fluorescence	DIC
UPlanSApo 4x/0.16	13.0	No	No
UPlanSApo 10x/0.4	3.10	Search/Cont <sup>a</sup>	No
UPlanSApo 20x/0.75	0.60	Search/Cont	Search
UApo/340 40x/1.35 Oil Iris <sup>b</sup>	0.10	Search/Cont	Search
PlanApo N 60x/1.42 Oil	0.15	Search/Cont	Search
UApo N 100x/1.49 Oil TIRF Corr <sup>c</sup>	0.10	Search/Cont	Search

<sup>a</sup>Search: focus search/single-shot mode; Cont: continuous focusing

<sup>b</sup>UV transmission down to 340 nm, iris to lower NA to 0.7

<sup>c</sup>For TIRF, cover glass thickness correction 0.13-0.19 mm (23/37°C)

## Widefield Illumination

- White LED
- Lumencor SpectraX light engine (hybrid solid state LED) with 6 excitation bands

## TIRF Lasers

- 405 nm (100 mW laser diode, TIRF or FRAP)
- 488 nm (100 mW laser diode, TIRF)
- 561 nm (100 mW DPSS laser, TIRF)
- Laser combiner with clean-up filters (405/20 and 488/10) and laser-grade dichroics (LP 430, LP 525, LP 595)

## Filters

Pos.	SpectraX	Reflector Turret	Filter Wheel sCMOS	Filter Wheel EM-CCD
1	DAPI 390/22	DAPI/FITC/TRITC/Cy5	DAPI 442/46	DAPI 450/50
2	CFP 438/24	CFP/YFP/mCherry	CFP 480/40	GFP 525/50
3	GFP 475/34	GFP/mCherry	GFP 520/35	DsRed 600/50
4	YFP 510/25	Cy3	YFP 535/30	mCherry 645/75
5	Red 555/55 <sup>a</sup>	DIC	mCherry 641/75	Cy5 655lp
6	Cy5 631/28	M4TIR <sup>b</sup>	Empty	Empty

<sup>a</sup>May be replaced by Cy3 (549/15) or mCherry (575/25)

<sup>b</sup>Quadband TIRF dichroic

## Cameras

- Hamamatsu ORCA-Flash4.0 V2 sCMOS, 2048 x 2048 pixel, 6.5 x 6.5  $\mu\text{m}$  pixel size, up to 100 fps
- Hamamatsu ImagEM X2 EM-CCD, 512 x 512 pixel, 16 x 16  $\mu\text{m}$  pixel size, up to 70 fps, EM gain 4-1200
- Olympus SC50 color CMOS camera, 2560 x 1920 pixel, 2.2 x 2.2  $\mu\text{m}$  pixel size, up to 15 fps (full frame; 77 fps at 480 x 270 pixel)

## Stage/Inserts

- M-MS-IX3-2 scanning stage (120 x 80 mm, 10 nm step size, 3  $\mu\text{m}$  positioning accuracy, repeatability 1  $\mu\text{m}$ )
- Stage inserts for slides, 35 mm dishes and multiwell plates

## Software

- Olympus cellSens 3.1.1 running on Windows 10 (64-bit). Modules: Multidimensional Acquisition, Stage Navigator, Well Navigator, Count and Measure, TIRF

## Environmental Control

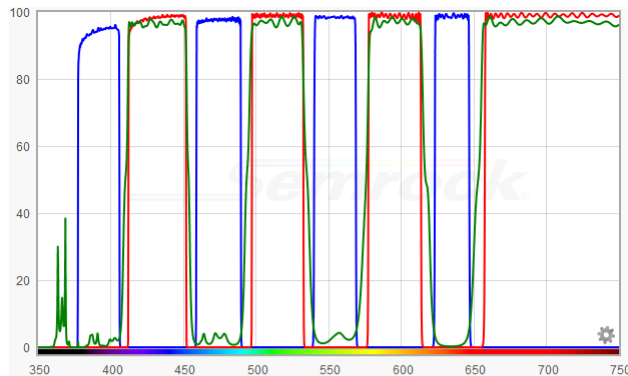
- Olympus cell<sup>vivo</sup> system for temperature control, PeCon CO<sub>2</sub> controller

## Additional Devices

- CellASIC™ ONIX microfluidic platform consisting of an EV262 microfluidic system and a MIC230 microincubator controller for temperature and gas control. Suitable for bacteria, yeast and mammalian cells (microfluidic plates to be provided by the users).

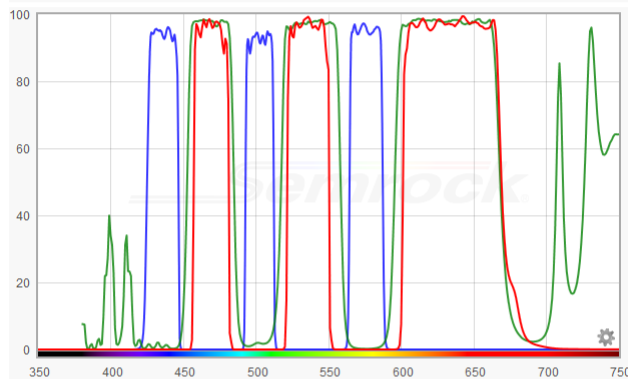
## Reflector Turret - Filter Cubes

Excitation: blue, dichroic: green, emission: red



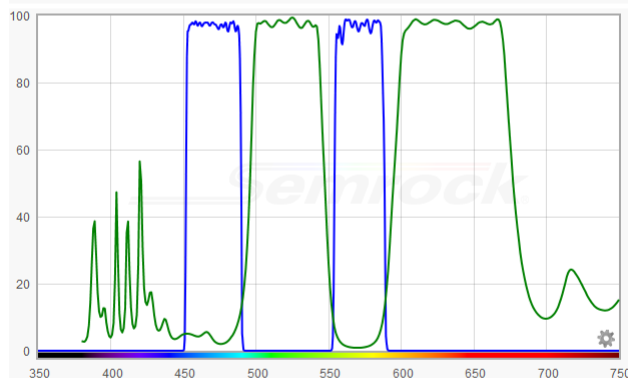
### Quad DA/FI/TR/Cy5

Semrock LED-DA/FI/TR/Cy5-A-000



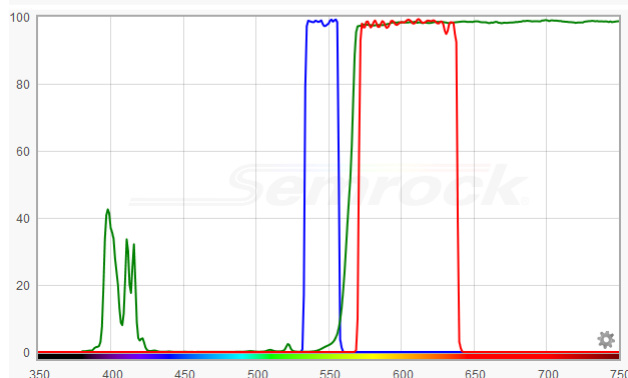
### Triple CFP/YFP/mCherry

Chroma 69008



### Dual GFP/mCherry

Chroma 59022



### Single Cy3

Chroma ET545/25x,  
Chroma T565lpxr,  
Chroma ET605/70m



## M4TIR – TIRF dichroic

Excitation clean-ups in laser combiner

Chroma ZT405/488/561/640rpc-UF2