



Zeiss LSM-780 Confocal & Multiphoton System Specifications

Microscope

The system is built on an inverted XYZ motorized Zeiss Axio Observer Z1, equipped with the following objectives and epi-fluorescence filter cubes:

Magnification	IMM	NA	Working Distance	Specific Technique	Contrast technique	Aberration Correction
10x	AIR	0.45	2.1 mm	FLUO	-	Plan-Apochromat
25x	OIL, W, GLIC	0.80	0.57mm	FLUO	DIC	Plan-Apochromat/Imm Korr
32x	W	0.85	1.1 mm	MP	-	C-Achroplan/VIS-IR/Korr 0-0.17
40x	OIL	1.3	0.2 mm	FLUO	DIC	Plan-Apochromat/(UV)VIS-IR
40x	W	1.2	0.28 mm	FCS/MP	DIC	C-Apochromat/VIS-IR/ Korr FCS/Korr 0.13-0.17
63x	OIL	1.4	0.18 mm	FLUO	DIC	Plan-Apochromat
63x	W, GLIC	1.3	0.17 mm	FLUO	DIC	Plan-Neofluar/Imm-temp Korr

Filter Set	Excitation filter	Dichroic mirror	Emission filter	Example fluorophores
49 (488049-0000)	G365	395	BP445/50	Dapi, Hoestch
38 (1031-346)	BP470/40	495	BP525/50	GFP
43 (1114-101)	BP545/25	570	BP605/70	Cy3, dsRED

Laser lines

- Diode laser: 405 nm
- Multiline Argon laser: 458/488/514 nm
- DPSS laser: 561 nm
- HeNe laser: 594 nm
- HeNe laser: 633 nm
- MaiTai HP DS: 2.1W 80MHz, <100fs, 690-1040 nm

Spectral detection system

Internal detectors: The LSM 780 system comes with 3 channels: 2PMTs and a 32 PMT GaAsP array, all of them usable for fluorescence and reflection. An additional PMT for transmitted light allows for simultaneous detection of fluorescence and brightfield/DIC images. For FCS (Fluorescence correlation spectroscopy) operation, the GaAsP detectors are able to count photons.

External (non-descanned) detector for MP microscopy: BIG2 type A (with two GaAsP channels), equipped with the filter sets cyan-yellow (BP450-500/BP520-560), green-red (BP500-520/BP570-610) and yellow-red (BP520-560/BP645-710).

Scanning system

The scanner is composed of two mirrors controlled by real time electronics. The large deflection angle of the scanning mirrors allows a wide area to be scanned: 11x11 mm with a 25x objective.

The scanning field size can be freely selected between 4x1 and 6144x6144 pixels.

Rotation of the scan field over 360° is possible without signal intensity fluctuations.

Environmental control

The system can be operated under temperature control to the incubator, and under temperature and CO2 using a P-insert (Pecon) with P3.5 adaptor.

The incubator is opaque black to avoid the detection of environmental light.

Software

The system is controlled under the LSM Software ZEN 2.1, based on the network capable graphic 64-bit Microsoft®WINDOWS 7 operating system. The ZEN is able to:

- Control the microscope, the scanning/detection module, the laser module, the IR laser compensation and the image acquisition process.
- Display, edit and analyze the images.
- A special module for FCS processing is included.