Leica TCS CARS

Live Molecular Profiling

Technical Documentation

Living up to Life

Leica
MICROSYSTEMS

Specifications

Microscopes	Inverted	Leica DMI6000 CS
Microscope anti-vibration table	**Specification**	**For imaging**
	Vibration insulation	Passive
Z-drive	SuperZ galvanometer stage	1500 µm travel range/3 nm stepsize
	Motorfocus (stand)	Travel range depending on mechanics of microscope/15 nm step size
Continuous wave lasers	**Laser type**	**For imaging**
	VIS	Diode, 40 mW: 442 nm
		Ar, 65 mW: 458, 476, 488, 496, 514 nm
		HeNe, 1 mW: 543 nm
		HeNe, 2 mW: 594 nm
		HeNe, 10 mW: 633 nm
		DPSS, 20 mW: 561 nm
	UV	Diode, 50 mW: 405 nm
Pulsed lasers	**Laser type**	**For imaging**
	IR	picoEmerald - dual wavelength output 1. > 600 mW, 780 – 940 nm, 5 – 6 ps 2. > 750 mW, 1064 nm, 7 ps
	VIS	–
		–
	UV	–
Excitation modulation	**Modulation type**	**For imaging**
	AOTF VIS	Up to 8 channels
	AOTF UV	Up to 3 channels
	AOTF CARS	Up to 2 channels

Specifications

Optics	**Features**	**For imaging**
	Number of laser ports	Up to 3 (UV - VIS - IR)
	Number of lasers	Up to 8
	Excitation – emission splitting	Acousto Optical Beam Splitter (AOBS®)
	Detection range	400...800 nm
	UV and IR imaging	Sequential or simultaneous
	Field upgradable	Yes (UV, IR)
	UV correction	Individual precise correction optics (up to 5 positions)
	Pinhole	Alignment stable single pinhole
	Pinhole diameter control	Motorized by software, automatic mode available
	Switchable beam expander, optional	DMI6000: removable
	Notch filters, optional	458, 514 nm 488, 561, 633 nm optional
Scanner	**Scanner design**	**For imaging**
	Scanning concept	Optically correct scanning at low inertia
	Switch conventional – resonant scanner	Conventional and resonant scanner in one system (optional)
	Conventional scanner	**For imaging (PMT and APD)**
	Minimum line frequency	2800 Hz
	Minimum line frequency	1 Hz
	Scan speed granulation	1400
	Maximum frame rate 512 x 512	5 Hz
	Maximum frame rate 512 x 16	50 Hz
	Beam park	Yes
	Maximum frame resolution	8192 x 8192 pixel
	Scan zoom	1.0 ... 64 x
	Panning	Yes
	Field rotation	200° optical
	Field diameter	22 mm

Specifications

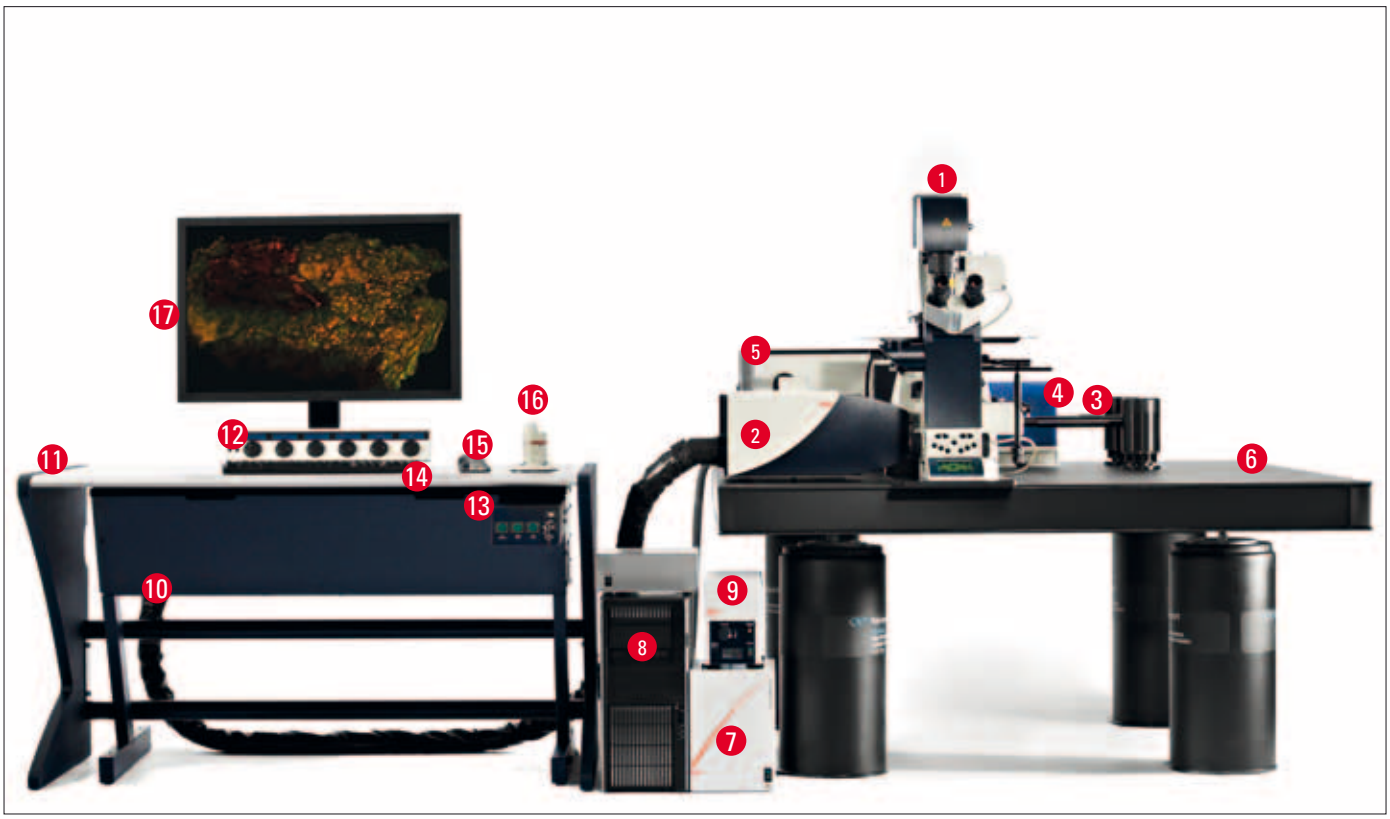
Scanner	**Resonant scanner**	**For imaging**
	Maximum line frequency	16000 Hz
	Minimum line frequency	8000 Hz
	Scan speed granulation	1
	Maximum frame rate 512 x 512	28 Hz
	Maximum frame rate 512 x 16	290 Hz
	Beam park	No
	Maximum frame resolution	1024 x 1024 pixel
	Scan zoom	1.7 ... 64 x
	Panning	Yes
	Field rotation	200° optical
	Field diameter	15 mm
Scan modes	**Scan options**	**For imaging**
	xt	Yes
	xy	Yes
	xyt	Yes
	xz	Yes
	xyz	Yes
	xyt	Yes
	xzt	Yes
	xyzt	Yes
	xytz	Yes

Specifications

Internal confocal detection	**Detection features**	**Up to 5 PMT for confocal imaging**
	Emission separation	Highly sensitive prism spectral detector
	Maximum number of confocal channels	5
	Tunability of emission bands	Yes
	Spectral detection range	400 – 800 nm
	Tuning steps of emission bands	1 nm
	Minimum detection range	5 nm
	Sensors	High sensitivity low noise PMT: R 9624
	Digitization	12 or 18 bit per channel
	Max. grey resolution	16 bit imaging
	Read out frequency	40 MHz
External confocal detection	**Detection features**	**2 APDs for confocal imaging**
	Emission separation	User-exchangeable beam splitting filter cubes
	Confocal channels	2
	Sensors	APDs from PE (SPCM-AQRH series) or MPD (PDM series)
	Quantum efficiency	PE APD: wavelength dependent, typ. 65% @ 670 nm MPD APD: wavelength dependent, typ. 45% @ 550 nm
	Dark counts	PE APD: < 250 cps MPD APD: < 250 cps
	Jitter FWHM	Not relevant
	Dead time	Not relevant
Non-confocal detection	**Detection types**	**For Imaging**
	Transmitted light detector	Optional, allowing BF, DIC, Ph etc.
	Non descanned transmitted light channels	Up to two channels: one for epi-CARS and one for epi-multiphoton fluorescence and SHG
	Non descanned reflected light channels	Up to two channels: one for epi-CARS and one for epi-multiphoton fluorescence and SHG
Electronics	**Devices**	**For imaging**
	Scanner control	Digitally at high performance (FPGA, field programmable gate arrays)
	Trigger in/out functions	Yes
	Auxiliary data input channels	Up to 2
	Max channels in parallel	12
	Computer	High performance PC workstation
	Monitors	2 x 19“ monitors or 1 x 30“ monitor
	Integration of third party software	–
	–	Programmable control panel with LCD function & value display

Specifications

Extensions	**Devices**	**For imaging**
	Fast ROI-spectrometer	Optional
	Auxiliary emission port	Optional
	Environment accessories	Various options
Software (LAS AF)	**General**	**Intuitive and guiding user interface**
	Context sensitive online help system	Included
	Multi-dimensional data acquisition	Included
	Region of interest (ROI) scan	Included
	Excitation line/frame sequential scan	Included
	Emission spectrum recording	Included
	Quantification tools	Included
	Multi-color restoration, spectral unmixing	Included
	General time lapse experiment control tile scanning (mosaic scan)	Included
Software options (LAS AF)	**Dedicated application wizards**	**For imaging**
	Advanced Mark & Find	Combines Mark & Find with sophisticated 3D recordings, Live Data Mode etc.
	3D visualization	Maximum and other projections, simulated fluorescence process, rotation animations, stereo pairs, red-green anaglyphs, height color coded extended depth of focus images etc.
	Colocalization	Histogram based colocalization and area measurements
	Deconvolution	Deconvolution option for widefield and confocal images
	MicroLab	FRAP wizard, FRAPxt wizard, FLIP wizard, FRET SE wizard, FRET AB wizard etc.
	SMD FCS wizard	–
	SMD FLIM wizard	–

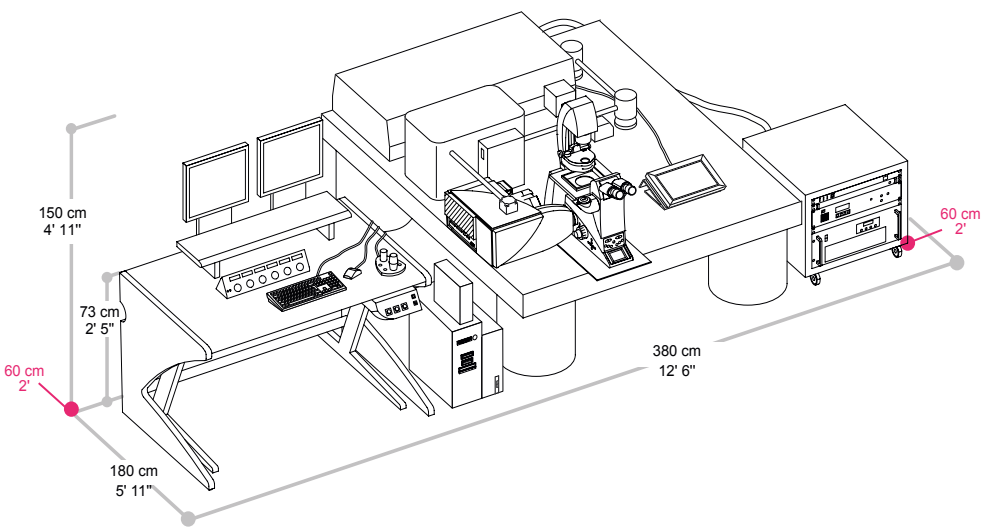


1 Research Microscope DMI6000
2 Scan Head
3 CARS Beam Routing
4 CARS Laser picoEmerald
5 Safety Box
6 Optical Table
7 Microscope Control Unit
8 Workstation
9 EL 6000 Fluorescence Illumination
10 Laser Supply and Power Supply
11 Computer Table
12 Control Panel
13 Supply Control
14 Keyboard
15 Computer Mouse
16 Smart Move
17 Monitor

visible and ultraviolet radiation:

Installation Requirements

Weight base system:	VIS: max. 320 kg UV: max. 428 kg picoEmerald: optical bench 1500 x 1800 mm + approx. 420 kg picoEmerald: + approx. 100 kg
Heat load max.:	VIS: 3.2 kW UV: 0.5 kW picoEmerald: 1.5 kW
Separate cooling:	UV laser, air-cooled heat exchanger picoEmerald, water-cooled heat exchanger (chiller)
Electric apply:	VIS lasers: 100 … 240 V AC ± 10 % 2 x 1600 VA, 50/60 Hz (Power input 1+2) UV laser: 100 … 240 V AC ± 10 % 750 VA, 50/60 Hz picoEmerald, power supply: 100 … 240 V AC ± 10 % 1A, 50/60 Hz Laser control unit: 110 V/230 V AC ± 10 % 6 A, 50/60 Hz
Environment:	Room temperature: +18 … +25 °C Avoid proximity to air conditioning equipment Protect from dust Room darkening recommended



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