

Living up to Life



# Leica SR GSD

Technical Data – May 2013



# Redefine the Limits of Microscopy

## Widefield super-resolution with ground state depletion

- ≡ **Maximum resolution down to 20 nm**
- ≡ **The SuMo Stage, with Suppressed Motion technology, minimizes drift for accurate localization of molecules**
- ≡ **Online super-resolution image projection – see results as they are acquired**
- ≡ **Full application flexibility offered by combining super-resolution with TIRF and epifluorescence on a multi-purpose live cell imaging system**
- ≡ **Standard fluorochromes can be used – no need to change protocols**
- ≡ **Powerful lasers for the highest flexibility in fluorochrome selection**
- ≡ **Large set of powerful image processing tools**



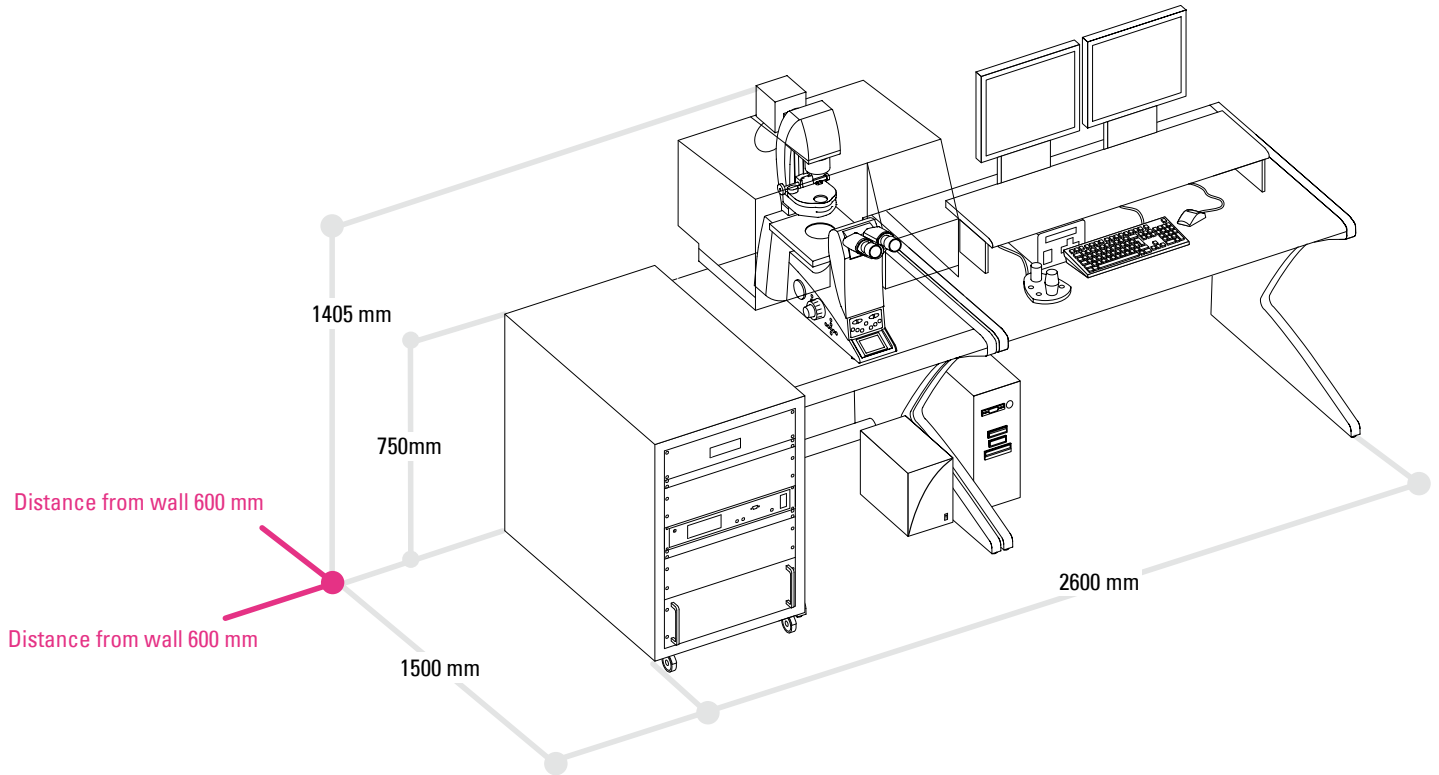
## Technical Specifications

Hardware		
Microscope stand	Leica DMI6000 B / AM TIRF MC	<ul style="list-style-type: none"> <li>• Right sideport obligatory: used for camera Andor iXon3 897</li> <li>• Left sideport optional for additional camera</li> <li>• Bottom port not supported</li> </ul>
Sample stage	SuMo Stage 11888963	<ul style="list-style-type: none"> <li>• Special stage for GSD super-resolution</li> <li>• Different stages for standard applications can be exchanged by customer</li> </ul>
Objective (GSD)	HCX PL APO 100x/1.47 Oil CORR TIRF PIFOC	<ul style="list-style-type: none"> <li>• Mounted at SuMo stage</li> <li>• Needed for GSD super-resolution imaging</li> </ul>
Objectives (additional)		<ul style="list-style-type: none"> <li>• DIC prism pairs for GSD systems</li> <li>• Mounted to nosepiece with 7.5 mm adapter ring</li> </ul>
Lasers: Wavelength / Power	405 nm / 30 mW 488 nm / 300 mW 532 nm / 500 mW 642 nm / 500 mW	<ul style="list-style-type: none"> <li>• TIRF + EPI-Fluorescence: All lasers for fluorescence imaging, regulated down to max. 50mW</li> <li>• GSD super-resolution: 488, 532, 642 nm for widefield/TIRF 405 nm for backpumping (control of single molecule switching behavior)</li> </ul>
Condenser	Condenser head 0.55 S28 (11505234) Condenser S1/S28, mot./fix (11522106)	<ul style="list-style-type: none"> <li>• Mandatory for any GSD system</li> </ul>
Filter cubes	11504186, 11504187, 11504188	<ul style="list-style-type: none"> <li>• Special filter cubes available for GSD imaging</li> </ul>
General Specifications		
Contrast methods	GSD super-resolution, TIRF, EPI-Fluorescence, Bright Field, DIC	
TIRF functionality	Fully integrated	<ul style="list-style-type: none"> <li>• Fully automated calibration</li> <li>• System can be used in standard TIRF and EPI mode (standard LAS AF GUI environment)</li> <li>• GSD super-resolution: TIRF and EPI mode available, fixed ROI 180 x 180 µm</li> </ul>
Software	LAS AF Release 2.5.0 or higher	<ul style="list-style-type: none"> <li>• Standard TIRF functionality supported</li> <li>• GSD implemented in integrated software wizard</li> </ul>
GSD Super-resolution		
Lateral resolution	<50 nm  Down to 25 nm	<ul style="list-style-type: none"> <li>• Proper sample preparation obligatory</li> <li>• Relevant for performance qualification / warranty</li> <li>• Reachable under ideal imaging conditions</li> </ul>
Camera	Andor iXon3 897	<ul style="list-style-type: none"> <li>• EM-CCD, necessary for GSD imaging</li> </ul>
Objective lens	HCX PL APO 100x/1.47 Oil CORR TIRF PIFOC	<ul style="list-style-type: none"> <li>• Special TIRF lens for GSD super-resolution,</li> </ul>
Field of view with GSD objective	18 x 18 µm: 51 x 51 µm: 90 x 67 µm: Up to 250 µm:	GSD: Andor camera (Sub-ROI), 1.6x MagChanger TIRF + GSD preview: Andor camera, 1.6x MagChanger DFC365 FX, 1x C-Mount (optional for standard TIRF/fluo. Imaging) Supported visual field, depending on camera + optics configuration
SR image processing	Real-time, various post-processing options	
Supported Dyes	Alexa 488, Atto 488, Rhodamine-6G, Atto 532, Alexa 532, Alexa 546, Atto 565, Alexa 568, Alexa 647, YFP, etc..	



- ① Laser rack
- ② Inverted research microscope Leica DMI6000 B
- ③ Active anti vibration table
- ④ Anti vibration table
- ⑤ Leica EL6000 external light source
- ⑥ Leica CTR7000 control box
- ⑦ Computer workstation
- ⑧ Piezo controller
- ⑨ TIRF/GSD Module

Additional objectives		Order number
HC PL APO	10x/0.40	11506284
HXC PL FLUOTAR L	20x/0.40	CORR 11506242
HC PLAN APO	20x/0.70	11506166
HXC PL FL L	40x/0.60	CORR 11506201
HXC PL APO	40x/1.25-0.75	OIL 11506250
HXC PL FLUOTAR L	63x/0.70	CORR 11506216
HXC PL FLUOTAR	63x/0.90	CORR 11506223
HXC PL APO CS	63x/1.20	W CORR 11506281
HXC PL APO	63x/1.30	GLYC 37°C 11506193
HXC PL APO CS	63x/1.30	GLYC 37°C 11506194
HXC PL APO CS	100x/1.40-0.70	OIL 11506210
HXC PL APO CS	100/1.46	OIL 11506274
HXC PL APO	100/1.47	OIL 11506318



Maximum footprint of the Leica SR GSD with antivibration table, laser rack and system desk.

## Installation Requirements

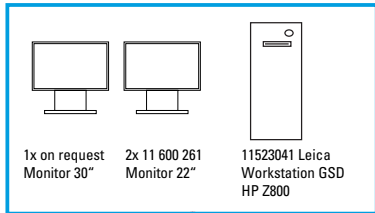
<b>Environment</b>	Room temperature: +15 to + 30° C Air condition required, but avoid proximity to GSD system Protect from dust Room darkening recommended Humidity max 80%, non condensing Temperature stability $\pm 1^{\circ}\text{C}$ ( $\pm 1.8^{\circ}\text{F}$ ) ; $\Delta T < 0.5^{\circ}\text{C}/15\text{min}$
<b>Electricity supply</b>	The system requires two mutually independent fuse circuits. One fuse circuit for the main system and the second for the laser rack.  2x Supply voltage 115 VAC $\pm 10\%$ : 15 Ampere 2x Supply voltage 230 VAC $\pm 10\%$ : 12 Ampere
<b>Heat load</b>	System: approx. 2 kW Climate controller: approx. 300 W Cooling capacity: max. 2.5 kW waste heat
<b>Crating (width, depth and height in mm)*</b>	Pallets: 2x 1200/800/1400, 1x 750/750/1100 max weight: 450 kg (if optional work desk and/or antivibration table is included)  Pallets for other hardware components

\* maximum numbers for the Leica SR GSD Systems

# Leica SR GSD

- 11 600 220 Keyboard US
- 11 600 221 Keyboard UK
- 11 600 223 Keyboard Italian
- 11 600 224 Keyboard German
- 11 600 225 Keyboard Spanish
- 11 600 222 Keyboard Swedish
- 11 600 219 Keyboard French

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### Cameras

- 11 600 240 Andor iXon DU-897 EM CCD back illuminated \*
- 11 600 245 Trigger cable Andor cameras
- 11 547 004 Leica DFC365 FX
- 11 600 243 Trigger cable DFC Cameras
- 11 547 003 Leica DFC345 FX
- 11 600 243 Trigger cable DFC Cameras
- 11 547 002 Leica DFC310 FX
- 11 600 243 Trigger cable DFC Cameras
- 11 640 270 Hamamatsu 9100-02 EM-CCD high speed set
- 11 600 246 Trigger cable Hamamatsu cameras
- 11 600 239 Hamamatsu 9100-13 EM-CCD back illuminated
- 11 600 246 Trigger cable Hamamatsu cameras
- 11 600 266 Hamamatsu Orca R<sup>2</sup> CCD
- 11 600 267 Trigger cable Hamamatsu Orca R<sup>2</sup>
- 11 532 798 Photometrics Evolve Camera EM CCD
- 11 547 100 High speed trigger cable for Evolve cameras

\* Default camera - always needed for GSD

### Peripheral triggering

2 channel in and 1 out

11 640 004 Adapter peripheral triggering

### Software Options

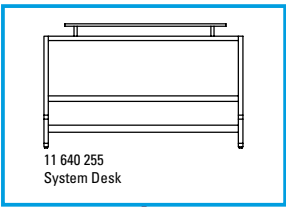
Acquisition Modules		Advanced Modules	
11 640 033	AF6000 Core	11 640 025	Calcium Imaging (Requires Multi-Channel Acquisition, Time-Lapse)
11 640 034	Dongle for AF6000 Extensions	11 640 803	Live Data Mode
11 640 032	AF6000 Multi-Channel Acquisition	11 640 804	3D Visualization
11 640 031	AF6000 Time-Lapse	11 640 805	Colocalization
11 640 030	AF6000 Z-Control and Software Autofocus**	11 640 806	3D Deconvolution
11 640 029	AF6000 Mark and Find*	11 640 807	2D Deconvolution
11 640 028	AF6000 Stitching*	11 640 808	Dye Finder
11 640 026	AF6000 Camera Driver Non-Leica Cameras	11 640 811	FRET Software (Requires Multi-Channel Acquisition, Time-Lapse)

**Packages**

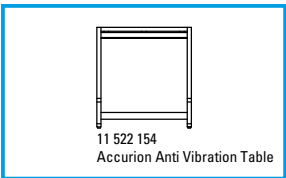
- 11 640 027 AF6000 Premium incl. PC (AF6000 Core, Dongle, Multi-Channel, Time-Lapse, Z-Control, Mark & Find, Stitching, Calcium Imaging, 3D-Visualization)
- 11 640 035 AF6000 Expert incl. PC (AF6000 Core, Dongle, Multi-Channel, Time-Lapse, Z-Control, 3D-Visualization)

\* Only available for configurations with motorized stage    \*\* Requires motorized z-drive

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### EL 6000

11 504 115 EL 6000

11 640 265 High Speed shutter cable

11 504 116 Liquid light guide

11 504 117 Adapter 1"

### EL 6000 + Leica External FW

11 504 115 EL 6000

11 640 265 High Speed Shutter Cable

11 504 117 Adapter 1"

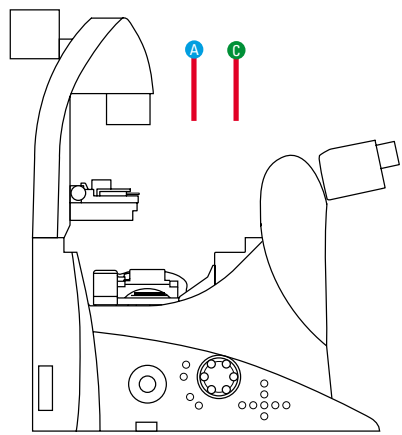
11 504 116 Liquid light guide

11 640 266 Holder for two FW sliders

### High-Speed Mic Boxes

- 11 888 423 High-Speed Mic Box Core
- 11 888 424 High-Speed Board 6000
- 11 888 425 High-Speed Board 6500
- 11 888 426 Extension Board for 2 Filter Wheels
- 11 888 427 Extension Board 7000 (for 4 Filter Wheels)

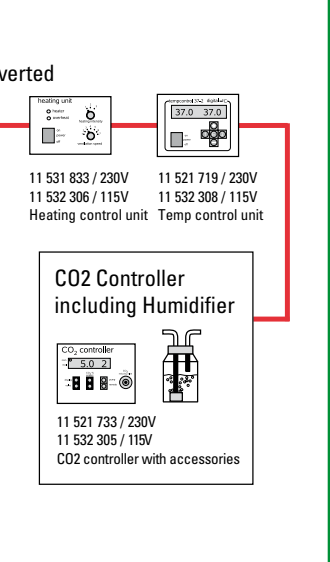
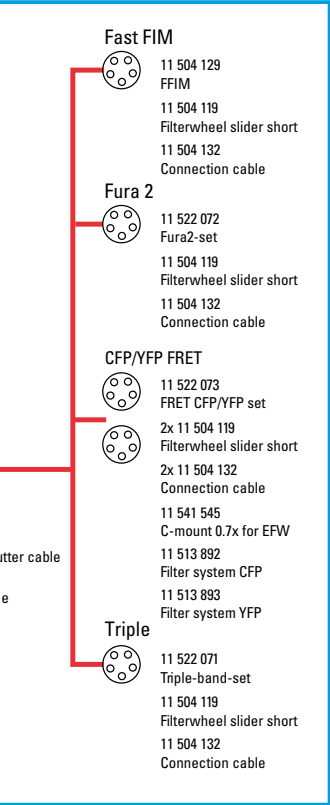
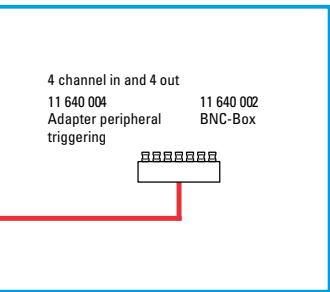
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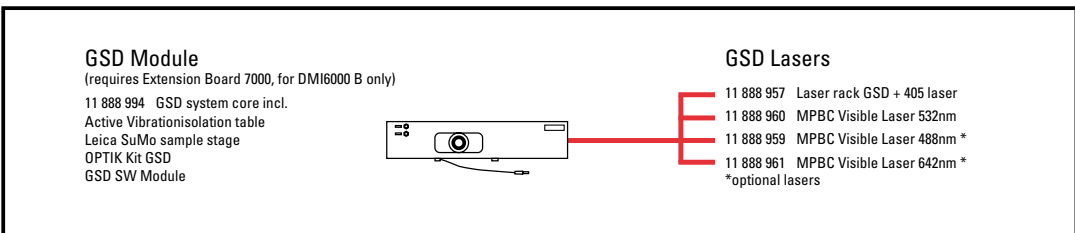
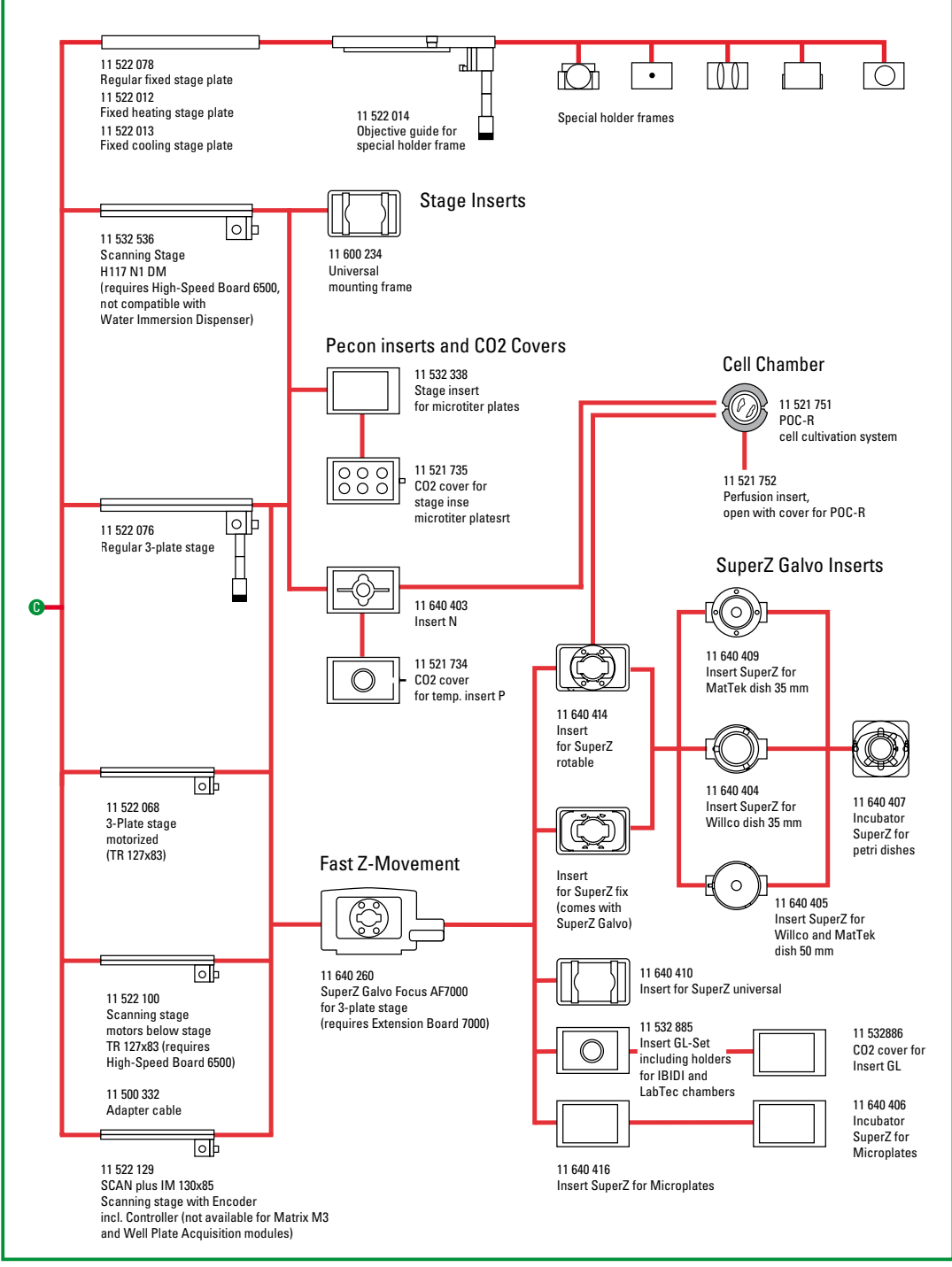
Leica DMI6000 B

### Climate Chambers Incubator

- 11 532 829 Incubator BLX
- 11 532 830 Incubator BLX Black
- 11 532 831 Incubator BLX TIRF



**Optional stages for system used as imaging platform (exchange of GSD stage with following stages possible)**



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The Leica Microsystems Life Science Division supports the imaging needs of the scientific community with advanced innovation and technical expertise for the visualization, measurement, and analysis of microstructures. Our strong focus on understanding scientific applications puts Leica Microsystems’ customers at the leading edge of science.

#### INDUSTRY DIVISION

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