From Eye to Insight



LAS X for Widefield

Release Notes LAS X 3.7.3

Release documentation for LAS X 3.7.3

This document describes the 3.7.3 release of the Leica Application Suite X imaging and analysis software for life science research and applied microscopy. You should read this document before installing your copy of this software.

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1.Compatible Microscopes and Cameras

1.1 Compatible Microscopes

Microscope/ System	Compa- tibility	Comments
Inverted Microscopes		
Leica DMi8	YES	
Leica DMi8 C/ A	YES	
Leica DMI6000 B/ with AFC	YES	
Leica DMI4000 B	YES	
Leica DMI3000 B	YES	
Leica DM IL	YES	
Upright Research Microscopes		
Leica DM4 B	YES	
Leica DM6 B	YES	
Leica DM6000 B	YES	
Leica DM5500 B	YES	
Leica DM5000 B	YES	stands with BZ >= 03 only
Leica DM4500 B	YES	stands with production date >=2008 only
Leica DM4000 B	YES	stands with production date >=2008 only
Fixed Stage Microscopes		
Leica DM6 FS	YES	
Leica DM6000 FS	YES	
Stereos and Macroscopes		
Leica M205 C/ A/ FA/ FCA	YES	
Leica M165 C/ FC	YES	
Upright Routine Microscopes		
Leica DM3000 / LED	YES	
Leica DM2000 / LED	YES	
Leica DM1750	YES	
Leica DM1000 / LED	YES	
Educational Microscopes		
Leica DM750	YES	
Leica DM500	YES	

<u>CLEM</u>	NO	Use LAS X 3.7.0
THUNDER Imager Model Organism	YES	
THUNDER Imager Live Cell	YES	
THUNDER Imager Cell Culture	YES	
THUNDER Imager 3D Tissue	YES	
THUNDER Imager Tissue	YES	
THUNDER Imagers		
Leica SR GSD	NO	
Leica AM TIRF MC with AFC	YES	
Leica AM TIRF MC	YES	
TIRF and GSD Systems		
Combination PLU and WSU	YES	
WF FRAP	NO	
Infinity Scanner FS	YES	
Infinity Scanner	YES	
Infinity TIRF HP	YES	
Infinity TIRF	YES	
Infinity Port Modules		
Leica EZ4W	YES	only USB connection, Ethernet and Wifi not supported
Leica EZ4E	YES	only USB connection, Ethernet not supported

1.2 Compatible Cameras

Supplier	Camera Type	Comments
Leica	DFC7000 T	
	DFC7000 GT	
	DFC9000 GT	
	DFC9000 GTC	
	DFC3000 G	
	DMC2900	
	DMC4500	
	DMC5400	
	DFC365 FX	
	DFC310 FX	
	DFC550	
	DMC6200	
	DFC495	
	DFC450	
	DFC450 C	
	DFC295	
	K5	
	MC120 HD	
	MC170 HD	
	MC190 HD	
	FLEXACAM C1	
	IC90E	USB only
	DMS1000	
	DMS300	
	DVM6	
	ICC50W	USB only
	ICC50E	USB only
	EZ4W	USB only
	EZ4E	USB only
	S9i	
Supplier	Camera Type	Comments
Andor	iXonUltra 888	
	iXonUltra Life 897	
	iXonUltra 897	
Hamamatsu	Flash 4.0 V2 CL	
	Flash 4.0 V2 USB	
	Flash 4.0 V3	
Photometrics	Prime 95B CL	
	Prime95B USB	

Win 10 Group policies:

Microsoft introduced with Windows 10 build 1803 "Camera Privacy Settings". There is the possibility to disable/enable the usage of UVC cameras. Please ensure when using DVM6, ICC50 W, S9i, or EZ4 W/E that "Let apps use my camera" is enabled.

Setti	ngs	
ŝ	Home	Camera
Fi	nd a setting \wp	Let apps use my camera
Priva	acy	- On
	^	Privacy Statement
۵	General	Learn more about camera privacy settings
	Location	
Ô	Camera	Choose apps that can use your camera

USB3 cameras:

Leica USB3 cameras are tested with USB3 PCIe cards from DeLock. These cards have a Renesas PD720202 chipset. Leica strongly recommends to use these cards. The majority of the Leica USB3 cameras are delivered with this USB3 PCIe card.

If you plan to use a different card or an onboard-USB port with a different chipset, please make sure you have the latest drivers from the card manufacturer and the latest Windows updates installed. Leica does not assume any liability when not using the recommended USB3 PCIe card.

Please also branch the internal power supply when using a card.

Due to the high power demands of some cameras, and the large amounts of data they deliver, Leica recommends to use each camera on a separate card. Leica recommends not to use other instruments with high power requirements, such as external hard drives, on the same USB socket.

Some computers have a USB3 charging port (USB3 with a flash sign). We do not recommend to use this port, since the camera will never power off and can prevent the computer from rebooting.

2. Technical Requirements and Installation

Warnings

Warning!! LAS X 3.7.3 is a Widefield Research release only. Do not install on Confocal systems nor Applied Microscopy systems.

Warning!! LAS X 3.7.3 is not released for EM Cryo CLEM

Warning!! LAS X 3.7.3 is not released for Windows 7

Operating System

LAS X 3.7.3 is a genuine 64 bit program and runs on Windows 10.

2.1 Compatibility to LAS, LAS AF, former LAS X versions and LMD

2.1.1 Compatibility to former LAS X versions

Former LAS X versions on widefield research systems can be upgraded with LAS X 3.7.3.

Former LAS X versions on EM Cryo CLEM systems can be upgraded with LAS X 3.7.3, but the performance of the PC might be not good enough to have a smooth software process.

2.1.2 Compatibility to LAS

LAS X 3.7.3 can read and process single images generated with LAS versions. However, <u>image series</u> generated with LAS need to be imported with the LAS X file importer by entering the metadata manually.

LAS versions cannot read data acquired with LAS AF or LAS X software versions.

2.1.3 Compatibility to LAS AF versions

All LAS AF 4 versions can be upgraded with LAS X 3.7.3

LAS X 3.7.3 and LAS AF 2.x cannot be installed on the same computer, unless it is configured with a dual boot option. Before installation of LAS X 3.7.3 on an offline workstation running LAS AF 2.x, it is necessary to uninstall LAS AF 2.x.

LAS X 3.7.3 does not accept the LAS AF 2.x license dongle and vice versa. Please make sure that the correct dongle is inserted in the workstation. LAS X dongles have a Leica logo engraved and a shiny surface to distinguish them from LAS AF 2.x dongles.

LAS X 3.7.3 can read and process files generated with LAS AF 2.x versions and LAS AF 4.x versions. LAS AF 2.x versions however cannot read all data acquired with LAS AF 4 or LAS X software versions.

2.1.4 Compatibility to Leica LMD Laser Microdissection

LAS X is fully compatible to Leica LMD application software and can be installed on the same workstation.

Important note: Use only one software at a time. The LMD application software and LAS X software cannot be used simultaneously.

LMD application software V8.1 and higher support Win10.

2.2 Installing the Correct Firmware Versions

In most cases, the LAS X installation takes care of installing the required microscope firmware. However, in some cases, the updating of the firmware may not take place. The firmware then must be updated manually via the LAS X Hardware Configurator.

The correct versions of firmware for use with LAS X 3.7.3 are:

DMI 8:

DMI8 Master (XE167FH200F100L_MASTER.HEX)	V02.65.9760
DMI8 Master FPGA (XP2_17_MASTER.HEX)	V210
SBM I2C (DSPIC33FJ128_SBM_I2C.HEX)	V01.01
motCORR (DSPIC33FJ128_MOT_CORR.HEX)	V01.08
AFC (TMS320F28335_AFC.HEX)	V02.21
SmartMove (TMS320F28023_SMARTMOVE.HEX)	V01.10
Sideports (DSPIC33FJ128_DC_TURRETII.HEX)	V01.06
Bottomport (DSPIC33FJ128_DC_TURRETII.HEX)	V01.06
Z Axis (DSPIC24HJ064_STEPPERA.HEX)	V01.15
XY Axes (DSPIC24HJ064_STEPPERA.HEX)	V01.15
Buttons Left (DSPIC33FJ128_BUTTONS_LEFT.HEX)	V01.08
Buttons Right (DSPIC33FJ128_BUTTONS_RIGHT.HEX)	V01.04
Nosepiece 2 positions (DSPIC33FJ128_NOSEPIECE_2POS.HEX)	V01.01
Nosepiece (DSPIC33FJ128_NOSEPIECE.HEX)	V01.14
IL Turret (DSPIC33FJ128_DC_TURRETII.HEX)	V01.06
Mag. Changer (DSPIC33FJ128_DC_TURRETII.HEX)	V01.06
T-House Splitter (DSPIC33FJ128_DC_TURRETII_B.HEX)	V01.05
DIC (DSPIC33FJ128_STEPPERB.HEX)	V01.05
IL Diaphragms (DSPIC33FJ128_STEPPERB.HEX)	V01.05
PIC GSD (PIC_GIST.HEX)	V01.01
FRAP (DSPIC24HJ064_STEPPERA.HEX)	V01.15
Lamphouse (STM32F301K8_LAMP2.HEX)	V01.01.9999
WF Scanner (DSPIC24HJ064_STEPPERA.HEX)	V01.15
Sequencer 2 (STM32F303CCTX_SEQUENCER2.HEX)	V01.02
Sequencer 2 FPGA (XP2_17_SEQUENCER2.HEX)	V01.24
Touch Panel 2nd Generation (TPC-G2.exe)	2.15.2.9760

Compound (except DMi8):

Master Module (DM4000, DM4500, DM5000) (MAN1.HEX)	V01.31
Leica Screen Module (DM5000) (MAN2.HEX)	V01.07
Master Module (DM5000, DM5500, DM6000, DM6) (SYS.HEX)	V02.40.9760
Master Module (DM4000, DM4500, DM4) (BM-16Bit.HEX)	V02.70.9760
Master Module (DMI6000, DMI5000, DMI4000) (DMI.HEX)	V02.80.9760
Master Module (DM8000, DM12000) (DM8_12000.HEX)	V02.20.9760
Touch Panel 2nd Generation (TPC-G2.exe)	2.15.2.9760
Touch Panel (STP6000) (TPC6000.exe)	1.46.0.9760
DM3000 Master (DM3000.HEX)	V02.30.9760
Condenser Module (PH/DIC) (KONDSCH.HEX)	V01.06
Condenser Module II (PH/DIC) (KONDSCH01.HEX)	V01.01
Condenser Module III (PH/DIC) (KONDSCH02.HEX)	V01.03
XYZ Module (DM6000, DM5500) (XYZ_DIS.HEX)	V01.10
Advanced XYZ Module (XYZ_ADV.HEX)	V03.10.9760
Advanced Z Module (Z_ADV.HEX)	V03.10.9760
LMD 6000 Head (LMD_6000.HEX)	V01.24.9760
Master Module LED4000 (LED4_7000.HEX)	V01.04.9760
LED7000 (LED7000.HEX)	V01.04.9760
AFC DSP (AFC_DSP.HEX)	V01.25
PIC motCORR (PIC_Corr.HEX)	V01.03
PIC GSD (PIC_GIST.HEX)	V01.01

Stereo:

Product	Tradename	Application	Bootloader
DMS	DMS300	1.9.25	1.3.00
DMS	DMS1000	1	
DVM 2500	MEL82 / 85 DCI	4.01.320196	no BL
	MEB121 / 122	3.01.162839	3.01.162696
	MEB128	3.01.218256	3.01.215563
DVM6 A / S / C / M	Sirius XYZ DVM 6 S / A	5.00.498432	5.00.400691
	Sirius Base Conn DVM 6 C / S / A	5.00.484890	5.00.377379
	Sirius Arm LED DVM 6 C / S / A / M	5.00.533950	5.00.377379
	Sirius Zoom Main DVM 6 C / S / A / M	5.00.569227	5.00.377368
	Sirius Camera DVM 6 C / S / A / M	1.38.480849	no BL
	Sirius Camera MCU DVM 6 C / S / A / M	5.00.381414	5.00.381452
Coded Zoom Knob for S9	MEL89/MAZ1	5.00.458206	5.00.437655
series			
Macroscope	Z6 / Z16 APO A (V51)	4.01.281758	4.00.231498
	Z6 / Z16 APO A (C51)	4.01.281758	3.02.128967
Dragon Zoom	M125C / M165C / M165FC / M205C / M205FCA	5.00.560177	5.00.559779
	Revision 1		
	M205A / M205FA Revision 1		
	M125C / M165C / M165FC / M205C / M205FCA	4.00.400935	4.00.217723
	M205A / M205FA		
	M-Zoom Display	4.02.511469	no BL
	M205FA / FCA - Automated Filter Wheel Revision	5.00.560772	5.00.532274
	1		
	M165FC-F Revision 1	5.00.559736	5.00.532274
	M205FA / FCA - Automated Filter Wheel	3.03.481710	4.00.217862
CAN to RS232 Converter-	MEL90	5.00.479890	5.00.474771
Cable			

Stereo Zoom	MZ16A / MZ16FA	2.1	no BL
	MZ16FA-F	2.14	no BL
	MZ16xA-D	2.11	no BL
UMC	MHS3	2.12	no BL
Fluo Combi	MRE17 Revision 1	5.00.560185	5.00.559591
Objective Revolver	MRE18 Revision 1		
Fluo Revolver	MRE19 Revision 1		
Fluo Combi	MRE17	4.00.320268	3.02.207905
Objective Revolver	MRE18		
Fluo Revolver	MRE19		
Focus	MST31	1.32	no BL
Dragon Focus	MST66/67 Focus Revision 1	5.00.549848	5.00.519383
	MST51/52/59/66/67 Focus	3.02.492813	3.02.126882
		3.01.116855	<-POF File
	MST5x-DCI	4.01.534019	no BL
MF Hand Control	MHS7	3.01.267191	no BL
TL RCI Base	MDG30	4.01.338410	4.01.263201
TL 5000 Ergo Base / LSI	MDG4x/MDG4xi	4.01.438080	no BL
TL 3000 Ergo Base	MDG43	5.00.446074	5.00.439523
Iso Pro Stage	MTI91 Iso Pro 6x4"	3.01.167675	3.02.147234
			<-POF File
	MTI91 XY-DCI	3.01.133449	3.01.117634
XY Joystick	MHS5	3.01.119315	3.01.117634
Footswitch	MFS17 Revision 1		
	MFS17 (V51)	3.03.255036	4.00.254686
	MFS17 (C51)	3.03.255036	3.02.147234
TCU	MHS6	5.00.537513	no BL
LED 3000 BLI	MEB137	3.01.321686	4.00.309569
LED 5000 CXI	MEB112	3.01.136125	3.01.136125
LED 5000 CXI	MEB133	3.01.285257	4.00.290100
LED 3000 HDI	MEB136	3.01.321335	4.00305195
LED 5000 HDI	MEB111	3.01.267922	4.00.290100
LED 3000 MCI	MEB125	3.01.267778	4.00.290100
LED 5000 MCI	MEB109	3.01.212854	3.01.117634
LED 5000 MCI	MEB129 Revision 1		
LED 5000 MCI	MEB129	3.01.216808	4.00.215703
LED 3000 NVI	MEB113	3.01.136125	3.01.136125
LED 3000 NVI	MEB132	3.01.285050	4.00.290100
LED 5000 NVI	MEB134	3.01.321246	4.00.309569
LED 5000 NVI	MEB135		
LED 5000 RL	MEB110	3.01.128263	3.02.126882
LED 3000 RL	MEB115	3.01.591555	4.00.290100
LED 5000 RL	MEB124	3.01.408218	4.00.291245
LED RL (Spider)	MEB123	3.01.321686	4.00.309569
LED 3000 SLI	MEB126	3.01.386468	4.00.290100
LED 5000 SLI	MEB127		
CAN to RS232 Converter-	MEL90	5.00.479890	5.00.474771
Cable			

2.3 PC Requirements

2.3.1 PC Requirements

Recommended PC Configuration:

Operating System:	Win10 64bit
CPU:	Intel XEONW-2123 3.6 4C CPU
RAM:	64GB DDR4 2666 ECC REG RAM
1st hard drive:	512 GB SSD
2nd hard drive:	4TB 7200 SATA ENT 3.5 2ND HDD
Graphics board:	NVIDIA QUADRO P1000 4GB

High-speed triggered sCMOS cameras or high-speed Navigator experiments require an SSD RAID NVMe hard disk.

PC minimum requirements (except EM Cryo CLEM)

Operating System:	Win10 64bit
CPU:	Intel Core-I5 3,20 GHz
RAM:	16 GB DDR3-1333 ECC
Hard drive:	500 GB HDD
Graphics board:	NVIDIA Quadro K600 (1GB)

Minimum requirements for EM Cryo CLEM systems:

Operating System:	Win10 64bit
CPU:	Intel XeonW-2123 3.6 4C
RAM:	128 GB DDR4-2666 ECC REG
1st hard drive:	SSD 512 GB SATA
2nd hard drive:	2TB SSD RAID NVMe hard disk
Graphics board:	NVIDIA Quadro P1000 (4 GB)
Monitor:	minimum screen resolution is 1000 lines vertically

3. Product Security Fix

Update of license component to a new secure version

Please see the official communication for detailed information

https://www.leica-microsystems.com/company/product-security/product-security-updates/

4.Important Information

• Fluo-DIC and Fluo-Ph Combi Mode on DM6 and DM4: Combi Illumination within the Illumination Settings panel needs to be switched to TL before activating a live image. Otherwise the TL illumination will be missing in the Combi Mode. The missing TL illumination only affects the live image but not image acquisition.

•	Illumination settings		* 0
	Standard	Advanced	
	Intensity O		100
	Aperture	•	24
	TL - Fld. 🛑 O		9
Co	ombi Illumination	L	

• Quantum stage (LMT200): after restart of the stage, speed and acceleration settings are reset to default even though LAS X displays the speed and acceleration settings prior to restart.

Workaround: Configuration->Microscope->XY stage ->define speed and acceleration again. Alternatively keep the stage switched ON.

- Shading correction: when switching between channels during live image, the shading reference is not changed accordingly.
 Workaround: switch live image off and on again.
- When acquiring multiple channels via Capture Image, only one shading reference is applied to the captured images. During a timelapse experiment the shading correction is applied properly.
- EDOF processing does not work for .lof files.
 Workaround: use .xlef or .lif files for EDOF processing.
- M205 FCA multichannel timelapse experiment with shutter control modes optimized and after each image: all images are acquired properly but light shortly switches on and off again after each cycle.
- M205 FCA multichannel experiment with Lambda then Z acquisition: all images are acquired properly but light switches on too early.
 Workaround: use Z then Lambda for acquisition.
- Navigator: although the live button shows that live image is OFF, the live image and light stay ON after creating a focus map with the "Find all by Autofocus" function.

Workaround: switch live image ON and OFF again.

- Auto exposure doesn't regulate the exposure of images with low brightness values.
- If SVI Huygens software is opened from LAS X by function "send to Huygens essential" the GPU processing capabilities of the Huygens license can't be used. However, if Huygens is launched independently the GPU is used for processing.
- High-speed triggered sCMOS cameras or high-speed Navigator experiments require the temp file being located on a SSD RAID NVMe hard disk. Temp file on a normal SSD disk may cause the experiment to stop without being completed.
- "Data handling in folders" requires more space on the temp drive compared to working in projects. For large experiments it is recommended to use "Data handling in projects".
- Experiments with high-speed autofocus and camera in global reset require the experiment to start with a selected acquisition channel. Starting the experiment with a selected autofocus channel can lead to underexposed images.
- THUNDER Imager EM Cryo CLEM: DFC9000 GT is the tested and approved camera for the THUNDER Imager EM Cryo CLEM. No other camera should be used.
- When installing LAS X from USB-Stick, Trend Micro blocks the AUTORUN.inf. **Workaround**: start setup.exe manually.
- When using USB cameras: please disable "USB selective suspend setting" in Windows advanced power settings. LAS X workstations have these settings already preset.

dvanced settings		
Select the power plan that you then choose settings that reflect computer to manage power.	want to custor t how you war	nize, and nt your
High performance [Active]	~	
 Internet Explorer Desktop background settings Wireless Adapter Settings Sicep USB settings 		^
 USB selective suspend setting Setting: Disabled Power buttons and lid DCL Formation)	
Processor power management		
m Dienlaw		

• HDR acquisition with camera: only 8 bit, high-speed acquisition not supported

- If you use a multicolor lightsource on your system, you've to set the IL shutter mode in the hardware configurator to "Always open after changing contrasting method". Otherwise the hardware shutter of the fluo axis stays closed.
- LAS X Navigator is not available within the Easy Operation mode.
- Use Do not use Navigator in combination with data handling "Work in Folders". Navigator experiments require data handling "Work in Projects" (Configuration tab -> User Configuration -> Data handling -> "Work in Projects")
- Stopping a running mark and find experiment may cause loss in data. **Workaround**: wait till mark and find experiment is finished.
- Do not stop an experiment with remaining manipulation steps in the Scan Sequencer. If stopped, the remaining manipulation steps cannot be deleted from the Infinity Scanners memory. All subsequent manipulations will trigger the remaining manipulations and not the actual definition.
- The scan sequencer works with AFC in continuous mode but not with the image based autofocus (HSAF).
- Z-stack acquisition with finefocus in combination with "AFC on demand" is not supported.
- Do not change hold position during AFC on demand while AFC is activated.
- When performing THUNDER Mark and Find experiments on the fly, the timestamps are written into the raw data but not into the thunder processed files.
- Best focus will not work if limits of capture range are too close to the image focus. **Workaround**: increase capture range.
- In high speed multi-channel T-series with shutter always open light intensity might differ between live image and acquired image.
 Workaround: use shutter mode "after each image".
- When zooming into an image with measurement lines the measurement lines are not zooming accordingly.
 Workaround: perform measurements after zooming.
- If LAS X is to be installed on the same workstation as the LMD application software, install first the LMD application software and then the LAS X Software afterwards.
 Important note: Use only one software at a time. The LMD application software and LAS X software cannot be used simultaneously.
- If an objective is changed via LAS X Inplace Configuration it can happen that in the AFC Panel the AFC cannot be set to "HOLD FOCUS POSITION" or "USE AFC". The checkbox might be grayed out.

Workaround: Close LAS X and use the HW configurator to teach in the objectives again followed by power cycle the microscope. Then start the LAS X again.

- After acquiring an image with FLUO-PH or FLUO-DIC the illumination panel disappears. **Workaround**: switch to a different contrasting method (not FLUO-PH or FLUO-DIC).
- The Leica Lamphouse for TL illumination works only in highspeed with I2C connection. BNC Connection is not supported for highspeed.
- XLED light source in combination with sequencer advanced and t-series with image streaming and high-speed autofocus: if acquisition channel and HS-AF channel both use the 365nm or 460 nm line, the HS-AF images are illuminated properly, but there is no light on the sample for the acquisition channels.
- When using DFC9000 GT with exposure time < 1,5ms and light source X-LED with 460nm, some images in an external triggered time series may not be illuminated correctly.
- Image export: Do not delete experiment data during export of the experiment. Otherwise the exported data will be corrupted.
- Image export: Do not close LASX from Process tab during image export this may lead to data loss.
- 3D Surface Viewer is not supported
- Hardware Configurator: TIRF cube alignment: After power up of the microscope the first start of the TIRF cube alignment can accidently terminate the Hardware Configurator application. In this case a restart Hardware Configurator application and a rerun of the TIRF cube alignment procedure is recommended.
- Hardware Configurator: If you teach in a new TIRF cube or replace an existing one with another type in the Hardware Configurator, please do not forget to fine-tune afterwards. Otherwise, the software may use incorrect TIRF fine-tune information.
- Restriction for DMI series with manual transmitted light arm: the light intensity of a transmitted light channel can drop to ZERO when changing between channels in the light path settings interface. This restriction does not apply to DMi8.

Workaround: keep live image always on when changing between channels

- Stereomicroscopes: Measurement function in live mode works incorrectly after an objective change. Please leave and re-enter the live mode to readjust the measurement function.
- Mobile Connection: iPads require iOS10 to connect with LAS X.
- LAS X is released for use with Windows Defender Antivirus and TendMicro Antivirus.