

Living up to Life



# Intuitive Innovative Indispensable



Leica Application Suite X  
Imaging and Analysis Software for  
Life Science Research

# Powerful Performance Made Simple

The Leica Application Suite X (LAS X) focuses on user-friendliness. The workflow-oriented design makes it an **Intuitive** imaging platform which can be personalized to your needs. Researchers can plan and execute even the most complicated experiments easily. Elevate the impact of your work with the most **Innovative** and powerful features available today in microscope software.

## INTUITIVE

### EASE OF USE

The LAS X workflow guides you intuitively through acquisition, processing and analysis. Save and recall customized system settings for maximum reproducibility. Use the Easy Operation Mode on widefield systems to design your own user interface with the functions you need. Just enter the dyes of your sample in the Dye Assistant and start your multi-color confocal image acquisition.

### APPLICATION WIZARDS

Intuitive wizards guide users through various applications like FRET, FRAP, FLIM, or FCS, thus reducing potential mistakes and minimizing time for setup. The LAS X application wizards go beyond the pure application by additionally providing sophisticated analysis options.

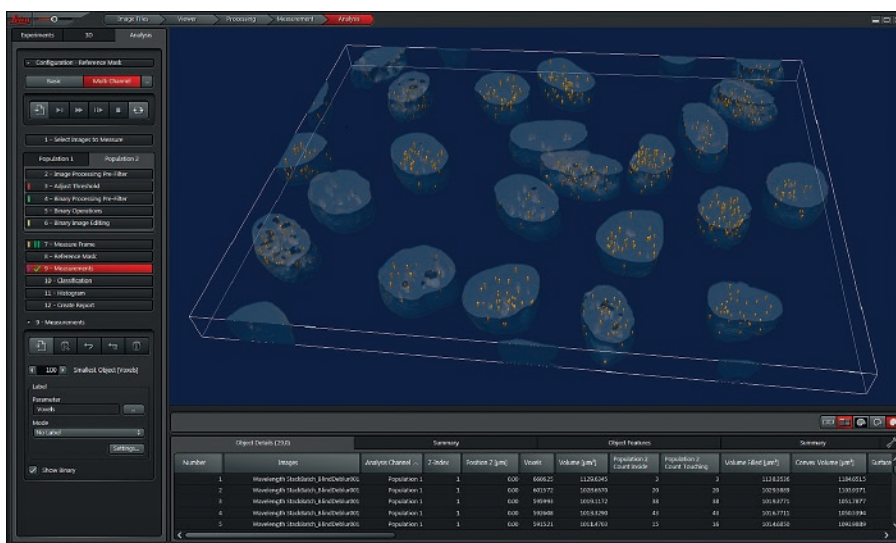
## INNOVATIVE

### LIVE CELL IMAGING

Keep cells in focus. With a click of a button, the hardware based Adaptive Focus Control (AFC) makes refocusing obsolete. Whether you search for the most interesting cells in your dish or you perform a fast multi-position time-lapse experiment, your sample stays reliably in focus, in real time. Experimental conditions can be documented and controlled with the Environmental Control module. You never have to question the validity of your results again, just analyze the environmental conditions together with your image data. The software-controlled water immersion micro dispenser and the motorized correction collar facilitate long-term time-lapse, deep-tissue and screening experiments at best possible image quality. The Mobile Connection module offers you the possibility to increase your working efficiency by controlling your imaging experiments from anywhere and anytime.

### HIGH CONTENT SCREENING

Leica Microsystems' High Content Screening Automation (HCS A) can speed up the process of discovery through high content screening and allows you to standardize biological applications for rapid and reproducible results by automated microscopy. Screening experiments can be performed with widefield and confocal systems including online data export, single object tracking and CAM interface. The CAM interface opens your experiments to bidirectional interaction with image acquisition and analysis, to acquire the right sample at the right time.





LAS X is the **Indispensable** software solution for all Life Science Imaging Systems from widefield to confocal and super-resolution microscopy. What could be easier than using just one software for all types of microscopes and applications?

## INDISPENSABLE

### VISUALIZATION

LAS X includes powerful visualization tools. Display images live during acquisition with the Image Viewer. Review data, write annotations, create image overlays or compare different experiments with each other. The Image Gallery offers a thumb nail view with various display and filter options available such as selecting the image with the best focus at each time point automatically. The 3D viewer provides smooth and fast motion of 3D volumes in real time. Use the movie maker to create astonishing 4D animated movie sequences.

### ANALYSIS AND MEASUREMENTS

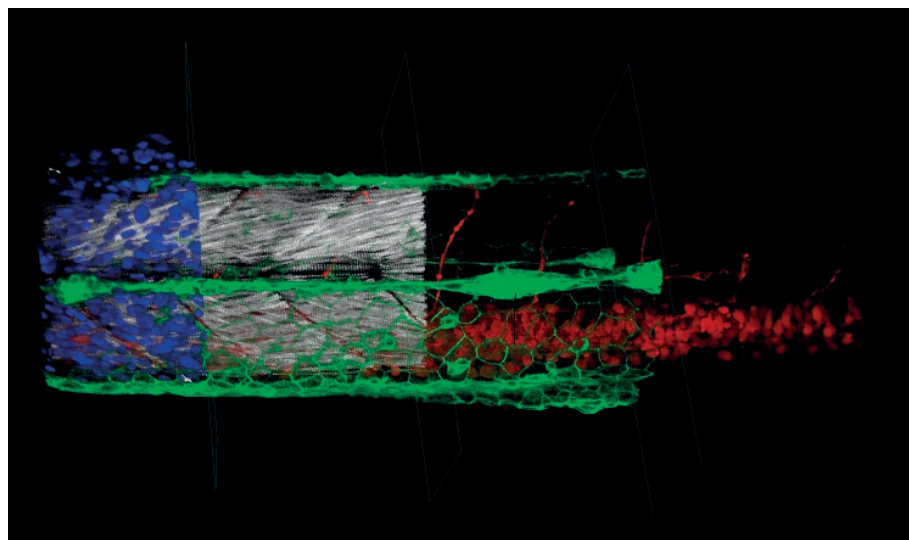
Obtain reproducible analysis results rapidly with the 2D and the 3D image analysis wizards. Go step by step through the workflow from applying filters, thresholding, binary image processing through measurements and classification. In addition, you can perform object tracking or call ImageJ macros within the 2D analysis wizard. Distances, areas, volumes, angles, and much more can be determined with the measurement tools.

### POWERFUL LAS X CORE MODULE

The LAS X Core module provides full image viewing capabilities, including annotations, image overlay and image comparison. Create Maximum Intensity Projections, quantify your images and export image series as a movie. You can also apply processing tools such as noise reduction filters, parallax correction and shading correction. To experience the full capabilities of the LAS X software, the LAS X Core module comes with a 30 day trial version of all optional modules (see back page).

### HARDWARE INTEGRATION

LAS X is one common software platform for widefield, confocal and super-resolution systems supporting upright, inverted, fixed stage and stereo microscopes from Leica Microsystems. Configure your widefield system with a rich choice of LED light sources, microscope stages and environmental equipment. LAS X supports not only a wide variety of added components, but also CCD, EM CCD and sCMOS cameras from all major suppliers. With LAS X you decide which technology best fits your research. There is no need to learn multiple operating concepts for different applications.



Zebrafish Embryo - Courtesy of Lionel Newton, EMBL Heidelberg - Green: Lateral line primordium (GFP), Red: Neuronal marker (DsRed); Blue: Nucleus marker (BFP), Gray: Muscles (SHG)

## LAS X MODULES AND FUNCTIONS

	Short Description	Widefield	Confocal
LAS X Core	Basic building block for all LAS X systems. Operates without the need for a dongle.	●	● <sup>1</sup>
Multi Channel Acquisition	Allows the definition of up to 8 sequential camera channels per experiment. Confocal Scanning allows acquisition of a multitude of channels simultaneously or sequentially.	○	●
Time-Lapse	Define the duration and frequency of image capture for time-lapse experiments.	○	●
Z-Control and Software Autofocus	Position focus or capture 3 dimensional data. Includes software autofocus.	○	●
Mark and Find	Define multiple stage locations and revisit them as part of a time-lapse or Z stacking experiment.	○	●
Stitching	Create overview images of large fields of view.	○	●
Driver Non-Leica Cameras	Allows the control of any third party camera supported by LAS X.	○	–
Lambda Scan	Imaging method that acquires the emission spectrum in each image pixel using spectral detectors.	–	●
Lambda-lambda scan	Imaging method that acquires the full excitation-emission spectrum in each image pixel using a tunable laser and spectral detectors. Allows Lambda square fluorescence mapping.	–	○
Dye Finder	Multi-color restoration, channel unmixing (online/offline)	○	○
Dye Assistant	Confocal users can select different dyes and LAS X sets up all hardware components accordingly.	–	●
LightGate	Restriction of detection to a certain time window removes unwanted signal from autofluorescence or backscattering with HyD detectors.	–	○
Z intensity compensation	Tool to compensate within a z-stack drop of fluorescence intensity that occurs deeper inside your sample with laser power and/or detector gain	–	●
Live Data Mode	Define acquisition macros. Allows interactive data recording, logging of comments, job-sequencing, and online evaluation.	○	○
HCS A	Versatile tool set for high content screening and automated microscopy.	○	○
3D Visualization	Graphic card based processing for smooth and fast motion of 3D volumes in real time.	○	○
3D Analysis	Easy and Versatile Wizard for 3D multi channel analysis and classification. Includes measurements in 3D and 3D process tools.	○	○
2D Analysis	Easy and Versatile Wizard for 2D multi channel analysis and classification.	○	○
Measurements	Module for 2D measurements such as distances, areas, angles. Count objects and classify objects manually. Create reports.	○	○
Calcium Imaging	Module for online ratio measurement, online display of ratio graphs and ratio image.	○	●
Colocalization	Histogram based colocalization and area measurements.	○	○
3D Deconvolution	Fully integrated deconvolution algorithm using adaptive calculated or supplied PSF.	○	○
2D Deconvolution	Algorithms for no neighbor and nearest neighbor deconvolution.	○	○
Data exchange between LAS X and Huygens	Convenient exchange of Confocal, STED and MP images between LAS X and Huygens Deconvolution Software.	–	○
FRET SE	Powerful wizard for FRET acquisition and analysis (sensitized emission FRET).	○	○
FRET AB	Powerful wizard for FRET acquisition and analysis (acceptor bleaching FRET).	–	○
FRAP	Wizard for user friendly setup and analysis of FRAP and FLIP experiments, optional fast zoom in during bleach with resonant scanner.	–	○
FLIM	Wizard for fast and reliable setup of FLIM experiments and full control of FLIM data acquisition.	–	○
FCS	Wizard for fast and reliable setup of FCS and FLCS experiments and full control of F(L)CS data acquisition.	–	○
Electrophysiology	Package to guide you through E-Phys experiments, incl. Automated recordings, interactive data acquisition and trigger functions.	○	○
SmartSTED Wizard	Intuitive workflow to operate STED 3X with three simple sliders to define the general level of resolution increase and the amount of super-resolution in 3D. With a third slider to adjust between signal-to-noise and the number of achievable images.	–	○
CARS Calculator	Automatic calculation of specific Raman wavenumbers according to the pump laser wavelength used for excitation and vice versa.	–	○
CARS Spectral Scan	Automatic spectral scan covering the Raman wavenumbers range 1200–3400 cm <sup>-1</sup> .	–	○
Environmental Control	Have full control of your experimental conditions. Log the environmental data and monitor it during the experiment.	○	○
Mobile Connection	Connect to your acquisition station via web client or mobile device and see the course of your experiment, review the whole experiment or open any image series available in the project tree.	○	–

● = included ○ = optional – = not available

<sup>1</sup> LAS X Core is not sufficient to drive a confocal system, but the offline version can be used to review the acquired data.



Download a free LAS X Core Offline Version from:  
<http://www.leica-microsystems.com/qrc-lasx>