

Leica Application Suite

Macro Editor and Macro Runner

Living up to Life

Leica
MICROSYSTEMS

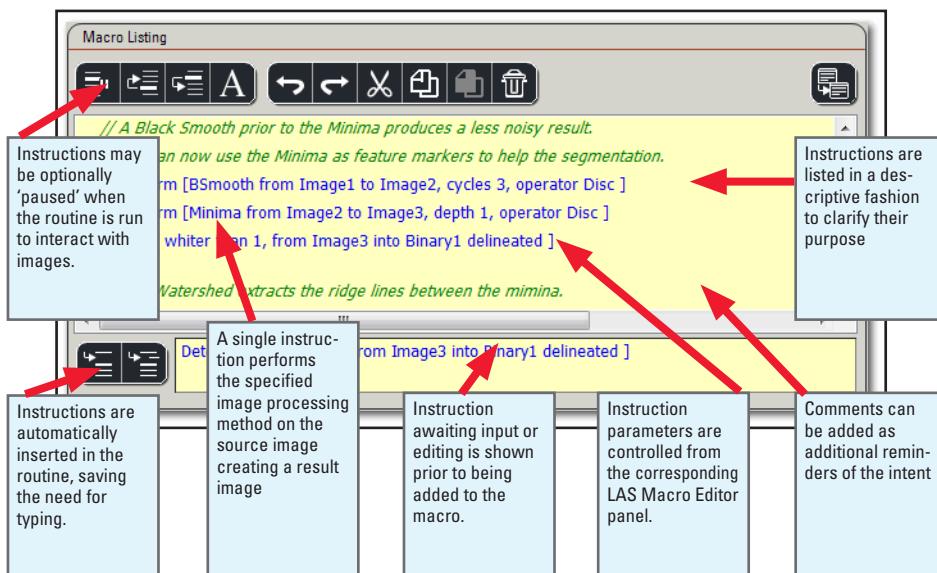
Customised and Automated

Efficient Macros

Leica LAS Macros automate image processing, analysis and measurements for quantitative microscopy. The richness of image processing functions in LAS can be adapted to a wide range of demanding imaging tasks. LAS Macro allows repetitive tasks to be customised for the needs of particular applications, optimising imaging solutions in a wide range of fields. This versatile software processes images obtained by Leica digital microscope cameras and Leica digital microscopes by the software of the Leica Application Suite.

The Leica LAS Macro Editor defines the instructions for image processing, binary processing and measurement. An LAS Macro routine with its Image Processing instructions is very much like a conventional software program. The main difference is the easy handling. It's not created by typing in its statements character by character; rather, you create it interactively, using facilities from the panels of the LAS Macro Editor. An instruction is created automatically and inserted into the LAS Macro by pressing the Insert button next to the instruction in the Pending Instruction window. There is no need to write any software code!

There is no need for specialized programming anymore, because nearly everyone can handle this fast and easy LAS Macro Editor module.



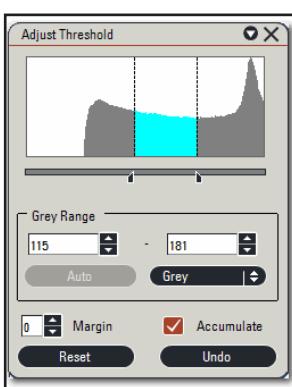
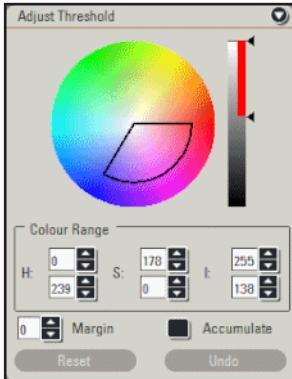
Advantages

- LAS Macro embodies versatility and so can be tailored exactly to the needs and sophistication of the application and expedites the creation of solutions to routine tasks
- Macros are not created by typing statements character by character; rather, you create them interactively. There is no need to write any software code!
- LAS Macro Runner allows operators with no specialist knowledge to use existing macros efficiently
- LAS Macro Editor allows repetitive tasks to be customised to the needs of particular applications
- Satisfies widest range of solutions – from simple interactive to totally automated
- Optimised for quantitative microscopy to solve a diverse range of life science and industrial applications
- Unrivalled in its richness of image processing and measurement functions.
- Highly effective in creating solutions to new and demanding applications
- Relevant details in images can be automatically selected by colour, or contrast, making measurements of size, number, shape, position or orientation in a consistent manner

Routine Operation

Macro programs are run within the LAS environment either using the LAS Macro Runner or in combination with LAS Image Analysis. LAS Macros are included in the analysis sequence at the step for Image Processing or Binary Processing. This combination makes a complete application solution that can be repeatedly used by operators with no specialist knowledge of LAS Macros.

Adding the versatility of LAS Macros to the automation of the LAS Image Analysis sequence or to the simplicity of the LAS Macro Runner, provides an efficient solution to demanding and unconventional tasks in analytical microscopy.



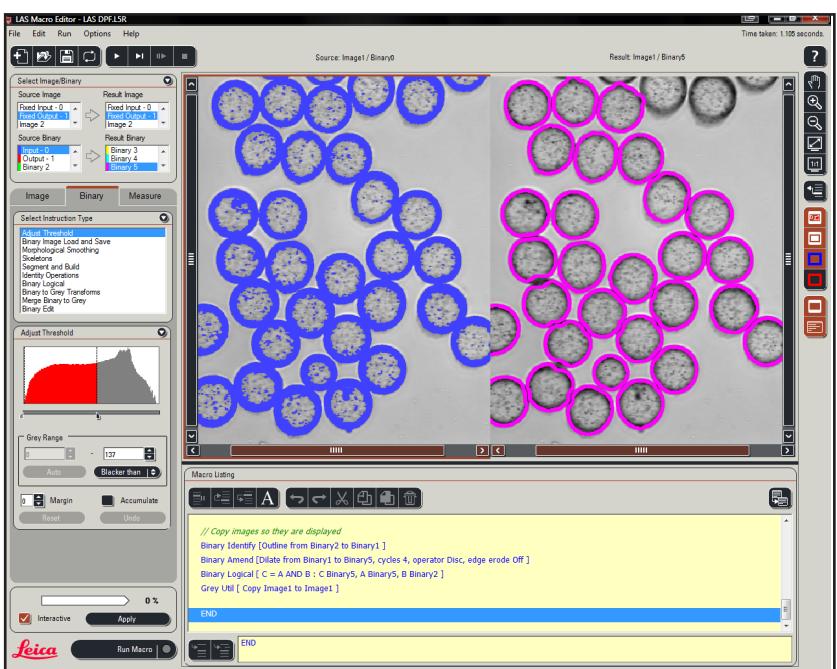
Applications

LAS Macro is used to create customised image processing procedures. The goal is to extract information of interest from the image so that it can be consistently measured.

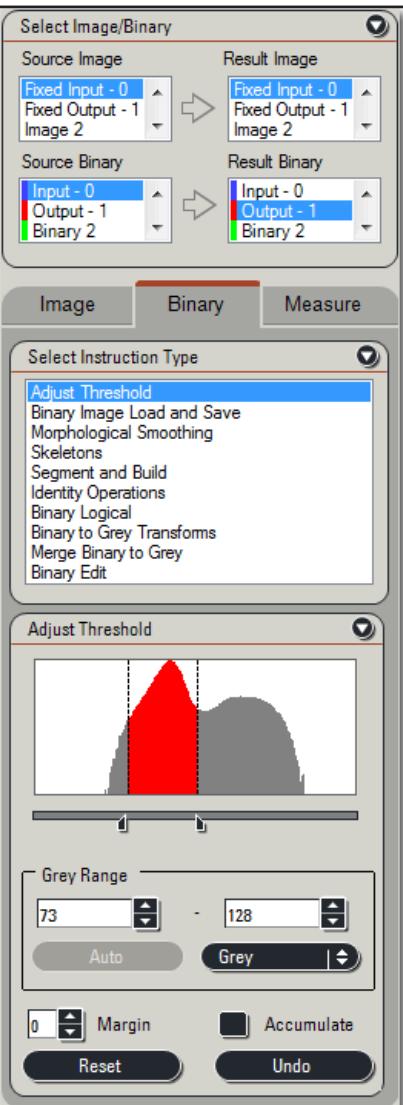
LAS Macro Editor allows you to put together a set of image processing steps that help achieve that goal.

Image processing is often used to simplify image content that prevents an accurate identification of the features to be measured. In this way, customised solutions can be provided where the prescriptive image processing menus fall short.

LAS Macros can be invaluable in reducing within specimen shading, identifying indistinct boundaries, separating agglomerated features, completing detected outlines and moreover doing this with repeatability.



Intensifying the Power



The fully coordinated Leica microscopes environment, cameras and LAS Software offer the user the one-of-a-kind benefit to control the whole system with only one environment. The easy use of LAS Marcos involves many aspects of the LAS, to provide a smooth workflow. Other LAS Modules produce images that are fully harmonized with the LAS Macros Module.

LAS Core

- Configures the microscope and camera, specifying objectives, stage automation, camera resolution etc
- Sets up imaging conditions used for a particular specimen
- Acquires images and saves them to a Windows folder
- Uses optional acquisition modules to capture images at different time intervals, different XY positions, different wavelengths or focus positions

LAS Macro Editor (Optional module)

- Creates LAS Macros interactively without user typing instructions
- Allows test run of macro for easy experimentation
- Provides a wide range of morphological colour, monochrome and binary processing functions
- Uses feature measurements as a means of modifying images

LAS Macro Runner (Optional module)

- Selects and loads LAS Macros
- Runs the selected LAS Macro on multiple images
- Performs automatically without the need for knowledge of macro programming
- Performs custom application solutions for image processing rapidly and repeatedly

LAS Image Analysis (Required module)

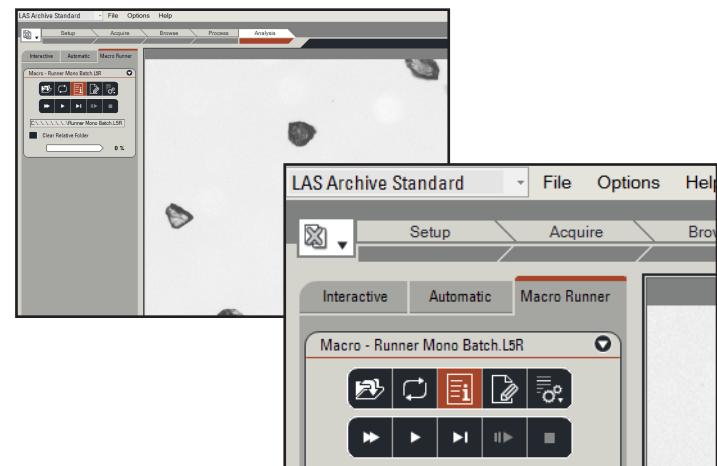
- Use image processing to make previously acquired images suitable for analysis
- Uses LAS Macros for image or binary processing in more demanding situations
- Enhance these regions by binary processing and manual image editing
- Measure whole field data and individual particles
- Produce graphical information in the form of histograms, bar charts and pie charts
- Output data to make a customized report using Excel

LAS Macro and the LAS Macro Runner

LAS Macros can be loaded into the LAS Macro Runner so that dedicated processing tasks can be performed without the user having to know how to create macros.

The LAS Macro Runner, in contrast to the LAS Image Analysis module, can use image processing steps in any order. The advantage of this versatility, is that the sequence can be as simple or as complex as required.

The macros are created in LAS Macro Editor but this option does not have to be present to run the macro. A macro can be copied to another LAS system and run with the LAS Macro Runner.

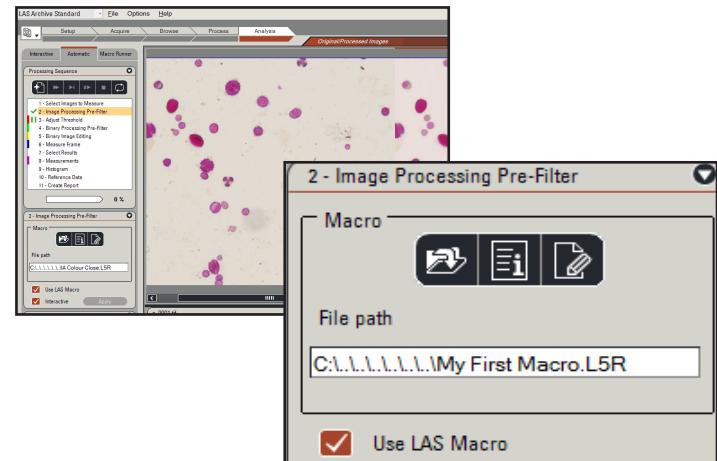


LAS Macro combined with LAS Image Analysis

LAS Macros work with the LAS Image Analysis module to enhance images for subsequent measurement and data analysis.

The LAS Macro is run at the image and or binary processing steps. Once selected, the macro is initiated when the IA sequence is run and processes the loaded image from the selected images. After the images are processed, they are measured and analysed by the integrated image analysis facilities.

The benefit of this arrangement is that there is almost no limit to the image processing sophistication that can be introduced, while the analysis is still performed in the same simple manner.



Creating or modifying with LAS Macro Editor

The editor concept is designed for rapid application development by simplifying the creation of macros.

The dual image viewer shows the before and after image, binary images are overlaid in contrasting colours so that the imaging steps can be clearly visualised. The macro instructions are interactively operated to allow easy experimentation with settings. The instructions are shown in plain language text that you don't type. The resulting list of instructions can be saved, recalled and edited

An LAS Macro can be run, normally for testing, the LAS Macro Editor enhancing the designer's macro productivity.



“With the user, for the user”

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■ Life Science Division

The Leica Microsystems Life Science Division supports the imaging needs of the scientific community with advanced instruments 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

The Leica Microsystems Industry Division's focus is to support customers' pursuit of the highest quality and result. Leica Microsystems provide the best and most innovative imaging systems to see, measure, and analyze the microstructures in routine and research industrial applications, materials science, quality control, forensic science investigation, and educational applications.

■ Biosystems Division

The Leica Microsystems Biosystems Division bridges histopathology lab and researches the highest-quality, most comprehensive product range. From patient to pathologist, the range includes the ideal product for each histology step and high-productivity workflow solutions for the entire lab. With complete histology systems featuring innovative automation and Novocastra™ reagents, Leica Microsystems create better patient care through rapid turnaround, diagnostic confidence, and close customer collaboration.

■ Surgical Division

The Leica Microsystems Surgical Division's focus is to partner with and support surgeons and their care of patients with the highest-quality, most innovative surgical microscope technology today and into the future.

The statement by Ernst Leitz in 1869, “with the user, for the user,” describes the fruitful collaboration with our users and driving force of innovation at Leica Microsystems. We have developed five brand values to live up to this tradition: **Pioneering, High-end Quality, Team Spirit, Dedication to Science, and Continuous Improvement**. For us, living up to these values means: **Living up to Life**.

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