From Eye to Insight

MICROSYSTEMS

Leica Acquire

User Manual

Leica Acquire User Manual

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Table of Contents

What is Leica Acquire?

Leica Acquire is a software environment which allows the acquisition, analysis and processing of high quality digital images using Leica cameras on an Apple Mac.

Leica Acquire is compatible with the latest Leica educational cameras and stereo-microscopes (with integral digital camera) and provides the basic software for the camera configuration and control, as well as image acquisition.

Captured images can be viewed in a gallery, saved to specified file locations and can have additional processing applied to them.

System Requirements

Supported Cameras

Leica ICC50 W, ICC50 E, IC90 E, MC 120 HD, MC 170 HD

Supported Microscopes

Leica EZ4 W, EZ4 E, DMS300, DMS 1000

Computer System

The minimum Mac computer specification is as follows:

- 1 GHz Intel Core2 Duo processor, with 1 GB RAM.
- Graphics: 256Mb RAM supporting 32 bit.
- USB 2.0 (High-Speed) port.

Approximately 30 Mb of disk space for a full installation.

Further space is required for data and image storage. Check free disk space regularly.

Operating System

Supported Mac OS operating systems: 10.14 (Mojave) up to 11 (Big Sur)

Please use the latest updates.

Please Note:
Faster processors, additional RAM memory and more advanced graphics adapters may improve the performance of Leica Acquire. Running other programs at the same time may limit performance.

Feedback

For help with any problems please refer to the sections in [Troubleshooting](#) or [Hints and Tips](#).

If you still encounter problems, report any issues or feedback concerning this software to your local Leica Microsystems representative.

Please describe the exact configuration you are working with and your software version, including:

Software Version number

Computer description (brand name, operating system, RAM, language, etc)
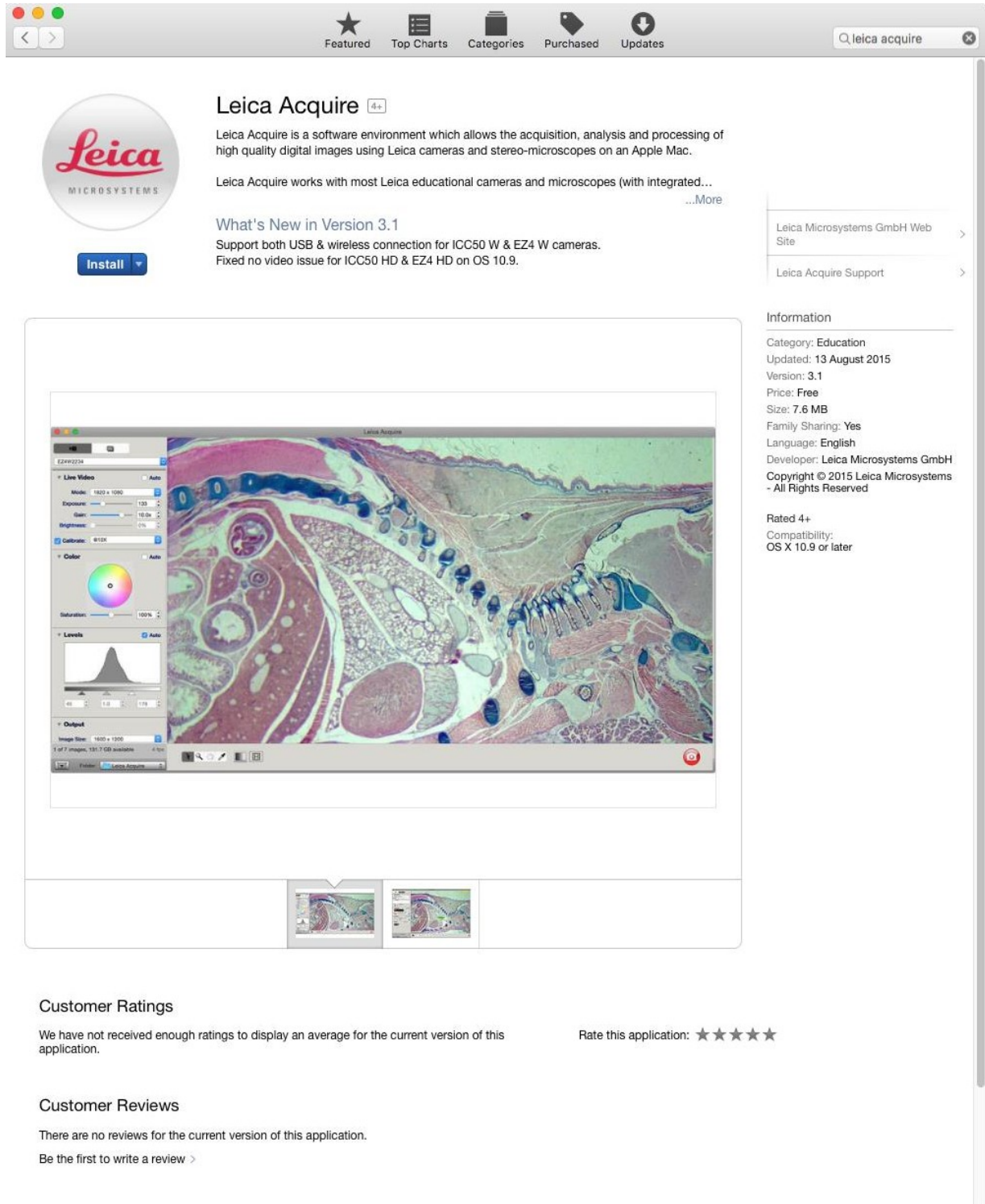
Microscope or camera description

Description of the exact steps that produce the error

Screenshot of any error message

Installing Leica Acquire

Open App Store app, search for Leica Acquire or open the below link using browser

[Click me to download Leica Acquire](#)

After installation, you can connect your camera or microscope to the computer.

Connections on the Computer

USB

The Leica educational cameras and stereo-microscopes use a High-Speed USB (USB 2.0) or Super-speed USB (USB 3.0) connection to the computer.

Please make sure both your computer and Mac Operating System support High-Speed USB (USB 2.0)or Super-Speed USB (USB 3.0). If your computer only supports standard USB (USB 1 or 1.1) please update your hardware.

Does your computer support USB?

The first step for proper USB connectivity is to make sure your computer supports USB and is enabled. If in doubt consult your computer system administrator or computer supplier.

A USB socket or port on your computer looks like this:

 with a USB symbol

Which version of USB do you have?

If your computer and Mac OS already supports USB but you are not sure if it is a High Speed USB or Super Speed USB, you can check which version you have in the following way:

Open the **About this Mac** panel from the Apple menu and click **More Info ......**This will display your computer system properties.

Expand **Hardware** and Click **USB**.
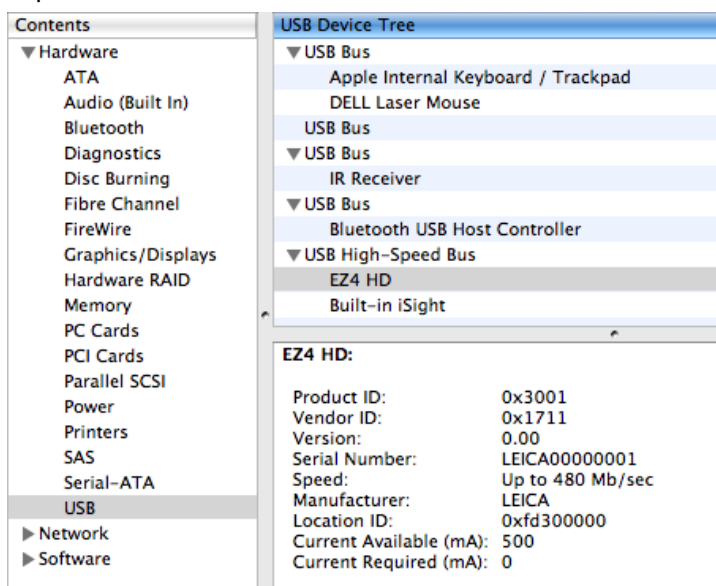
If **USB High-Speed Bus** is displayed, then the computer supports High-Speed USB.

If you have already a High-Speed USB device connected to a High-Speed USB port, the device **Speed** should read **Up to 480 Mb/sec**.

Otherwise it is a standard speed USB device and/or port.

Connecting the camera or microscope
USB Connection:

Familiarize yourself with the USB cable provided and the connections on the microscope or camera.

Connect the power cable to the microscope or camera. Do not switch on the power.

Connect one end of the USB cable to the rear of the microscope or camera and the other end to a free High Speed USB port of the computer.

Switch on the power. The Leica Stereo-microscope or camera should now be ready for you to start Acquire. See how to use Acquire -->.

Ethernet Connection:

- Some cameras have an Ethernet mode which allows them to connect to a network. In this case, after the camera is connected to a network, and the camera is switched on, a computer running iOS connected to the same network and same subnet as the camera will find the camera when launching Leica Acquire.

- Follow the instructions included with the camera for using Ethernet Mode.

- Follow the instructions of your Computer to connect to an external network.

Adding Manual Camera
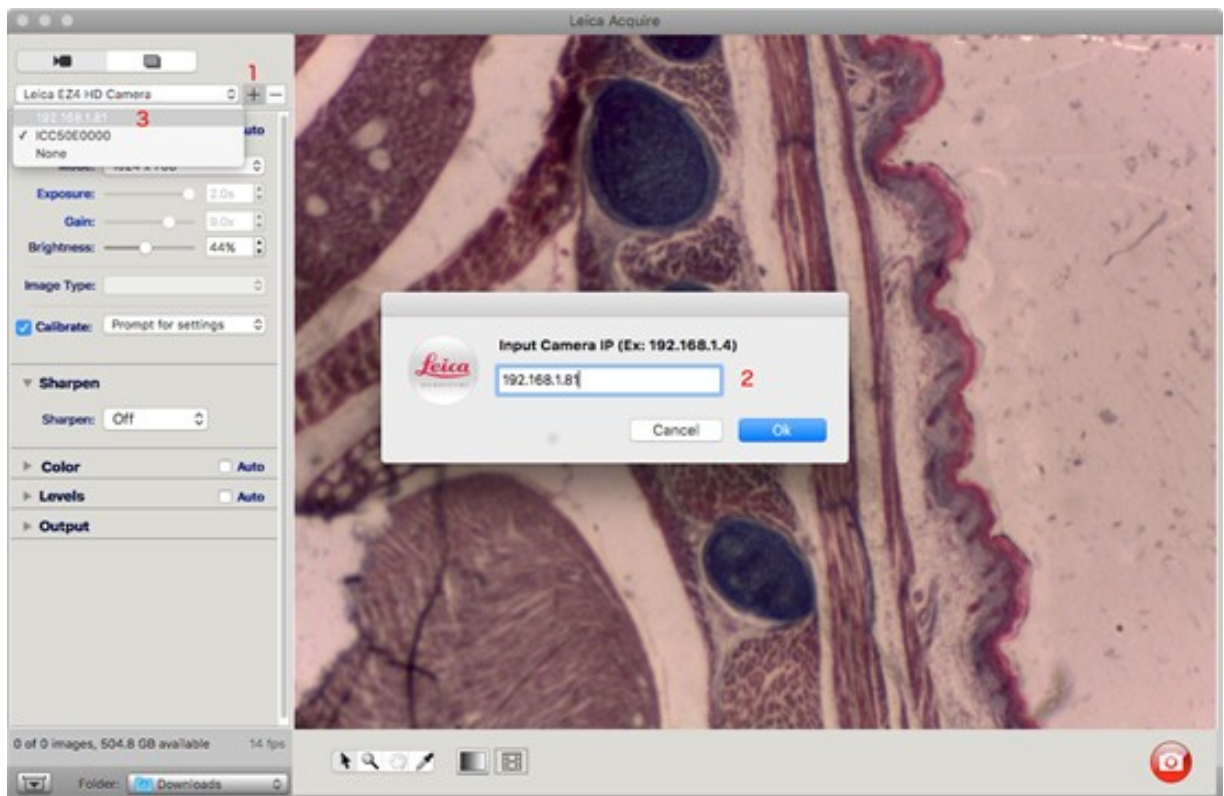
Step 1: press the '+' button beside camera dropdown menu.

Step 2: Input camera IP, in this example is 192.168.1.81, press ok.

Step 3: Select the manual added camera in the dropdown menu.

If user need to remove manually added camera, just click the ' - ' button.

Overview
Starting Acquire

Leica Acquire can be started from the Leica Acquire icon in the application folder.
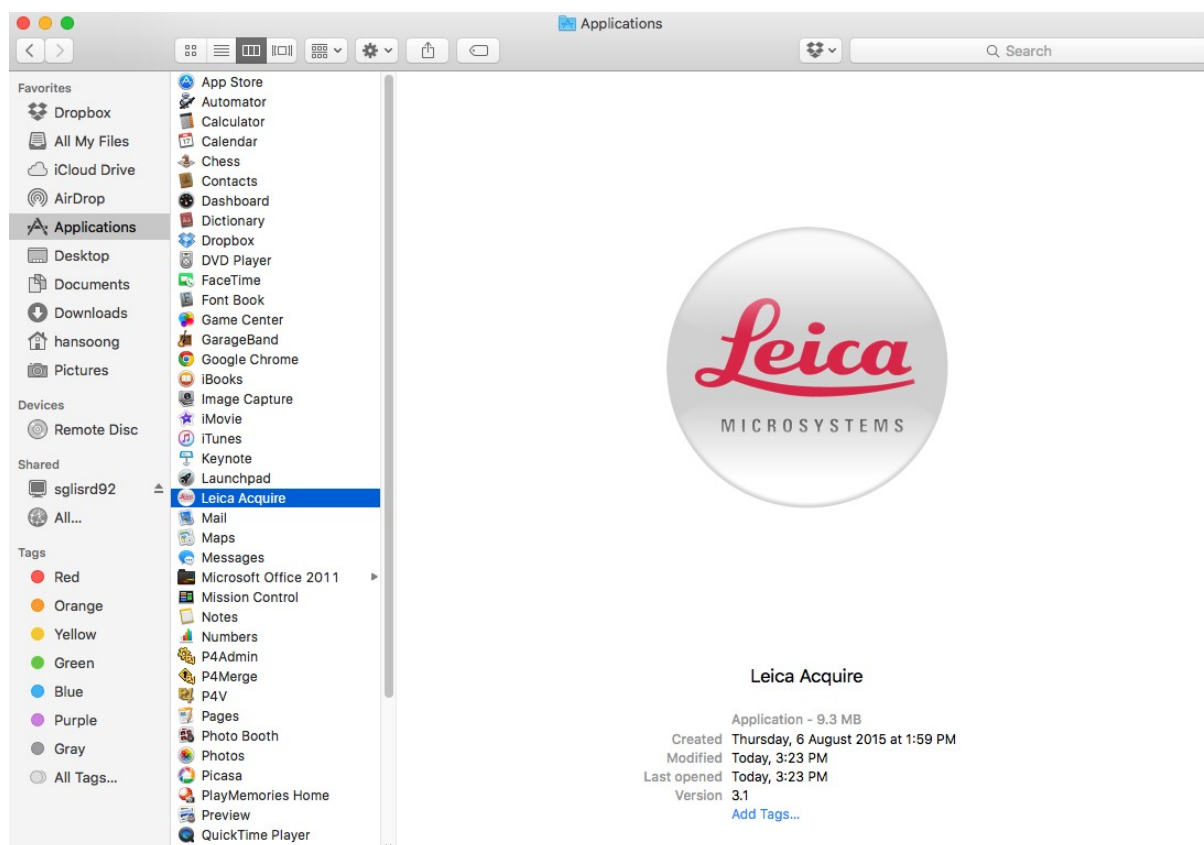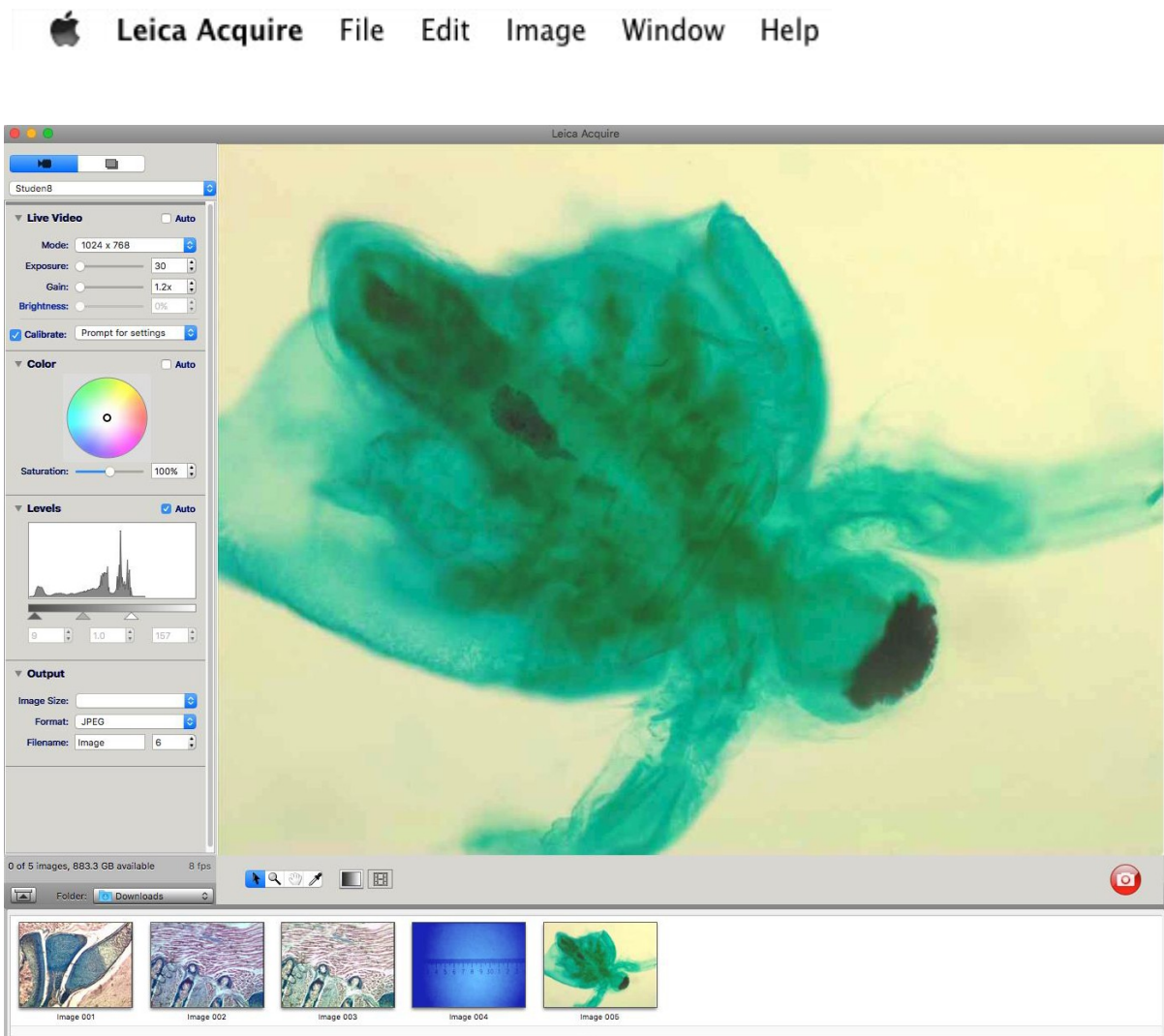

For easier access to Acquire, drag the icon to the Dock on the Desktop, or create an alias and place the alias on the Desktop.

Double-click the icon and Acquire will open in the design as shown overleaf.

Overall Design

Acquire shows camera controls on the left, and the Image Viewer on the right, as shown.

Acquire is divided into 5 main areas:

- Acquire has a common Mac OS **Menu Bar**.
- **Control** and **information** panels.
- **Image Viewer**, showing the live and captured images.
- **Imaging Tools**.
- **Image Gallery**.

Menu Bar

You can view the help files and version information, and also select some image processing. Go to the Menu Bar -->.

Control panel

The control panel has two different modes:

1. When viewing a live image, this panel contains the camera controls for setting, adjusting and capturing the live image (**Capture**).
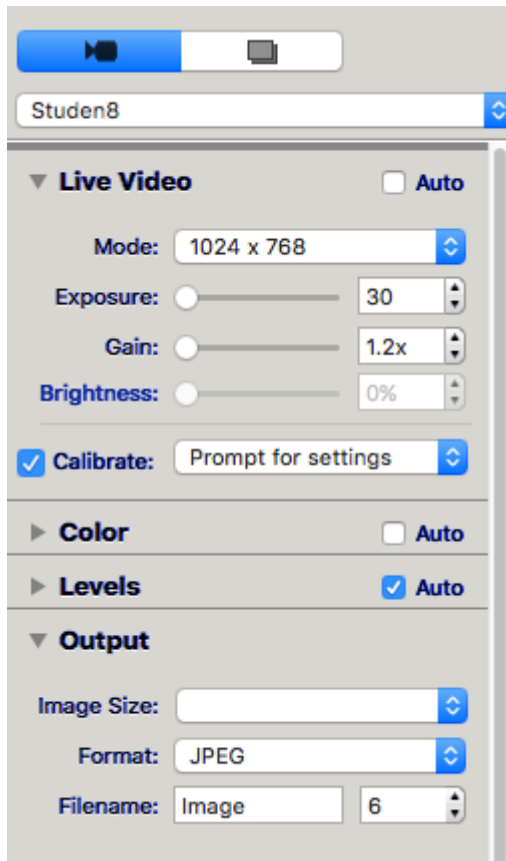
2. When viewing a captured or saved image, this panel displays information about the selected image (**Review**).
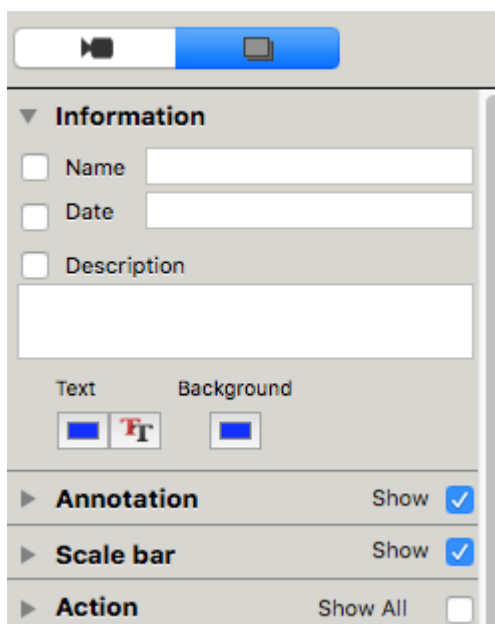
Image Viewer

The right-side and largest part of Acquire shows the Image Viewer.

In the Capture Panel, the live image fills the Image Viewer, as above.

In the Review Panel, the Image Viewer displays the image selected from the thumbnails in the Image Gallery.

Imaging Tools

These tools provide manipulation of live or acquired images.

Image Gallery

Acquired images are displayed as thumbnails in a horizontal gallery along the bottom or vertical gallery along the right of the main Acquire window.

Menu Bar

As with all other applications on the Mac OS, Acquire displays a menu bar along the top of the screen.

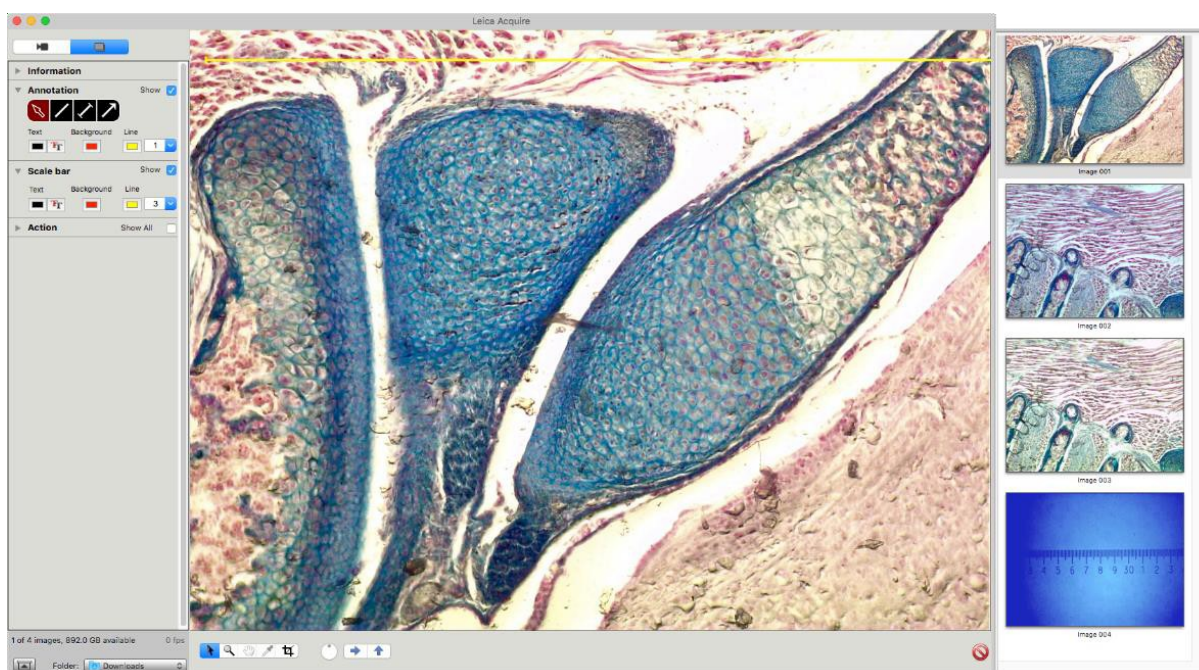Leica Acquire contains general **Apple** menu commands for the entire application such as hiding or quitting and also general **Window** menu commands for minimizing and restoring.

Leica Acquire

About Acquire displays the application version information.

Preferences... (⌘,)

General has the option to open the image in another application after capture.
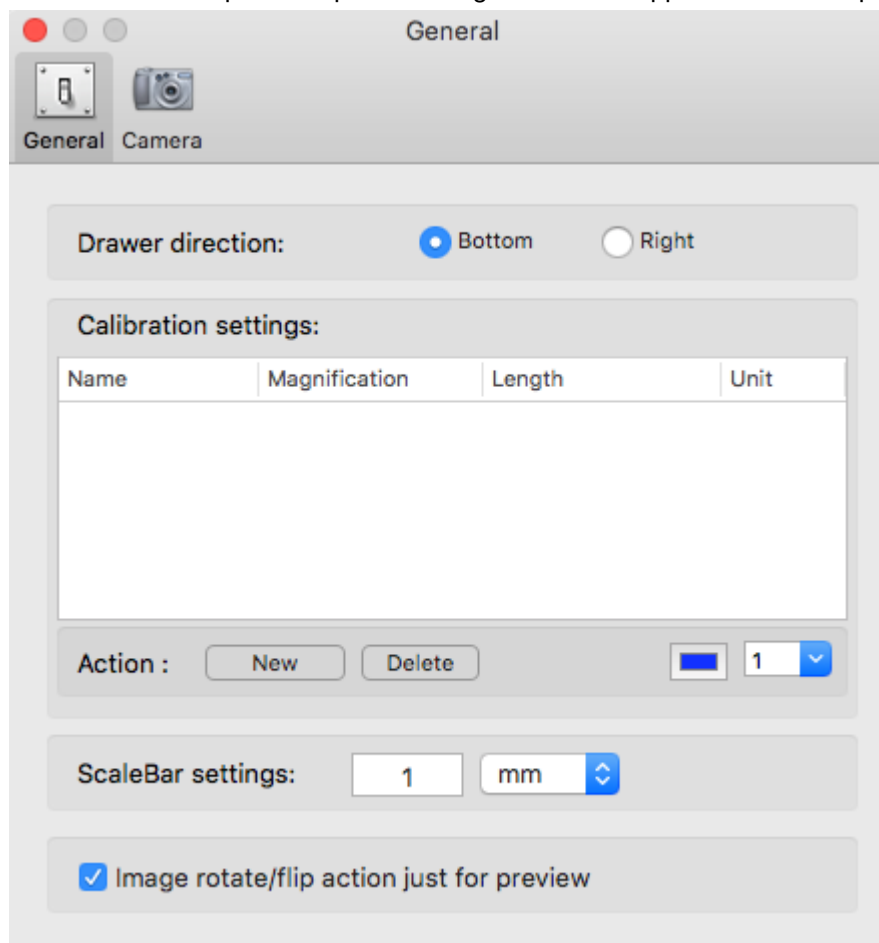
Camera displays the active camera name and serial number and firmware version.

Image

Rotate

.. Left turns the image in a counter- (or anti-) clockwise direction by 90'.

.. Right turns the image in a clockwise direction by 90'.

Flip

.. Horizontal flips the image from left to right and vice-versa.

.. Vertical flips the image from top to bottom and vice-versa.

Crop

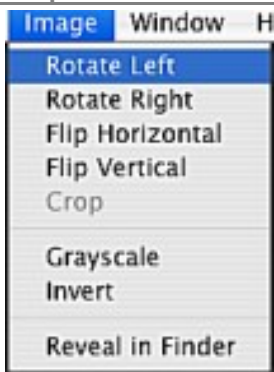Click to crop the image after first drawing a region using the Toolbox Crop Region Tool.

Grayscale

Converts a color image to a grayscale or monochrome (black & white) image.

Invert

Creates a "negative" picture from the image.

Reveal in Finder

Disable in this version

Window

Fullscreen (⌘+F) displays the live or saved image across the whole of monitor display screen, without any controls being visible.

You can toggle (⌘+F) at any time.

Help

Acquire Help opens this Help file (⌘+?).

Controlling the Live Image

The live image can be viewed and adjusted in the Capture Panel.
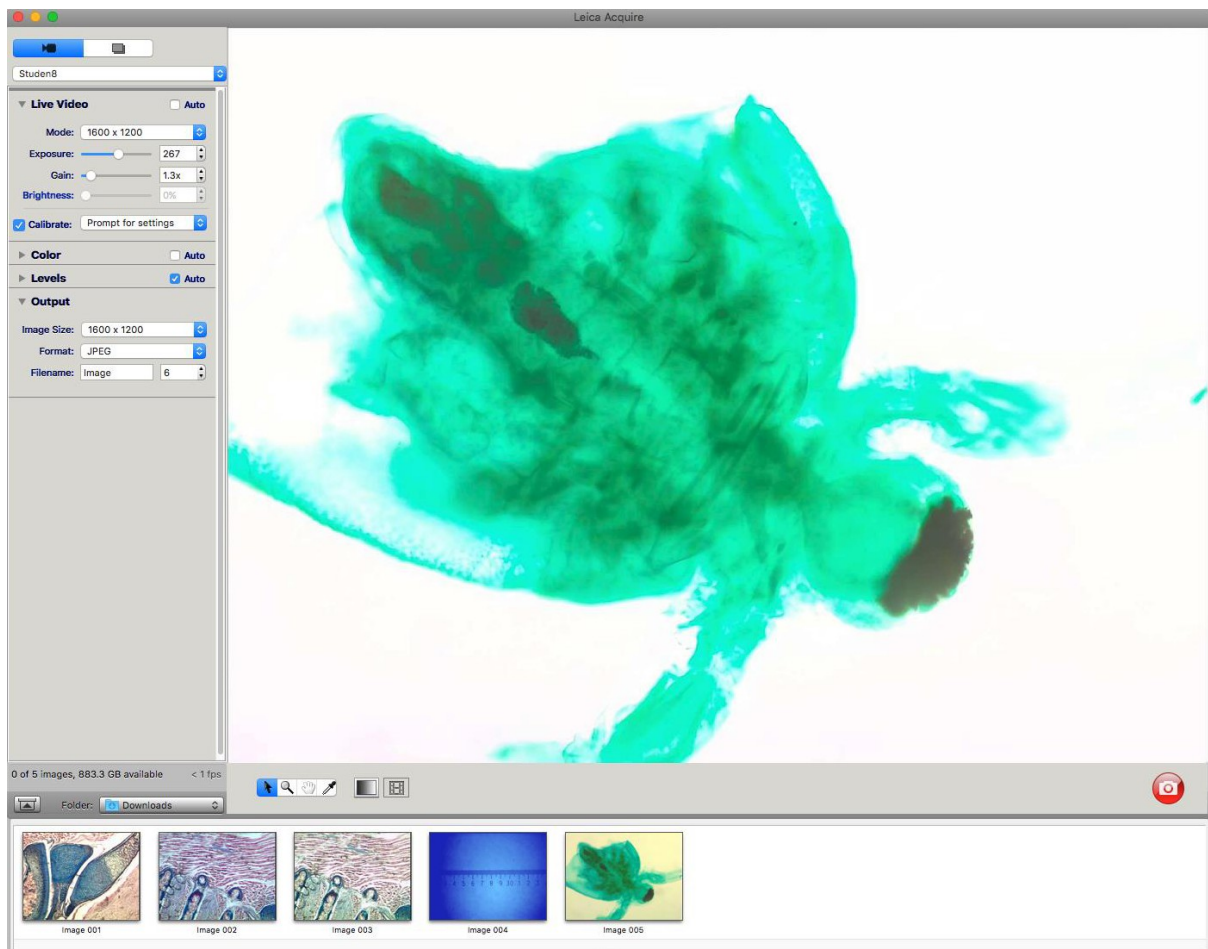
Camera controls are on the left; the live image is on the right.

Camera Controls

Camera controls are divided into several main areas:

Camera configuration
Adjusting basic brightness of the Live image.
White & Color Balance.
Sharpening the image
Histogram
Selecting Output options for acquisition.
Image Capture.

Camera configuration

Camera

Normally, Acquire will startup and show a live image with the active camera automatically. If you have more than one camera connected to the computer, you can select which camera is to be active.

Live Video

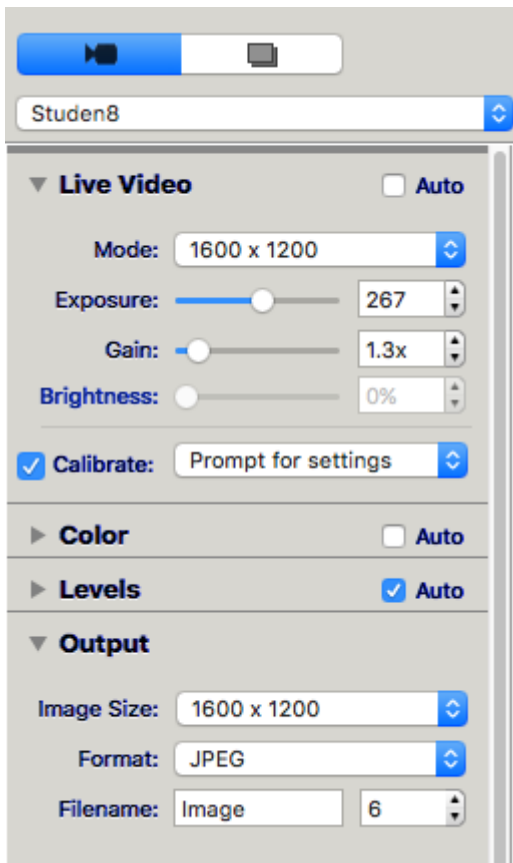This contains the controls for adjusting the basic brightness of the live image either manually or in automatic mode.

Mode

Select the largest resolution for a better quality live image, and the smallest for a lower resolution but with faster frame rates.

Exposure

Increasing Exposure time will make the image lighter. However, as the exposure increases, the live image refresh (frame) rates will become slower.

Minimum exposures are to the left and maximum to the right. You can write values directly in the edit box.

Gain

Gain is used to amplify the image signal. Increasing Gain brightens the image without increasing the exposure time. However, high gain values can reduce image quality.
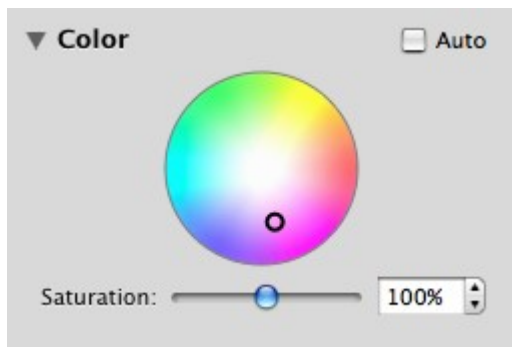
The minimum value of 1x is to the left and different cameras have different maximum values to the right. You can write values directly in the edit box.

Auto

When checked, this will enable automatic brightness and you can adjust the level with the Brightness slider.

Color

You can adjust the image Color and Saturation and select automatic White Balance.

Saturation

The Saturation slider sets the color intensity of the image.

It can be adjusted to the left so that the image appears as monochrome (black & white) and to the right for falsely bright colors. The default is 100. The range of the slider is from 0 - 200%, but you can write directly in the edit box these and any values greater that 200.

Color

The color wheel is used for fine-tuning the color balance. Depending on the light source, subject matter and camera characteristics, fine correction of the image may be necessary even after a white balance.

Drag the central dot in the color wheel towards the color you require.

White Balance

White Balance corrects the live image without any color bias (neutral). It can be applied to the whole image or to a specific region.

The term "white balance" is not strictly correct - neutral balance would be more accurate - but as the term is used worldwide, we will continue to use it here.

When **Auto** is checked, White Balance is continuously applied to the whole of the live image.

To make a White Balance at a particular point or a region drawn on the live image - select the *White Balance* eyedropper in the Toolbox.

Sharpen

Apply Sharpening to Live and Captured images. Move the slider to the left for minimum and to the right for maximum sharpening.

Levels

The live image *Histogram* displays a visual representation of the current light levels as seen by the camera.
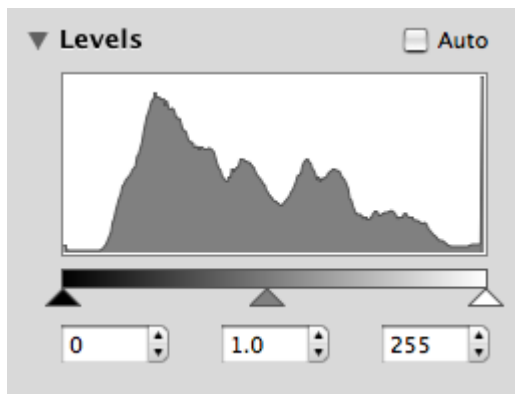
It shows the relative distribution of pixels by tonal value from the darkest elements (indicated in the grayscale bar) on the left-hand side to the brightest on the right. A peak represents many pixels in that density range. A well-illuminated image should contain all elements from dark to light.

While automatic exposure offers the best overall image quality for most acquisition purposes, you may wish to make some adjustments. The histogram can be used to control brightness and *contrast* of an image and an understanding the histogram is, therefore, important to obtain the best captured images.

You can adjust the minimum brightness (gray) level (or black point or level) by dragging the left-most triangle indicator below the grayscale bar, and maximum brightness (gray) level (or white point or level) by dragging the right-most triangle. You can also alter these values in the edit boxes - use arrow keys for precision. These controls remain active until you move them again or check **Auto**.

To obtain the best image, these contrast indicators for minimum and maximum brightness levels should be aligned with the limits of the brightness distribution. The closer the indicators are together, the higher the image contrast.

The default minimum is 0 and default maximum is 255.

Gamma

Gamma adjusts the contrast range and how it is applied to an image.

For a gamma value of 1.0, contrast is applied evenly (linearly) across the whole light intensity range. However dark areas, for example, may appear too dark to view easily, and by adjusting the gamma to below 1.0 (to the left), the detail becomes more visible. The image becomes lighter but also duller. Conversely, increasing the gamma above 1.0 (to the right) makes the image darker but also more vibrant.

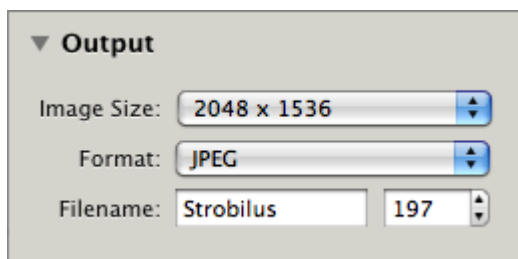Gamma is adjusted by dragging the middle triangle indicator. The default is 1.0.

As the gamma value is calculated as a factor of the minimum and maximum gray levels, the gamma triangle position moves according to the position of the contrast indicators.

Auto

When checked, optimum gamma, black and white levels are automatically calculated from the current brightness distribution.

Output

The captured image type and name can be selected here.

Image Size

Select the captured image size from the available resolutions in the list. Each camera may have several different sizes.

Format

Select from:

TIFF (8 & 16 bit).

JPEG (8 bit only)

PNG (8 & 16 bit)

Filename

The saved image file name has an automatically incremented number added to the end of the name. By default (and if the name is blank) this name is "image".1. The increment number can be set (or reset) to any number.

Capturing an Image

Once the image is satisfactory, capture it by clicking the **Capture** button, in the bottom right corner.

The image will be added to the Gallery and stored in the folder defined in the [Folder options](#).

Recording a video

User may switch from capture mode to record mode using switch button
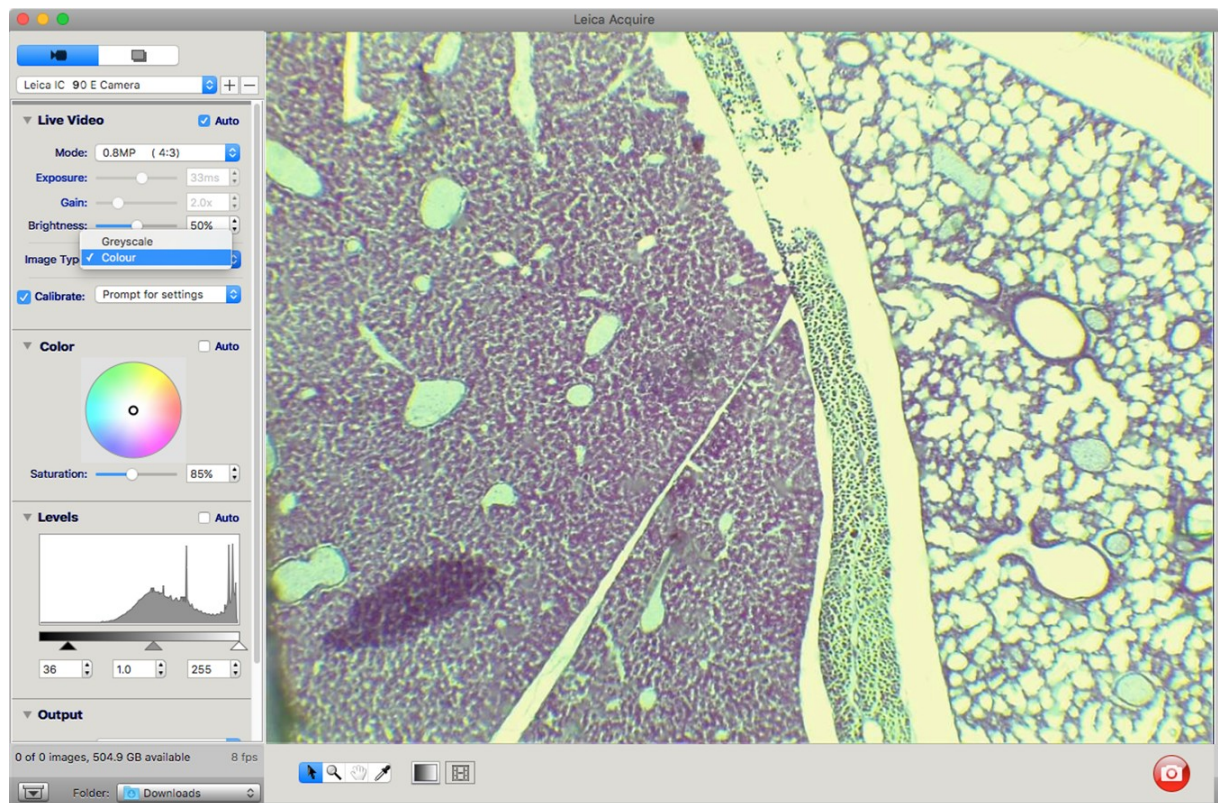

Once the image is satisfactory, record it by clicking the **Record** button, in the bottom right corner.

The video will be added to the Gallery and stored in the folder defined in the Folder options.

Additional Feature for ICC90 E Camera

ICC 90E camera support additional Colour/Grayscale image type settings

Imaging Tools

These tools are available for manipulating the live image or any captured image. All Images that appear in the Gallery may be edited with these tools (apart from Exposure Check).

Toolbox

The Toolbox contains mouse-controlled tools to select actions for drawing a Cropping region, White Balance, Magnifying and Navigating around an image.

Selecting a tool changes the shape of the mouse cursor and function of the mouse, and by doing so makes the tool active.
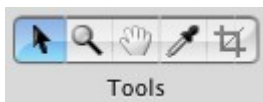
Arrow

The Arrow tool turns off other mouse tools. This is the default cursor.

Zoom

This will enable you to Zoom In or Zoom Out of the image.

Zoom In: Move the cursor over the live image and it will change to . Click one or more times on the live image to zoom in by fixed amounts.

Zoom Out: Repeat as for Zoom In, but press the **alt** key at the same time and the mouse will appear as . Click on the live image one or more times to zoom out by fixed amounts.

Alternatively you can click in the live image and scroll the mouse up or down to zoom in or out smoothly.

See also the Zoom Slider.

Hand

The Hand tool enables you to navigate around the whole of an image when it is zoomed-in. It is grayed out when fully zoomed-out, but becomes available once the image is zoomed-in.

The mouse cursor turns to a hand. Click in the live image with the Hand cursor and drag the mouse anywhere in the image.

White Balance (eyedropper)

To apply white balance correction on a live image, you can use the eye-dropper tool.
Simply click on the eyedropper tool, then draw a square at the region of interest (ROI) that is dominantly white in the image. Once you are finished drawing the square, the eyedropper tool will disappear at the cursor and the selected white area will be used as a reference for the white balance correction. The bigger the selected white area (ROI), the more correct the white balance correction.

To apply the White Balance to the whole image, click **Auto** in the **Color** panel.

⊡ Crop Region

Draw a rectangle with this tool. The area you wish to crop or cut away will become slightly grayed-out. The area that you wish to keep inside the cropped region will remain at normal viewing brightness.
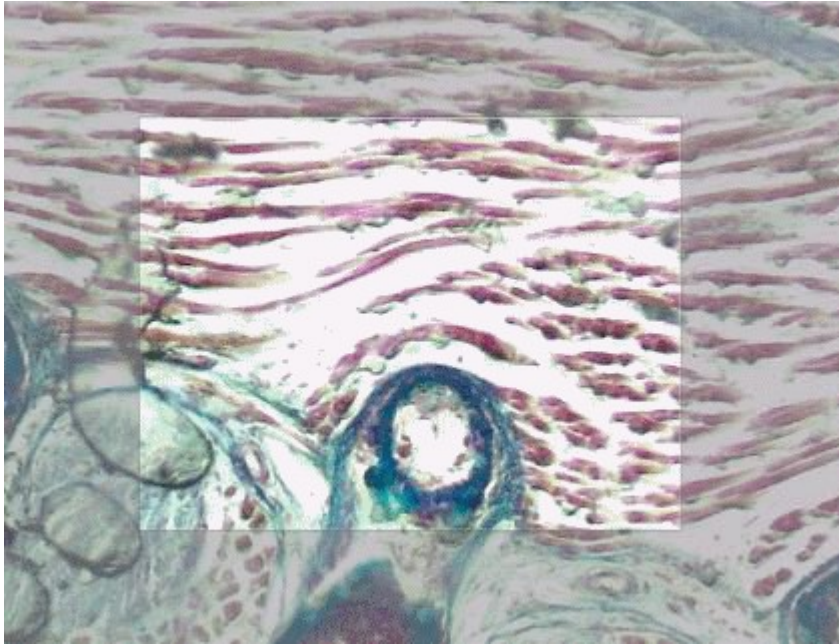
To **move** the region you wish to crop, move the mouse inside the rectangle to show a Hand cursor. Click and drag the rectangle to a different position.

To **resize** the region, grab an edge or corner and drag to enlarge or reduce the rectangle.

Deactivate the cropping region by clicking again (with the crop cursor showing) anywhere in the grayed-out area outside the rectangle.

To **crop** the image to this region, use the Crop Image button.

Button Tools

These tools rotate, flip and crop the image.

Rotate Image

Rotate the whole image right (clockwise) or left (anti- or counter-clockwise) by 90'.

You can also apply this to multiple captured images by selecting more than one image in the Gallery.

Flip Image

Flip the whole image horizontally or vertically.

You can also apply this to multiple captured images by selecting more than one image in the Gallery.
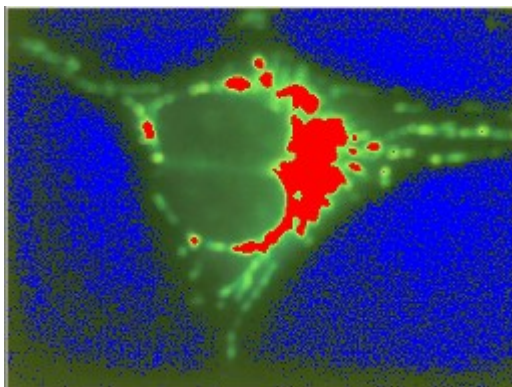
 Exposure Check (live image only)

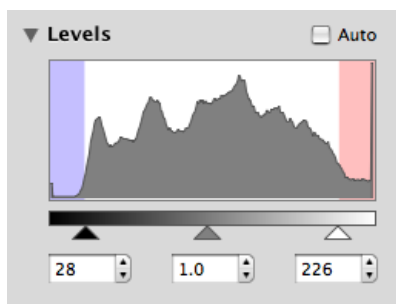Sometimes it is difficult to know when the live image is under- or over-exposed.

 When active , Exposure Check indicates those parts of the under- and over-exposed image as blue and red regions respectively.

You can also adjust these regions by dragging the histogram black and white levels.

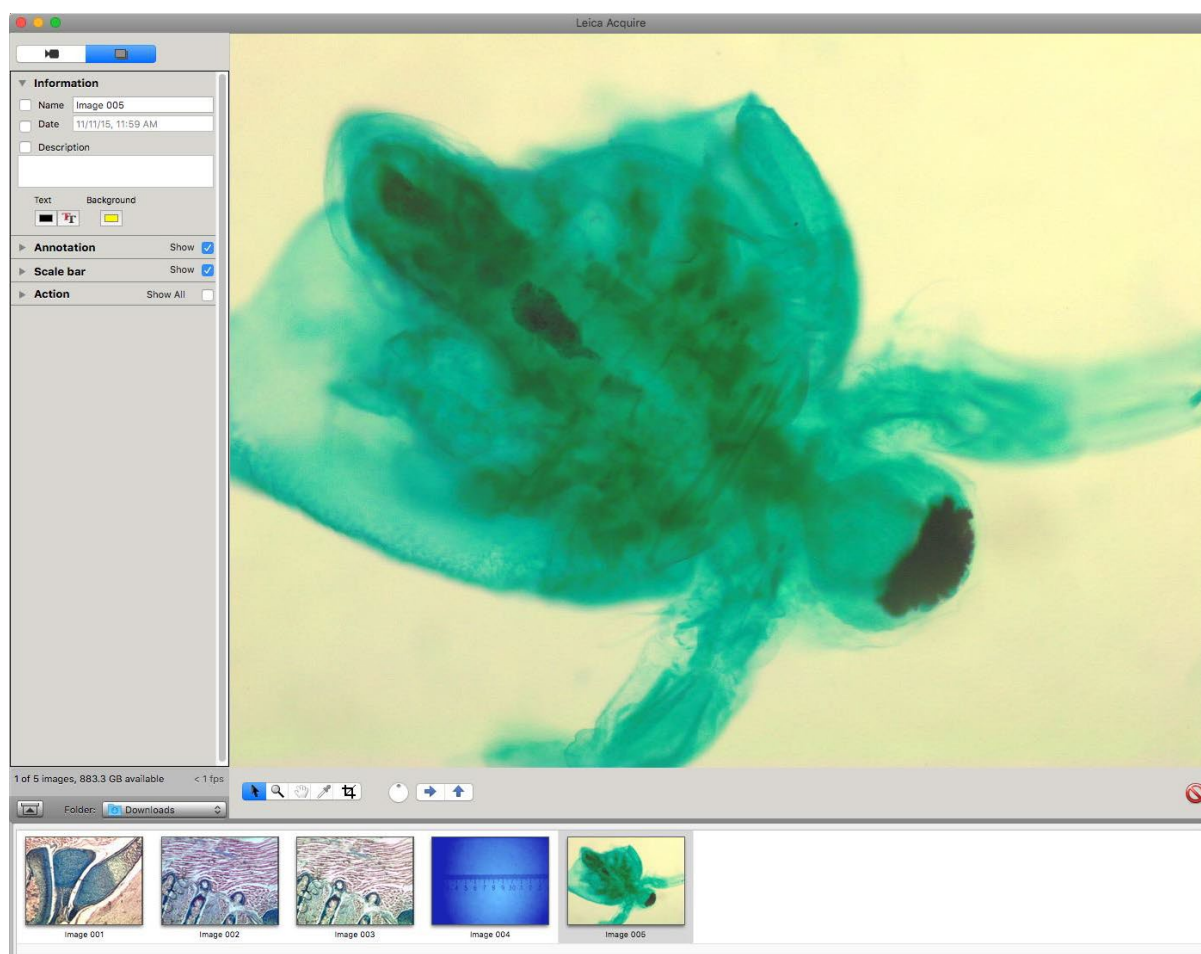The histogram is marked with corresponding pale blue and red colors:

 Delete

Delete (Move to Trash) one or more selected image in the Gallery. This will delete the file(s) from your computer.

Viewing Captured Images

The Review Panel enables you to view captured (or stored) images and add or change the image name or descriptions.

Acquired images are displayed as thumbnails in the expandable horizontal Gallery at the bottom of the main Acquire window. An image selected in the Gallery is displayed in the viewing area on the right and the image description is shown in the information panel on the left.

There are also a number of tools below the displayed image for further processing.

The description is attached to each image and some items may be amended.

Image Information

Name

This is the name applied at the time of acquisition in the Output option in the Capture panel. To rename an image, type another filename into the box. If it already exists, the filename is rejected, and the original name is established.

Format

This is the file type selected in the Output option in the Capture panel. It is not editable.

Dimensions

This is the size selected in Image Size in the <u>Output</u> option in the Capture panel. It is not editable.

Date

This is the date and time of the acquisition. It is not editable.

Author

You can type any name in this box.

Copyright

You can type any name in this box.

Comments

You can type any comments in here. Long descriptions will automatically scroll beyond the end of the displayed panel.

Imaging Tools

Toolbox

The Toolbox contains mouse-controlled tools to select actions for cropping, magnifying and navigating around an image highlighted in the Gallery.

Button Tools

These tools rotate, flip and crop the image.

The operations of all these tools are shown in <u>Imaging Tools</u>.

Image Gallery

Acquired images are displayed as thumbnails in an expandable horizontal Gallery along the bottom of the main Capture window.
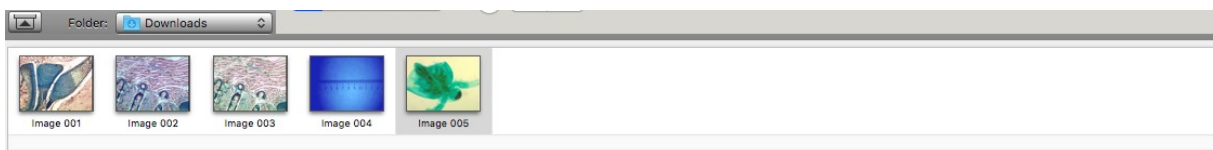

Image Types

The Gallery will display and open any files on your computer with a file type of Jpeg (or jpg), Tiff (or tif) and Png. Acquire will ignore other file types. It will also display and open files on another networked computer if you have access to these files.

Access to the Gallery

The Gallery can be opened or closed by toggling **Show/Hide** at the bottom of the control panel.

The Gallery is accessible when viewing live or acquired images.

Folder options

The current Gallery folder is shown in **Folder**. The default folder is located in ~/Pictures/Acquire (where ~ is the current login username).

Click **Folder** to change the location or create a new folder by selecting **Other Folder...** from the list of options. Make sure you have write-access permissions to capture images to the folder you select.

Images are captured and saved to the current gallery folder active at the time of capture.

Once the Gallery is open, the size and number of visible thumbnails can be controlled by dragging the bottom of the gallery up or down.

The number of images in the Gallery folder is displayed below the image viewer. You can select one or more thumbnails and the number of images selected will be shown as well as the free space available on

the computer or volume.

For example, 4 images have been highlighted out of 24 that are visible to Acquire. The amount of free space available on this computer is 31.7 Gb:
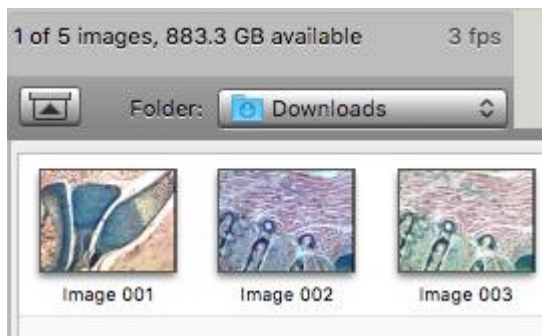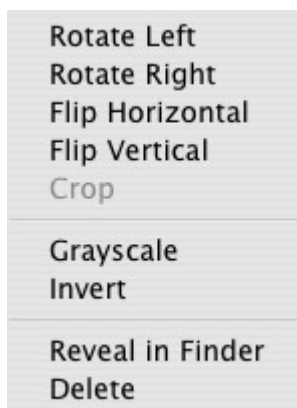

Image Options

Gallery actions will permanently affect the image file on your computer and not just in Acquire.

Each of these actions may be applied to more than one image at a time. This means that the action will be applied to all thumbnails highlighted in the Gallery, and not just the image displayed in the Image Viewer.

Rotate

Rotate Left turns one or more selected image in a counter- (or anti-) clockwise direction by 90'.

Rotate Right turns one or more selected image in a clockwise direction by 90'.

Flip

Flip Horizontal flips the image from left to right and vice-versa.

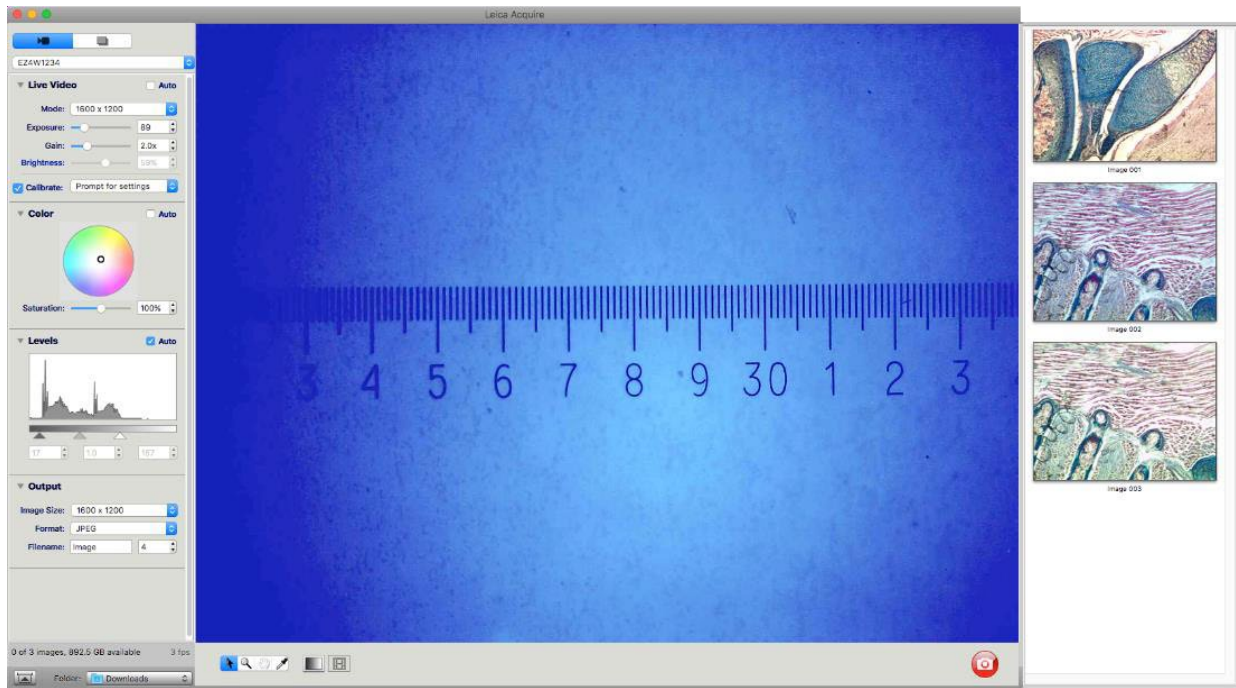Flip Vertical flips the image from top to bottom and vice-versa.

Grayscale

Converts a color image to a grayscale or monochrome (black & white) image.

Invert

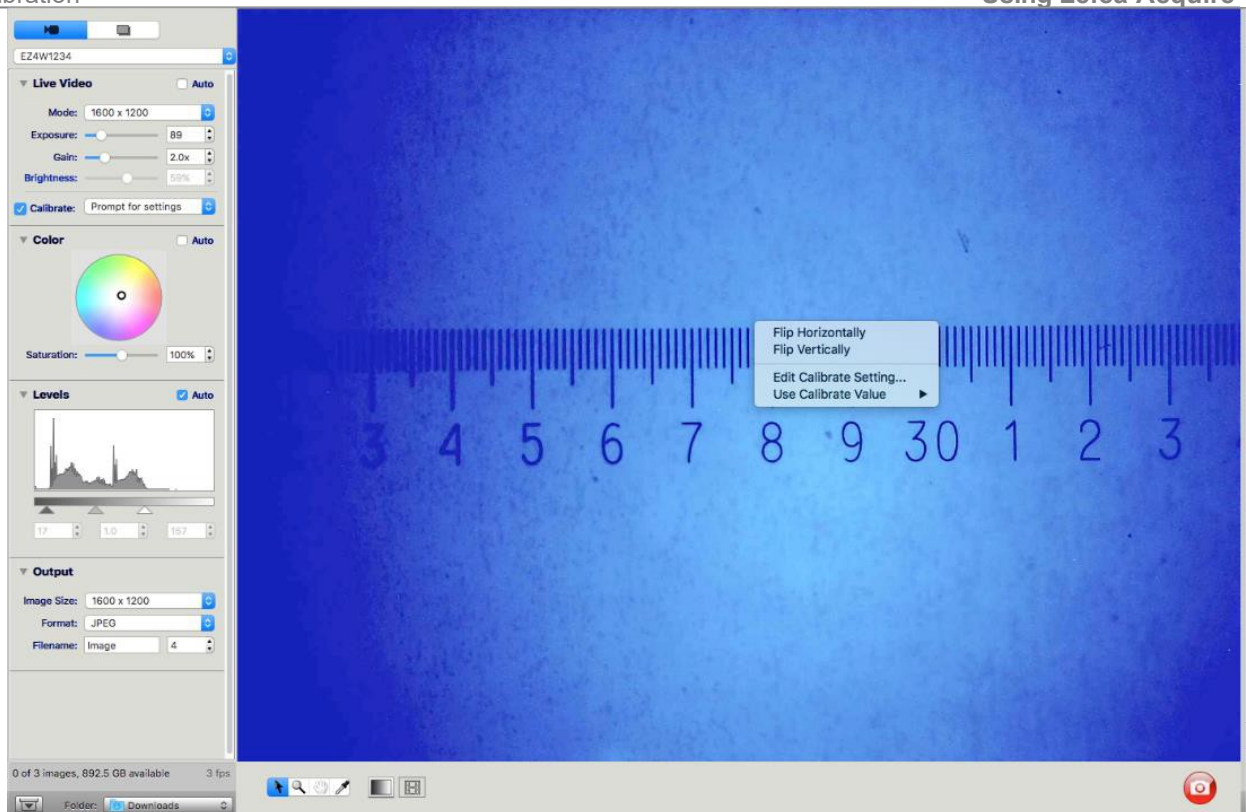Creates a "negative" picture from the image.
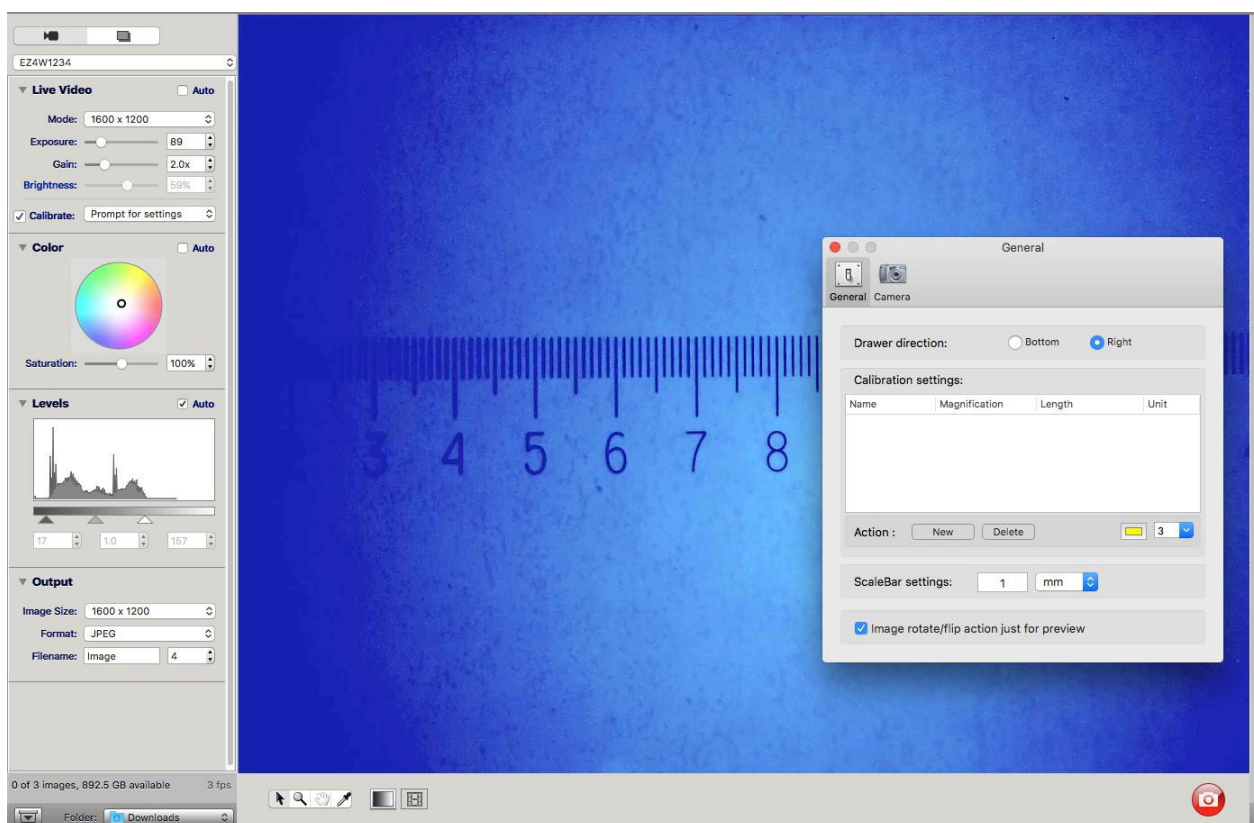
Calibration

Step 1

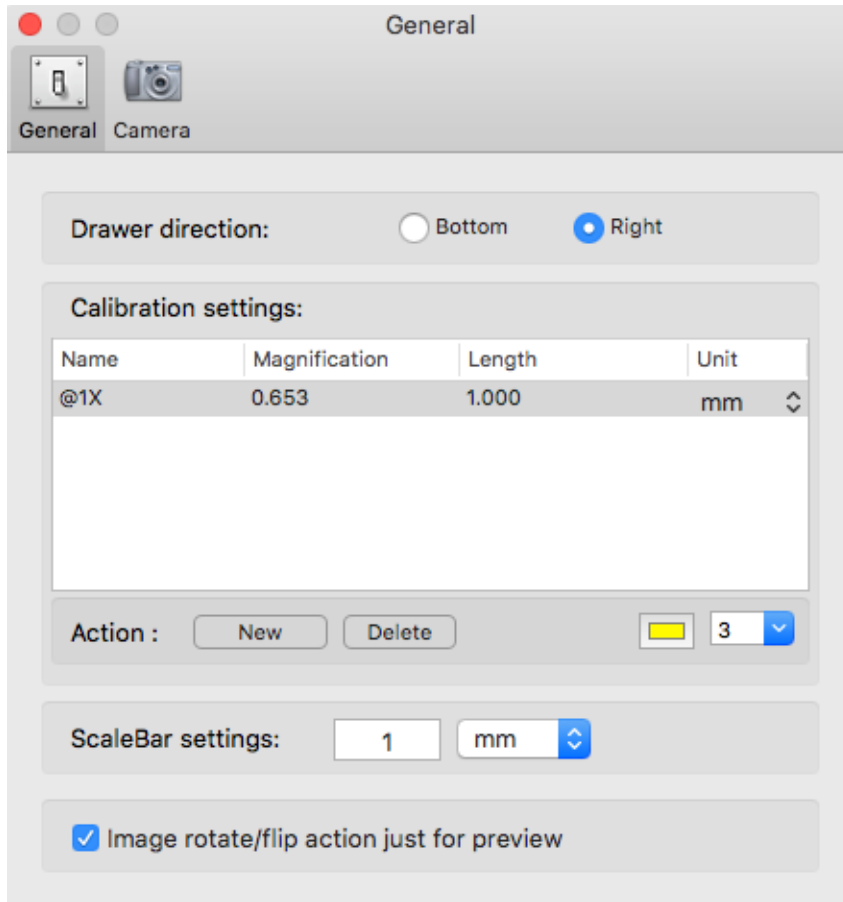Put in the calibrated ruler, as graph below.

Step 2

Right click on the live view and select 'Edit Calibrate Setting' to open Calibration Panel
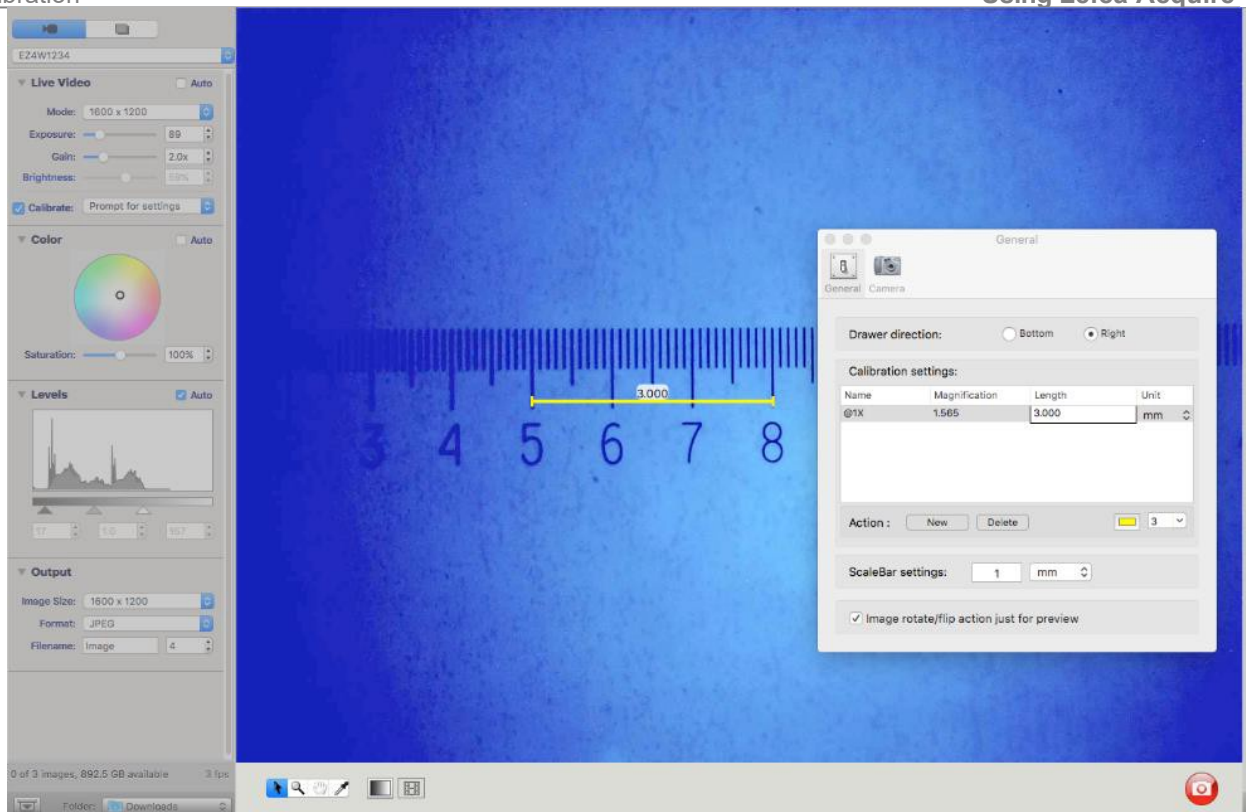
Step 3

Click 'New' button on the calibration panel to add a new calibration

Step 4

Double click on the new list @1x to edit the calibration
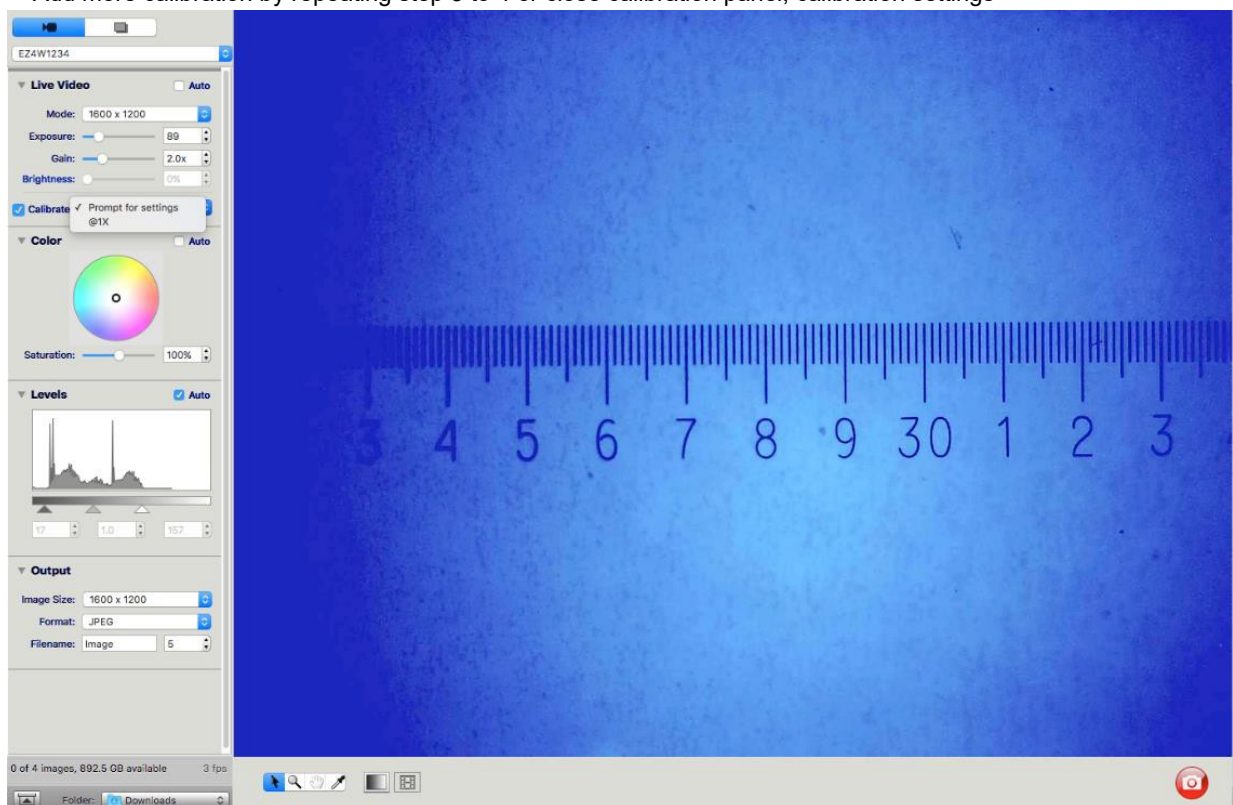
Step 5

Drag the line to match the desire position, input the correct value for length (3mm in this example)
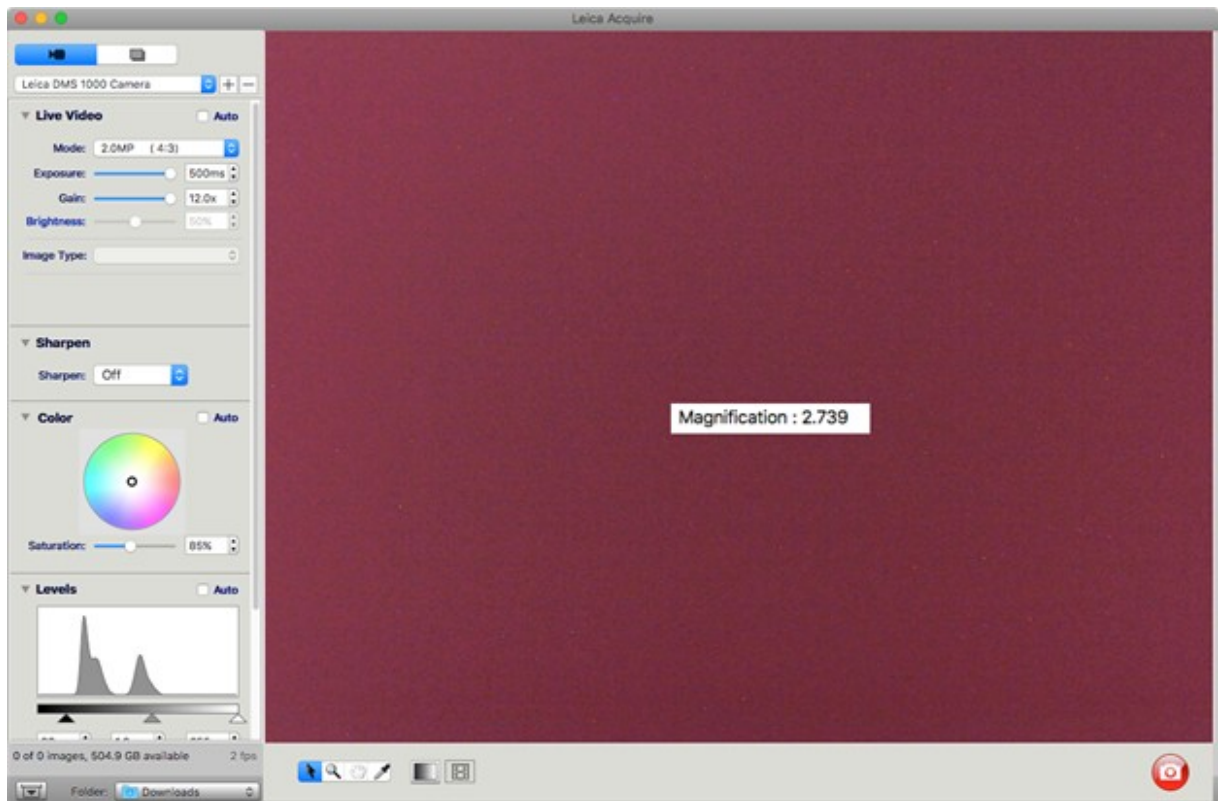
Step 6

Add more calibration by repeating step 3 to 4 or close calibration panel, calibration settings

Auto Calibration for DMS1000

For DMS1000 Microscope, calibration is auto detect and set to proper setting, user does not need to do calibration manually.

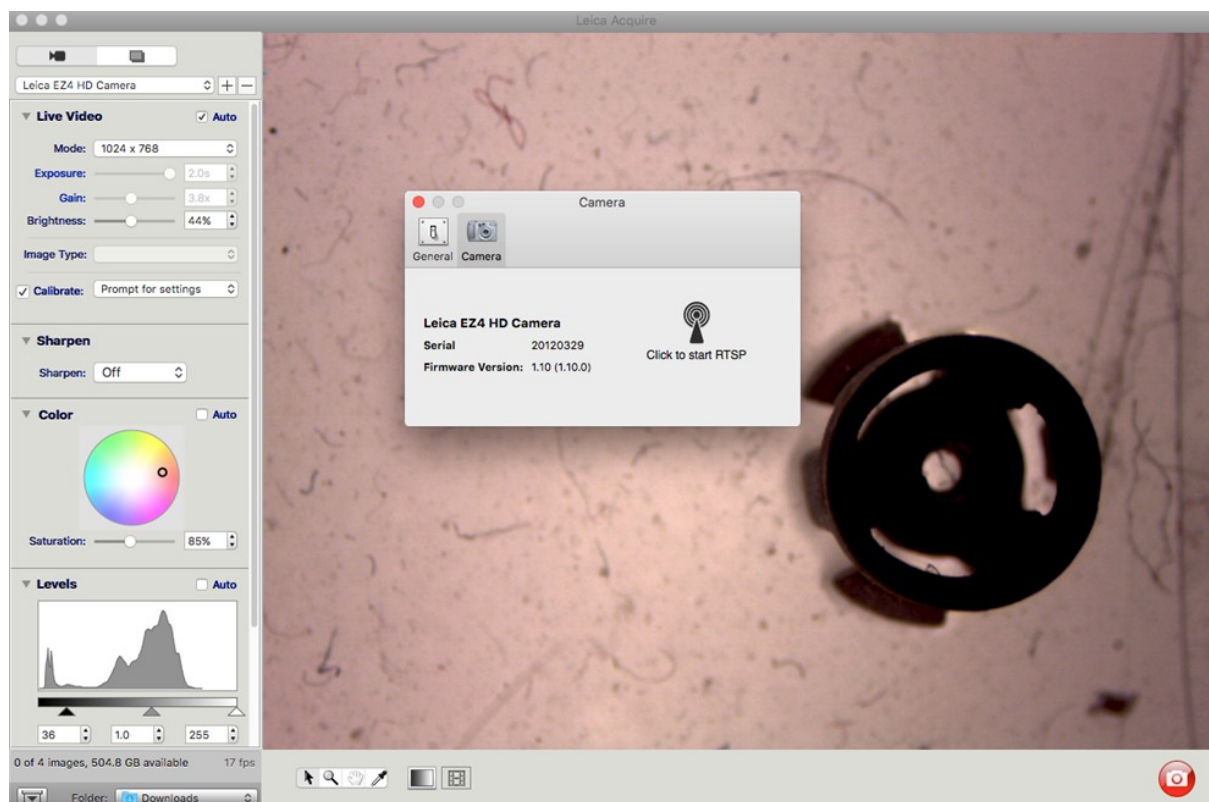# Rstp Live Streaming

Leica Acquire can act as a streaming server if enable rtsp streaming feature.

Step 1
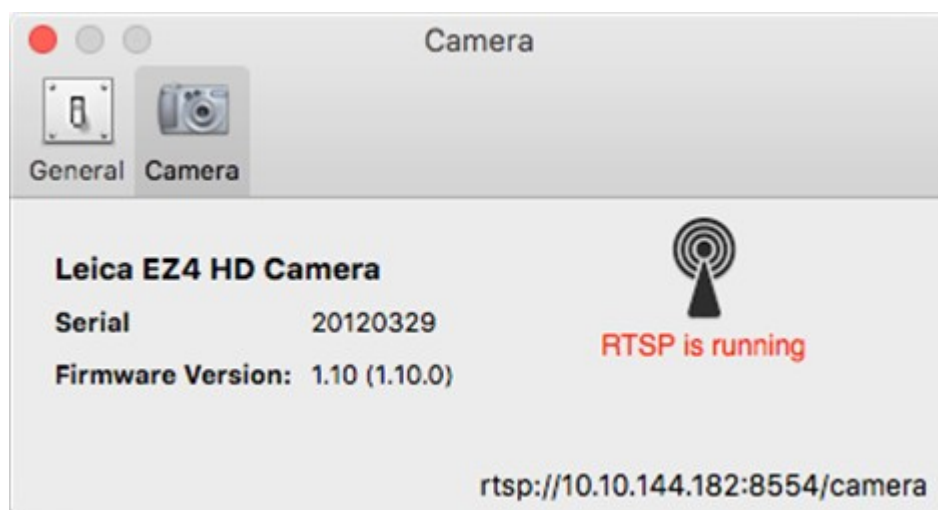
Select File->Preferences… to open preferences windows and switch to Camera Tag.

Step 2

Click the Start Rtsp button to start rtsp live streaming server, server information will display at right corner (in this example is rtsp://10.10.144.182:8554/camera).

Now you can use RTSP client software like Leica AirLab or VLC to view the live stream. Below an example from Leica AirLab for iPad.
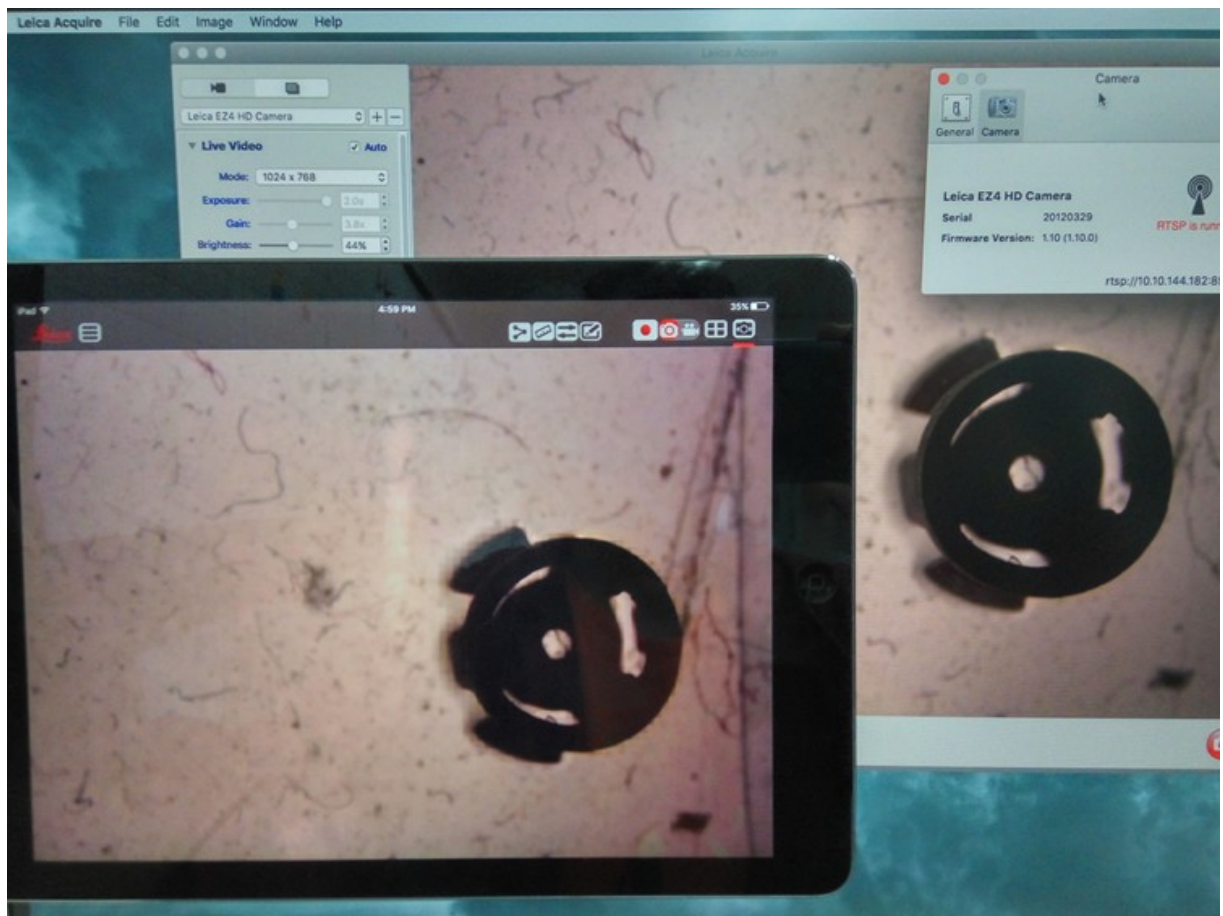
Troubleshooting

The live image window is completely gray

Check that the USB connection from the microscope to the computer is connected securely.

Check that the microscope power cable is connected securely, and the power is on at the mains and at the microscope.

Check that Acquire has been installed correctly and that the cameras are visible in the Computer Hardware Overview.

The live image window is completely black

Check the light conditions and the microscope light settings. Ensure that light reaches the camera.

The incident lights are faulty or covered by an obstacle.

The transmitted light box on the microscope is faulty or has been covered by opaque materials.

Exposure or gain is too low - increase exposure or gain or both.

Gamma is set too high - decrease gamma.

Auto Brightness is selected but the brightness level is too low - increase the brightness level.

The live image is too dark

Exposure or gain is too low - increase exposure or gain or both.

Gamma is set too high - decrease gamma.

Auto Brightness is selected but the brightness level is too low - increase the brightness level.

Check the microscope and lighting settings.

The live image is not in focus

Check the microscope settings and follow the instructions in the microscope operating manual.

Compare the focus through the eye-piece and compare with the image within Leica Acquire. It is possible that they are not identical. As a temporary work-around, focus using the live image within Leica Acquire.

Check the Zoom dial on the microscope. The focus is automatically adjusted when zooming in or out. It is possible this may be defective.

Poor image quality

Check microscope light settings.

Check exposure and gain settings to avoid under- or over-exposure.

Make sure the eyepiece fits snugly around the eye, so no stray light enters the eyepiece. Cover the eyepiece to external light if it is not being used.

Check the gain setting. An Increase in Gain will increase the electronic noise of the microscope camera. If you reduce Gain you should increase the exposure to compensate.

Hints and Tips

Navigation within Leica Acquire

Navigate check-boxes & edit boxes within the control's panels, using the Tab key.

Slow live image performance

Set Exposure to as short a time as possible to obtain a correct image. Increase Gain to compensate if necessary. This will improve camera response and performance.

Set the image Live Format to a smaller resolution for a faster live image.

Browsing the images on your computer

In order to speed up the navigation of images in the folders on your computer, create sub-folders rather than having one large folder for the Gallery.

Mouse Functions

Most Macs are traditionally operated with a single-button mouse, but can also be used with a two-button mouse which Leica Acquire takes advantage of:

1-button mouse:
Normal functionality is by clicking the mouse. Alternative functions are accessible by holding Ctrl (Control) key + mouse click.

2-button mouse:
Normal functionality is by clicking the left mouse button. Alternative functions are accessible by clicking the right mouse button (as well as by holding Ctrl key + either mouse click).