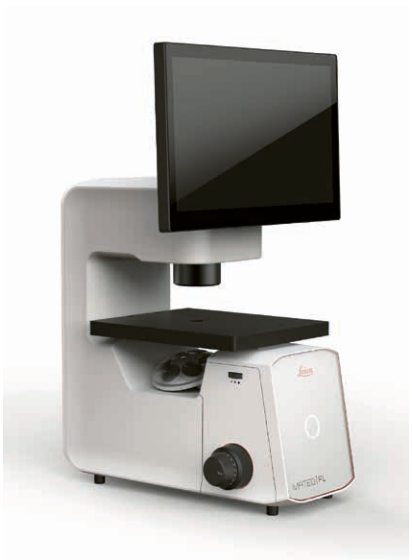


Mateo FL
User Manual

Leica Microsystems CMS GmbH, User Manual Mateo FL, 11934230, V00, 2024-05-22

Contents

Important Notes

This user manual is an essential part of the product. It must be read carefully before the product is assembled, put into operation or used and must be kept for later reference.

Symbols Used

Symbol	Meaning
	This symbol is used to warn against touching hot surfaces, such as light bulbs.
	This symbol indicates additional information or explanations that are intended to provide clarity.
	This symbol indicates a hazard with a medium degree of risk that, if not avoided, can result in death or serious injury.
	This symbol indicates a hazard with a low degree of risk that, if not avoided, can result in minor or moderate injury.
	This symbol indicates especially important information that is mandatory to read and observe. Failure to comply may cause the following: ● *Personal injury.* ● *Product malfunctions and damage*
	Warning of hazardous electrical voltage! Risk of electrical shock! Failure to comply may cause the following: ● *Personal injury.* ● *Product malfunctions and damage.*
	Warning of electromagnetic field

	Warning of permanent eye damage from hazardous optical radiation. Optical radiation can cause irreversible eye injuries. Do not look into the lamp, light source or light guide.
	Warning of permanent eye and skin damage from hazardous UV radiation. UV radiation can cause irreversible eye and skin injuries. Do not look into the lamp, light source or light guide or expose your skin to UV radiation.
	Connection to ground!
	Item not contained in all configurations.
	Manufacturing date, for example: 04/2024 for April 2024
	China RoHS 50 years EFUP (Environmentally friendly use period)
REF	Catalogue number
SN	Serial number

Safety Notes

In order to maintain the microscope in its original condition and to ensure safe operation, you must follow the instructions and warnings contained in this manual.

Only operate the system in a technically perfect condition.

General Safety

The instrument and accessories described in this manual have been tested for safety and potential hazards. The responsible Leica affiliate or the main plant must be consulted whenever the device is altered, modified or used in conjunction with non-Leica components that are outside of the scope of this manual.

Unauthorized alterations to the device or noncompliant use shall void all rights to any warranty claims and product liability!

Prior to connecting power or to operation, check the components and accessories for damage.

Do not use damaged, non-functioning components or accessories. Instead, notify your Leica branch office or Leica dealer.

In order to ensure the product reliability and warranty services, the system must be exclusively operated with the original accessories and in particular the original power cord. The user bears the risk when using non-approved accessories.

Unauthorized alterations to the device or noncompliant use shall void all rights to any warranty claims and product liability!

This instrument is for indoor use only.

In case of safety-related malfunctions, switch off the system immediately, disconnect it from the power supply and take suitable measures to prevent further use.

In all cases of doubt regarding the safety of the system, switch off the system and prevent further use.

The internal battery has a durability of approx. 5 years and can be replaced in the factory or by a certified service engineer.

The product should be positioned to ease the plug and unplug of power cord by the operator.

Only insert or unplug data and control circuits when the instrument is switched off, otherwise the instrument may be damaged.

The external USB devices associated with the equipment should comply with IEC62368-1.

IMPORTANT! Mateo FL should not be subjected to UV sterilization. UV degrades many materials, including plastic. Damage from UV exposure exceeding 800 hours over the lifetime of the device is not covered under the manufacturer's warranty.

Directives of European Community (EC-Directives)

The system fulfills the EU Directive 2014/35/ EU concerning the safety of electrical equipment and 2014/30/EU concerning electromagnetic compatibility.

System Safety and EMC

Our system has been designed, produced and tested in compliance with:

 IEC 62368-1: Information technology equipment – Safety – Part one: general requirements

 Radio interference suppression in compliance with EN 55011 class B

 EN 61326-1, Electrical equipment for measurement, control and laboratory use – EMC requirements

 This product of protection class 1 is built and inspected in accordance with IEC/EN61010-1 Safety requirements for electrical equipment for measurement, control and laboratory use.

The system meets the requirements of EU directives and carries the CE mark.

 2014/35/EU Low voltage directive

 2014/30/EU EMC directive

 2011/65/EU RoHS directive

 2009/125/EC + VO EU 2019/1782 Eco-design requirements for energy-related products

The Mateo FL microscope has also been tested in accordance with EN 62471/IEC 62471 photobiological safety of lamps and lamp systems and is classified in risk group 1 (low risk).

Electrical Safety

WARNING Use only original power cables or alternative cables with a VDE / HAR logo, which at least fulfill the requirement of 3x0.75 mm^2 and 10A/250V. Use the original power supply only (LPS-certified Power Supply with the same specifications).

Make sure that the power cord is approved for use in the country in which you intend to use it.

The cables shall be plugged or unplugged in the de-energized state! Before connecting the system, check that the supply voltage and frequency are correct at the installation site.

Always hold the plug of power supply when removing it from the socket outlet. Never unplug it by pulling the cable.

If the original power supply fails or is damaged, have it replaced by Leica service. Original power supplies are available from your Leica branch office or Leica dealer.

Do not repair the power supply.

Electrical work must only be carried out by Leica Service.

To avoid injury to the user and for cooling reasons and fire protection, never remove the covers of the components.

WARNING By definition, the main circuit breaker of this instrument is the connector between the power cable and device port. An unobstructed access to the main circuit breaker must be ensured at all times.

WARNING The power plug may only be plugged into an outlet equipped with a ground contact. Do not interfere with the grounding function by using an extension cord without a ground wire. Any interruption of the ground wire inside or outside of the device, or release of the ground wire connection, may cause the device to be hazardous. Intentional ground interruption is not permitted!

Do not use this instrument near sources of high electromagnetic radiation (for example, unshielded, intentionally operated ultra-high frequency sources); otherwise, the proper operation may be disrupted.

We recommend assessing the electromagnetic environment before operation of the components and then giving corresponding instructions.

Do not use the microscope in altitudes exceeding 2000 m ASL/ NL.

Transport and store in a temperature range of -20° – +70°C and at a humidity not exceeding 90 %. If the system has been stored in a cold environment or at high humidity, wait until it is absolutely dry and has reached approximately room temperature before operating the system. Please contact Leica Service in case of high condensation. High condensation can harm the device.

The microscope's electrical accessory components are not protected against water. Water may cause electric shock.

Do not immerse the components in water.

Ensure that no liquids or objects enter the interior of the components (during cleaning, etc.).

Protect the microscope from excessive temperature fluctuations. Such fluctuations may lead to the accumulation of condensate and damage the electrical and optical components.

Before operating the system make sure the cover of the filter cube module is closed.

Photobiological Safety

UV radiation is emitted from this product. Never expose your eyes and skin to radiation. Do not look into the light source.

Observe the warnings on the product.

The light source of Mateo FL generates high-energy light with invisible UV components. Always use the provided protective shield. In normal use, there is no risk to the eyes or skin; with the attached protective shield, the device is classified in Risk Group 1 (low risk). The system has been classified in Risk Group 3 (high risk due to blue light) according to EN 62471-1/IEC 62471-1 when the protective shield is not attached.

The highest risk of blue light is directly above the objective lens (light exit) with the light source turned on at maximum intensity. Avoid positioning your hand directly above the objective lens during sample changes or positioning.

It is recommended to dim or deactivate all LEDs before changing samples, if possible.

Notes on Handling Acids and Bases

Be absolutely certain to avoid direct contact with these chemicals.

Notes on Disposal

After the end of the product life, please contact Leica Service or Leica Sales on how to dispose of it.

Please observe the national laws and ordinances which, for example, implement and ensure compliance with EU directive WEEE.

Like all electronic instruments, the microscope, its components and expendables may not be disposed of as general household waste!

Hazardous Substance Marking Table

Part name	Hazardous substances					
	Pb	Hg	Cd	Cr (VI)	PBB	PBDE
Printed circuit boards	x	o	o	o	o	o
Electronic components	x	o	o	o	o	o
Mechanical parts	x	o	o	o	o	o
Cables and cable accessories	x	o	o	o	o	o
Displays	x	o	o	o	o	o
Light sources	x	x	o	o	o	o
Optics	x	o	x	o	o	o

This table is prepared in accordance with the provisions of SJ/T 11364.

o: Indicates that said hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement of GB/T 26572.

x: Indicates that said hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement of GB/T 26572.

Introduction

The Mateo FL is a fluorescence digital inverted microscope and is intended for use as a general laboratory microscope for routine examinations of biological samples such as cells and tissues.

Intended Use

Mateo FL is a digital inverted fluorescent light microscope for routine quick cell check, providing user coding function/all-in-one PC and software features including label-free counting as well as confluency and transfection efficiency to increase the ease of use.

Mateo FL enables all your members to observe, document and analyze cell status easily and consistently, supporting their informed decision making and increasing your confidence on the success of downstream experiments.

Mateo FL is specifically designed for cell culture quick check workflow and does not target continuous cell growth monitoring.

Directions for Use of Mateo FL RUO

Inspection, counting, identification and monitoring of cell and tissue cultures, as well as examination of biological specimens. Not for use in diagnostic procedures.

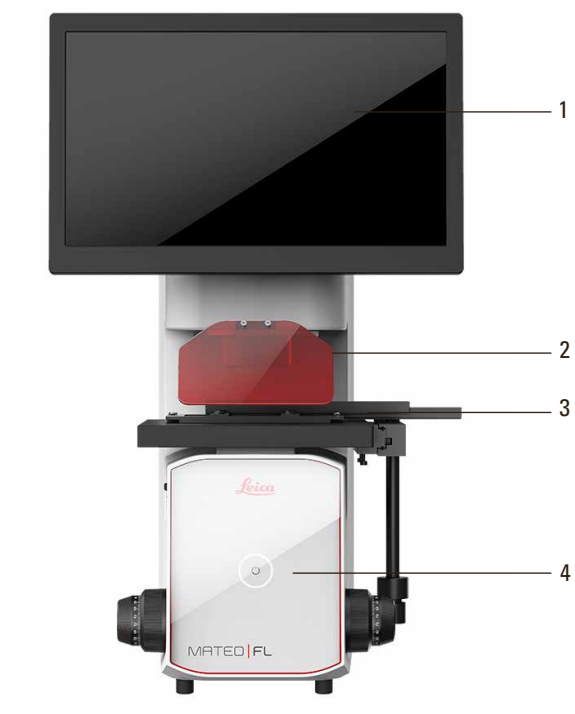
System Specifications

System type	Inverted microscope
Illumination	LED
Contrast methods	Transmitted light: Brightfield (BF) and Phase Contrast (PH) Incident light: Fluorescence
Condenser	S40/0.45 condenser Working Distance: 50 mm
Phase turret	5-position turret: BF, PH0, PH1, PH2, Block, motorized
Objective nosepiece	6-position nosepiece, encoded
Objectives	For objectives, please refer to "Table 1: Objectives (standard)" on page 88.
Camera	6 megapixel color camera (integrated) 6 megapixel monochrome camera (integrated)
Touch monitor	15.6 inch, 1080P, CTP (1920 x 1080)
Stage	Fixed stage (L*W) 262 x 212 mm Optional object guide kit including one attachable object guide, two holding frames, and one thermoplate
Focusing	Coarse and fine focusing, travel range 7 mm, min. adjustment 2 µm
USB ports	1x USB 3.0 and 3x USB 2.0
USB power output	5V, 0.5A (back plate) 5V, 1.0A (on the side of the stand)
AI-based software modules	Confluency module, cell counting module, transfection efficiency module

Optional Wi-Fi dongle	Wi-Fi Dongle 5 GHz/2.4 GHz
Dimension (depth x width x height)	Monitor in display position: 377 mm x 397 mm x 611 mm / 14.8 in x 15.6 in x 24.1 in Monitor in folded position: 377 mm x 397 mm x 466 mm / 14.8 in x 15.6 in x 18.3 in
Weight	22 kg (base configuration without optional accessories)
Operating temperature	15°C ~ 35°C
Storage temperature	–20°C ~ 70°C
Relative humidity	20% ~ 90%
Input power/Power supply	Rated mains power supply voltage: 100–240 VAC Rated mains frequency: 50/60 Hz Max. power: 84 VA Power supply connection: Electrical circuits (10 A) for socket outlet Permitted power consumption of the multiple socket outlets: 2200 VA Protection class: I Overvoltage category: II Pollution degree: class II
Microscope	Voltage: 12 VDC Max. power: 84 W
Manufacturer	Leica Microsystems CMS GmbH, Ernst-Leitz-Strasse 17–37, 35578 Wetzlar (Germany) Tel. +49 (0) 6441 29-0, F +49 (0) 6441 29-2599

System Overview

Front View



1. **Touch display**

   Adjustable display to suit user viewing angle.

2. **UV protection shield**

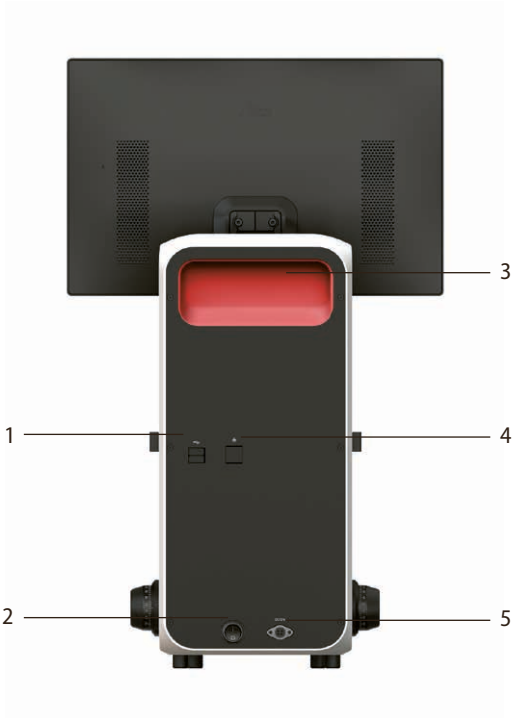
3. **Object guide and holding frame**

   Supports precise movement of the sample vessel.

4. **Power/Stand-by button with LED indicator**

   - Indicator light on: indicates the system is on.
   - Indicator light off: indicates the system is off.
   - Indicator light blinks when the button is pressed.

Rear View



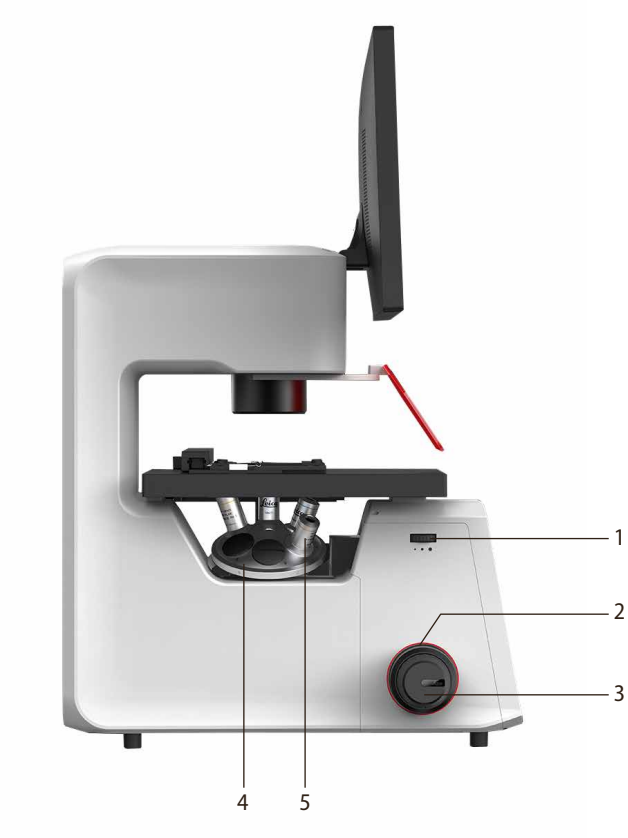
1. **USB 2.0 ports**
2. **Power switch**

   Press to power on/off the system.
3. **Supporting handle**

   Hold the handle to facilitate safe and steady transportation of the equipment.
4. **Ethernet connection**
5. **Power supply connection**

   For plugging in the power supply.

Left View



1. **Light intensity adjustment wheel**

   Turning to the right increases light intensity.
   Turning to the left reduces light intensity.

2. **Coarse focus knob**

   For quickly adjusting nosepiece vertical position to identify image focus.

3. **Fine focus knob**

   For fine tuning the focus of the specimen.

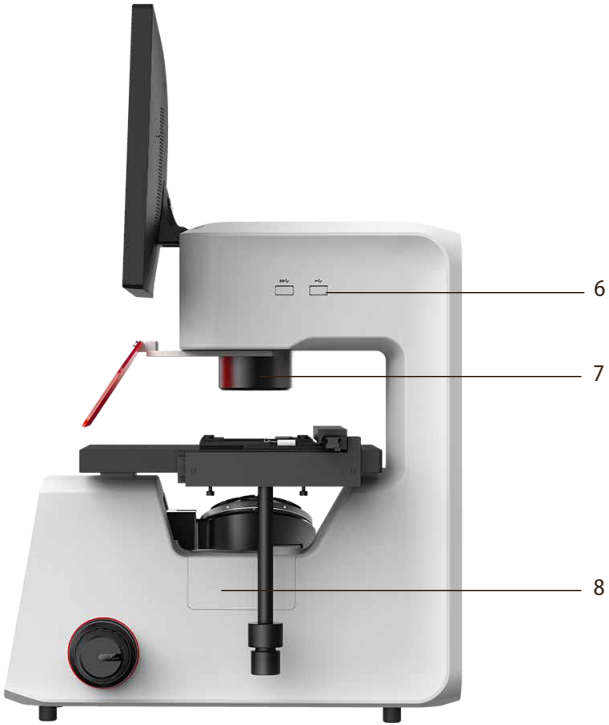
4. **Nosepiece**

   Nosepiece is the base where objectives are to be installed. Rotate the nosepiece to move the objective of interest to the light path.

5. **Objective**

   For magnifying the sample.

Right view



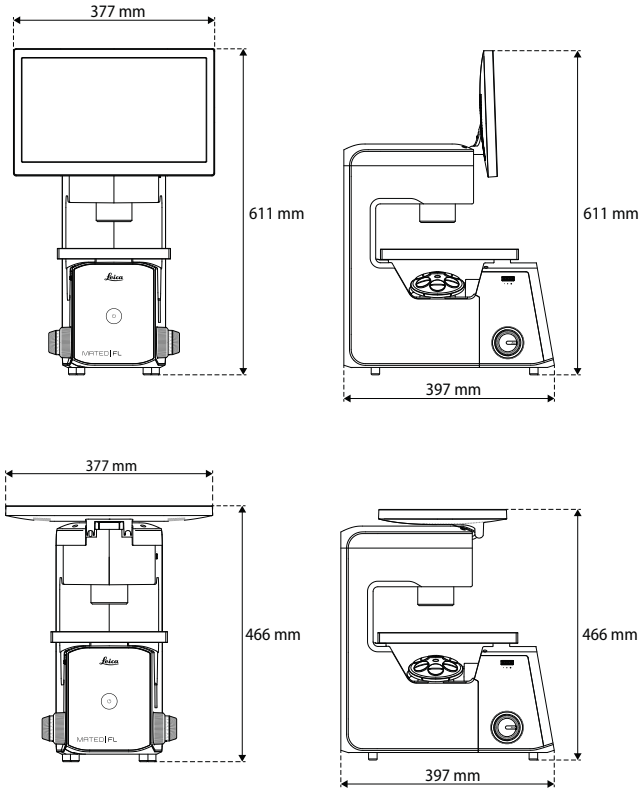
6. **USB ports**

   Left: USB 2.0
   Right: USB 3.0

7. **Condenser**

8. **Filter cube turret (under magnetic cover)**

Display in Upright and Folded Position (dimension data in mm)



Unpacking

Before setting up Mateo FL, carefully remove all components from the transportation box and packaging materials.

Before installation and operation make sure that the system is in proper condition.

If possible, avoid touching the lens surfaces of the objectives. If fingerprints do appear on the glass surfaces, remove them with a soft leather or linen cloth. Even small traces of finger perspiration may damage the surfaces in a short time. Please see "Care and Maintenance" on page 83.

Mateo FL base configuration:

The following parts will be included in the delivery:

- Mateo FL stand with integrated cameras and touch monitor
- UV protection cover
- Light shield
- Wireless mouse (Wi-Fi)
- Mouse pad
- Power adaptor and power cord
- Dust cover
- User manual
- Quick start guide (RUO only)

Optional accessories:

The following parts, if purchased, will be included in the delivery:

- Object guide kit (one object guide and two holding frames)
- Optional objectives (see "Table 1: Objectives (standard)" on page 88)
- Wi-Fi dongle (to wirelessly transfer data to your smart device)
- Optional filter cubes:

  DAPI 390

  GFP ET

  Y3 ET

  Y5 ET
- Barcode reader
- Thermoplate

Preparation

Before performing any experiments, please set up your microscope according to the following instructions.

Microscope should be used in a dust-free room, which is free of oil vapors or other chemical vapors, as well as extreme humidity. At the workplace, large temperature fluctuations, direct sunlight and vibrations should be avoided which may distort measurements and micrographic images.

If you want to put the Mateo FL inside a laminar flow hood, you should check in advance whether there is a cable port inside the flow hood.

Connecting Power Supply

Prerequisites:

1. The power switch is on "off" position.
2. The power button on the front panel with LED indicator is off.

Steps:

1. Connect the power cable and the power adaptor.
2. Connect the power adapter to the power port on the rear side of Mateo FL.
3. Connect the power cable to the power socket.

Turning on the System with the Power Button

1. Press the "On" end of the power switch at the lower rear side of the microscope to turn on the system.
2. Check the LED status at the lower front side of your microscope:

- ***Indicator light on:*** *indicates the system of Mateo FL is on.*
- ***Indicator light off:*** *indicates the system of Mateo FL is off.*

Only use the power button on the rear side of the system to boot up the system for the first time.

For subsequent turning on/off, use the power button on the front panel of the system.

 Do not turn off the device when the system is processing or loading images, analyzing or transferring data.

Turning on/off the System with the Front Panel

To turn on/off the system, press the power button on the front panel for about 5 seconds. The light ring starts to blink before the system is about to be turned on/off.

To use the standby mode, press the power button on the front panel for about 2 seconds. The monitor will be turned off. To use the system again, press the power button on the front panel for 2 seconds.

When the system is in use, the light ring around the power button on the front panel is on, along with the monitor.

When the system is in standby mode, the light ring around the power button on the front panel is on while the monitor is turned off.

When the system is turned off, the light ring around the power button on the front panel is off, along with monitor.

Installing Wireless Mouse

1. Plug the USB connector or USB dongle of your wireless mouse to one of the USB ports on the side of the stand (USB 2.0 port is preferred).
2. Power on your mouse and move it around to make sure the cursor moves along with your mouse.

Installing Keyboard

Mateo FL system comes with a built-in virtual keyboard. You can also connect a physical keyboard, wired (on the back or side of the stand) or wireless (on the side of the stand), if needed (USB 2.0 port is recommended for connection with the system).

The built-in virtual keyboard supports English and Chinese input.

Installing UV Protection Shield

1. Attach the UV protection shield to the condenser.
   The UV protection shield is held by magnets.
2. Rotate the UV protection shield according to your needs.

Never look directly into the light beam of the microscope. Wear safety goggles or operate with an assembled fluo shield.

Installing Wi-Fi Dongle

Wi-Fi dongle is an optional item.

With a Wi-Fi dongle, you can share images using your smart device. For installation and usage instructions, please refer to chapter "Transferring Image(s) to your Smart Device through Wi-Fi" on page 59.

AI Software Modules

For the usage of the corresponding module, see "Using AI-based Software Modules" on page 63.

All software modules are already activated.

Installing Objectives

For supported objectives, please refer to "Technical Data" on page 61.

If necessary, first lower the focus knob to prevent damaging the objective front lenses.

Whenever you switch to 63x, you need to lower the nosepiece to prevent damage to the objective lens.

1. Remove the protective screw caps on the nosepiece.

2. Rotate the nosepiece to the free position you want to install the objective in.
3. Screw the objective into the free position until it sits firmly.

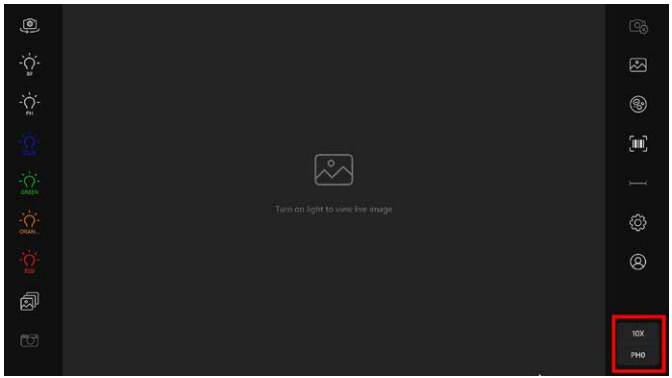
Avoid touching the lens surfaces of the objectives. If fingerprints do appear on the glass surfaces, remove them with a soft leather or linen cloth. Even small traces of finger perspiration may damage the surfaces in a short time. Refer to chapter "Care and Maintenance" on page 83 for additional instructions.

If any nosepiece opening is left unused, cover it with the screw cap to protect the microscope optics against dust.

Objective Setting

There are no pre-installed and pre-configured objectives before delivery.

You can install up to 6 objectives in the nosepiece of Mateo FL, and switch to any one of them during experiment. The current objective in use is shown at the bottom right corner of the screen.

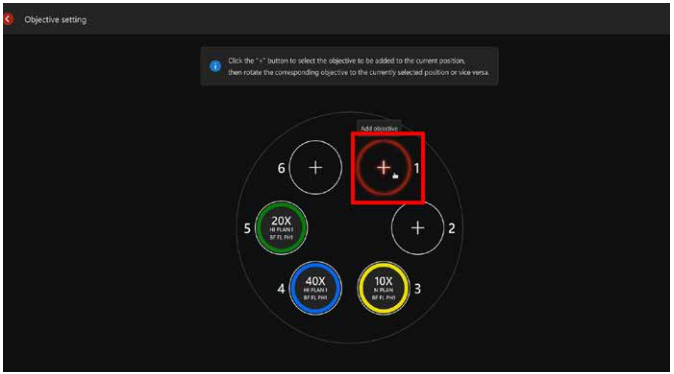


Configuring Objectives

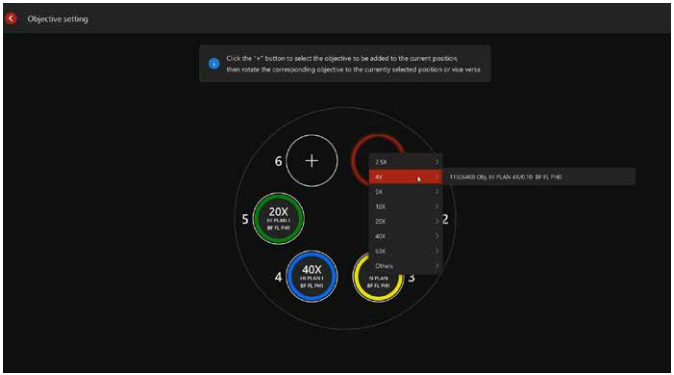
1. Click  to open the system "Settings" menu.
2. Click "Hardware".
3. Click "Objective setting". A window appears, allowing you to configure the objective.

The objective you are configuring in the system is ideally the one at the left side of the nosepiece on the device. The numbering of the objectives in the "Objective Setting" corresponds with the numbering in the nosepiece on the device.

4. Click the + button.



5. Select the desired objective in the drop-down menu to add it to the current position.



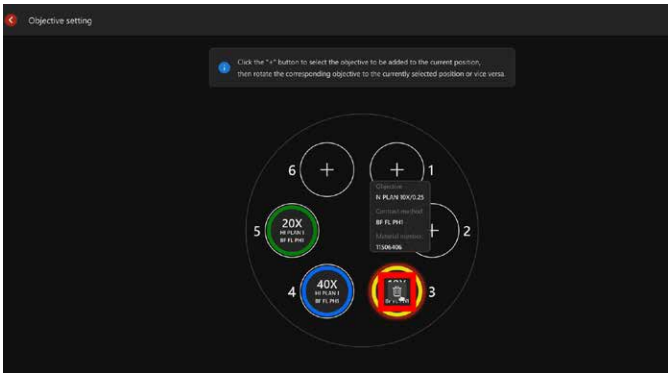
6. Click the red arrow in the top bar to go back to the main screen.

After the completion of one objective repeat the steps 4 and 5 to configure another objective. Please make sure the objective to be configured is positioned to the left of the nosepiece.

Delete/Change the Objective Setting

If an objective is removed from the nosepiece, it is necessary to delete the corresponding objective setting.

1. Rotate the nosepiece to position the objective to be removed at the left of the nosepiece.
2. Click  to open the system "Settings" menu.
3. Click "Hardware".
4. Click "Objective setting".
5. Move your cursor to the icon of the objective (corresponding to the numbering of the nosepiece) to be removed until a trash bin icon  appears, or simply tap the objective you want to delete.

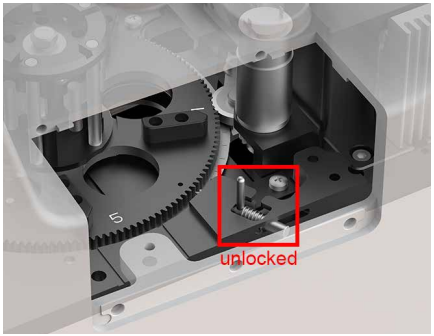


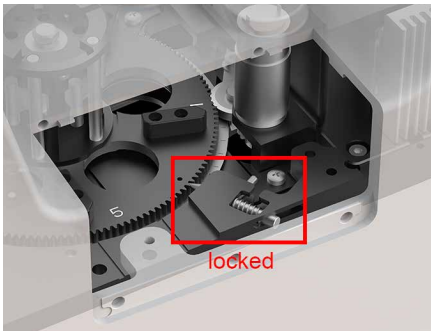
6. Click  , then click "Confirm" to remove the objective from the configuration.
7. Remove the corresponding objective from the nosepiece.
8. To install a new objective on this position, repeat steps 4 and 5 from "Installing Objectives" on page 25.

Installing Filter Cubes

1. Remove the magnetic cover of the filter cube chamber carefully by tilting the cover to the side.

2. Push the locking pin through the gap (as shown in the images below) to lock the filter cube turret.

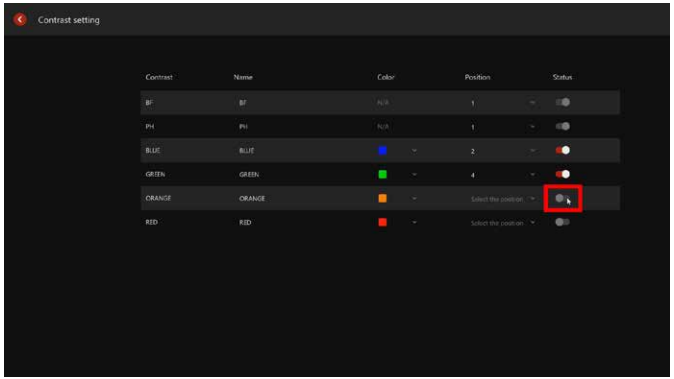




3. Click "Settings"  .
4. Select "Hardware" and "Filter cube setting". A window appears, allowing you to configure the filter cubes.
5. Choose the position in which you like to install the filter cubes.
6. The filter positions on the filter turret are numbered. Insert the filter cubes according to the numbering you set up in the GUI.

One of the positions from 1 to 5 needs to be reserved for BF/PH.

7. Slide the filter cube along the physical guide all the way to the back of the filter cube holder. Rotate the filter cube to the right while pushing it to the back to clip it firmly into the mounting. The filter cube sits firmly in its position.
8. In the "Filter cube setting", enter the corresponding name and select the color for the filter cubes. The status is activated automatically when the configuration is completed.



10. When the filter cube is installed, unlock the pin of the filter cube turret again so that it can rotate freely.
11. To install another filter cube, lock the pin again.
12. Turn the filter turret to the next free position and repeat steps from 5 to 9.
13. After installing all filter cubes, unlock the pin and close the magnetic cover.

Make sure that the magnetic cover of the filter turret is properly attached to avoid injuries from motorized parts.

Installing Object Guide and Holding Frame

Object guide and holding frames are optional items.

Installing Object Guide

1. Locate the two screw holes on the right side of the stage, as shown in the picture below.

2. Align the two hexagon screws of the object guide with the two screw holes on the stage, as shown in the picture below.
3. Turn the two screws counterclockwise manually until they are engaged with the holes.

Installing Holding Frames

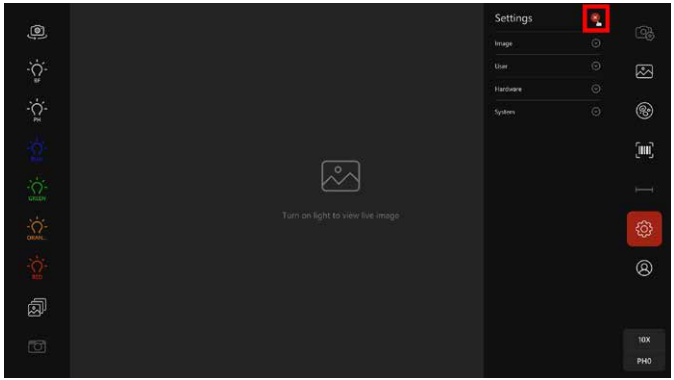
Align a holding frame with the installed object guide, push the holding frame until the fixing clip is locked with a click. See image below.

To uninstall/remove the holding frame, you can pull it outward until it is off from the object guide.

Getting Familiar with System Settings

Click to open the system "Settings" menu where you can configure system settings per your preference.

To exit from system "Settings" menu, click on the top right corner of the screen.



Quick Save Image

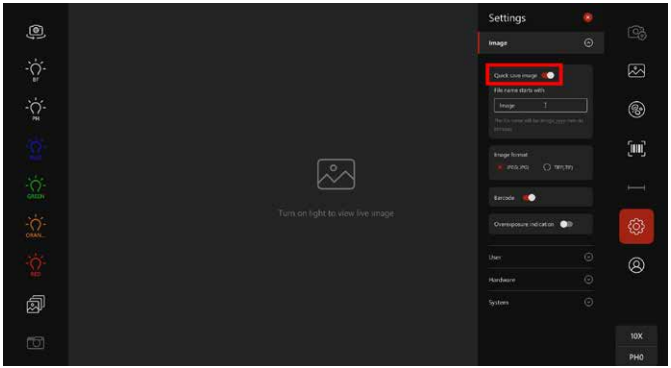
Options: Enabled or disabled.

Enabled:

If "Quick save image" is enabled, image can be automatically saved to gallery right after capturing an image, with the default naming rule below:

Prefix_contrast method_timestamp_extension

Example: Leica_2021-12-12 120000.jpeg

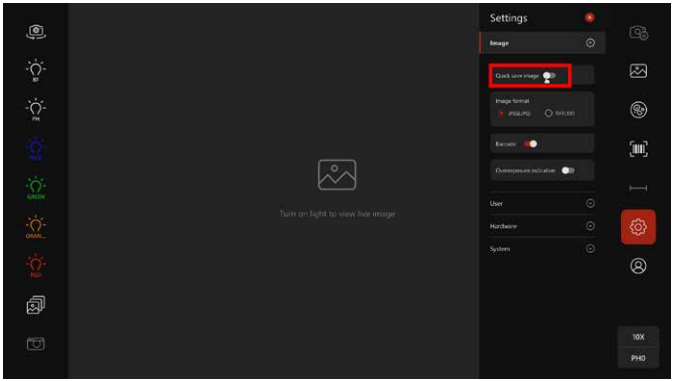


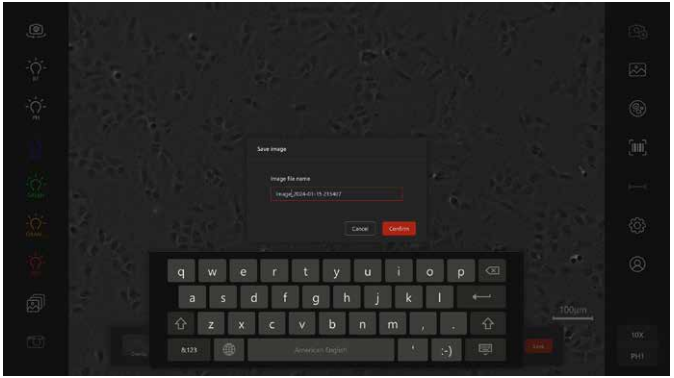
Disabled:

If "Quick save image" is disabled, you need to name a captured image after clicking "Save" in the lower panel of the live mode.

After pressing "Save", the system prompts a dialog window.

Enter the image name, and click "Confirm" to save the image. Then the system goes back to the main screen automatically.





If the name of a newly captured image is identical with that of an existing image in the gallery, the new image will be renamed by adding a number suffix, e.g. "(1)". (For example, new image whose intended name is identical with an existing image "Leica_BF_2023-12-12 161616.jpeg" will be renamed as Leica_2023-12-12 161616(1).jpeg.) Such situation occurs mostly when "Quick save image" is disabled and you are manually naming a newly captured image.

The images are stored chronologically to facilitate later reference and repeating experiment. (For details, see chapter "Repeating the Image Settings in the Gallery" on page 62).

Image Format

Options: JPEG and TIFF

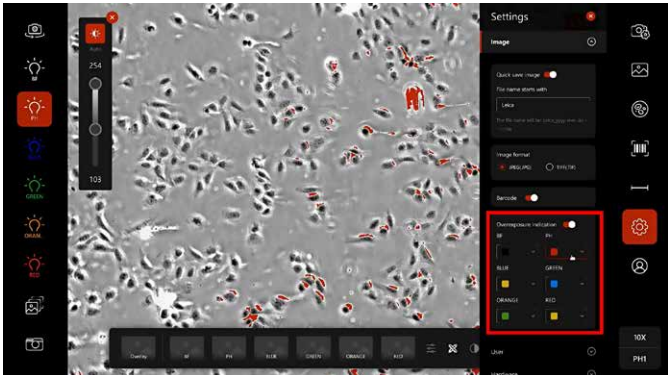
After system reboot, it goes back to the default value "JPEG".

Overexposure

The Overexposure indicator is enabled by default.

1. You can disable it either under "Camera" settings or right-click in live mode or long-press on the screen. Enabling or disabling "Overexposure indicator" is only possible in live mode.
2. To change the color of the indicator according to your preference, click "Settings" and "Image".
3. Turn on overexposure indicator.

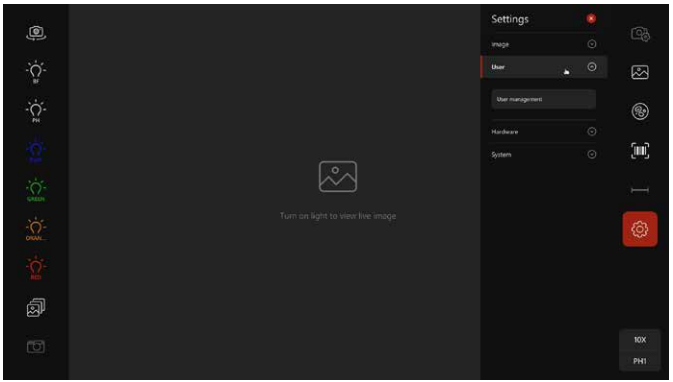
4. In the section "Overexposure indicator", select your preferred color from the drop-down menus for each of the channels.



User Management

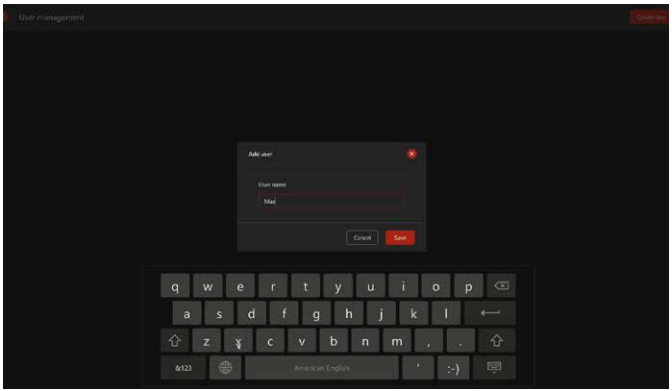
On Mateo FL you can create password-protected user profiles. Only the admin can access the user management system which allows them to reset, unlock and delete other user accounts and view the audit trails. Besides, only the admin can back up and restore the system.

1. To create user profiles, click "Settings"  , then "User" and "User management".

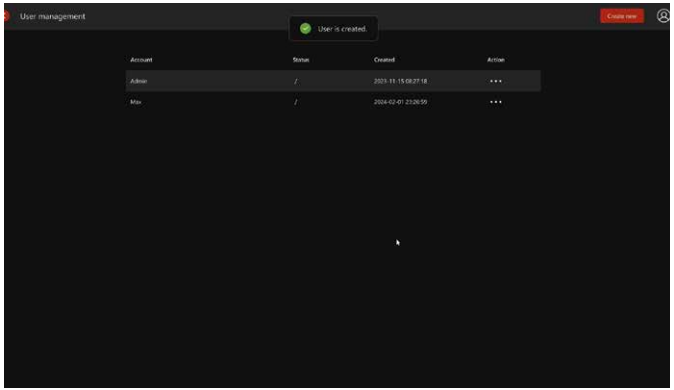


2. Click "Create new".

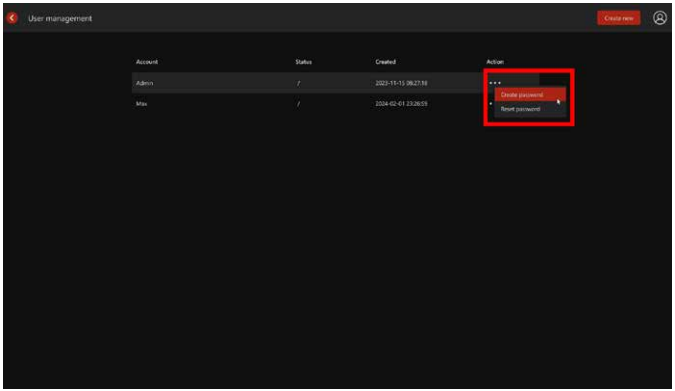
3. In the pop-up window "Add user", type in the user name and click "Save".



Along with the user account, the admin account is created automatically. Similarly, when deleting the last user profile, the admin account will be deleted automatically at the same time. User account name has to be unique in the system and cannot be: Admin, ADMIN, or Administrator.



You can create a password directly on this page by clicking on the three dots under "Action".

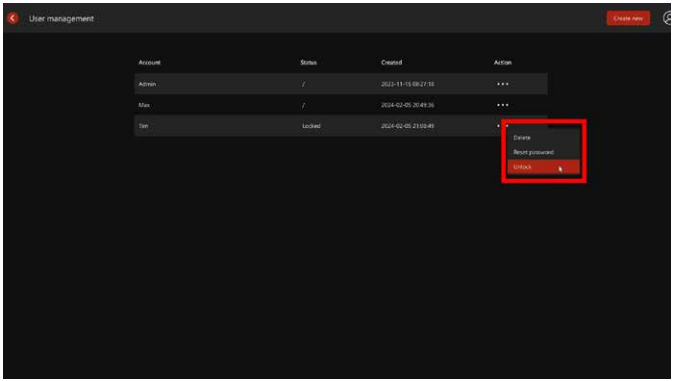


Alternatively, after restarting the device you will be prompted to create a password.

As a user you can change your password by clicking "User" on the right panel.

Only admins can reset passwords and unlock or delete user profiles.

In case of three consecutive incorrect password entries, the user should contact the admin to unlock their profile.



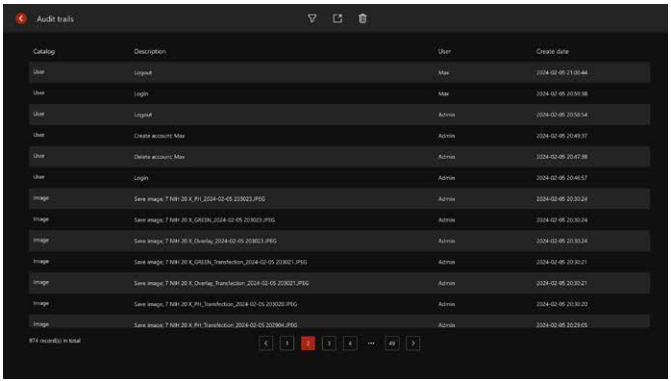
If the admin forgets their password, Leica Service needs to be contacted to reset it.

Audit Trail

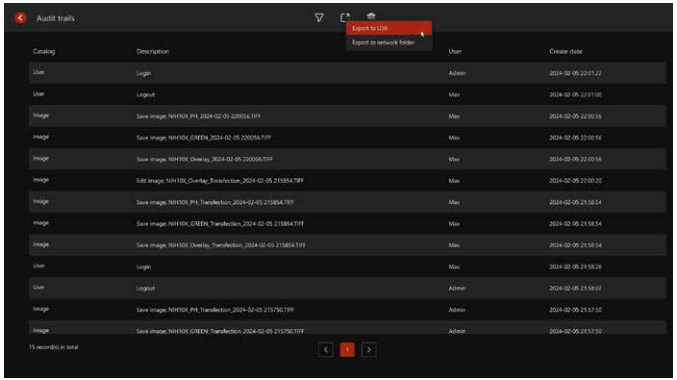
Mateo FL creates an electronic record of user activities such as login, logout, saving, modifying and deleting images. Refer to "Table 8: Audit trail record of user activities" on page 91 that contains a description of the audit trail. These records are retained indefinitely in the system or can be backed up by the admin.

Audit trail is only available when user management is activated, i.e., when user profiles have been created.

Only the admin can access, view, export, filter, and delete the audit trail.



To take a backup of the electronic record you can export the audit trail as a CSV file to a USB stick or to your network folder. No one can edit the audit trail.



If you want to free some space on the device, the admin needs to delete the entire audit trail. Since the audit trail cannot be recovered anymore, the admin needs to make a backup of the audit trail before deleting it.

Start Self-diagnosis

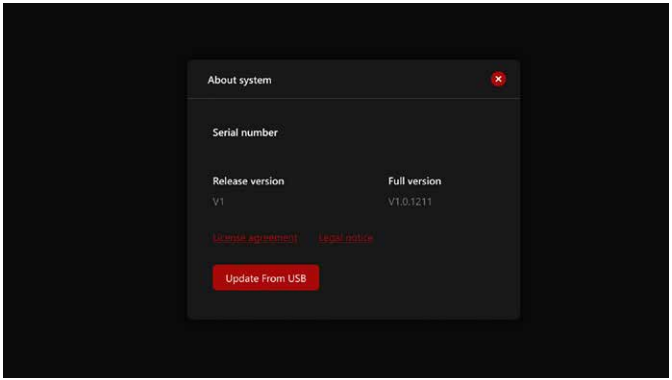
For details, please refer to chapter "Self-diagnosis" on page 80.

About System

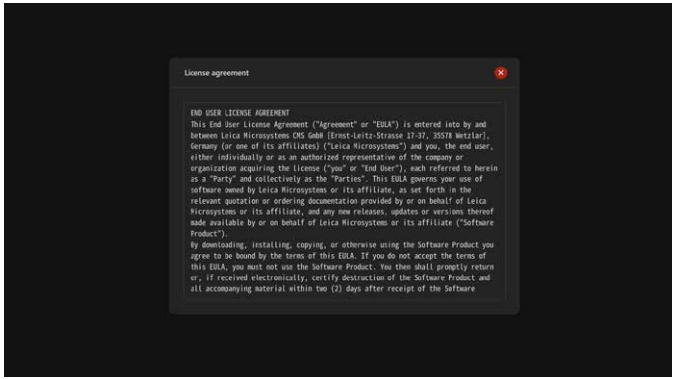
From "About system", you can check the system information.

1. Click to open the system "Settings" menu.
2. Click "System" and "About System". You can see the "Software version" and the "Serial number".

A shows up if the system cannot obtain serial number. Hover the cursor over the icon or tap the icon with the finger to see the detailed reason for the presence of , and you are recommended to restart the system or contact Leica service.



3. Click "License agreement".
   You can see the content of the software license agreement. Then, click "Close" to close the window.



4. Click "Legal notice" to view the content.
5. To update the software click on "Update from USB" and follow the instructions given in chapter "Updating Software" on page 71.

Shading Correction for Phase Contrast

1. Click "Settings" , then "System" and "Shading correction".
2. Make sure to turn on the PH mode.
3. Move the focus to a blank area of the sample or just remove it.
4. Adjust mean brightness to green range using the light intensity adjustment wheel on the left side of the device.
5. Click "Shading correction" and the software will automatically select the corresponding contrast.
6. Close the window by clicking .

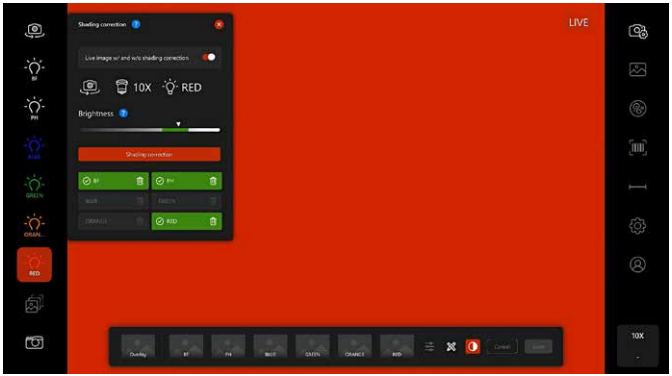
Shading Correction for Brightfield

1. Click "Settings" , then "System" and "Shading correction".
2. Make sure to turn on the BF mode.
3. Repeat the steps 3 to 6 from chapter "Shading Correction for Phase Contrast" on page 39.

Shading Correction for Fluorescence

1. Click "Settings" , then "System" and "Shading correction".
2. Make sure to turn on the corresponding FL channel.
3. Place a uniform fluorescence slide on the stage.
4. Lower the nosepiece using the focus knobs a few micrometers to get out of focus.
5. Adjust mean brightness to green range by turning the light intensity adjustment wheel.

6. Click "Shading correction" and the software will automatically select the corresponding contrast.

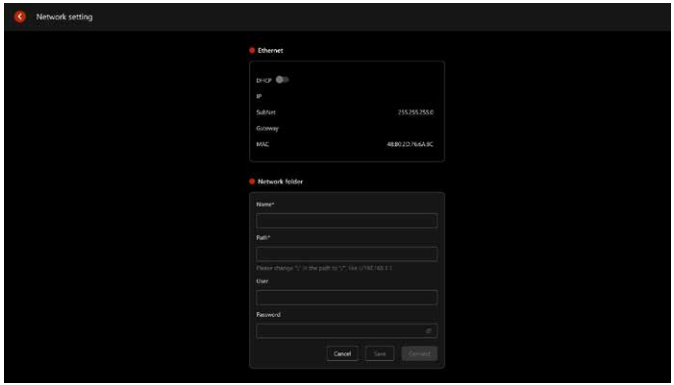


7. Close the window by clicking .
8. Repeat steps 1 to 6 for each FL channel.

Network Setting

To use the option Network Folder, you need to configure the network folder.

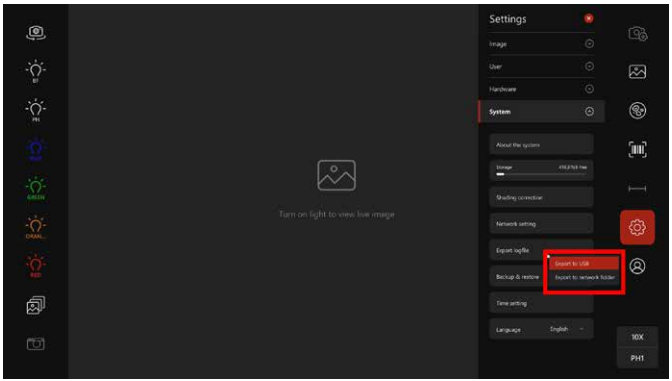
1. Click "Settings" , then "System" and "Network setting".
2. Define the name and path of the network folder.
   If needed, contact your IT for support.



Export Log File

The system stores log files for the last 180 days. Those files facilitate the diagnosing and troubleshooting if service is required.

1. Click to open the system "Settings" menu.
2. Click "System" and "Export logfile".
3. Select your preferred export option: "Export to USB" or "Export to network folder".



4. Select the desired folder and click "Confirm".
5. If needed, provide the log file to Leica service for analysis.

Backup and Restore

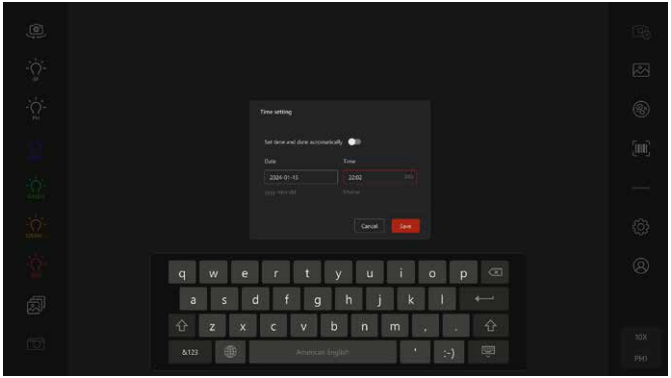
Only the admin can perform a backup and restore of data such as images with metadata files and user profiles (if any). Please see "User Management" on page 34. Click "Backup" button. A zip file will be created. Click "Share" to export the backup file. Click "Import" button for restoring data.

Time Setting

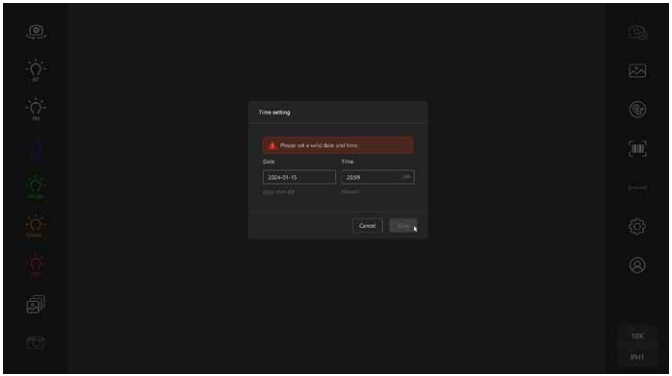
1. Click to open the system "Settings" menu.
2. Click "System" and "Time setting". You can either set the time automatically or configure it manually.
3. Enter date and time meeting the format requirements in the prompted window. Then, close the window by clicking .

Format requirement:

- *Date: yyyy-mm-dd*
- *Time: hh:mm (24 hours)*

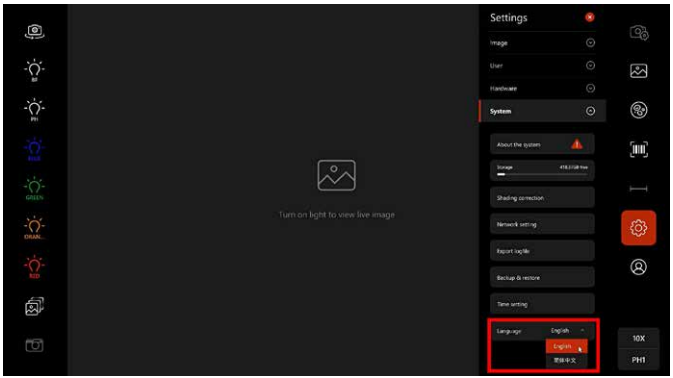


If the format requirement for date or time is not met, a warning message appears to remind you the date and time you entered is invalid.



Language

Mateo FL supports English and Simplified Chinese. The default language is English. A system restart is required on each language switch.



1. Click  to open the system "Settings" menu.
2. Click "System" and "Language".
3. Select between English and Simplified Chinese.

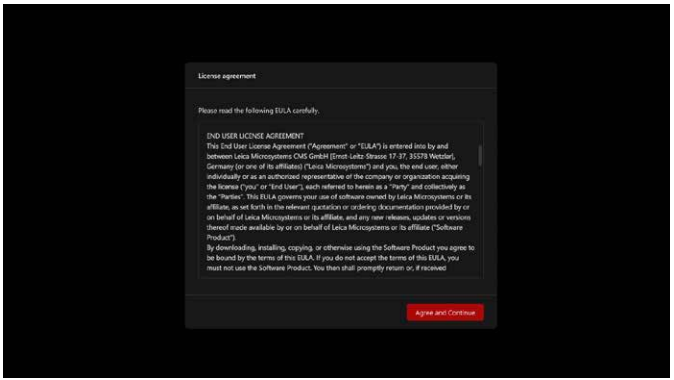
Operations

This chapter includes step-by-step instructions on how to use the system correctly. Please read the instructions carefully before operating the device.

Turning on the Microscope

To turn on the system, please refer to chapter "Turning on the System with the Power Button" on page 23.

Upon powering on your system for the first time a window is displayed to show you the content of the software license agreement. Please read it carefully, then click "Agree and Continue" to activate the software system. Otherwise, you cannot proceed.



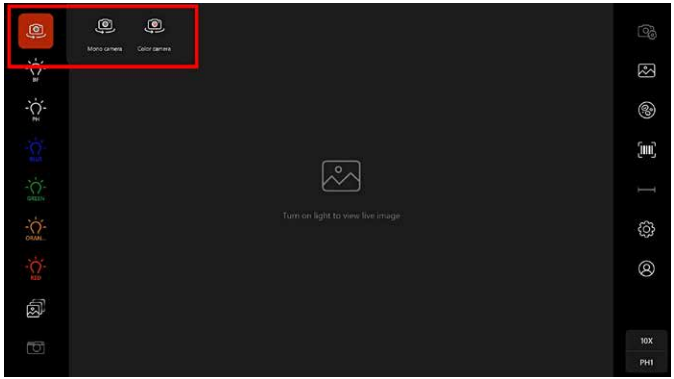
For subsequent powering on/off, use the power button on the front panel of the device.

Managing Camera

You can choose between mono camera (default) and color camera depending on your sample.

In case of cells and fluorescence dye, choose the mono camera. In case of tissue, choose color camera. If you use both fluorescence stains and color stains for cells, choose color camera.

1. Place the sample on the stage.
2. Click "Camera" and select the correct camera type.



Phase Contrast/Brightfield

1. After making sure you selected the right camera, you need to switch on the light (brightfield, phase contrast or fluo channel).

When the phase contrast mode is selected, the motorized phase turret will automatically move into position according to the corresponding objectives.

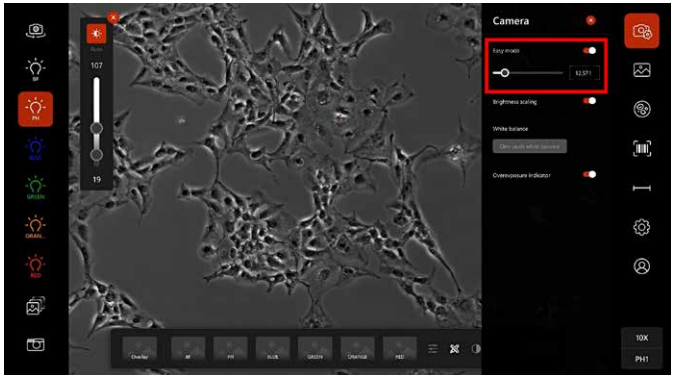
When the Brightfield (BF) mode is selected the aperture diaphragm is automatically adjusted.

2. Select the desired objective by rotating the nosepiece.
3. Focus on the sample to see the live image. Adjust the coarse focus knob and the fine focus knob to get a focused image of the sample.
4. If the image quality does not reach your expectation, you can adjust the camera parameters for an optimum effect (see "Adjusting Camera Parameters" on page 45).

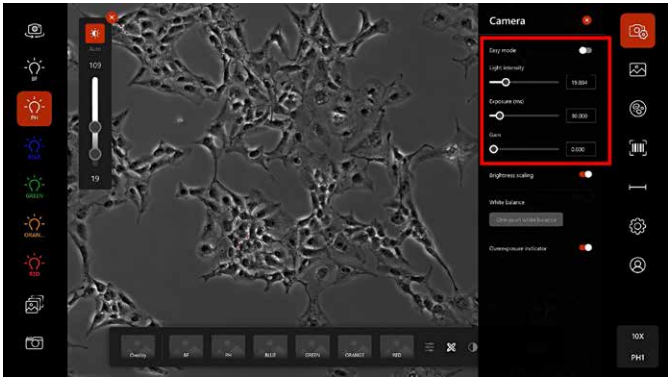
Adjusting Camera Parameters

In the live view, click "Camera" settings on the right panel of the main menu.

By default, the camera is in "Easy mode". In this mode, you can adjust the parameters light intensity, exposure and gain all at once by moving the easy mode slider in the user interface or by turning the light intensity adjustment wheel on the left side of the system.



With "Easy mode" disabled, you can individually adjust the parameters of the camera: Light Intensity, Exposure and Gain.



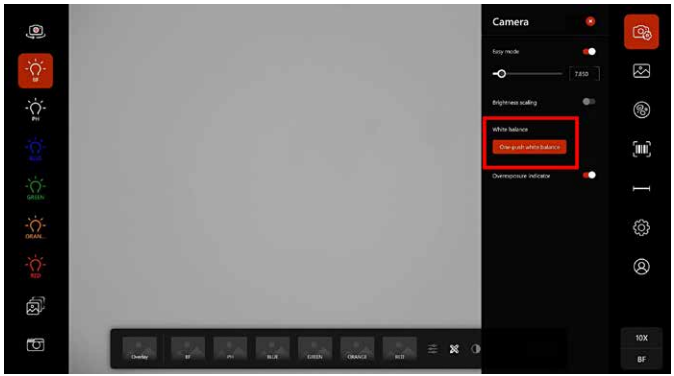
You can adjust each parameter through any way below:

- *Move the slider by dragging it.*
- *Select the slider or input box, and adjust it by scrolling your mouse wheel.*
- *Enter value in the textbox.*

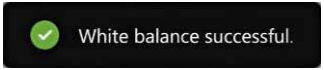
White Balancing

In color camera BF mode, you can white balance the image.

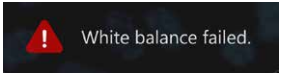
1. Move the white area of the sample to the optical path.
2. In the live view, click "Camera" settings  at the top right panel of the screen.
3. Click the button "One push White Balance".



When it completes, the system prompts the result as below:

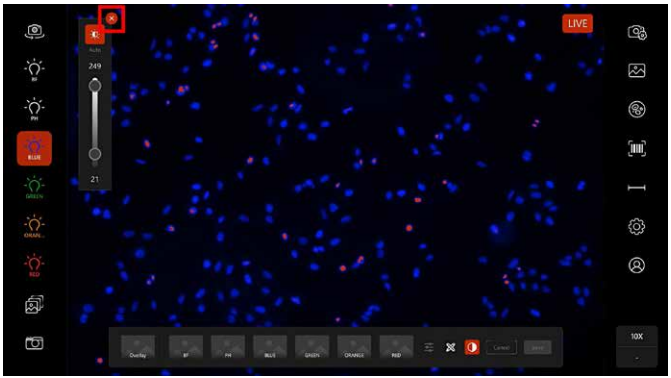


If the white balance fails, click and the button "One push White Balance" to repeat.



Brightness Scaling

"Brightness scaling" is enabled by default. You can disable it by clicking on the brightness scaling bar.



Alternatively, right-click in live mode or long-press on the screen.

You can also disable and enable "Brightness scaling" by clicking "Camera" setting .

Enabling or disabling "Brightness scaling" is only possible in live mode.

The "Auto" function of "Brightness scaling" is enabled by default. You can disable it by clicking on the brightness scaling bar.

Fluorescence

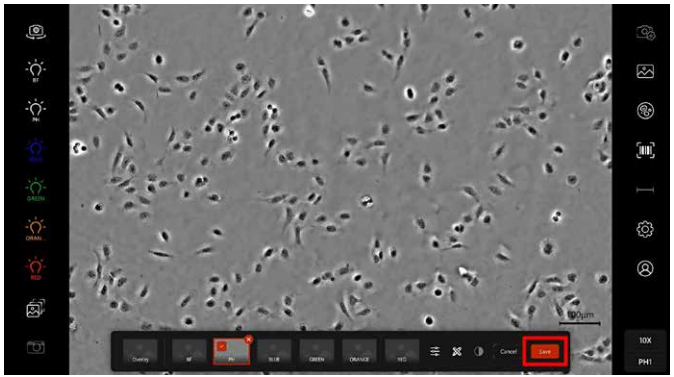
For fluorescence contrast mode, select the desired fluorescence channels (mono camera or color camera depending on your sample. For more information, see "Managing Camera" on page 44).

The fluo turret will automatically move into position according to the corresponding channel.

Taking an Image

In the live view, click "Camera" at the bottom left corner of the screen to take an image of the current sample view.

By default, the "Quick save image" is enabled. An overview of the images captured is displayed in the panel at the bottom of the screen. Make sure to click "Save" to store the image in the gallery.



The image will be saved according to the image naming rule of the system.

To save an image manually with a preferred name, you need to disable the "Quick save image" by clicking to open the "Settings" menu and then clicking "Image" setting. (For details, please refer to "Quick Save Image" on page 24.)

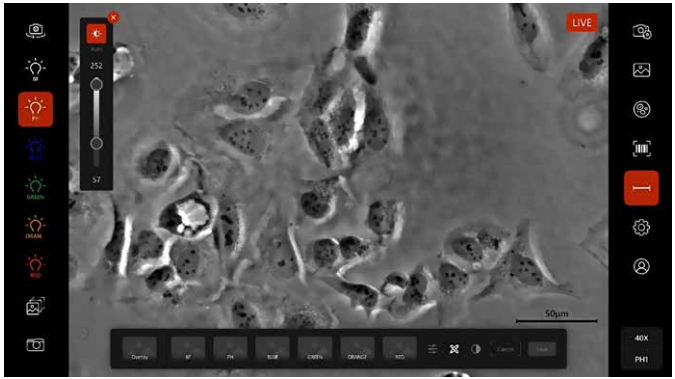
For a fluorescence image you can turn off the pseudo color by clicking in the panel below.

If grays out, check the remaining storage space by clicking "Settings" and "System". If it is due to shortage in storage space, please see "Storage" on page 87.

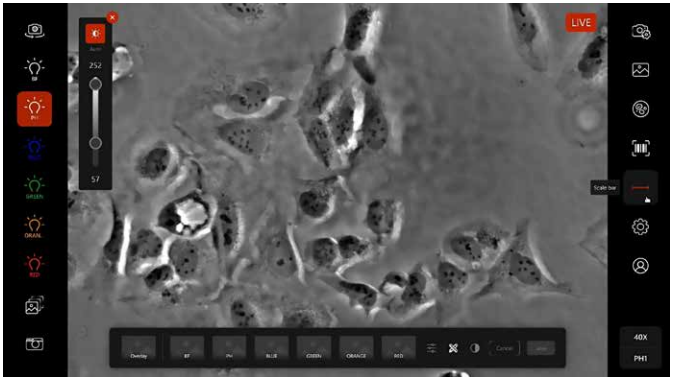
When the user has live cells or non-adherent cells, to minimize vibration as much as possible, the user should use the mouse.

Adjusting Scale Bar

By default, the scale bar is enabled and is displayed at the bottom right corner of the live view.

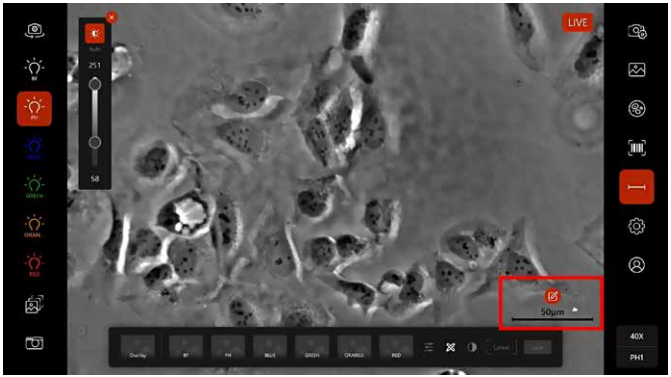


You can disable the scale bar by clicking "Scale bar" at the right panel of the screen.



You can also change its color and length.

1. Click the scale bar at the bottom right corner of the screen.

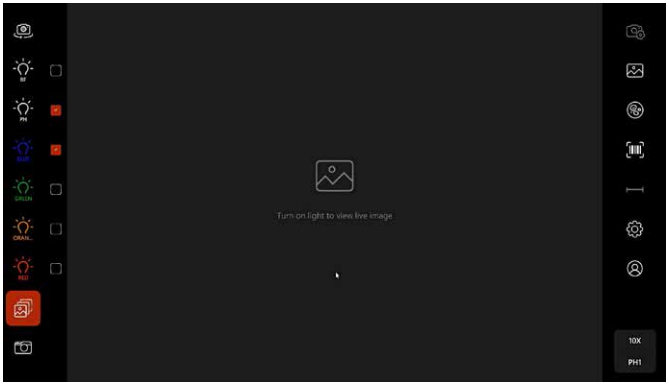


2. Select the color (white or black) from the prompted box to set the color of the scale bar, and select one length value from the drop-down list to set the length of the scale bar.

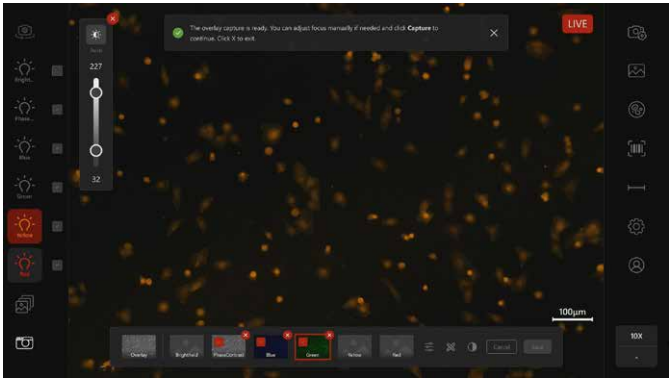
The scale bar length changes according to the objective magnification chosen and when zooming into the image.

Multichannel Capture

1. In the main menu, click Multichannel on the left panel. Checkboxes will appear next to each channel.
2. Tick the desired checkboxes and click Capture to acquire a multichannel image.



The image is not acquired automatically. You need to focus and click "Capture" for each channel. The channel changes automatically to the next one.



In the panel at the bottom of the screen you can see an overview of the images captured as well as an overlay image.

3. Click "Save" to store the images in the gallery. They will be stored according to the image naming rule of the system.

Zooming in/out in Live View

In live view, there are two ways of zooming in and out. You can either zoom in/out by rolling the mouse wheel or zoom in/out with the tips of two fingers on the touch monitor (pinch-to-zoom).

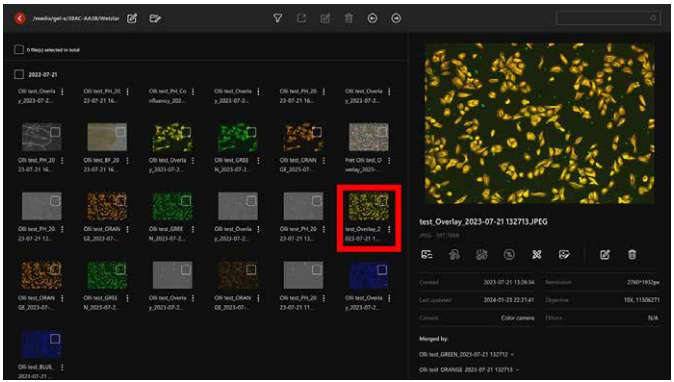
Managing Images in Gallery

The images you captured during experiments are stored in the gallery. In addition to viewing images and checking image parameters, you can also rename, edit, delete, share, use the measurement or AI tools, repeat image parameters, search and filter images and change the gallery folder path there.

Checking Image Parameters

1. Click  to open the gallery where your experiment images are stored.
2. Click the image of interest which is then surrounded by red borders. You can see the original image and all its parameters on the right side of the screen.

 If multiple images are selected, only the image that was clicked (surrounded with red borders) and its parameters are presented. (For details, see chapter "Selecting Image(s)" on page 54.)



Changing Gallery Folder Path

1. Click  to open the gallery.
2. Click  to define the storage location for the saved images. You can choose among USB folder, SSD folder and Network folder.

 To use the option USB folder, plug in a USB stick.

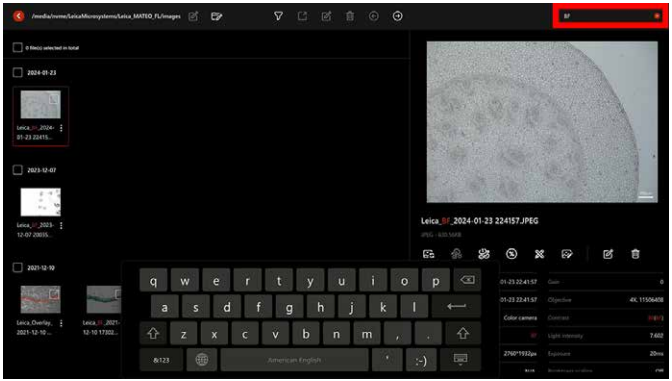
To use the option SSD folder, please note that the total storage of the system is 500 GB.

To use the Network folder, see chapter "Network Setting" on page 40.

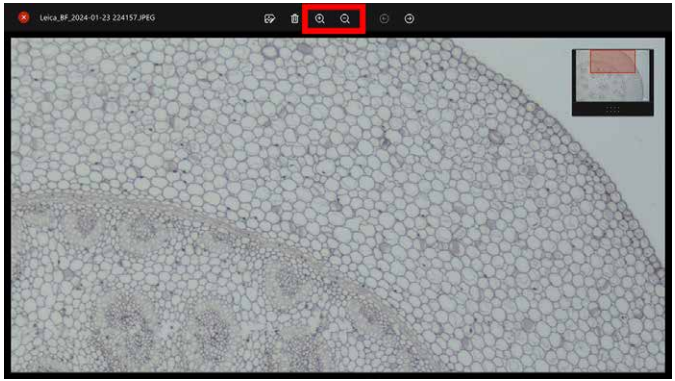
Selecting Image(s)

1. Click to open gallery where your experiment images are stored.

If needed, enter the keyword in the search bar at the top right corner to search images by name or parameters. Alternatively, you can click Filter and filter your images according to the date or other parameters.



2.1. Double click the image to open the original file. You can zoom in/out to check it in detail (see chapter "Zooming in/Zooming out in Gallery" on page 55). By clicking "Edit file" you find the option to crop, rotate and adjust image parameters.

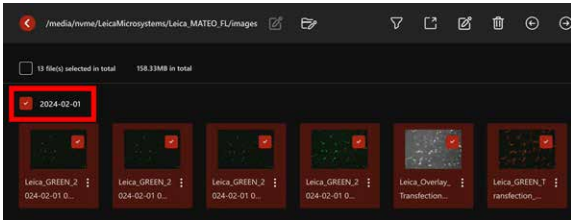


Click at the top left corner of the original image to close it.

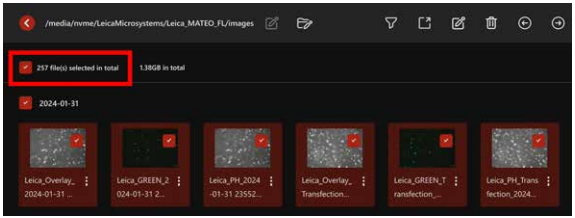
2.2. You can select multiple images in any way below:

- *Click the checkbox on the top right of each image of interest.*

- *Click the checkbox on the left of the date label to select all images taken on that day.*



- *Click "Select all" at the top of the screen to select all images.*



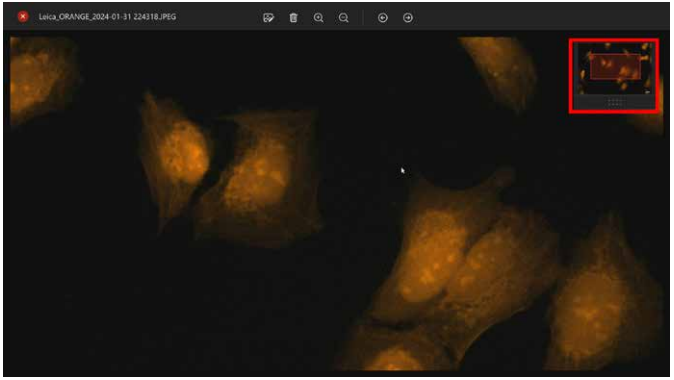
Zooming in/Zooming out in Gallery

1. Click to open the gallery where your experiment images are stored.
2. Double click the image of interest to open its original file.
3. Click zoom in /zoom out in the middle of the top panel to locate and observe the fields of interest.

You can also roll your mouse wheel to zoom in/out.

You can also zoom in/out with the tips of two fingers on the touch monitor (pinch-to-zoom).

While zooming in, a window is prompted at the top right corner of the original image, which pinpoints the current field of interest in the original image. You can move the window to the desired position on the screen.



4. Click at the top left corner of the original image to close it.

Using Measurement Tool

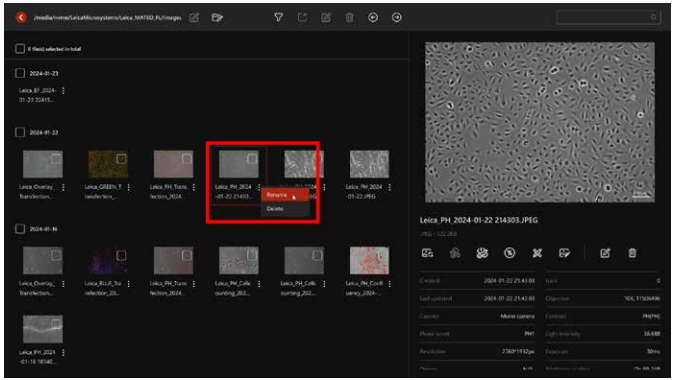
1. In the gallery select the image of interest, so that it is displayed on the right side of the screen.
2. Click "Measure" to open the measurement tools. With these tools you can measure parameters such as area of regions of interest or distance between points of interest.

Renaming Image(s)

There are three methods for renaming images.

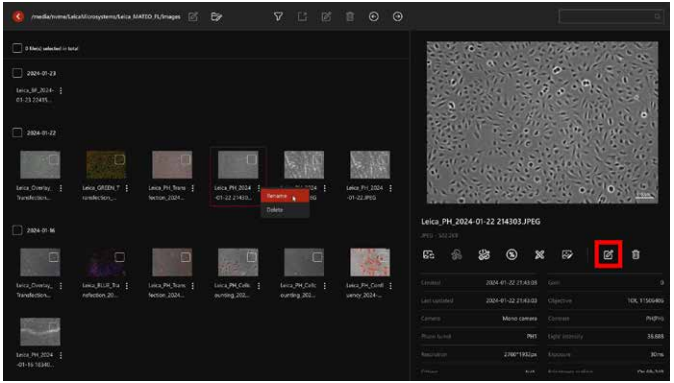
Method 1

1. In the gallery, click the three dots on the right side of the image name.
2. Select "Rename" from the drop-down menu.
3. Rename the image of interest.



Method 2

1. Select the image of interest, so that it is displayed on the right side of the screen.
2. Click the "Rename" icon under the displayed image.
3. Rename the image of interest.



Method 3 (Renaming multiple images at once)

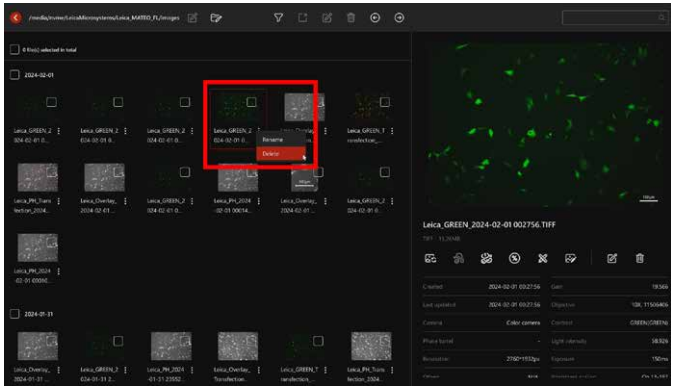
1. Tick the checkbox of the image(s) of interest.
2. Click "Rename"  in the middle of the top panel.
3. Rename the image(s) of interest.

Deleting Image(s)

You can delete images in thumbnail view or original file view using one of the following methods.

Method 1

1. In the gallery, click the three dots on the right side of the image name.
2. Select "Delete" from the drop-down menu and click "Delete" again to confirm your action.



Method 2

1. In the gallery, select the image of interest, so that it is displayed on the right side of the screen.
2. Click "Delete" under the displayed image and click "Delete" again to confirm your action.

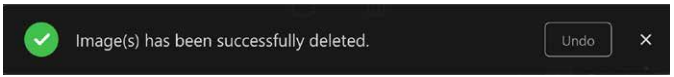
Method 3 (Deleting multiple images at once)

1. In the gallery, tick the checkbox of the image(s) of interest.
2. Click "Delete" in the middle of the top panel to delete the image(s) of interest.

Method 4

1. In the gallery, double-click the image of interest to open the file.
2. In the original file view, click "Delete" in the middle of the top panel and click "Delete" again to confirm your action.

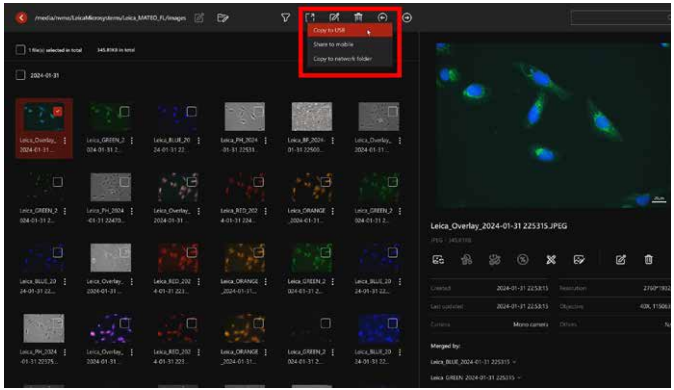
After deleting the image(s) of interest, the device prompts a message saying the image was deleted successfully. You can undo this action to retrieve the deleted images by selecting the "Undo" button within 10 seconds before it disappears. This step is possible with each method.



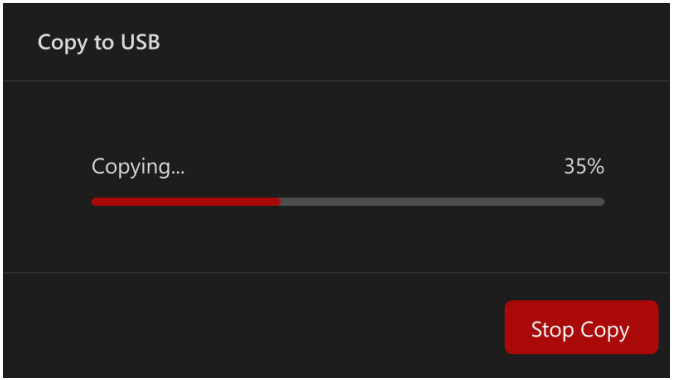
Copying Image(s) to USB Disk

Clear your USB disk beforehand to ensure there is enough space to store your images.

1. Plug your USB disk into one USB port of the microscope, preferably USB3.0 port for faster transmission.
2. Select the image(s) to be transferred by clicking the checkbox(es).
3. Click "Share" in the top panel, then click "Copy to USB".

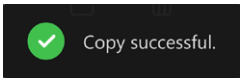


4. Select the target folder to save the images, then click "Confirm" to start copying. The progress bar is displayed.



Please see "Table 2: Recommended USB disks and USB hard disks" on page 89.

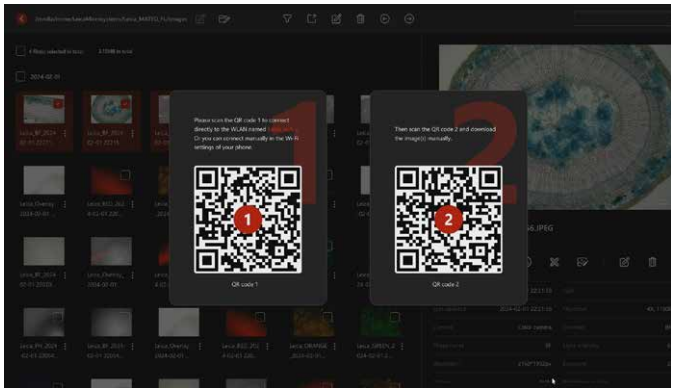
5. When the copy completes, a message appears: "Copy successful".



Transferring Image(s) to your Smart Device through Wi-Fi

Before sharing, please make sure the optional Wi-Fi dongle is purchased.

1. Plug the Wi-Fi dongle to a USB port of your microscope, preferably USB 3.0 for faster transmission.
2. Select the image(s) to share by clicking the checkbox(es).
3. Click "Share" in the middle of the top panel, then click "Share to mobile".
4. Follow the instructions in the prompted window to share your image(s).



4.1. Using your smart device scan the QR code with label ‘1’ to connect to wireless network "Leica Wi-Fi+serial number".

Please make sure that your phone is connected to the Leica Wi-Fi, not to mobile data/internet.

Please use your smart device’s own built-in QR scanner. The scanning function of any APPs is not recommended to use due to compatibility issues.

After a successful connection between your Mateo FL and your smart device, you can directly select the wireless network "Leica Wi-Fi+serial number" on your smart device without having to scan the QR code ‘1’ again.

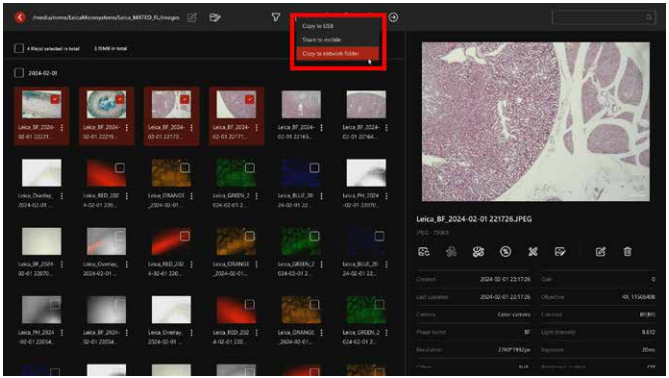
4.2. Scan the QR code with label ‘2’, you are directed to a page where the selected image(s) are displayed. Click the "Download" button to download the image to your smart device.

After the image is shared, the Wi-Fi dongle can be unplugged from the equipment to avoid unauthorized connection to download images.

Transferring Image(s) through the Network Folder

Before sharing, please make sure you are connected to a network folder by plugging in an ethernet cable.

1. In the gallery, select the image(s) of interest and click "Share" in the middle of the top panel.
2. Select "Copy to network folder" and click your folder of interest.



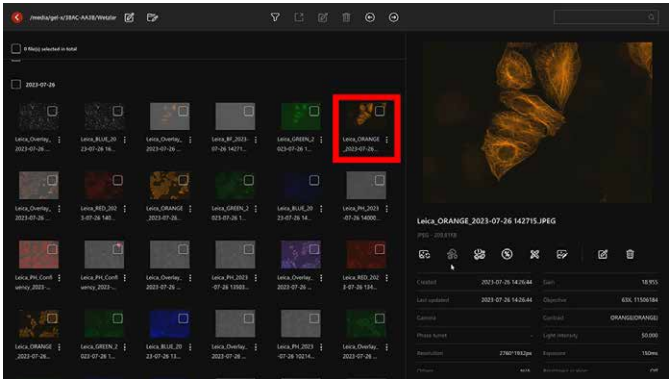
If the network folder is not defined, follow the instructions and click "Go to settings" and define the name and path of the network folder. If needed, contact your IT for support.

3. Next, click "Confirm".

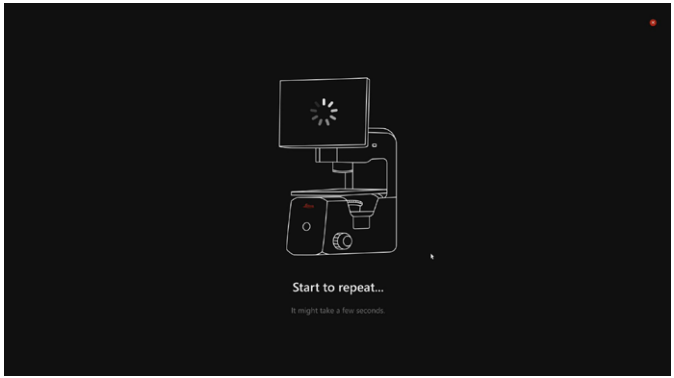
Repeating the Image Settings in the Gallery

Many experiments are conducted repeatedly under the same conditions. With Mateo FL, you can take one image from the gallery as a reference and reuse its parameters to repeat the imaging conditions of the reference.

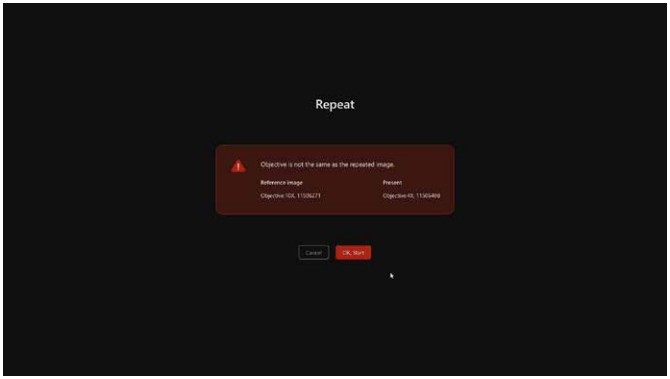
1. Click  to open the gallery where your experiment images are stored.
2. Click the image of interest.
   You can see all its parameters on the right side of the screen.



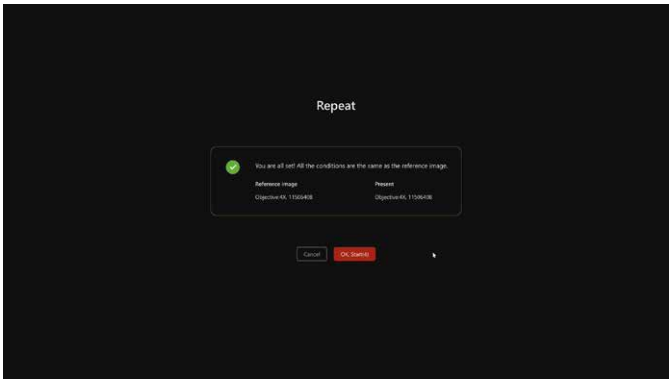
3. Click "Repeat"  . The system starts verifying whether the current imaging parameters are identical with those of the reference image.



4. If there is any parameter discrepancy (such as objective position), a warning message displays as shown below.



5. Click "OK, Start" to start repeating.



If "OK, Start" is not clicked, the "Repeat" function applies the image parameters automatically after 5 seconds.

6. You get a live view where you can change field of view or set focus.

Using AI-based Software Modules

Confluency Module

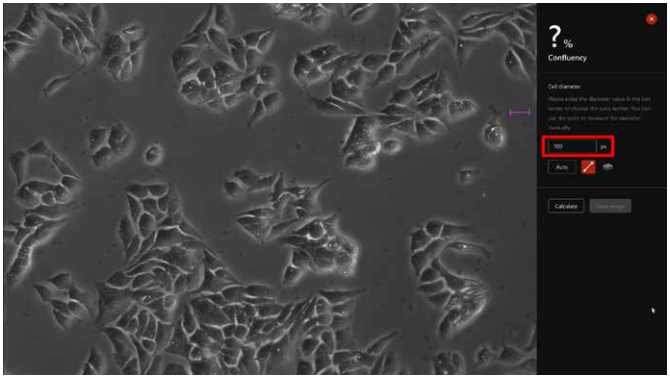
The Confluency module can be used to estimate cell confluency, the percentage of the surface of a culture vessel that is covered by adherent cells. Many cell-based experiments require cell culture to reach a certain confluency. With Mateo FL, you can use the onboard Confluency module to measure the confluency of your cell culture.

Checking Confluency from Live Image

1. Place the sample on the stage and focus the sample.

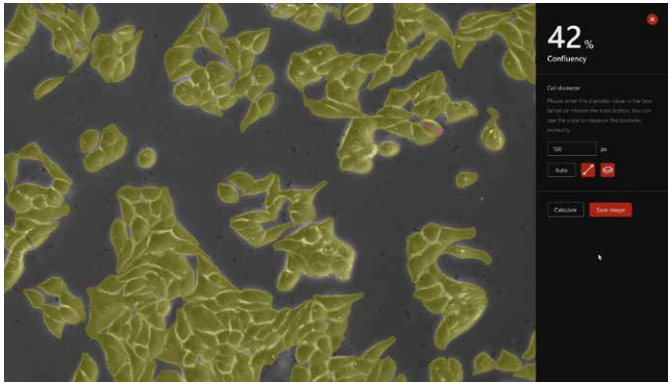
The Confluency module can only be used in PH mode and is not available under BF and FL mode.

2. Click AI module on the right panel in the live view.
3. Click Confluency . The system takes an image of the sample and opens the Confluency module.
4. Enter the diameter value in the text box either by using the scale or the Auto button.



5. Click "Calculate" to obtain the Confluency results.

The confluency value is presented on the top right corner of the image. The cells in the image are outlined in yellow.



6. You can click "Outline" to make the mask invisible/visible.

Doing so you can evaluate the result by comparing the original image and the image processed by Confluency module. If the result is not accurate, you can try to adjust the diameter value.

7. Click "Save" to save the image with the analysis.

If "Quick save image" is enabled, the image is automatically named with a suffix "-Confluency", following the naming rules of "Quick save image".

After that, the system closes the Confluency module and goes back to main menu.

You can also close the Confluency module manually by clicking "Close" in the right corner of the screen.

Checking Confluency from Gallery

1. Click to open the gallery where your experiment images are stored.
2. Click the image of interest which is then surrounded by red borders. You can see the original image and all its parameters on the right side of the screen.
3. Click to calculate the confluency percentage and follow steps 4 and 5 in chapter "Checking Confluency from Live Image" on page 64.
4. To save the image with the analysis, click "Save" or cancel to exit without saving.

Cell Counting Module

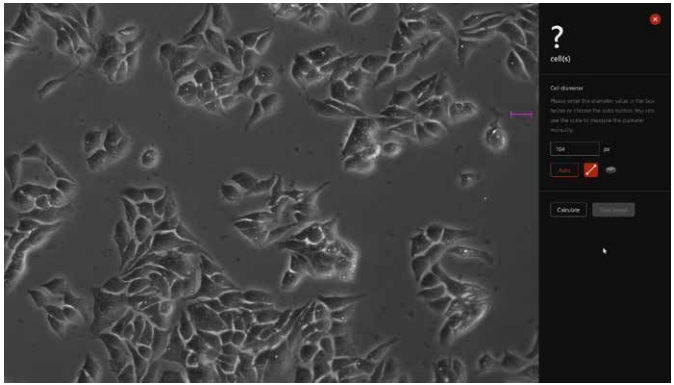
The cell counting module can be used for calculating the number of cells in the image.

Cell Counting from Live Image

1. Place the sample on the stage and focus on the sample.
2. Click AI module on the right panel in the live view.
3. Click cell counting .

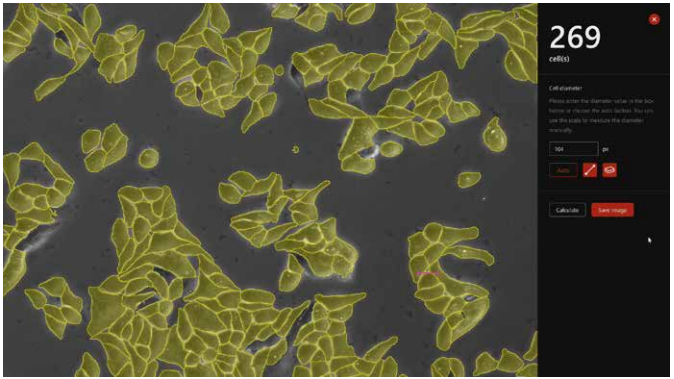
The system takes an image of the sample and opens cell counting module.

4. Enter the diameter value in the text box either by using the scale or the Auto button.



5. Click "Calculate" to obtain the cell counting results.

The cell count value is presented on the top right corner of the image. The cells in the image are outlined in yellow.



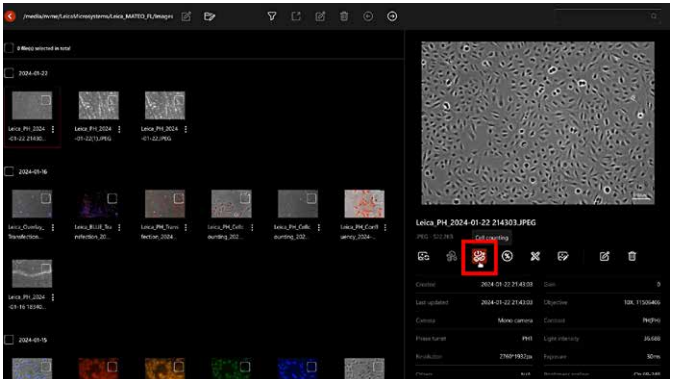
6. You can click "Outline" to make the yellow outlines invisible/ visible.

Doing so you can evaluate the result by comparing the original image and the image processed by Cell Counting module. If the result is not accurate, you can try to adjust the diameter value.

You can also close the Cell Counting module manually by clicking "Close" in the right corner of the screen.

Cell Counting from Gallery

1. Click to open the gallery where your experiment images are stored.
2. Click the image of interest which is then surrounded by red borders. You can see the original image and all its parameters on the right side of the screen.
3. Click cell counting to calculate the number of cells and follow steps 4 and 5 in chapter "Cell Counting from Live Image" on page 65.



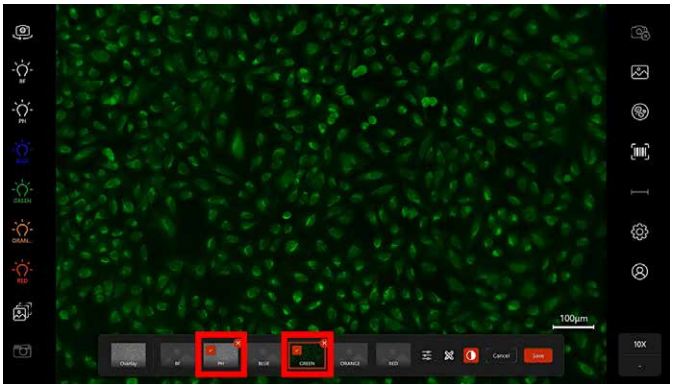
4. To save the image with the analysis, click "Save" or cancel to exit without saving.

Transfection Module

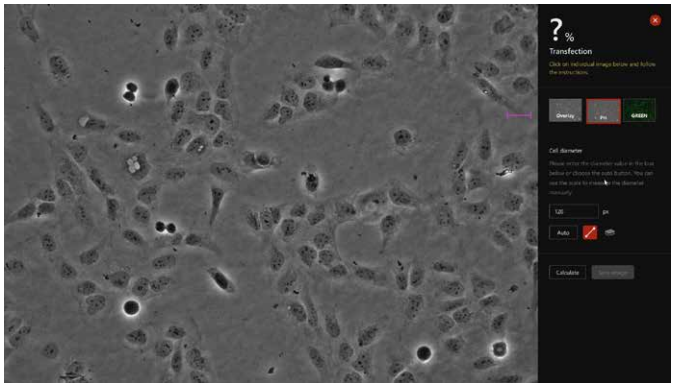
The Transfection module can be used to estimate the percentage of positively transfected cells.

Checking Transfection from Live Image

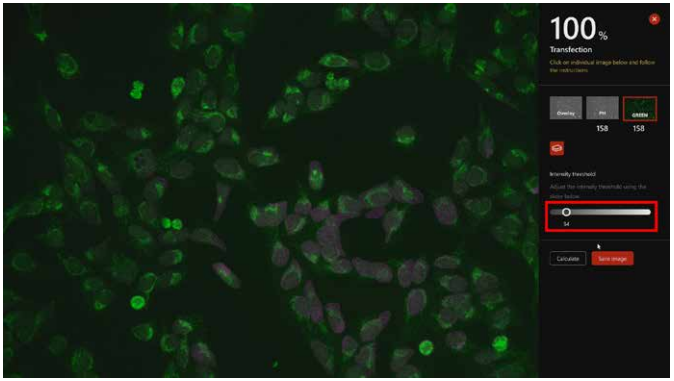
1. Place the sample on the stage and focus the sample.
2. To use the transfection module, you first need to acquire an image in PH and FL mode of the same field of view.



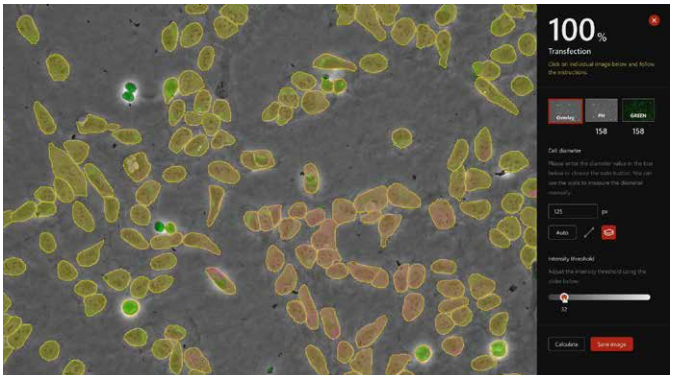
3. Click AI module  on the right panel, then Transfection  .
4. With the Transfection module page opened, click on the individual images and follow the instructions.
5. For phase contrast image, enter the diameter value in the text box either by using the scale or the Auto button, and click "Calculate" to identify the cells in your image.



6. For the fluorescence channel, adjust the intensity threshold.



The Transfection percentage is presented on the top right corner of the image. The cells in the image are outlined in yellow and the fluorescence signal is highlighted in pink.



7. Click "Save" to save the image with the analysis. The system saves 3 images with analysis: the overlay displaying the result and the individual channels displaying the annotation.

If "Quick save image" is enabled, the image is automatically named with a suffix "-Transfection", following the naming rules of "Quick save image". After that, the system closes the Transfection module and goes back to main menu.

8. You can click "Confirm" to exit without saving image or click "Cancel" to return to the Transfection module.

Barcode Reader

If you want to use a barcode reader, first consult the list about compatible devices given in "Table 4: Recommended barcode scanners" on page 90. This function can be used to add more info to the image, like batch number for tracking and scanning your samples.

The barcode function can be switched on or off in the "Settings" page.

1. Click "Settings" and "Image".
2. Enable the "Barcode".

3. To use the barcode function, plug in the barcode reader to a USB port of the device (wired: backport, wireless: sideport).

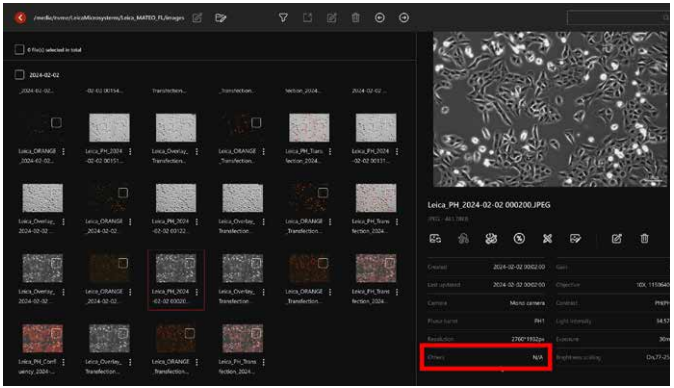
4. Click the "Barcode" icon.

A window with an input box appears on the screen. You can then use the barcode reader to scan the barcode. The info of the barcode will be automatically read and displayed in the input box. You can also enter the information in the input box manually.

When you save the captured image(s), the text from the input box will be saved with the image parameters of the image automatically.

5. To view this information, go to "Gallery" and select the image of interest, so that it is displayed on the right side of the screen along with its image parameters.

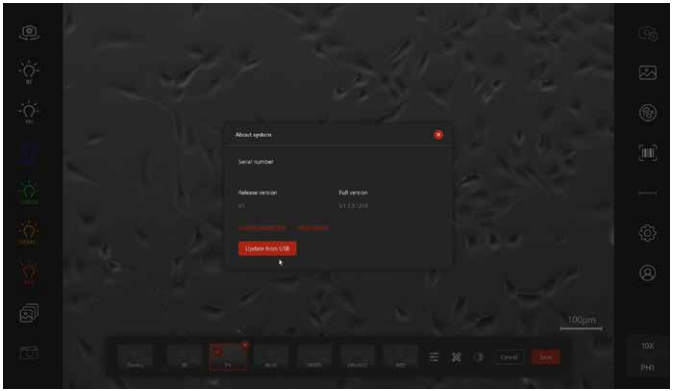
You can see the barcode information in the image parameters section under "Others". If the input box is empty or the Barcode function is not activated, "N/A" will be displayed under "Others".



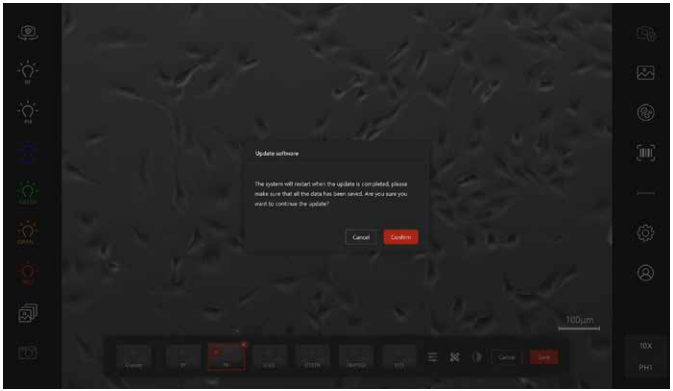
Updating Software

You should update the software regularly to make sure the system is using the latest software version and keep your Mateo FL running at an optimum performance level.

1. Download the latest software package from Leica official website, save it to a USB disk, then plug the USB disk into a USB port on the right or back side of the stand.
2. In the main screen, click  to open the "Settings" menu.
3. Click "System" and "About system", you can see the current version of the software.



4. Click "Update from USB". The following window is prompted to remind you to save all your unsaved data before proceeding.

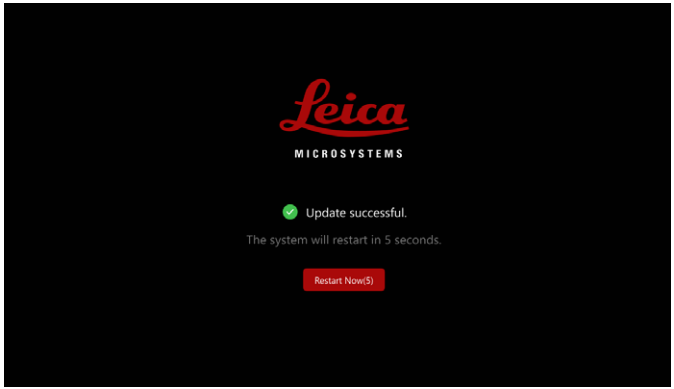


5. Click "Confirm" to proceed.

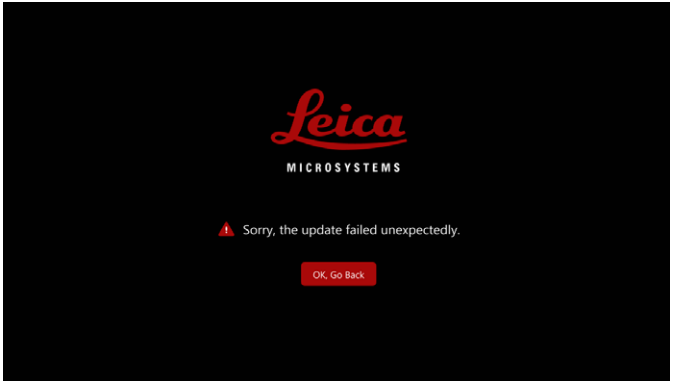
6. In the "Update software" window, select the software package from your USB disk. Then, click "Confirm" to start updating. It shows following information.

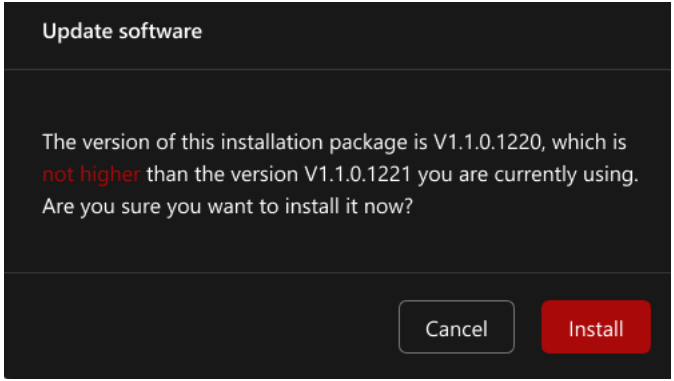
7. If update succeeds, it shows the successful result as shown below, which indicates the system will restart in 5 seconds.

You can also click "Restart Now" to restart the system immediately.



8. If the update fails, it shows the failed result. Click "OK, Go Back" to roll back to the previous version.





9. Go back to "About system" to verify whether the software is the target version.

It is also possible to downgrade the Mateo FL system to any previous version, if needed. To do so, you can download the package of your desired version and repeat the steps above. Note that after clicking "Update Software", a window is prompted for your confirmation of the downgrade.

Troubleshooting

This chapter gives an overview about the most common problems and their possible causes and solutions.

Problem	Possible Cause/Solution
The microscope does not start after pressing the On/Off button.	**Possible cause:** No power supply. **Solution:** 1. *Ensure that the power outlet has power.* 2. *Check cable connections between:* • *microscope and power adapter* • *power adapter and power cord* • *power cord and power outlet*
Powering on/off fails.	**Possible cause:** Hardware- or software-related issue. **Solution:** Reboot the system. After powering off the device, wait 5 to 10 seconds before switching it on again using the power button on the back side of the device. **Solution:** If rebooting does not help, call Leica service.
The live image is too dark.	**Possible cause:** Light intensity is too low. **Solution:** Adjust light intensity to make the image brighter. For details, please refer to "Managing Camera" on page 32.
The image of samples on glass slide is blurry.	**Possible cause:** The wrong side of the slide is facing the objective. **Solution:** The glass slide must be placed the right way. **Possible cause:** The sample/objective is not clean. **Solution:** Clean the sample/objective.

Problem	Possible Cause/Solution
The white balance button in BF mode is disabled.	**Possible cause:** The camera is disconnected. **Solution:** Restart the system or Start self-diagnosis, then connect the Leica service. Please note, one push white balance is only possible in color camera mode.
The capture button is disabled.	**Possible cause:** The available space is below 2 GB. **Solution:** Remove images to make sure at least 2 GB available space is left. For details, please refer to "Clearing Storage/Gallery" on page 48. **Possible cause:** The camera is disconnected. **Solution:** Restart the system or Start self-diagnosis, then connect the Leica service.
The AI analysis result is not accurate enough.	**Possible cause:** The cell diameter is not accurate enough. **Solution:** Try to adjust the cell diameter in the text box. **Possible cause:** The cell models for PH and for FL are not the same under transfection. **Solution:** Select the same cell models under both channels.
There is no yellow reference line in the image processed by the AI modules.	**Possible cause:** "Outline" is not enabled in the AI modules. **Solution:** Go to the respective AI module, enable "Outline" to show the lines.
The outlines are not shown on the saved image.	**Possible cause:** Burn to image is not enabled. **Solution:** Enable burn to image.
The system cannot detect the USB disk.	**Possible cause:** The USB disk is incompatible with the system. **Solution:** Use one of the recommended USB disks (see "Table 2: Recommended USB disks and USB hard disks" on page 89).

Problem	Possible Cause/Solution
Camera is not connected.	**Solution:** Please contact Leica Service.
There is no response on the smart device after scanning the QR code with label "1".	**Possible cause:** The built-in QR scanner of your smart device is not used. **Solution:** Use your smart device's own built-in scanner. Do not use the scanner function of any APPs installed in your smart device. For details, please refer to "Sharing Image(s) via Your Smart Device through Wi-Fi" on page 40. **Possible cause:** The smart device is incompatible with the system. **Solution:** Use one of the recommended smart devices (see "Table 3: Recommended smart devices" on page 89).
The screen blacks out when a physical keyboard is used.	**Possible cause:** The user used a built-in shortcut key function of the physical keyboard. (The shortcut key function is not supported in the Mateo FL system as the definitions of shortcut keys vary from manufacturer to manufacturer and they all cannot be verified.) **Solution:** Please reboot the system.
After power-on, the LED Indicator turns on, but the screen blacks out without response.	**Possible cause:** The interval between power on and off is too short (< 1 s). **Solution:** Please reboot the system (power on after 10 s of power-off).

Problem	Possible Cause/Solution
Filter cube switch is not available.	**Possible cause:** Filter cube is incorrectly installed. **Solution:** Please see "Installing Filter Cubes" on page 28 and install the filter cubes according to the instructions given in this chapter. **Possible cause:** Adjacent filter cubes are out of position due to incorrect installation. **Solution:** Remove all filter cubes and insert them back in correctly. **Possible cause:** Status is not activated. **Solution:** Activate the status in the "Filter cube setting". If all filter cubes are correctly inserted and the error message still appears, restart the system by pressing the power button at the rear side of the stand.
Illumination is not uniform across the image shown on the monitor.	**Possible cause:** Light leakage or improper shading correction. **Solution:** Make sure that the magnetic cover of the filter cube chamber is properly closed. Please see chapters "Shading Correction for Phase Contrast" on page 39, "Shading Correction for Brightfield" on page 39 and "Shading Correction for Fluorescence" on page 39. Make sure shading correction is done properly.
The image is noisy/grainy.	**Possible cause:** Signal from the sample is too low and auto brightness scaling is on. **Solution:** Increase the light intensity under camera settings or by using the light intensity adjustment wheel. Turn off brightness scaling and adjust the parameters under camera settings.

Self-diagnosis

Mateo FL features quick and easy self-diagnosis. With it, you can easily diagnose your system, get the needed technical information and report the issue to Leica service via your smart device.

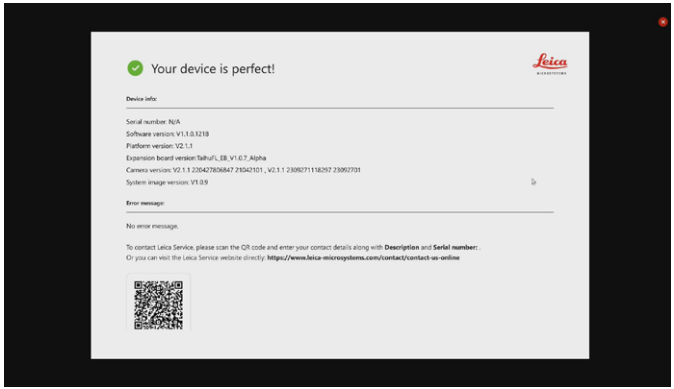
For instructions on log file export, see chapter "Export Log File" on page 41.

1. In the main screen, click to open the system "Settings" menu. Then, click "Hardware" and "Start self-diagnosis" to start self-diagnosing.

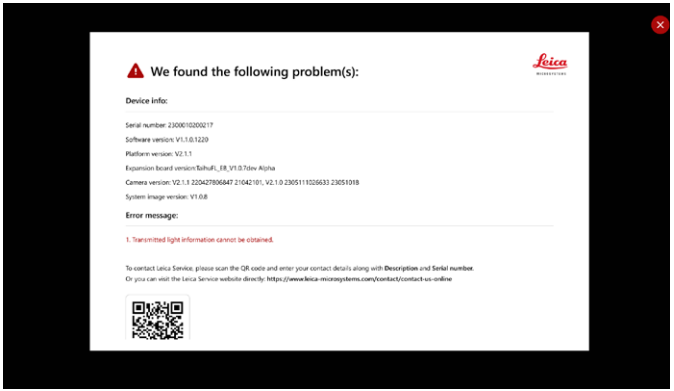
You cannot stop self-diagnosing during the process.

2. When the self-diagnosis is completed, the result is shown with the following information.
   - *Device info (Serial number and Software version)*
   - *Error message*
   - *QR code (Login portal to Leica service website)*

Example result for normal system:



3. If the result shows a system with error message, scan the QR code to visit Leica service website and enter required information (model, serial number, etc.), then click "Submit Form" to send the information to Leica service.



Care and Maintenance

The following chapter includes instructions on how to clean and protect the device to support the longlasting function of your Mateo FL.

Contact address

If your system is no longer functioning properly, contact your local Leica representative. You can find information on the Leica website: www.leica-microsystems.com.

Protection from dirt

Dust and dirt will affect the quality of your results.

Place a dust cover over the components when they are not in use for an extended period of time.

Keep accessories in a dust-free place when not in use.

WARNING Removing the covers of the components exposes hazardous voltages. Risk of electric shock and death.

Do not clean any interior parts yourself.

Please contact an authorized Leica dealer for technical service.

Unplug the power supply before cleaning and maintenance!

Protect electrical components from moisture!

Care and cleaning of the Mateo FL unit

Keeping all components clean is important for maintaining good optical performance.

Do not use any unsuitable cleaning agents, chemicals or techniques for cleaning. Clean the microscope surface using paper towels dampened with 70% ethanol. The system can also be cleaned with 3% H_2O_2.

Protect your components from moisture, fumes and acids and from alkaline, caustic and corrosive materials.

Glass surfaces, and particularly objectives, are always to be cleaned as described in the brochure "Cleaning of Microscope Optics". You can download the information from the Mateo FL product website.

In case of a leak or spillage, clean the surface of the filter cube chamber thoroughly before you open the magnetic cover.

Never use chemicals (e.g., thinners containing acetone, xylene or nitrogen) to clean the components, in particular-colored surfaces or accessories with rubberized parts. This could damage the surfaces, and specimens could be contaminated by abraded particles.

Test cleaning solutions of unknown composition on a less visible area of the components first. Ensure that coated or plastic surfaces do not become matted or etched. Protect your components from oil and grease.

Do not grease guide surfaces or mechanical parts.

You can also contact our Technical Service in case of any questions.

Cleaning polymer components

Some components are made of polymer or are polymer-coated. They are, therefore, pleasant and convenient to handle. The use of unsuitable cleaning agents and techniques can damage polymers.

Handling acids and bases

For examinations using acids or other aggressive chemicals, take particular caution.

Never allow the optics and mechanical parts to come into direct contact with these chemicals.

Maintenance, repair work and servicing

Ensure that repairs are only carried out by Leica-trained service engineers.

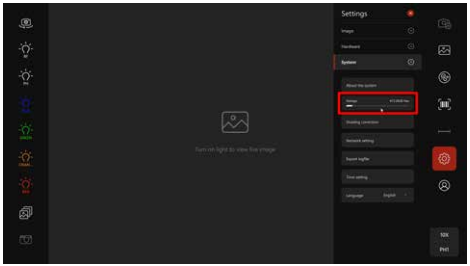
Only use original Leica spare parts.

Technical Data

This chapter gives an overview of onboard storage, recommended objectives and external devices such as keyboard, mouse, barcode scanner.

Storage

To see the currently available storage space of the system storage, click "Settings" and "System". The total storage of the system is 500 GB.



Icon color	Meaning	Impact	Action to take
White/Grey Example: 	Normal status, which means the available space is greater than 3 GB.	No functional impact.	No.
Yellow Example: 	The available space is less than 3 GB, and greater than 2 GB.	No functional impact.	Clearing space is re-commended.
Red Example: 	The available space is less than 2 GB.	The is grey out, which means you cannot take an image.	Clearing space must be done.

For the specific clearing method, please refer to chapter "Deleting Image(s)" on page 57.

Table 1: Objectives (standard)

Objective Type	Working Distance (mm)	Numerical Aperture (NA)	Material Number
2.5x N PLAN	11.2	0.07	11506083
4x HI PLAN / PH0	13.9	0.10	11506408
5x N PLAN / PH0	14	0.12	11506303
10x HI PLAN I / PH1	7.8	0.22	11506271
10x N PLAN / PH1	17.7	0.25	11506406
20x HI PLAN I	3	0.30	11506264
20x HI PLAN I / PH1	3	0.30	11506272
20x N PLAN L / PH1	6.9	0.35	11506248
20x HC PL FL L / CORR PH1 PL FLUOTAR L	7.5 – 6.2	0.40	11506243
40x HI PLAN I / PH1	2	0.50	11506369
40x HI PLAN I / PH2	2	0.50	11506273
40x N PLAN L / CORR PH2 N PLAN L	3.3 – 1.9	0.55	11506298
40x HC PL FL L / CORR PH2 PL FLUOTAR L	3.3 – 1.9	0.60	11506203
63x N PLAN	0.26	0.80	11506184

Table 2: Recommended USB disks and USB hard disks

Brand	Type	Storage Format	Specification
Western Digital	Elements SE (WDBEPK0020BBK)	exFAT	2 TB, USB3.0
Seagate	Basic (STJL2000400)	exFAT	2 TB, USB3.0
TOSHIBA	HDTB420YK3AA	exFAT	2 TB, USB3.0
Kingston	DTKN/64 GB, USB3.2 Gen1 or compatible	exFAT	64 GB, USB3.2 Gen1
Kingston	DTKN/128 GB, or compatible	exFAT	128 GB, USB3.3 Gen1
SanDisk	Ultra Flair USB 3.0 Flash Drive	–	32 GB, up to 130 MB/s, Black
Samsung	980	–	1 TB, PCIe 3.0 (up to 3,500 MB/s) NVMe M.2 Internal Solid State Drive
SanDisk	Extreme Portable SSD SDSSDE61-1T00	–	1 TB, USB3.0

Table 3: Recommended smart devices

Type	Specification
Apple iPhone	iOS 15 and higher
Apple iPad	iOS 16 and higher
SAMSUNG galaxy A52	Android 12 and higher
SAMSUNG TAB S6 Lite	Android 13 and higher

Table 4: Recommended barcode scanners

Brand	Type	Specification
Honeywell	N5600 Series 2D Scan Engines	integrated, N5600 Series 2D Scan Engines | Honeywell
Honeywell	1250G	–
Zebra	DS2208	–

Table 5: Recommended keyboard and mouse (wired)

Brand	Type	Specification
Logitech	MK120 Corded Keyboard and Mouse Combo	Logitech MK120 USB set with keyboard and mouse (corded)
Microsoft	Wired Desktop 600	Microsoft Keyboard & Mouse: Wired Desktop 600 | Microsoft Accessories

Table 6: Filter cubes

Material No.	Description
11504164	Filter system GFP ET, k
11504169	Filter system Y3 ET, k
11504171	Filter system Y5 ET, k
11533332	DAPI 390 Filter cube, size K

Table 7: Recommended keyboard and mouse (wireless)

Brand	Type	Specification
Cherry	MW2400, MW2310	Wireless mouse
Cherry	DW3000	Combi set, white and black, different languages available
Logitech	MK270	Wireless Keyboard and Mouse Set, 2.4 GHz wireless connection via USB nano receiver
Logitech	MK470 Slim Combo	Logitech MK470 Slim Combo – wireless set with keyboard and mouse
Microsoft	Microsoft Wireless Desktop 900	Microsoft Wireless Desktop 900 – Microsoft Store
Microsoft	Microsoft Wireless Desktop 3050	Microsoft Wireless Desktop 3050 – Microsoft Store

Table 8: Audit trail record of user activities

Catalog	Description	User	Date
User	Login/Logout	User name	2020-10-19 3:47:00
User	Create/Delete/Reset account; User name	Admin	2020-10-19 3:47:00
User	Change Password	User name	2020-10-19 3:47:00
User	Unlock account; User name	Admin	2020-10-19 3:47:00
Image	Save image; image name.tiff	User name	2020-10-19 3:47:00
Image	Delete image .jpeg	User name	2020-10-19 3:47:00
Image	Rename image; from "old image name.tiff" to "new image name.tiff"	User name	2020-10-19 3:47:00
Image	Edit image; image name.tiff	User name	2020-10-19 3:47:00
Image	Copy to USB/network folder; image name 1, image name 2, image name 3 ...	User name	2020-10-19 3:47:00
Image	Send to mobile; image name 1, image name 2, image name 3 ...	User name	2020-10-19 3:47:00
System	Create/Delete confluency module; module name	User name	2020-10-19 3:47:00

System	Create/Delete cell counting module; module name	User name	2020-10-19 3:47:00
System	Create/Delete transfection module; module name	User name	2020-10-19 3:47:00
System	Export system log to USB/network folder	User name	2020-10-19 3:47:00
System	Backup system; Vxxx	Admin	2020-10-19 3:47:00
System	Copy backup to USB; backup file name	Admin	2020-10-19 3:47:00
System	Copy backup to network folder; backup file name	Admin	2020-10-19 3:47:00
System	Import backup files; backup file name	Admin	2020-10-19 3:47:00
System	Restore system; Vxxx to Vxxx	User name	2020-10-19 3:47:00
System	Delete backup file; file name	User name	2020-10-19 3:47:00
System	Update software; Vxxx to Vxxx	User name	2020-10-19 3:47:00
System	Export audit trails	Admin	2020-10-19 3:47:00
System	Delete audit trails	Admin	2020-10-19 3:47:00

Leica MICROSYSTEMS

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