EVOS™ XL Imaging System

For Transmitted Light Applications

Catalog Number AME3300

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Revision history: MAN0007987

Revision	Date	Description
A.0	09 October 2017	Update branding, legal/regulatory language, reorganize content.
1.0	8 April 2013	Basis for this revision.

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Contents

About this guide

Audience

This user guide is for laboratory staff operating, maintaining, and analyzing data using the EVOS™ XL Imaging System.

User attention words

Two user attention words appear in Thermo Fisher Scientific user documentation. Each word implies a particular level of observation or action as described below.

Note: Provides information that may be of interest or help but is not critical to the use of the product.

IMPORTANT! Provides information that is necessary for proper instrument operation, accurate installation, or safe use of a chemical.

Safety alert words

Four safety alert words appear in Thermo Fisher Scientific user documentation at points in the document where you need to be aware of relevant hazards. Each alert word—**IMPORTANT, CAUTION, WARNING, DANGER**—implies a particular level of observation or action, as defined below:

IMPORTANT! – Provides information that is necessary for proper instrument operation, accurate installation, or safe use of a chemical.

CAUTION! – Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

WARNING! – Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.

DANGER! – Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

Except for **IMPORTANT!** safety alerts, each safety alert word in a Thermo Fisher Scientific document appears with an open triangle figure that contains a hazard symbol. These hazard symbols are identical to the hazard symbols that are affixed to Thermo Fisher Scientific instruments (see "Safety symbols", page 47).

SDSs

The Safety Data Sheets (SDSs) for any chemicals supplied by Thermo Fisher Scientific are available to you free 24 hours a day. For instructions on obtaining SDSs, see "Safety Data Sheets (SDS)", page 55.

IMPORTANT! For the SDSs of chemicals not distributed by Thermo Fisher Scientific contact the chemical manufacturer.

1. Product information

Product description

EVOS™ XL Imaging System
The Invitrogen™ EVOS™ XL Imaging System (Cat. No. AME3300) is a fully automated, digital, inverted imaging system. The system is designed for a broad range of transmitted light applications including time-lapse imaging, manual-assist cell counting, and image review.

Product use
For Research Use Only. Not for use in diagnostic procedures.

Standard items included

Before setting up the EVOS™ XL Imaging System, unpack the unit and accessories and verify all parts are present. Contact your distributor if anything is missing. Damage claims must be filed with the carrier; the warranty does not cover in-transit damage.

> **Note:** If you do not have your distributor information, contact Technical Support (page 55).

- EVOS™ XL Imaging System, per order
- Power adapter and power cord
- Dust cover
- USB flash drive (includes User Guide and Quick Start Guide)
- Condenser shield, removable
- Accessories box
- USB mouse
- Stage lock pin (in place on stage)
- Condenser slider: Diffuser

> **IMPORTANT!** Wiping the computer supplied with the EVOS™ XL Imaging System (i.e., erasing the hard drive to remove all programs, files, and the operating system) voids the product warranty. Do not install third party software or update the operating system.

Instrument exterior components and mechanical controls

①	Power switch	⑥	Objective selection wheel
②	Power input jack	⑦	Focus knobs
③	USB and DVI ports	⑧	Stage Y-axis knob
④	Coarse stage positioning knobs	⑨	Phase annuli selector
⑤	Stage X-axis knob	⑩	Condenser slider slot

Onscreen controls
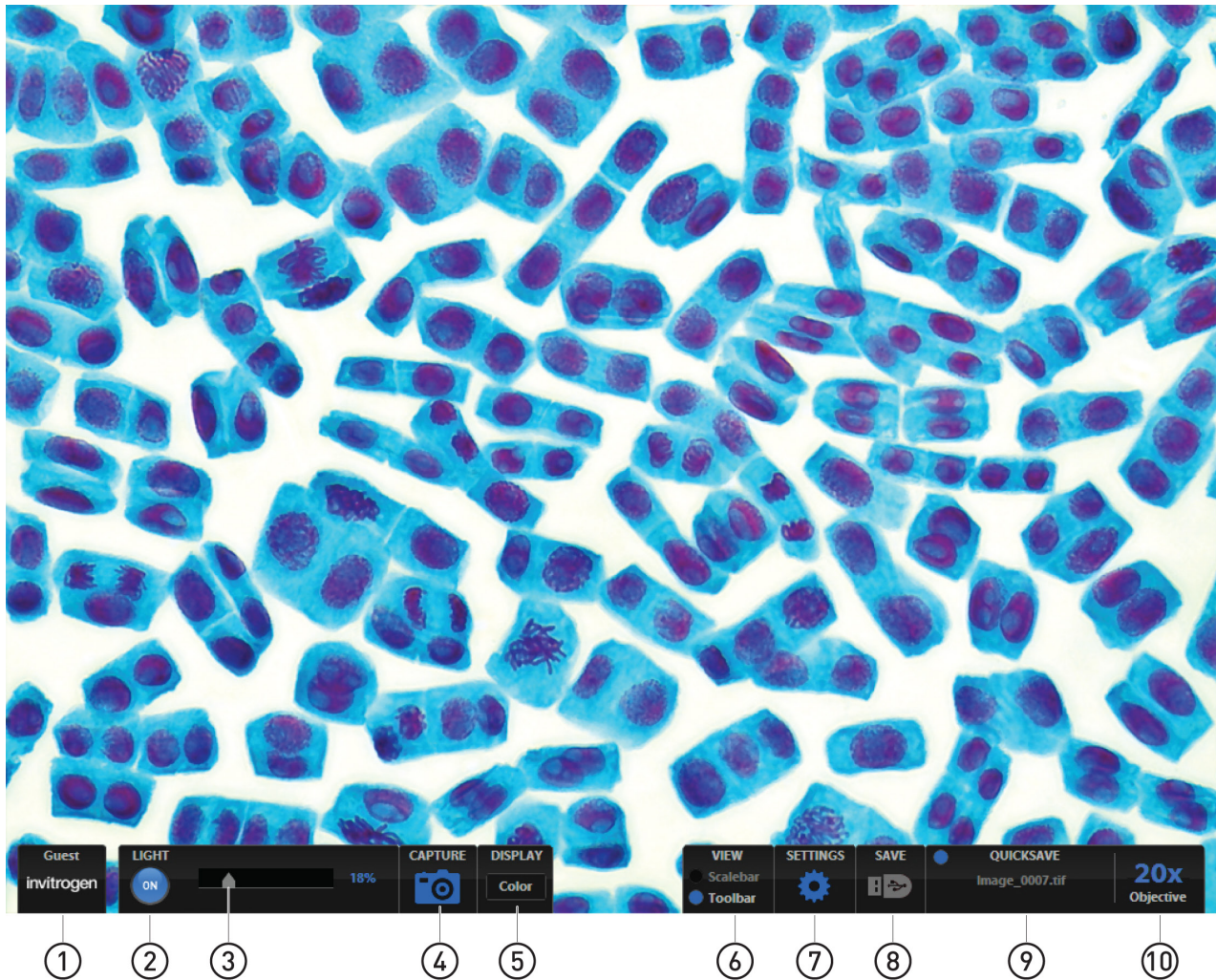
① Login button   ⑥ Scale bar and toolbar options

② Light ON/OFF button   ⑦ Settings control button

③ Illumination slider   ⑧ Save image button

④ Capture image button   ⑨ QuickSave option

⑤ Color adjustment button   ⑩ Selected objective

Note: See "Appendix C: Controls glossary" on page 38 for more details about onscreen and mechanical controls.

2. Installation

Operating environment

- Place the EVOS™ XL Imaging System on a level surface away from vibrations from other pieces of equipment.

- Allow at least 5 cm (2 in) free space at the back of the instrument to allow for proper ventilation and prevent overheating of electronic components.

- Set up the EVOS™ XL Imaging System away from direct light sources, such as windows. Ambient room lighting can enter the imaging path and affect the image.

- Operating temperature range: 4°–32°C (40°–90°F).

- Relative humidity range: 30–90%.

> ⚠ **IMPORTANT!** EVOS™ XL Imaging System should not be subjected to UV sterilization. UV degrades many materials, including plastic. Damage from UV exposure is not covered under the manufacturer's warranty.

Transport the EVOS™ XL Imaging System to the installation site

1. **IMPORTANT!** ALWAYS lock stage with the stage lock pin ① before moving the instrument.

2. Lift the instrument by grasping it firmly with both hands under the support arm ②, balancing the weight as shown in the image below.

3. To transport the EVOS™ XL Imaging System to a different facility, use the original packaging materials if possible. Always be sure the instrument is properly cushioned and braced to prevent damage.
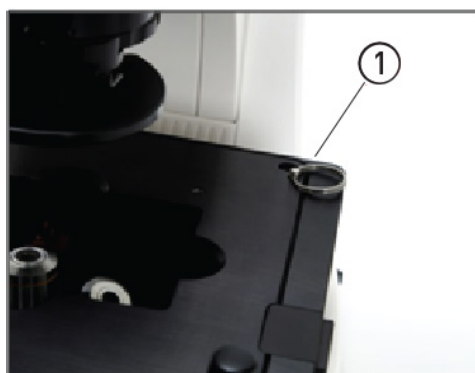

> ⚠ **IMPORTANT!** Never allow the EVOS™ XL Imaging System to be subjected to sudden impact or excessive vibration. Handle the instrument with care to prevent damage.

Unlock mechanical stage

Remove stage lock pin

Before using the mechanical stage for the first time, remove the stage lock pin ① from the back right-hand corner of the stage plate.

Pull firmly to remove this pin.
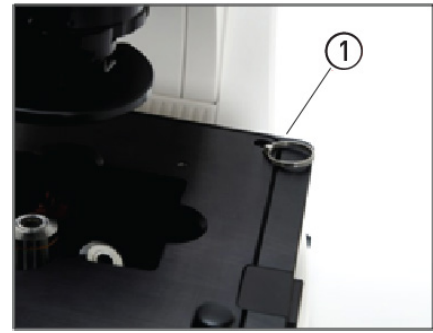
> 📝 **Note:** Always secure the mechanical stage with the stage lock pin before moving the instrument. Store the stage lock pin in your accessories box for future use.

Connect power supply

Connect power adapter

1. Turn the power switch ② to the "O" (OFF) position before connecting the power adapter.

2. Connect the power adapter to the power jack ③ on the right side of the instrument base, attach the cord to the adapter, and plug the cord into an outlet.
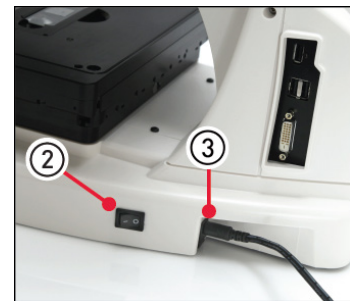
> ⊙ **IMPORTANT!** Always use the correct power supply. The power adapter specifications appear on the serial number label (front of LCD hinge) and in "Appendix B: Specifications", page 37. Damage due to an incompatible power adapter is not covered by warranty.

USB and DVI output ports

USB ports

Plug the mouse and the USB flash drive into the USB ports ④ located on the bottom right of the support arm. You may also plug in a USB keyboard (not included) for text input.

DVI port

A DVI port ⑤ allows output to a projector or other display (DVI cable not included). This port produces digital output only; EVOS™ XL Imaging System is compatible with either a DVI-D or DVI-I display.
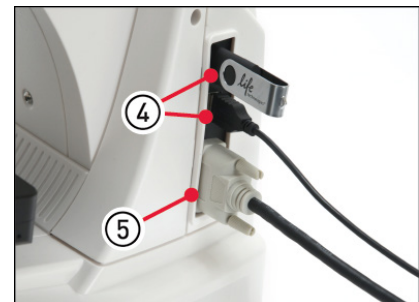
Condenser shield

This shield can help reduce the effects that overhead lighting might have on your image.

Install the EVOS™ XL Imaging System in a cell culture hood

EVOS™ XL Imaging System's small footprint and simple power connection allow it to be installed quickly to be conveniently used in a cell culture hood.

Dimensions

The EVOS™ XL Imaging System will fit in cell culture hoods that are at least 20½ inches (520 mm) deep. If your cell culture hood is smaller, it may be possible to turn the instrument at a slight angle to fit.

	English	Metric
Depth	18.5 in	47.0 cm
Width	14.0 in	35.5 cm
Height, transport	12.75 in	32.4 cm
Height, display	22.75 in	57.8 cm
Weight	31.4 lbs	14.2 kg

Install the instrument

Note: See the illustrations on page 7 for details about moving the EVOS™ XL Imaging System.

1. Secure the stage with the stage lock pin, switch the EVOS™ XL Imaging System off, and disconnect the power cord, mouse and, if connected, keyboard.
2. Tilt the LCD screen back until it is parallel with the tabletop.
3. Lift the instrument by grasping it firmly with both hands under the support arm just behind the condenser.
4. Gently place the instrument on a lab cart and transport it to the cell culture hood.

   Note: Verify that the hood sash is raised enough for the instrument to slide underneath (approximately 14 inches or higher).

5. Lift the instrument as before and move it into the hood.
6. Tilt the LCD monitor upright.
7. Remove the stage lock pin, connect the power cord, mouse and, if desired, keyboard, and switch the instrument on.

3. Basic operation

The EVOS™ XL Imaging System uses both mechanical and software controls for operation. Mechanical controls include the stage X-Y axis knobs, focus knobs, and the objective selection wheel. Software controls are located in the control bars ① at the bottom of the screen. The login button ② displays the current user ID.

See "Instrument exterior components and mechanical controls" (page 5), as needed. See also "Appendix C: Controls glossary" (page 38) for more details.
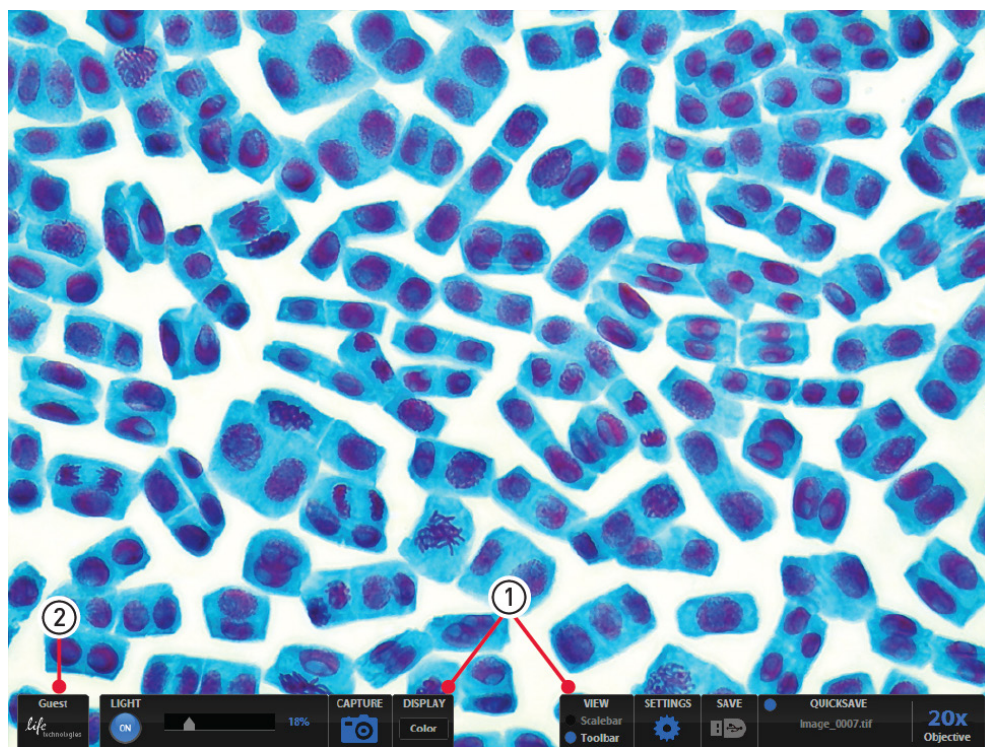

1. Turn on the instrument using the power switch ③ on the right side of the instrument base.

2. Plug a USB flash drive into one of the USB ports ④ on the right side of the instrument arm.

3. Place the sample on the stage, using a vessel holder if needed.
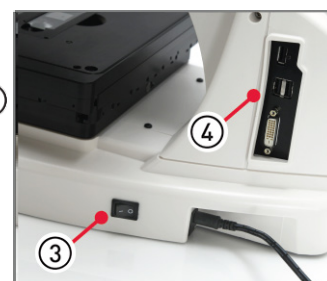
4. Set the magnification using the objective selection wheel ⑤ located in the front of the instrument.
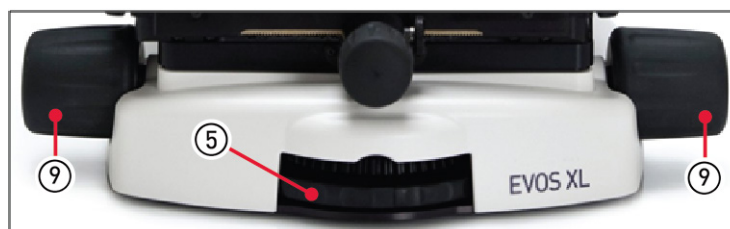
5. Turn the phase annuli selector ⑥ to the position that corresponds to the selected objective and contrast method.

6. Insert the appropriate condenser slide ⑦ into the slot on the condenser assembly.
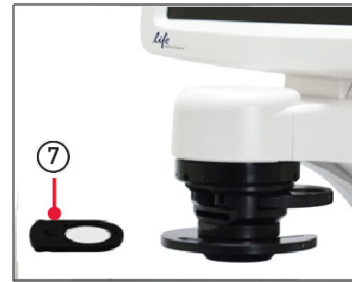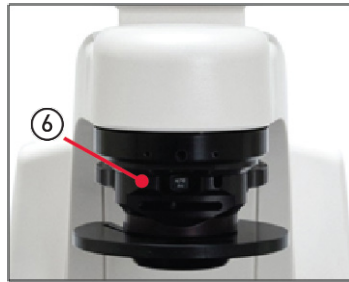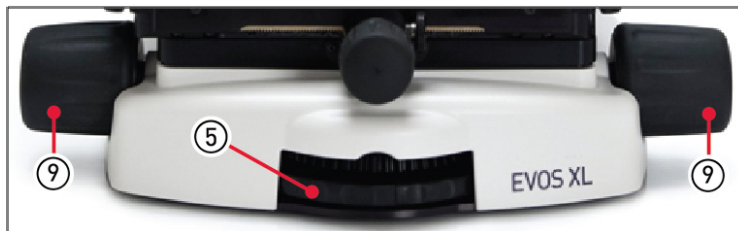

📝 **Note:** A Diffuser slider can be used for low magnification (2× or 4×) brightfield applications to improve flat field illumination.

7. Turn on illumination using the **Light ON/OFF** toggle ⑧ in the left control bar.
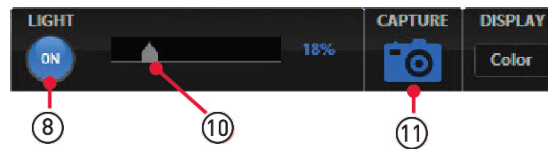
8. Focus the sample using the focus knobs ⑨.

9. Adjust the illumination intensity if necessary, using the **Illumination** slider ⑩ on the left control bar or the mouse scroll wheel.

10. Click the **Capture** button ⑪, in the left control bar to acquire the image.

11. Click the **Save** button ⑫, located in the right control bar to save the color image. The "Save File dialog" opens.
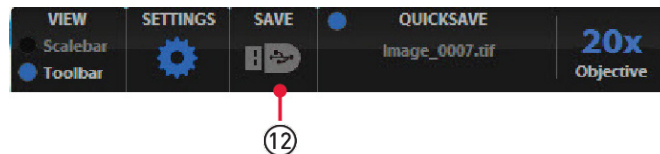
📝 **Note:** Overexposed pixels appear red. To get the maximum level of brightness without any overexposed areas, dim the illumination until the red highlights disappear.

EVOS™ XL Imaging System User Guide

12. To enter the file name, click in the **Save File Name** field ⑬.

The virtual keyboard opens.
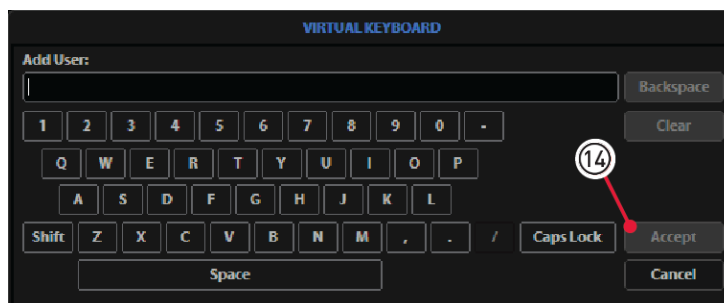
13. Enter the file name, then click the **Accept** button ⑭.

14. Choose the file type and click the **Save** button ⑮.

> **Note:** See "Save images and manage files" (page 16) for more information.

4. Advanced operation

Manage users

EVOS™ XL Imaging System keeps settings in memory for each user ID, so that multiple users can work with the same EVOS™ instrument without having to reset their preferences.

To use this feature, set up a user profile for each regular user. You can also assign user IDs for experiments in progress.

> **Note:** User profiles are not password protected. All users should verify they are logged in correctly to avoid changing other users' settings.

Log in with an existing profile

1. Click the **Login** button at the bottom left of the screen (this is the Invitrogen logo with the current user profile).

2. Login dialog opens. Select the desired user profile, then click **OK**.
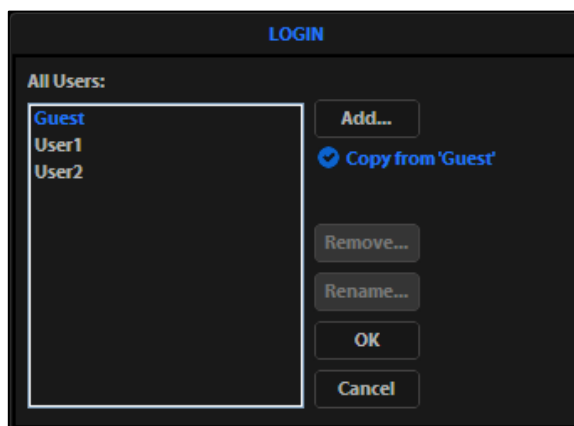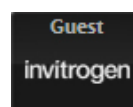
> **Note:** No password is necessary to log in.

Add or remove a user profile

1. Click the **Login** button.
2. To copy an existing profile, highlight the profile from the user list, select the **Copy from 'name'** option, then click **Add**. The virtual keyboard opens for you to assign name the new profile.
3. To create a new user profile without copying any settings, deselect **Copy from** option, click **Add**, then enter a user name.
4. After adding a new user profile, click **OK** to log in under that name and adjust settings as desired. When you switch off, the EVOS™ XL Imaging System saves your settings to memory.
5. To remove a user profile, highlight it and click **Remove**.
   A confirmation dialog opens. Deleting the user profile will remove all its associated settings from memory.
6. To rename a user profile, click **Rename** and enter the new name.

Change the default login

The default user login is Guest; to set the default login as the last active user, go to the **Basic** tab of the Settings dialog and uncheck the **Default to Guest on startup** option.
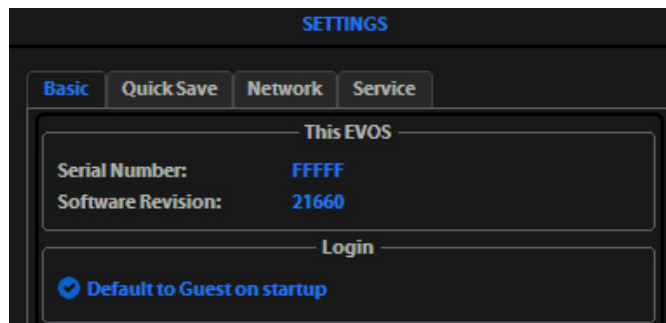
> **Note:** For multiple users, we recommend leaving the "Default to Guest on startup" option checked.

Save images and manage files

Save images

1. Click **Save** to open the "Save file" dialog.
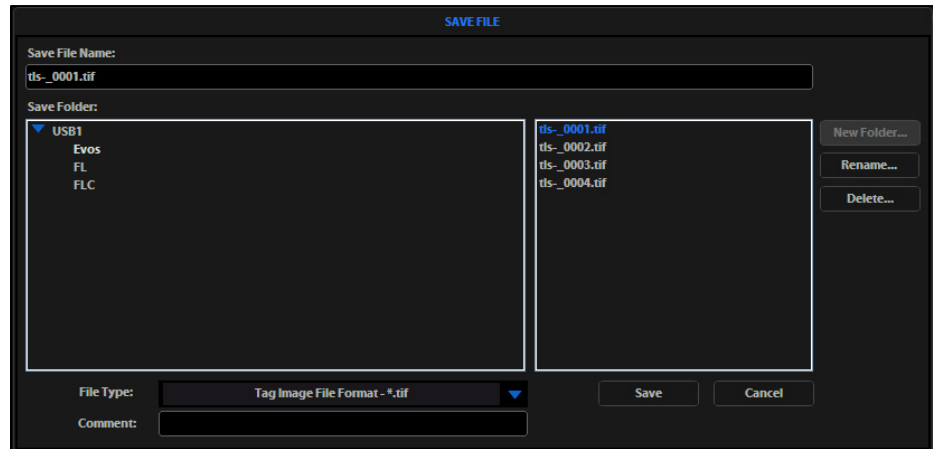
In the "Save Folder list" and the "Saved files list", selected items appear blue.
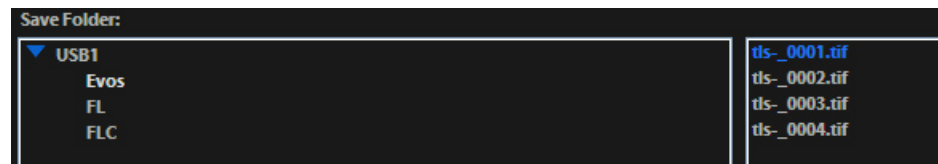
Note: If a USB keyboard is installed, the virtual keyboard does not appear. Pressing the **Enter** key on a physical keyboard is equivalent to clicking the **Save** button in the Save file dialog.

2. If there is no USB flash drive or network connection in place, an information message appears in red. Click **Cancel** to clear this message.
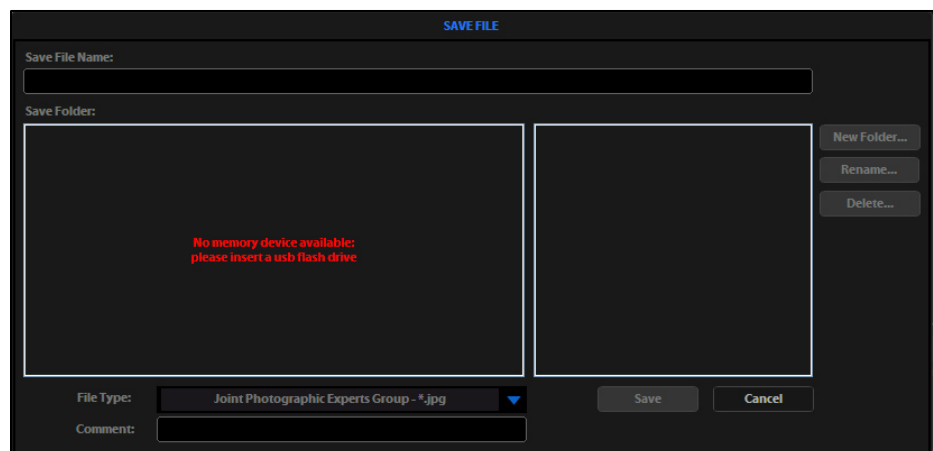
3. Click in the **Save File Name** field to enter a file name. If you are using the virtual keyboard, click **Accept** after entering the text. The "Save As confirmation dialog" opens.

   To overwrite a file, simply select the name of the file from the saved files list instead of clicking on the **Save File Name** field.

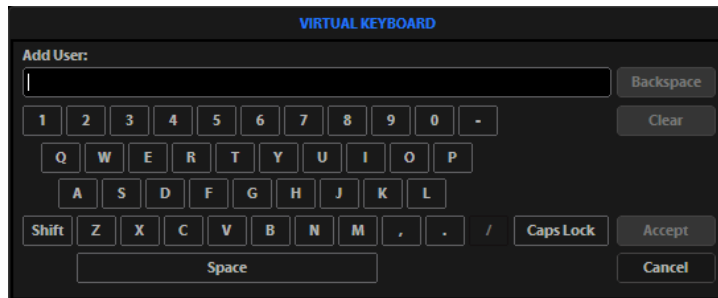   **Note:** It is not possible to recover an overwritten file.

4. Click on the **name of a folder** in the "Save Folder list" to select the destination for the new image.

5. To create a new folder, first click the **name of the parent folder**, and then click the **New Folder** button. This activates the virtual keyboard (if it is needed) so you can enter a folder name and date.

Note: Click the **Date** button anywhere within a field to automatically insert the current date (MM-DD-YYYY) wherever the cursor is in that field.

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6. Select a file format (.tif, .png, .jpg or .bmp) from the **File Type** dropdown.

7. *Optional*: Click in the **Comment field** to enter a comment and date.

8. Click **Save**.

9. To delete a file or folder, highlight the item on the list, then click the **Delete** button. A confirmation dialog opens. It is not possible to recover a deleted file.
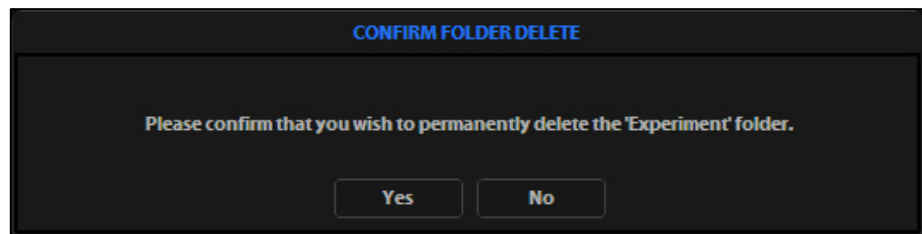
10. To rename a file or folder, highlight the item on the list and click **Rename**. The virtual keyboard opens. You can click **Clear** to reset to a blank field.

Use the QuickSave option to save multiple images
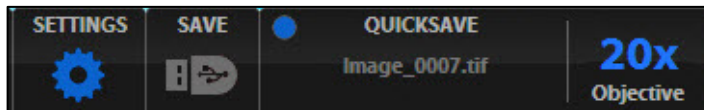
QuickSave allows you to save multiple images under a single base file name. When you specify the settings and select the **QuickSave** option, the EVOS™ XL Imaging System saves each image with a single click of the **Save** button.

1. Click **Settings** to open the "Settings dialog", then select the **QuickSave** tab.

2. Click in the **Base Filename** field, then enter a name that describes the capture session. The blue "Next" file name reflects the information entered.
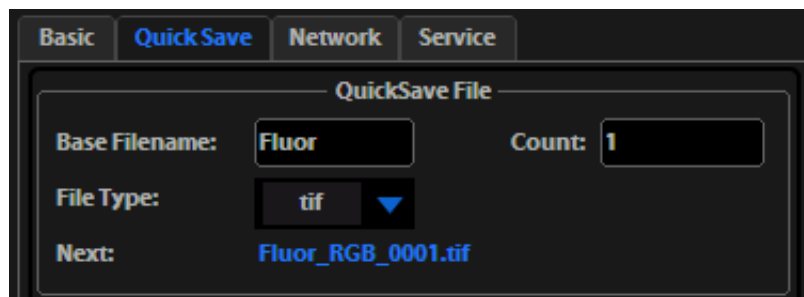
3. Click in the **Count** field to enter the starting number, if you do not want to start at 1. The blue "Next" file name reflects the information entered.

4. Select a file format (.tif or .png) from the **File Type** dropdown.

5. Click **Browse** to select a destination folder for the Quick Save files. In the Browse dialog that opens, highlight the desired folder, then click **OK**.
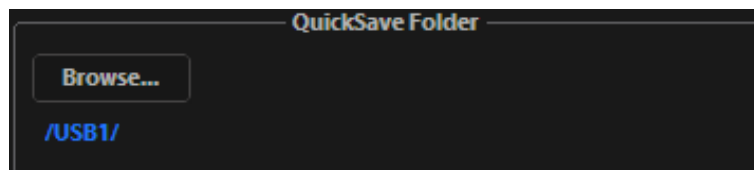
6. To create a new folder, first click the name of the desired parent folder, then click **New Folder**. Enter a folder name and date, if desired. After creating the new folder, click **OK** to close the Browse dialog.
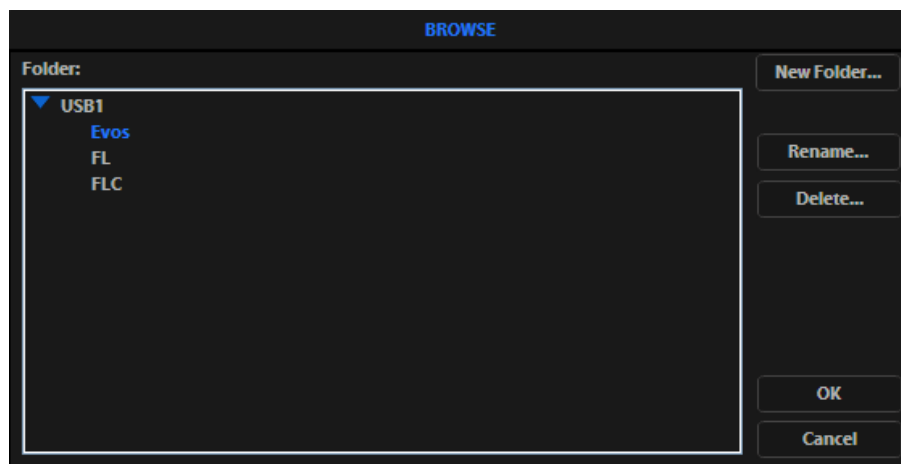
Note: Click the **Date** button anywhere within a field to automatically insert the current date (MM-DD-YYYY) wherever the cursor is in that field.

7. Click **OK** to accept QuickSave settings.

8. In the right control bar, select the **QuickSave** option.
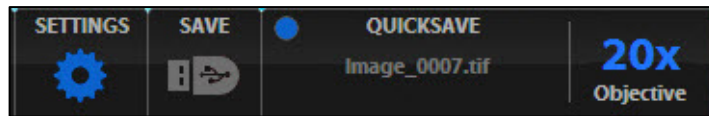
9. After acquiring an image with **Capture**, click **Save**. The image will be saved as specified in the QuickSave settings.

Record time lapse images

Time lapse tool

With the Time lapse tool, you can set up your cells and program the EVOS™ XL Imaging System to record time lapse images.

Start a time lapse session

1. Once the sample is focused and ready, tighten the stage brakes ① to prevent the stage from drifting during the session.

2. Open the **Toolbar** and expand the **Time lapse** tool.

3. In Time Lapse Settings, click the **Interval** field, then enter a value. Choose a unit of measure for the capture interval from the **Interval Unit** dropdown.

4. Click the **Duration** field and enter a value. Choose a unit of measure for the duration of the capture session from the **Duration Unit** dropdown.
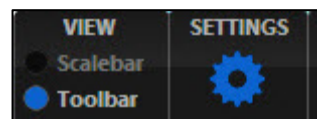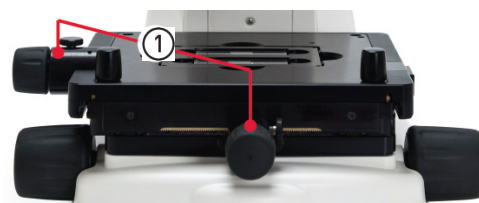
> **Note:** The Images field shows the total number of images for the session.

5. To save the session in a folder other than the default location, click **Browse** to select the destination.

6. In the **Browse** dialog, highlight the desired folder, then click **OK**.

7. To save the session in a folder other than the default location, click **Browse** to select the destination.

8. In the **Browse** dialog, highlight the desired folder, then click **OK**.

9. Under File, click the **Base Filename** field to enter a name, then choose a file type (.png or .tif) from the **File Type** dropdown.

10. To create a video (.avi) file, select **Write Video File**.
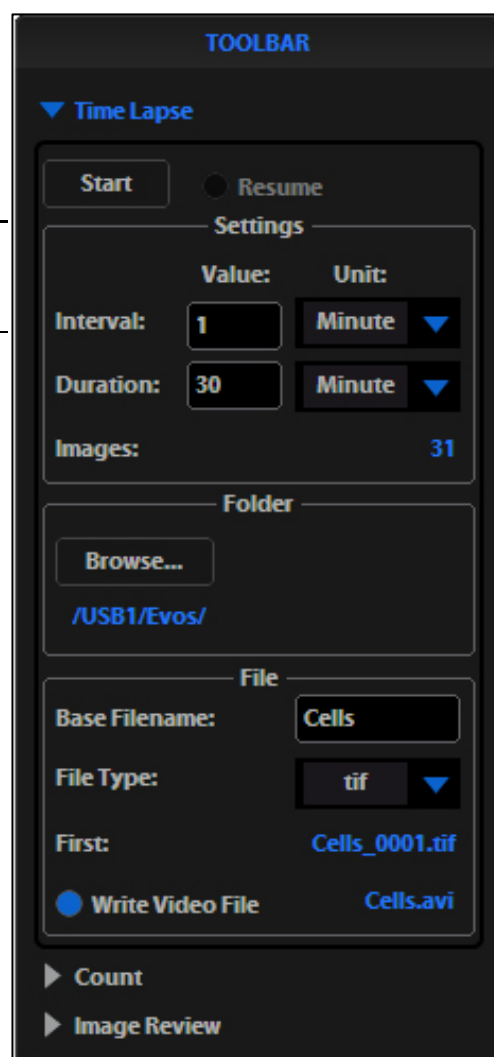
11. Click **Start** to begin the time lapse session. The system displays the Time Lapse Progress dialog as long as the session is active.
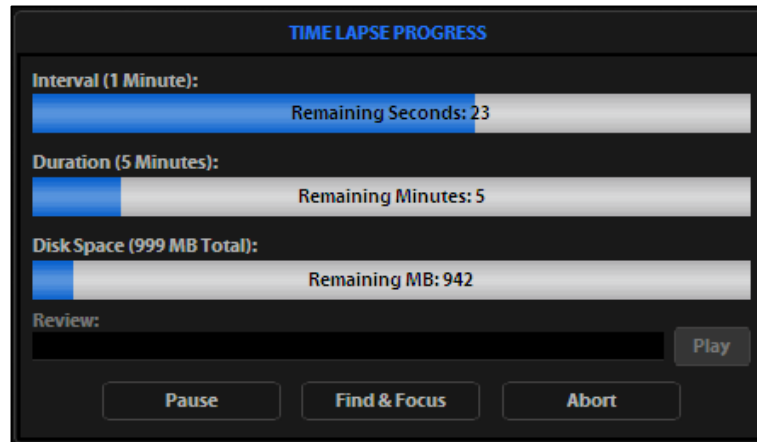
> **Note:** The **Review** slider lets you review the images already captured during the current session. Click **Play** to view all images in sequence.

Pause and restart a time lapse session

1. In the Time Lapse Progress dialog, click **Pause** to suspend the time lapse session. The progress dialog dims, and a **Resume** button replaces the **Pause** button.
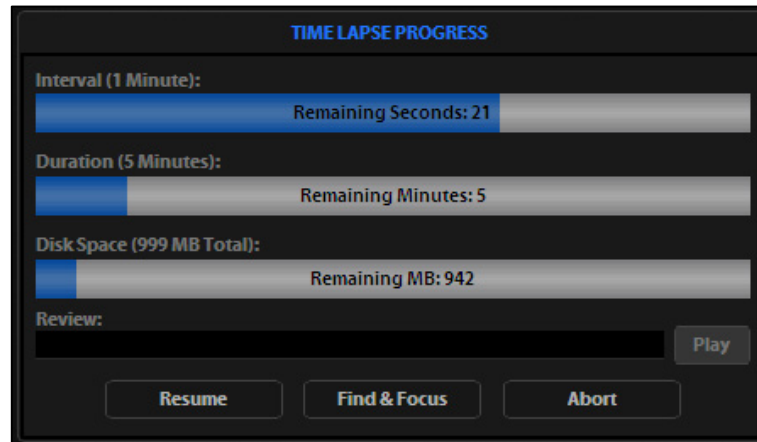
Alternatively, to pause and adjust the settings, click **Find & Focus**.

2. Click **Start** to resume the time lapse capture sequence, or uncheck the **Resume** option and start a new time lapse session.
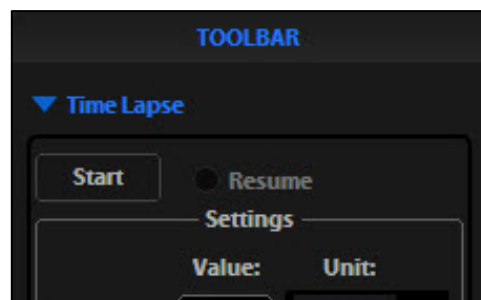
Abort a time lapse session

1. In the time lapse progress dialog, click **Abort**. A new dialog opens and gives you the option to delete or keep the files already saved.

2. To resume the session, click **Cancel** to return to the time lapse progress dialog.

TIME LAPSE PROGRESS

Interval (1 Minute):

Remaining Seconds: 21

Duration (5 Minutes):

Remaining Minutes: 5

Disk Space (999 MB Total):

Remaining MB: 942

Review:

Play

| Resume | Find & Focus | Abort |
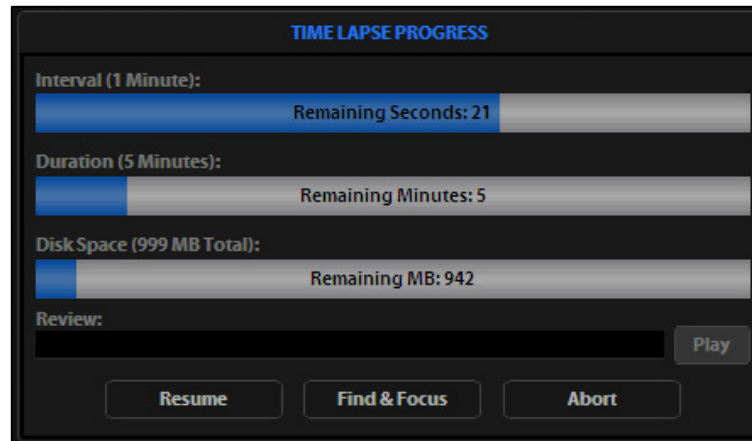
Count cells

Count tool

The Count tool streamlines cell counting by marking items with up to six labels onscreen. As you tag items, the system keeps a running tally of counts with percentages for each label assigned. You can document your results by saving the tagged image with the Count tool displaying the totals.

Count cells

1. Acquire an image. See "Basic operation" (page 11) for detailed instructions.

2. Open the **Toolbar**, then expand the **Count tool**.

3. Click in a **Label field** to enter a name for that label. You can use up to six labels.

4. Under **Settings**, choose the desired grid size using the **Grid size dropdown** or leave the **Show Grid option** inactive.

5. Select a **Label**, then left-click at each point onscreen to tag the items for that category. Switch labels as desired; the EVOS™ XL Imaging System will tag for the selected label.

6. To move a tag, select and drag it. Left-click anywhere else onscreen to deselect.

7. To delete a tag, right-click the tag. Alternatively, choose the **Delete mode**, then left-click the tag.

8. To delete all tags for all labels, click the **Clear All** button.

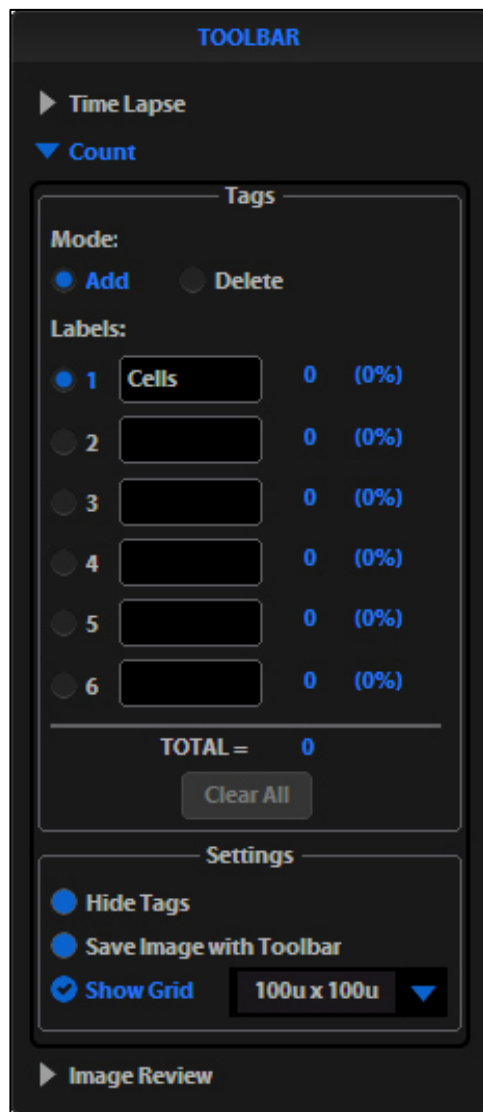9. To save an image showing the labels, counts, and percentages as shown in the Count tool, select the **Save Image with Toolbar option**, then click **Save** on the right toolbar. Deselecting this option produces an image saved with the tags only.

Note: To use Digital Zoom while counting cells, first suspend the Count tool. Either select the Hide Tags setting, click the triangle to minimize the Count tool, or click the Toolbar option to minimize the whole Toolbar. When the Count tool is suspended, the left mouse button will behave according to the rules described in "Use digital zoom" (page 25). After zooming, reactivate the Count tool by deselecting Hide Tags or reopening the tool.

Review images

Image review tool

The Image review tool allows you to review still images or play video files from the USB drive or network connection. You can also use this tool to rename or delete saved files.

Review images

1. Open the **Toolbar**, then expand the **Image review tool**.

2. The preview list displays thumbnail images for all viewable files in the selected directory (the top-level USB directory is selected by default). If there are no viewable files in the directory, the preview area remains empty.

   📝 **Note:** The File Type dropdown filters files by type. By default, it is set to display all files with .png, .tif, .jpg, .bmp, or .avi extensions.

3. If the image or video file you wish to review is not in the directory displayed, click **Browse** to find and open the desired directory.

4. Use the scroll bar as needed to search the preview list for the desired image file. Click the image to select it. The selected file name appears blue.

5. Click **View File** to display the image in the image review window. This button toggles between **View File** and **Hide File**. Hide the file to close the image review window. You can also double-click the thumbnail image to toggle between displaying and hiding the file.

6. To zoom the image in the review window, double-click the area of interest; right-click to restore normal magnification. See "Use digital zoom" (page 25) for more detailed instructions.

7. To rename a file, select it and click **Rename**. The Virtual Keyboard opens. Enter the new file name, then click **Accept**.

8. To delete a file, select it and click **Delete**. A confirmation dialog opens. It is not possible to recover a deleted file.

9. Click **Slide Show** to display each image thumbnail within the image review window continuously.
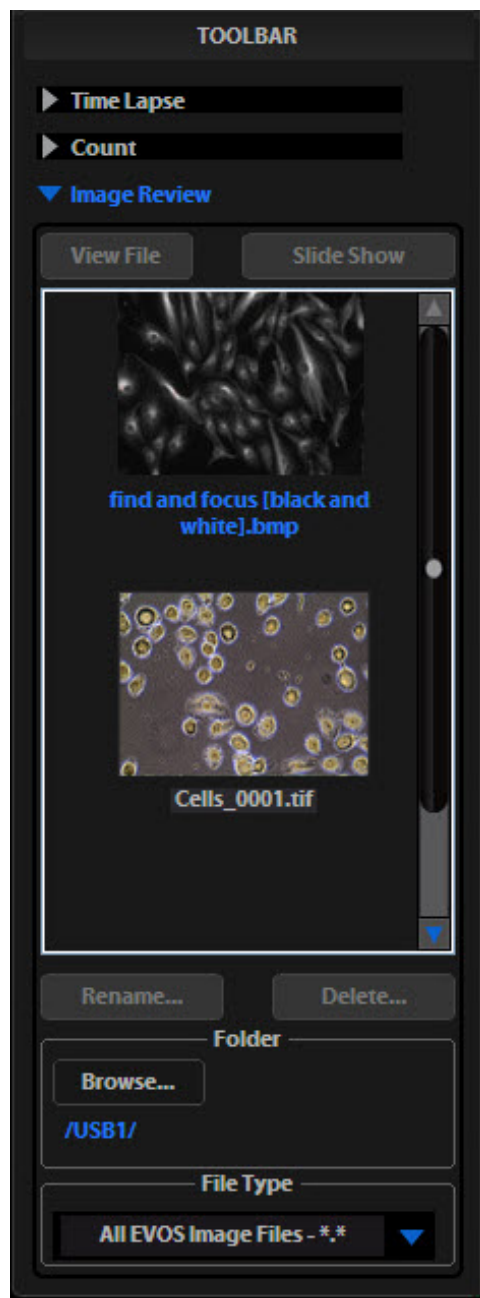
Use digital zoom

The EVOS™ XL Imaging System can zoom in the image onscreen, allowing you a closer look. Double-click live or captured images to zoom in to them. In the images below, the numbered arrows indicate the click points. Note that the zoom factor display appears over the selected objective indicator.

Zoom in and recenter live images

> **Note:** Live images can only zoom in to 2×. To zoom in to an image at higher levels, you must first capture it.

1. Double-click the area of interest ① in the image onscreen. EVOS™ imaging system displays a view zoomed in at 2×, centered on the point clicked.
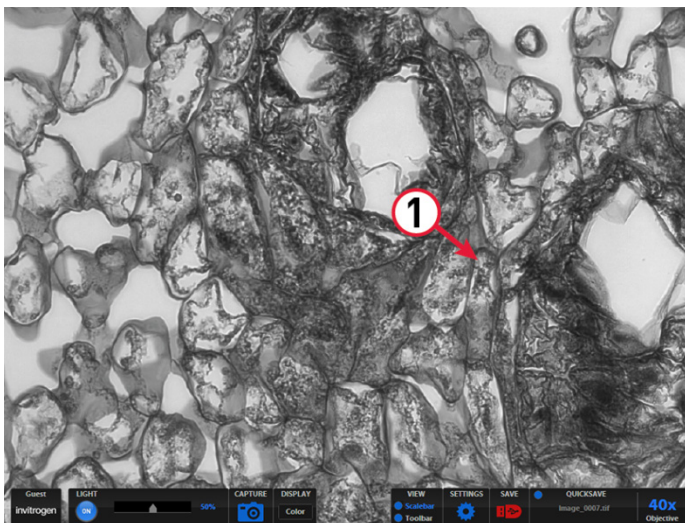
Live image at 40× magnification

2. In the enlarged image, double-click on any point in the middle area of the screen to re-center the image. The system places points from the outer edges of the screen as close to the center as possible. You can re-center repeatedly.
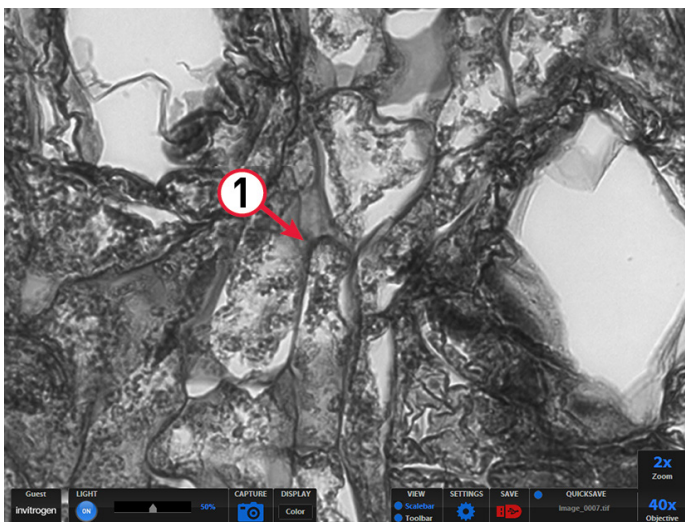
Live 40× image zoomed 2×, re-centered

3. Right-click anywhere on the image to restore the view to unzoomed magnification.

Zoom in on captured images

1. Double-click the area of interest ②in the image onscreen. The screen displays the zoomed in at 2× and centered on the clicked point.
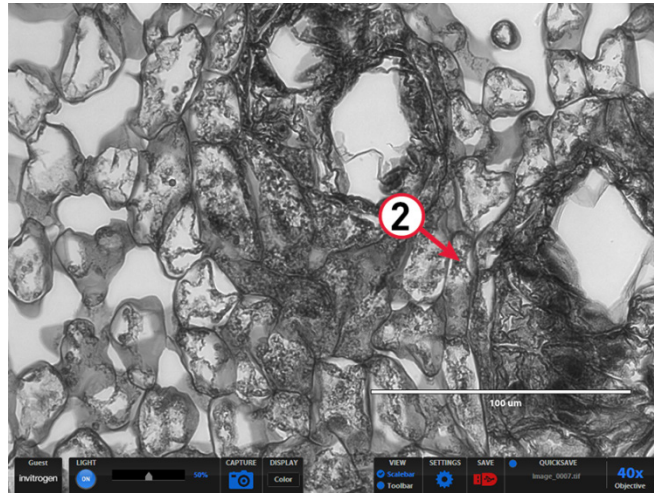
Captured image at 40× magnification, with scale bar
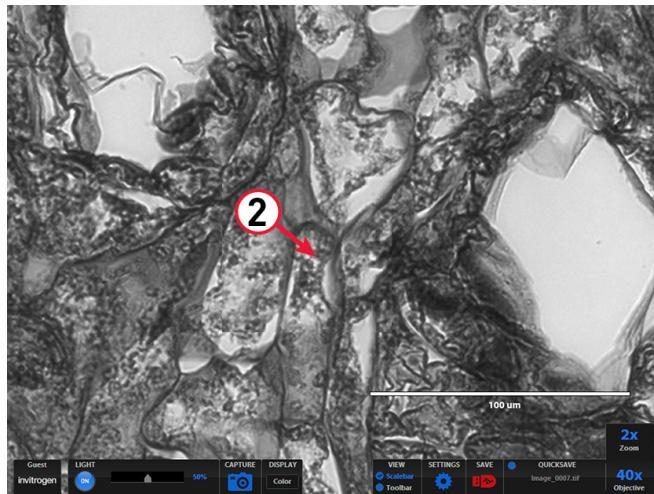
Captured 40× image zoomed 2×

2. In the enlarged image, double-click again on any point ③to double the digital zoom level. The enlarged image centers around the point clicked.
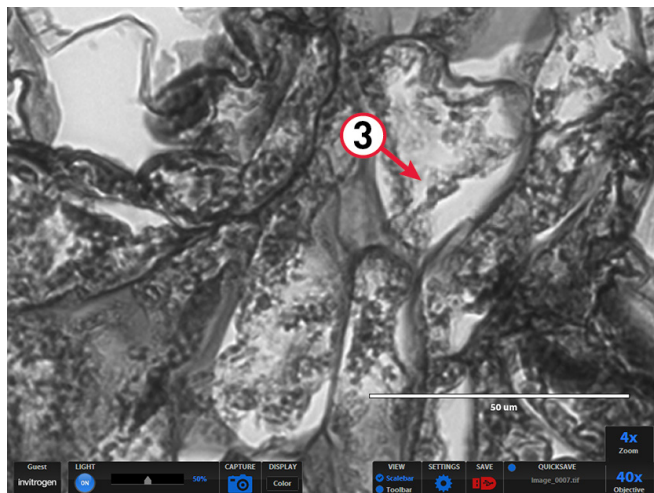
Captured 40× image zoomed 4×

3. Continue double-clicking to double the digital zoom value as desired. It is possible to zoom in to the pixel level of the digital image.

Captured 40× image zoomed 8x

4. Right-click to restore the view to unzoomed magnification.

> **Note:** Capturing and saving a zoomed image results in a file showing the actual magnification, not the zoomed magnification. If the scale bar is active, it appears in the file.

Connect the EVOS™ XL Imaging System to a network

You can log the EVOS™ XL Imaging System onto a Windows/SMB network via an Ethernet cable connection and save captured images directly to shared folders on the network.

> **Note:** SMB is the only supported protocol. No other protocols (such as HTTPS, FTP, or WebDAV) are currently supported. If you are connecting to a Linux server, it will have to use Samba for EVOS™ XL Imaging System to find it. Contact your network administrator for help if a physically connected EVOS™ XL Imaging System cannot find the SMB network.

Items needed for ethernet connection

To set up the network connection, you need the following items (not included):

- Ethernet cable
- USB-to-Ethernet adapter

Log onto the network

1. Verify the instrument is powered on and the network cable is plugged into the correct jack and connected via the adapter to the USB port.

2. Be sure you are logged in under your own EVOS™ user ID. The current user ID is displayed above the Invitrogen logo in the bottom left corner of the screen. See "Manage users" (page 14) for more information.

3. Click the **Settings** button to open the Settings dialog, then select the **Network tab**.
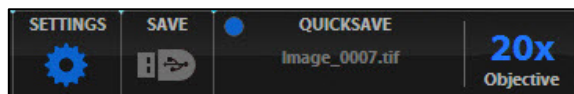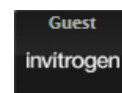
> **Note:** EVOS™ XL Imaging System will try to connect for about 30 seconds. If there is a problem with the connection, the Network page will display "No Items."
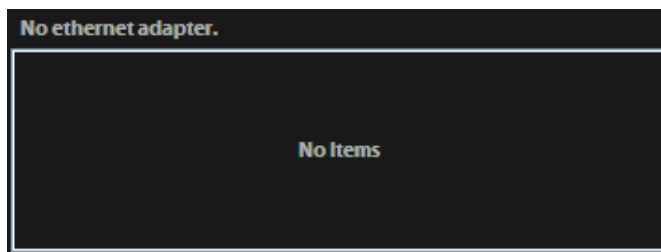
Double-check the physical connections and click **Refresh Network**. During the refresh, a progress icon appears.

Unless there is an issue with the network, or you are using an incompatible adapter, refreshing the connection should resolve the problem within a few moments. Contact your network administrator for help if the problem persists.

If your configuration requires using a static IP address, select the **Use Static IP Address** option, enter your IP Address, Subnet Mask, Gateway Address, and DNS Server Address, then click **Set Static IP**.

4. The upper list box of the Network page will display the top level (available domains) of the Windows/SMB network file tree. Click the **triangle icon**, or double-click the **domain name**, to expand a domain and display the available servers.
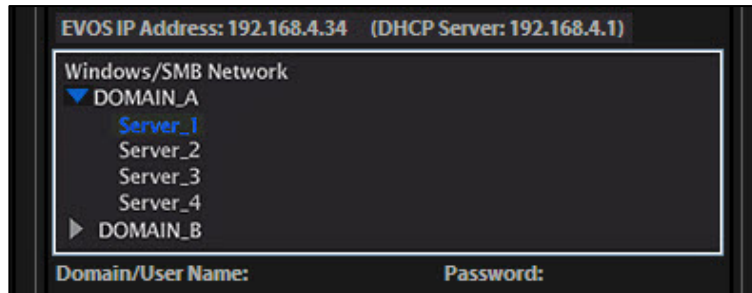
Note: If a domain, server, or shared file appears on the file tree without a triangle icon, and you are not able to expand or open it, your permission to access that item is restricted.

5. Enter your **network domain**, **user name**, and **password** in the login fields, then select a server to view the top level of shared folders on that server. You can now navigate below the top-level shared folders on the Network page.

After the server accepts your login, EVOS™ XL Imaging System displays the list of available shared folders on the selected server.
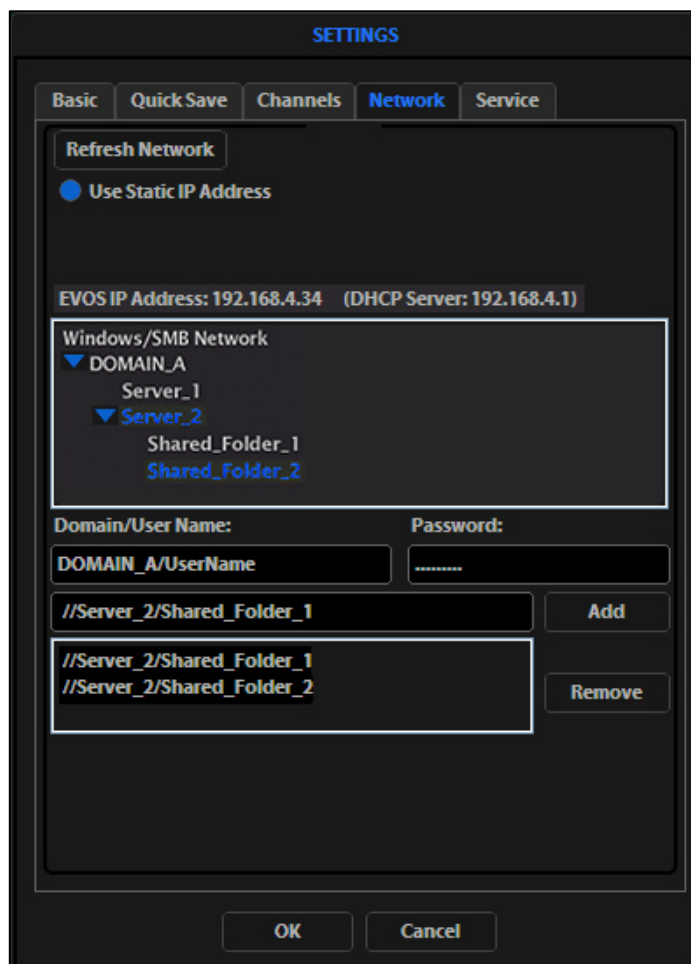
6. Select a shared folder, then click **Add** to include it in the list of possible file destinations.

   Alternatively, type in the **file path**, then click **Add**. The folder should appear on the list box below the Add button. If it does not, contact your network administrator for help.

Domain/User Name:		Password:	
DOMAIN_A/UserName		·········	
//Server_2/Shared_Folder_1			**Add**
//Server_2/Shared_Folder_1 //Server_2/Shared_Folder_2			**Remove**
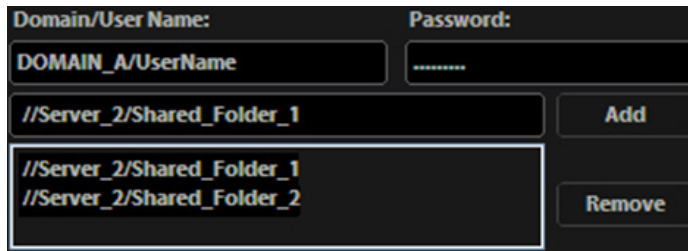
> 📝 **Note:** You can add multiple shared folders to the list, but you can only use a single login on any one server or domain. We recommend that each EVOS™ user establish network connections under their own EVOS™ user ID. See "Manage users" (page 14) for more information on EVOS™ user IDs.
>
> Your EVOS™ user ID remembers your network login (it is encrypted in the instrument's non-volatile memory). All your connections and login information are hidden from other EVOS™ user profiles.

7. If you need to remove a shared folder from the destinations list, select the folder name, then click **Remove**.

8. Click **OK** to close the Settings dialog.

9. To verify your list of network destination folders, go to the **QuickSave tab**, then click **Browse** to display the QuickSave Browse dialog.

   All your selected network destinations and any USB flash drives currently plugged in appear in the Browse dialog.

   These locations are also available in the Save dialog and through the Browse button in the Time lapse and Image review tools.

BROWSE	
Folder:	**New Folder...**
▼ USB1	
Evos	**Rename...**
FL	
FLC	**Delete...**
	OK
	Cancel

Update the software

Periodically, Thermo Fisher Scientific adds functionality and other improvements to the EVOS™ user interface. We recommend keeping your EVOS™ XL Imaging System up to date with the latest software. If you have any questions about software updates, contact your local EVOS™ distributor. If you do not have your distributor information, contact Technical Support (page 55).

Download software update

Software updates are available from the EVOS™ XL Imaging System product page at **thermofisher.com/evosxl**.

1. Download the update directly to the top level of a USB flash drive with at least 30 MB available. Do not open or rename the file on your computer; EVOS™ XL Imaging System will verify and install it during the update procedure.

2. Download the current user guide for the EVOS™ XL Imaging System from our website. The updated user guide covers the new software functionality when features are added.

   Alternatively, you can get the latest software and documentation updates from your local EVOS™ distributor or by contacting Technical Support (page 55).

Install software update

1. Plug the USB flash drive into the data port on the lower right side of the EVOS™ support arm.

2. Click **Settings** to open the Settings dialog, then select the **Service tab**.

3. Click **Update** in the **Service tab.** A verification progress bar appears.

   If a missing update notification appears, make sure that the USB flash drive with the update file is fully plugged in. Click **OK**, then click **Update** again.
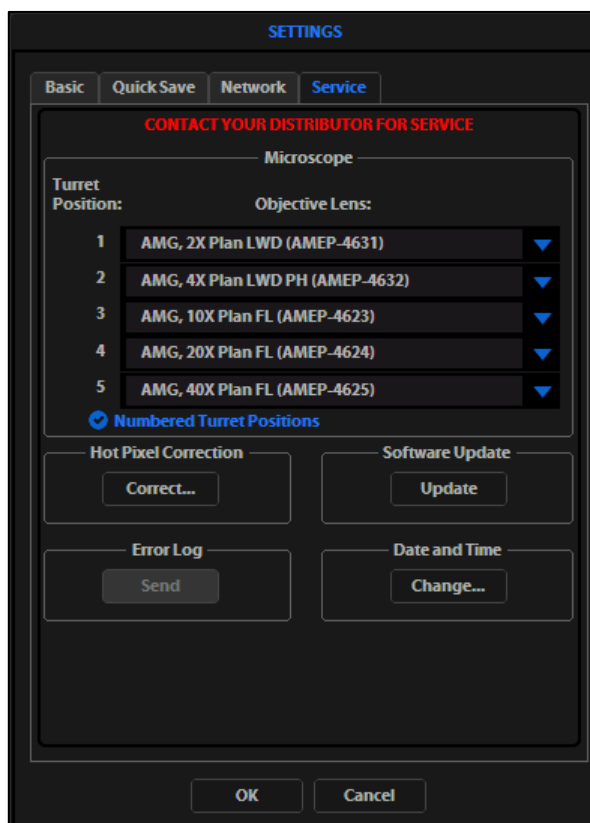
4. After file verification, the update confirmation dialog opens. Verify the revision details, then click **Yes** to start the update.
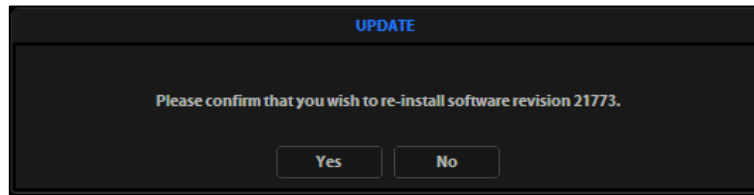
5. The screen displays the update progress. When the update is complete, the main EVOS™ screen reappears.
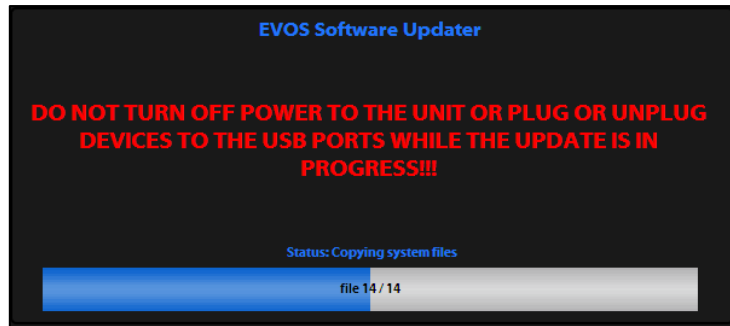
> ⊘ IMPORTANT! **Do not** power off the instrument, unplug the USB flash drive, or add or remove any devices during the update.

Set date and time

To ensure accurate date and time information on saved image files, verify your date/time settings on the EVOS™ XL Imaging System before your capture session.

1. Click **Settings** to open the Settings dialog, then select the **Service tab**.

2. Click the **Change** button under **Date and Time** in the Service tab.

3. In the Date and Time dialog, use the **arrows** and the **dropdowns** to set the time, date, and time zone.
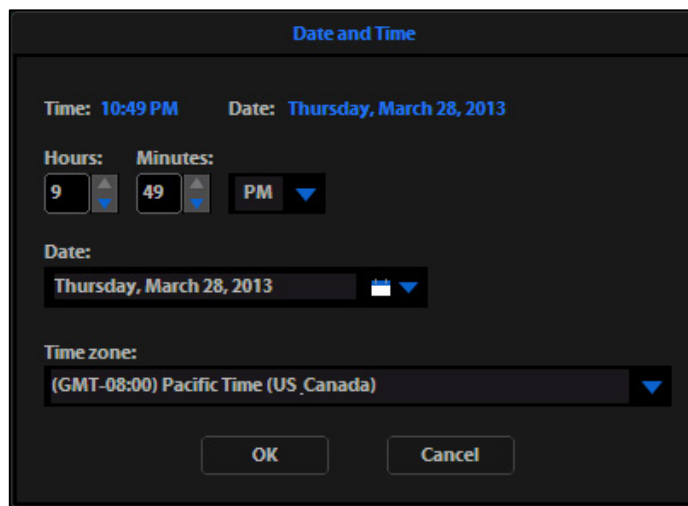
4. Click **OK** in the Date and Time dialog.

5. Click **OK** in the Settings dialog. The new settings take effect immediately.

5. Care and maintenance

General care

- When cleaning optical elements, use only optical-grade materials to avoid scratching soft lens coatings.

- Use the appropriate cleaning solutions for each component, as described in the "Decontamination procedures" (page 34).

- If liquid spills on the instrument, turn off the power immediately and wipe dry.

- Do not exchange objectives between instruments unless you know that the components have been approved and recommended by Thermo Fisher Scientific.

- After using, cover the instrument with the supplied dust cover.

> ⚠ **IMPORTANT!** Never disassemble or service the instrument yourself. Unauthorized repairs may damage the instrument or alter its functionality, which may void your warranty. Contact your local EVOS™ distributor to arrange for service.

Objective lens care

Clean each objective periodically or when necessary with an optical-grade swab and a pre-moistened lens wipe (or lens paper moistened with lens cleaning solution). To avoid scratching the soft lens coatings, use only optical-grade cleaning materials and do not rub the lens.

> 📝 **Note:** To protect all optical components of the instrument, use the dust cover when the instrument is not in use.

Stage care

- Clean the stage as needed with paper towels or Kimwipes™ laboratory wipes dampened with 70% ethanol.

- When moving EVOS™ XL Imaging System, lock the stage with the stage lock pin to prevent the stage from sliding (page 4).

Decontamination procedures

To decontaminate the EVOS™ XL Imaging System, follow these procedures:

1. Turn power OFF.
2. Clean the LCD display.

   a. Use a soft, dry, lint-free cloth to wipe off any dust from the screen.

   b. Clean the LCD display with a non-alcohol based cleaner made for flat-panel displays.

   > (!) **IMPORTANT!** Do not spray cleaning fluid directly onto the screen, as it may drip into the display or optics.

3. Lightly wipe the working surfaces of the instrument (stage top, focus knobs, objective selection wheel, housing) with paper towels or Kimwipes™ laboratory wipes dampened with 70% ethanol or 4,000 ppm hydrogen peroxide (H_2O_2).

   > (!) **IMPORTANT!** Do not allow decontamination solution to get into lubricated areas, such as the stage roller bearings, or any points of rotation such as axles for the stage knobs, condenser wheel, etc. Do not soak any surface in decontamination solution. NEVER spray liquid anywhere on the EVOS™ XL Imaging System. Always wipe surfaces with dampened paper towels instead.

4. If it is necessary to decontaminate the condenser, do not apply the decontamination solution directly to the condenser assembly. Instead, select the desired phase ring, and then cover the condenser with clear plastic wrap and wipe the wrap with decontamination solution.

   > (!) **IMPORTANT!** EVOS™ XL Imaging System should not be subjected to UV sterilization. UV degrades many materials, including plastic. Damage from UV exposure is not covered under the manufacturer's warranty.

Appendix A: Troubleshooting

> **Note:** For additional technical support, contact your local EVOS™ distributor. If you do not have your distributor information, you can look it up at the **thermofisher.com/evos** or contact Technical Support (page 55).

Image quality issues

Problem	Possible solutions
Image is too dim (at higher magnifications)	• Set the phase annuli selector to the BF position. • Remove condenser slider, if one is in place.
Specks, dots, or blurs on image	• Follow instructions under "Objective lens care" (page 33) to clean objectives.
Uneven focus across screen	• Position sample so that it lies flat on the stage; be sure the sample's thickness is even.
Difficulty focusing on coverslipped sample on standard slide	• Place the slide so the coverslip is facing up (long working-distance objectives require a thick optical substrate, and image best through 1.0–1.5 mm of glass or plastic).
LCD screen is black	• Click the LIGHT ON button (onscreen). • Move objective selection wheel so that light shines through objective. • Verify that the phase annuli selector on condenser is not stuck between settings. • Center sample over objective. • Verify power supply is connected and power switch is on.
LCD screen is red, or red patches cover parts of the screen	• Dim the illumination until the red highlights disappear to get the maximum level of brightness without any overexposed areas. • Disable the "Highlight saturated pixels in red" option in the Settings: Basic tab.

Software interface issues

We recommend keeping your EVOS™ instrument up to date with the latest software. See "Update the software" (page 31) for more information.

Problem	Possible solutions
Image does not respond to changes in focus or stage position	• Click the LIGHT ON button to return to live observation (note that a red USB icon on the Save button indicates there is an unsaved image, which will be lost unless it is saved before clicking LIGHT ON).
LIGHT ON/OFF button is inactive	• Verify that the objective selection wheel is clicked into a position.
Scale bar does not appear when clicked	• Capture image first; scale bar is only available after capturing an image.
Save button does not respond when clicked	• Click capture first; It is only possible to save an image that is captured. The USB icon on the Save button is red when there is a captured image to save.
DVI output does not work on an external LCD monitor or projector	• Power EVOS™ off, check the cable connections, and power on the instrument. • Verify that the external display accepts DVI-D input (i.e. digital input). A monitor with analog input only (DVI-A) will not display the EVOS™' digital output.
Unable to connect to network	• Verify physical cable connections; confirm the Ethernet jack is active. • Use a compatible network adapter. • If the physical connections are good, and the problem persists, contact your network administrator to resolve any network issues. Note that a Linux network must use Samba for the EVOS™ XL Imaging System to be able to find it.

Mechanical issues

Problem	Possible solutions
Mechanical stage does not move	• Remove stage lock pin. • Check stage brakes (on the stage knobs) and loosen as needed.
Vessel does not sit securely on moving stage	• Use the correct vessel holder for the application (refer to the EVOS™ Vessel Holders spec sheet, included on the USB flash drive. This information is also available at **thermofisher.com/evosxl** or from Technical Support (page 55).).
Mechanical stage drifts during time lapse sessions	• Tighten the stage brakes (on the stage knobs) before starting a time lapse session (page 20).
Mechanical stage tension is loose	• Tighten the stage brakes (on the stage knobs) as desired to increase tension.

Appendix B: System specifications

Optics	Infinity-corrected optical system; RMS-threaded objectives with 45 mm parfocal distance
Objectives	Objectives included vary per order. Contact your EVOS™ distributor or Technical Support (page 55) for a full list of objectives supported.
Objective turret	5-position; front-mounted control
Illumination	LED (50,000+ hour life); adjustable intensity
Contrast methods	Brightfield and phase contrast
Condenser	Includes 3-pos with brightfield and phase contrast annuli
Condenser working distance	60 mm
Mechanical "glide" stage	• X-Y axis fine-positioning controls; 28.3 mm (1.11 in) per rotation; 110 mm × 110 mm (4.3 in × 4.3 in) range of motion • Z-axis focusing controls, 480 mm/rotation • Interchangeable vessel holders available for most common shapes and sizes
LCD display	15-inch color, 1024 × 768 pixels; adjustable tilt
Camera	1/2-inch 2048 × 1536, 3.1 Megapixels COLOR
Image acquisition	Onboard microprocessor; built-in software for image acquisition via mouse control
Captured images	24-bit/px, full color TIFF, PNG, JPG or BMP (2048 × 1536) pixels
Output ports	3 USB and 1 DVI
Power supply	AC Adapter; Input 100–240 V, 50–60 Hz; Output 12 VDC/4.15 A ⊖—Ⓒ—⊕
Dimensions	Operating height: 57.8 cm (22.75 in) Storage/transport height: 32.4 cm (12.75 in) Depth: 47.0 cm (18.5 in) Width: 35.5 cm (14.0 in)
Weight	14.2 kg (31.4 lbs)

Appendix C: Controls glossary

On screen controls

Login button

The **Login** button (Thermo Fisher Scientific logo, bottom left) allows you to log in and create or change user profiles. This button also displays the current user profile (in this example, "Guest").
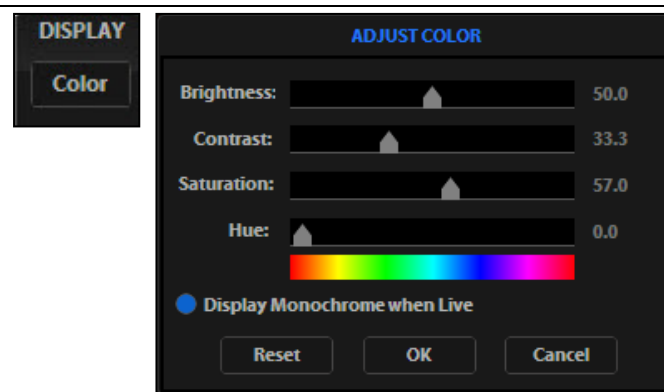
Left control bar

The following functions are available in the **left control bar** (bottom left):

- LIGHT ON button
- Illumination slider
- Image capture button
- Color Adjustment button
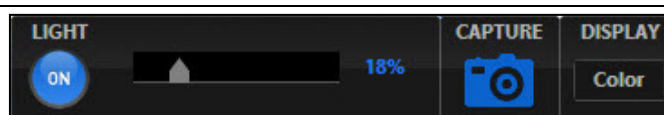
Adjust color dialog

The **Color adjustment** button (left control bar) opens the Adjust color dialog where you can fine tune your live image **Brightness**, **Contrast**, **Saturation**, and **Hue** prior to capture.
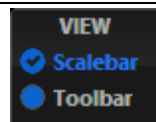
Right Control Bar

The following functions are available in the **right control bar** (bottom right):

- View: Scale bar option
- View: Toolbar option
- Settings button
- Save button
- QuickSave option
- Selected objective indicator
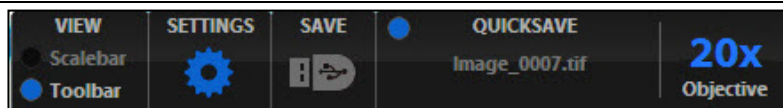
View: Scale bar option

The **Scale bar** option (right control bar) is a toggle button that displays or hides the Scale bar tool. This option is only available after an image is captured. To move the Scale bar, click and drag it.

View: Toolbar option

The **Toolbar** option (right control bar) includes the Time Lapse, Count, and Image review tools. Click the small gray triangle ① to open each tool.
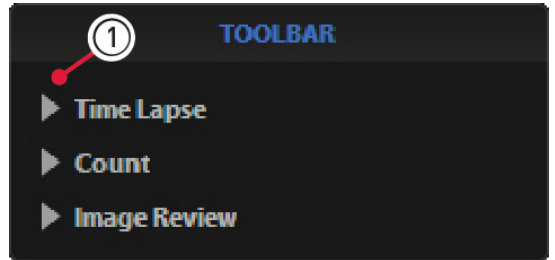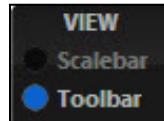
Time lapse tool

The **Time lapse tool** allows you to set up the interval/duration and the file name/destination for time lapse sessions. See "Record time lapse images", page 20.

Count tool

The **Count** tool allows you to tag cells and other features using up to 6 labels, and it calculates the totals and percentages for each label. See "Count cells", page 23.

Image review tool

The **Image review tool** allows you to review still images or play video files from the USB drive or network connection and to rename or delete saved files. See "Review images", page 24.
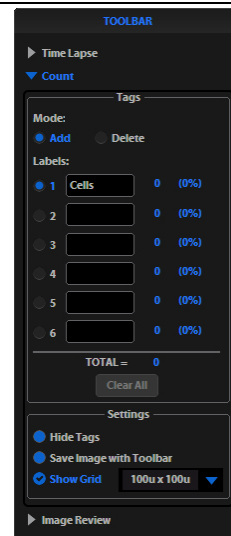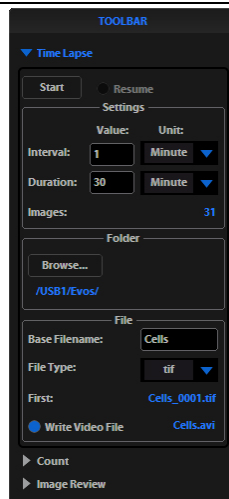
Settings button

The **Settings** button (right control bar) opens the Settings dialog. Within the Settings dialog, the following options are available:

- Basic tab
- QuickSave tab
- Network tab
- Service tab

Settings: Basic tab

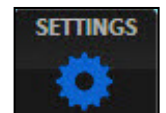- **This EVOS™** section displays the serial number and software version.

- **Login** section controls default Guest login.

- **Display** section controls the following options:

- **Highlight saturated pixels in red** indicates overexposed areas onscreen;

- **Reset Scale bar Location** moves the Scale bar back to its default position in the lower right corner of the screen;

- **Enable Mouse Wheel** allows the mouse scroll wheel to control illumination levels;

- **Mouse Speed** controls the mouse's reaction time;

- **LCD Backlight** controls the LCD lighting.

- **File Save** section allows you to specify 8-bit as the default format for TIFF files.
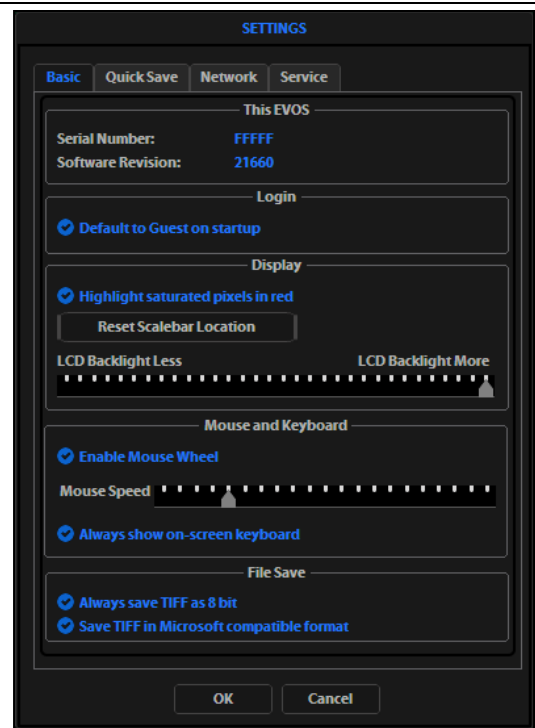
Settings: QuickSave tab

Allows you to set up a file name, count, file type, and folder to save captured images automatically.

Network tab

(Not shown)
Allows you to set up connections to shared folders via Ethernet. See "Connect the EVOS™ XL Imaging System to a network", page 28.

Service tab

(Not shown)
Allows for maintenance functions; contact your distributor if service is needed.
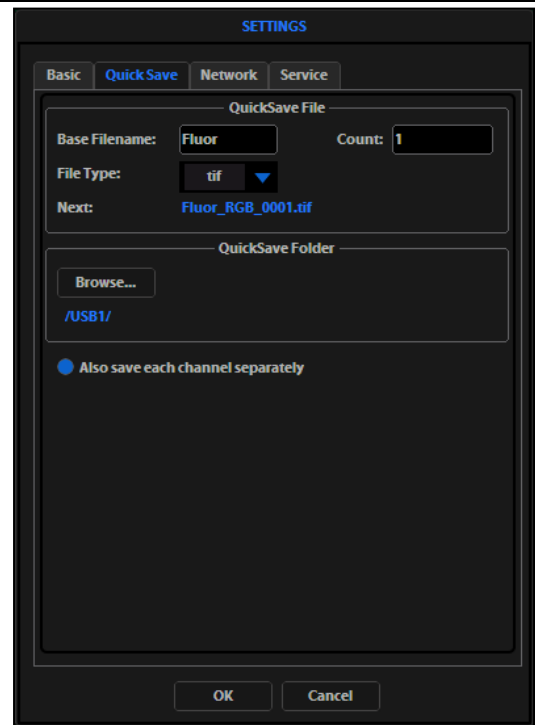
Save button

The **Save** button (right control bar) saves the current image to the USB flash drive or network folder. A red USB icon indicates that the current image has not been saved yet. After a file is saved, the USB icon turns blue.

Save File dialog

The **Save File** dialog allows you to name and save captured image files. The following options are available in the Save File dialog:

- **Save File Name** field: Click to enter a file name.

- **New Folder** button**:** Click to enter a folder name and date (optional).

- **Save Folder** list: The captured image will save to the selected (blue) folder.

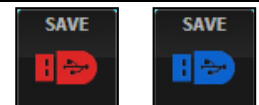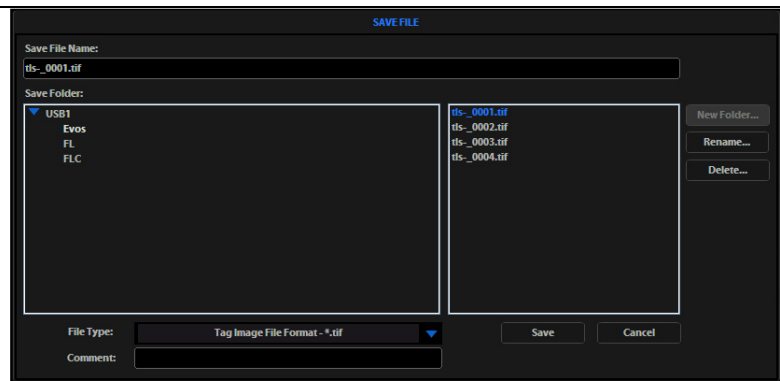- **File** list: (to the right of the Save Folder list) Displays saved files already in the selected folder.

- **File type** menu: Dropdown allows .tif, .png, .jpg, or .bmp formats.

- **Comment** field: Click to enter a comment and date (optional).

Virtual keyboard

The **Virtual keyboard** allows you enter text anytime a field or text-related button is selected. Where applicable, a **Date** button is available to include the current date in the field. Click the **Accept** button when you have finished entering the text.
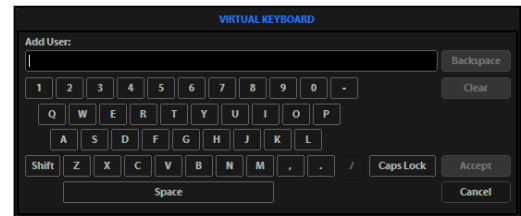
📝 **Note:** You can connect a USB keyboard to the EVOS™ XL Imaging System for text input. When a keyboard is connected, the virtual keyboard will not appear on screen except when you add a new user ID or rename a file with the Image review tool.

QuickSave option

The **QuickSave** option (right control bar) shows the QuickSave option button with the current QuickSave file name. If no QuickSave base file name is set up, this space will appear blank. For more information, see "QuickSave tab" under "Settings button", page 40.
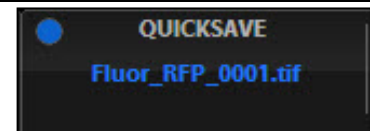
Selected objective

The **Selected Objective** display (right control bar) shows the magnification currently in use.
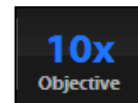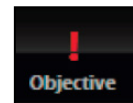
Selected objective   Objective turret between positions

Digital Zoom Value display

The **Digital Zoom Value** display (right control bar) appears above the Selected Objective display to show the zoom value when you zoom in on an image.
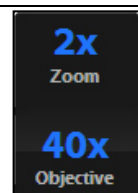
Mechanical controls

①	Power switch	⑥	Objective selection wheel
②	Power input jack	⑦	Focus knobs
③	USB and DVI ports	⑧	Stage Y-axis knob
④	Coarse stage positioning knobs	⑨	Phase annuli selector
⑤	Stage X-axis knob	⑩	Condenser slider slot

Power input jack Plug the power adapter into the power input jack.

Power switch Set the power switch to "—" to turn the instrument on or "O" to turn it off.

USB and DVI ports Plug the mouse and flash drive into the USB ports. Use the DVI port for digital output to a projector or other display.

**Coarse stage positioning knobs** Use the coarse stage positioning knobs to position the sample within the field of view, particularly at low magnifications.

Stage X-axis knob Use the stage X-axis knob for fine left-right movements to position the sample within the field of view, particularly at high magnifications. To secure the stage in place for time-lapse image captures, tighten the X-axis stage brake.

Stage Y-axis knob	Use the stage Y-axis knob for fine front-back movements to position the sample within the field of view, particularly at high magnifications. To secure the stage in place for time-lapse image captures, tighten the Y-axis stage brake.
Focus knobs	Use the focus knobs to bring the sample into focus.
Objective selection wheel	Turn the objective selection wheel to change magnifications. The objective turret clicks into place at each position.
Phase annuli selector	Set the phase annuli selector to the position that corresponds with your selected objective for transmitted light observations. The selector clicks into place for each of the following positions:

- BF (use for brightfield observations)

- 4/10 PH (use for phase observations at 4x or 10x)

- 20/40x PH (use for phase observations at 20x or 40x)

Condenser slider slot	Enhance image quality by inserting a condenser slider all the way into the slot.

Mouse scroll wheel	When the "Enable Mouse Wheel" option is selected in the Basic tab of the Settings dialog, the mouse scroll wheel can be used to adjust the illumination intensity. Roll the scroll wheel away from you for brighter illumination, or roll it toward you for dimmer illumination.

Appendix D: Safety

This section includes the following topics:

- Safety conventions used in this document
- Symbols on instruments
- Safety labels on instruments
- General instrument safety
- Chemical safety
- Chemical waste safety
- Electrical safety
- Physical hazard safety
- Biological hazard safety
- Workstation safety
- Safety and electromagnetic compatibility (EMC) standards
- SDSs

Safety conventions used in this document

Safety alert words   Four safety alert words appear in Thermo Fisher Scientific user documentation at points in the document where you need to be aware of relevant hazards. Each alert word–**IMPORTANT, CAUTION, WARNING, DANGER**–implies a particular level of observation or action:

Definitions

IMPORTANT! Provides information that is necessary for proper instrument operation, accurate installation, or safe use of a chemical.

CAUTION! – Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

WARNING! – Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury.

DANGER! – Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations.

Except for **IMPORTANT!** safety alerts, each safety alert word in a Thermo Fisher Scientific document appears with an open triangle figure that contains a hazard symbol. These hazard symbols are identical to the hazard icons that are affixed to Thermo Fisher Scientific instruments (see "Safety symbols" on page 47).

Symbols on instruments

Electrical symbols on instruments

The following table describes the electrical symbols that may be displayed on Thermo Fisher Scientific instruments.

Symbol	Description
		Indicates the **On** position of the main power switch.
◯	Indicates the **Off** position of the main power switch.
⏻	Indicates a standby switch by which the instrument is switched on to the **Standby** condition. Hazardous voltage may be present if this switch is on standby.
⏼	Indicates the **On/Off** position of a push-push main power switch.
⏚	Indicates a terminal that may be connected to the signal ground reference of another instrument. This is not a protected ground terminal.
⏱	Indicates a protective grounding terminal that must be connected to earth ground before any other electrical connections are made to the instrument.
∼	Indicates a terminal that can receive or supply alternating current or voltage.
≂	Indicates a terminal that can receive or supply alternating or direct current or voltage.

Safety symbols

The following table describes the safety symbols that may be displayed on Thermo Fisher Scientific instruments. Each symbol may appear by itself or in combination with text that explains the relevant hazard (see "Safety labels on instruments", page 48). These safety symbols may also appear next to **DANGERS**, **WARNINGS**, and **CAUTIONS** that occur in the text of this and other product-support documents.

Symbol	Description
	Indicates that you should consult the manual for further information and to proceed with appropriate caution.
	Indicates the presence of an electrical shock hazard and to proceed with appropriate caution.
	Indicates the presence of a hot surface or other high-temperature hazard and to proceed with appropriate caution.
	Indicates the presence of a laser inside the instrument and to proceed with appropriate caution.
	Indicates the presence of moving parts and to proceed with appropriate caution.
	Indicates the presence of a biological hazard and to proceed with appropriate caution.
	Indicates the presence of an ultraviolet light and to proceed with appropriate caution.

Environmental symbols on instruments

The following symbol applies to all Thermo Fisher Scientific electrical and electronic products placed on the European market after August 13, 2005.

Symbol	Description
	Do not dispose of this product as unsorted municipal waste. Follow local municipal waste ordinances for proper disposal provisions to reduce the environmental impact of waste electrical and electronic equipment (WEEE). **European Union customers:** Call your Customer Service representative for equipment pick-up and recycling. See **www.thermofisher.com** for a list of customer service offices in the European Union.

Safety labels on instruments

The following **CAUTION**, **WARNING**, and **DANGER** statements may be displayed on Thermo Fisher Scientific instruments in combination with the safety symbols described in the preceding section.

Hazard symbol	English	Français
⚠	**CAUTION!** Hazardous chemicals. Read the Safety Data Sheets (SDSs) before handling.	**ATTENTION!** Produits chimiques dangereux. Lire les fiches techniques de sûreté de matériels avant toute manipulation de produits.
	CAUTION! Hazardous waste. Refer to SDS(s) and local regulations for handling and disposal.	**ATTENTION!** Déchets dangereux. Lire les fiches techniques de sûreté de matériels et la régulation locale associées à la manipulation et l'élimination des déchets.
⚡	**DANGER!** High voltage.	**DANGER!** Haute tension.
	WARNING! To reduce the chance of electrical shock, do not remove covers that require tool access. No user-serviceable parts are inside. Refer servicing to Thermo Fisher Scientific qualified service personnel.	**AVERTISSEMENT!** Pour éviter les risques d'électrocution, ne pas retirer les capots dont l'ouverture nécessite l'utilisation d'outils. L'instrument ne contient aucune pièce réparable par l'utilisateur. Toute intervention doit être effectuée par le personnel de service qualifié venant de chez Thermo Fisher Scientific.
☢	**DANGER!** Class 3B visible and/or invisible laser radiation present when open. Avoid exposure to beam.	**DANGER!** Rayonnement visible ou invisible d'un faisceau laser de Classe 3B en cas d'ouverture. Evitez toute exposition au faisceau.
⚠	**CAUTION!** Moving parts. Crush/pinch hazard.	**ATTENTION!** Pièces en mouvement, risque de pincement et/ou d'écrasement.

General instrument safety

⚠️ **WARNING! PHYSICAL INJURY HAZARD.** Use this product only as specified in this document. Using this instrument in a manner not specified by Thermo Fisher Scientific may result in personal injury or damage to the instrument.

Moving and lifting the instrument

⚠️ **CAUTION! PHYSICAL INJURY HAZARD.** The instrument is to be moved and positioned only by the personnel or vendor specified in the applicable site preparation guide. If you decide to lift or move the instrument after it has been installed, do not attempt to lift or move the instrument without the assistance of others, the use of appropriate moving equipment, and proper lifting techniques. Improper lifting can cause painful and permanent back injury. Depending on the weight, moving or lifting an instrument may require two or more persons.

Moving and lifting stand-alone computers and monitors

⚠️ **WARNING!** Do not attempt to lift or move the computer or the monitor without the assistance of others. Depending on the weight of the computer and/or the monitor, moving them may require two or more people.

Things to consider before lifting the computer and/or the monitor:

- Make sure that you have a secure, comfortable grip on the computer or the monitor when lifting.
- Make sure that the path from where the object is to where it is being moved is clear of obstructions.
- Do not lift an object and twist your torso at the same time.
- Keep your spine in a good neutral position while lifting with your legs.
- Participants should coordinate lift and move intentions with each other before lifting and carrying.
- Instead of lifting the object from the packing box, carefully tilt the box on its side and hold it stationary while someone slides the contents out of the box.

Operating the instrument

Ensure that anyone who operates the instrument has:

- Received instructions in both general safety practices for laboratories and specific safety practices for the instrument.
- Read and understood all applicable Safety Data Sheets (SDSs). See "Safety Data Sheets (SDS)", page 55.

Cleaning or decontaminating the instrument

⚠️ **CAUTION!** Using cleaning or decontamination methods other than those recommended by the manufacturer may compromise the safety or quality of the instrument.

Chemical safety

Chemical hazard warning

⚠ **WARNING! CHEMICAL HAZARD.** Before handling any chemicals, refer to the Safety Data Sheet (SDS) provided by the manufacturer, and observe all relevant precautions.

⚠ **WARNING! CHEMICAL HAZARD.** All chemicals in the instrument, including liquid in the lines, are potentially hazardous. Always determine what chemicals have been used in the instrument before changing reagents or instrument components. Wear appropriate eyewear, protective clothing, and gloves when working on the instrument.

⚠ **WARNING! CHEMICAL STORAGE HAZARD.** Never collect or store waste in a glass container because of the risk of breaking or shattering. Reagent and waste bottles can crack and leak. Each waste bottle should be secured in a low-density polyethylene safety container with the cover fastened and the handles locked in the upright position. Wear appropriate eyewear, clothing, and gloves when handling reagent and waste bottles.

General safety guidelines

To minimize the hazards of chemicals:

- Read and understand the Safety Data Sheets (SDSs) provided by the chemical manufacturer before you store, handle, or work with any chemicals or hazardous materials. (See "Safety Data Sheets (SDS)", page 55.)

- Minimize contact with chemicals. Wear appropriate personal protective equipment when handling chemicals (for example, safety glasses, gloves, or protective clothing). For additional safety guidelines, consult the SDS.

- Minimize the inhalation of chemicals. Do not leave chemical containers open. Use only with adequate ventilation (for example, fume hood). For additional safety guidelines, consult the SDS.

- Check regularly for chemical leaks or spills. If a leak or spill occurs, follow the manufacturer's cleanup procedures as recommended in the SDS.

- Comply with all local, state/provincial, or national laws and regulations related to chemical storage, handling, and disposal.

Chemical waste safety

Chemical waste hazard

⚠ **CAUTION! HAZARDOUS WASTE.** Refer to Safety Data Sheets (SDSs) and local regulations for handling and disposal.

Chemical waste safety guidelines

To minimize the hazards of chemical waste:

- Read and understand the Safety Data Sheets (SDSs) provided by the manufacturers of the chemicals in the waste container before you store, handle, or dispose of chemical waste.

- Provide primary and secondary waste containers. (A primary waste container holds the immediate waste. A secondary container contains spills or leaks from the primary container. Both containers must be compatible with the waste material and meet federal, state, and local requirements for container storage.)

- Minimize contact with chemicals. Wear appropriate personal protective equipment when handling chemicals (for example, safety glasses, gloves, or protective clothing). For additional safety guidelines, consult the SDS.

- Minimize the inhalation of chemicals. Do not leave chemical containers open. Use only with adequate ventilation (for example, fume hood). For additional safety guidelines, consult the SDS.

- Handle chemical wastes in a fume hood.

- After emptying the waste container, seal it with the cap provided.

- Dispose of the contents of the waste tray and waste bottle in accordance with good laboratory practices and local, state/provincial, or national environmental and health regulations.

Waste disposal

If potentially hazardous waste is generated when you operate the instrument, you must:

- Characterize (by analysis, if necessary) the waste generated by the particular applications, reagents, and substrates used in your laboratory.

- Ensure the health and safety of all personnel in your laboratory.

- Ensure that the instrument waste is stored, transferred, transported, and disposed of according to all local, state/provincial, and/or national regulations.

IMPORTANT! Radioactive or biohazardous materials may require special handling, and disposal limitations may apply.

Electrical safety

DANGER! ELECTRICAL SHOCK HAZARD. Severe electrical shock can result from operating the EVOS™ XL Imaging System without its instrument panels in place. Do not remove instrument panels. High-voltage contacts are exposed when instrument panels are removed from the instrument.

Fuses

WARNING! FIRE HAZARD. For continued protection against the risk of fire, replace fuses only with fuses of the type and rating specified for the instrument.

Power

DANGER! ELECTRICAL HAZARD. Grounding circuit continuity is vital for the safe operation of equipment. Never operate equipment with the grounding conductor disconnected.

DANGER! ELECTRICAL HAZARD. Use properly configured and approved line cords for the voltage supply in your facility.

DANGER! ELECTRICAL HAZARD. Plug the system into a properly grounded receptacle with adequate current capacity.

Overvoltage rating

The EVOS™ XL Imaging System has an installation (overvoltage) category of II, and is classified as portable equipment.

Physical hazard safety

Moving parts

⚠ **WARNING! PHYSICAL INJURY HAZARD.** Moving parts can crush and cut. Keep hands clear of moving parts while operating the instrument. Disconnect power before servicing the instrument.

Biological hazard safety

⚠ **WARNING! BIOHAZARD.** Biological samples such as tissues, body fluids, and blood of humans and other animals have the potential to transmit infectious diseases. Follow all applicable local, state/provincial, and/or national regulations. Wear appropriate protective eyewear, clothing, and gloves. Read and follow the guidelines in these publications:

In the U.S.:

- U.S. Department of Health and Human Services guidelines published in *Biosafety in Microbiological and Biomedical Laboratories*

  (stock no. 017-040-00547-4;
  www.cdc.gov/OD/ohs/biosfty/bmbl4/bmbl4toc.htm)

- Occupational Safety and Health Standards, Bloodborne Pathogens

  (29 CFR§1910.1030;
  www.access.gpo.gov/nara/cfr/waisidx_01/29cfr1910a_01.html)

- Your company's/institution's Biosafety Program protocols for working with/handling potentially infectious materials.

- Additional information about biohazard guidelines is available at:

  www.cdc.gov

In the EU:

- Check your local guidelines and legislation on biohazard and biosafety precaution, and the best practices published in the World Health Organisation (WHO) Laboratory Biosafety Manual, third edition

  www.who.int/csr/resources/publications/biosafety/WHO_CDS_CSR_LYO_2004_11/en/

Safety and electromagnetic compatibility (EMC) standards

This section provides information on:

- U.S. and Canadian safety standards
- European safety and EMC standards
- Australian EMC standards

U.S. and Canadian Safety Standards

The **CSA C/US Mark** signifies that the product meets applicable U.S. and Canadian standards, including those from CSA, CSA America, ANSI, ASME, ASSE, ASTM, NSF and UL.

European Safety and EMC Standards

The **CE Mark** symbolizes that the product conforms to all applicable European Community provisions for which this marking is required. Operation of the instrument is subject to the conditions described in this manual.

The protection provided by the instrument may be impaired if the instrument is used in a manner not specified by Thermo Fisher Scientific.

Australian EMC standards

The **C-Tick Mark** indicates conformity with Australian and New Zealand standards for electromagnetic compatibility.

Documentation and support

Obtaining support

Technical support For the latest services and support information for all locations, visit **www.thermofisher.com**.

At the website, you can:

- Access worldwide telephone and fax numbers to contact Technical Support and Sales facilities

- Search through frequently asked questions (FAQs)

- Submit a question directly to Technical Support (**thermofisher.com/support**)

- Search for user documents, SDSs, vector maps and sequences, application notes, formulations, handbooks, certificates of analysis, citations, and other product support documents

- Obtain information about customer training

- Download software updates and patches

Safety Data Sheets (SDS) Safety Data Sheets (SDSs) are available at **thermofisher.com/sds.**

> (!) **IMPORTANT!** For the SDSs of chemicals not distributed by Thermo Fisher Scientific contact the chemical manufacturer.

Limited product warranty Life Technologies Corporation and/or its affiliate(s) warrant their products as set forth in the Life Technologies' General Terms and Conditions of Sale found on Life Technologies' website at **www.thermofisher.com/us/en/home/global/terms-and-conditions.html**. If you have any questions, please contact Life Technologies at **www.thermofisher.com/support**.

> (!) **IMPORTANT!** Wiping the EVOS™ XL Imaging System computer (i.e., erasing the hard drive to remove all programs, files, and the operating system) voids the product warranty.