

USER GUIDE

life

EVOS[®] XL

Imaging System for **Transmitted Light** Applications

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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 Life Technologies 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 Life Technologies 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 Life Technologies 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 Life Technologies instruments (see “Safety Symbols” on page 48).

SDSs The Safety Data Sheets (SDSs) for any chemicals supplied by Life Technologies are available to you free 24 hours a day. For instructions on obtaining SDSs, see “Safety Data Sheets (SDS)” on page 56.



IMPORTANT! For the SDSs of chemicals not distributed by Life Technologies contact the chemical manufacturer.

1. Installation

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.



Note: If you do not have your distributor information, contact Technical Support (see page 56).

- ▶ 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

Operating Environment

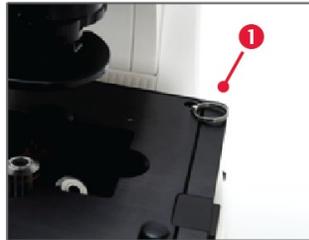
- Place the EVOS® XL Imaging System on a level surface away from vibrations from other pieces of equipment.
- Allow at least 5 cm (2 in) free space at the back of the instrument to allow for proper ventilation and prevent overheating of electronic components.
- Set up the EVOS® XL Imaging System away 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.

Moving/Transporting the EVOS[®] XL Imaging System

1. 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, right 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.

Mechanical Stage

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.

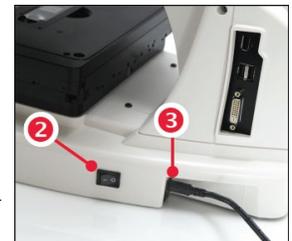


Power Supply

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 44. Damage due to an incompatible power adapter is not covered by warranty.

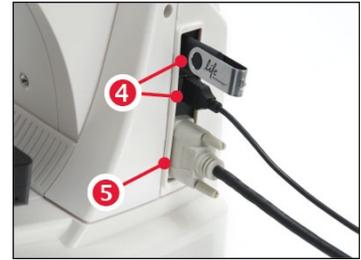


USB and DVI Output Ports

USB Ports DVI Port

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.

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.



Installing EVOS® 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 20 ½ 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 |

Installation



Note: See the illustrations on page 6 for more 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 (see image below).
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.

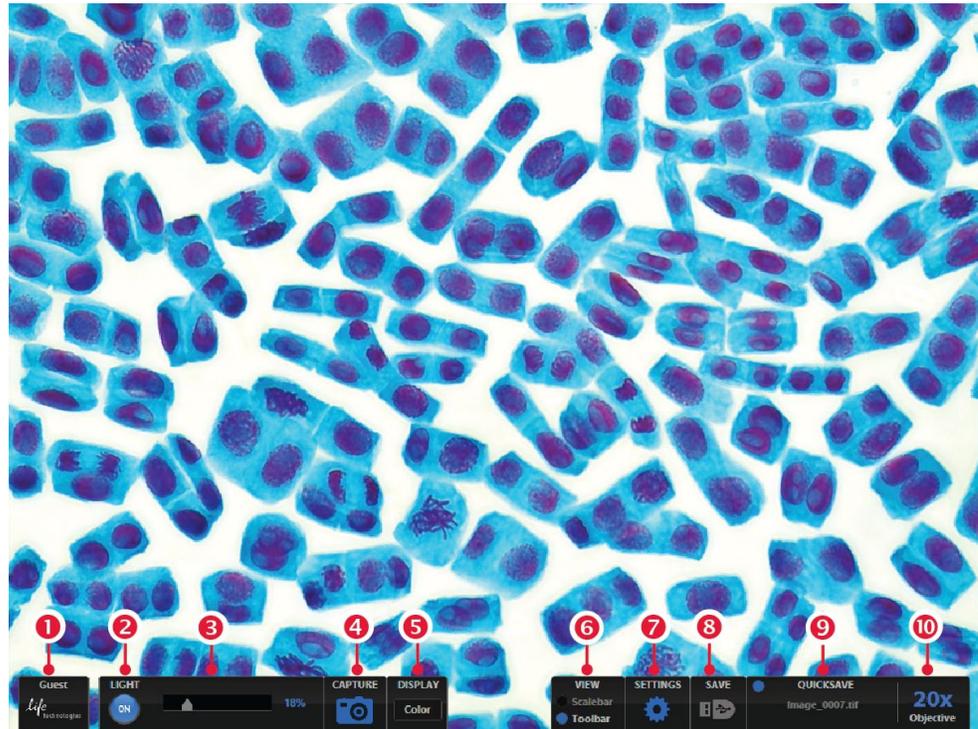


2. Quick Reference Diagrams



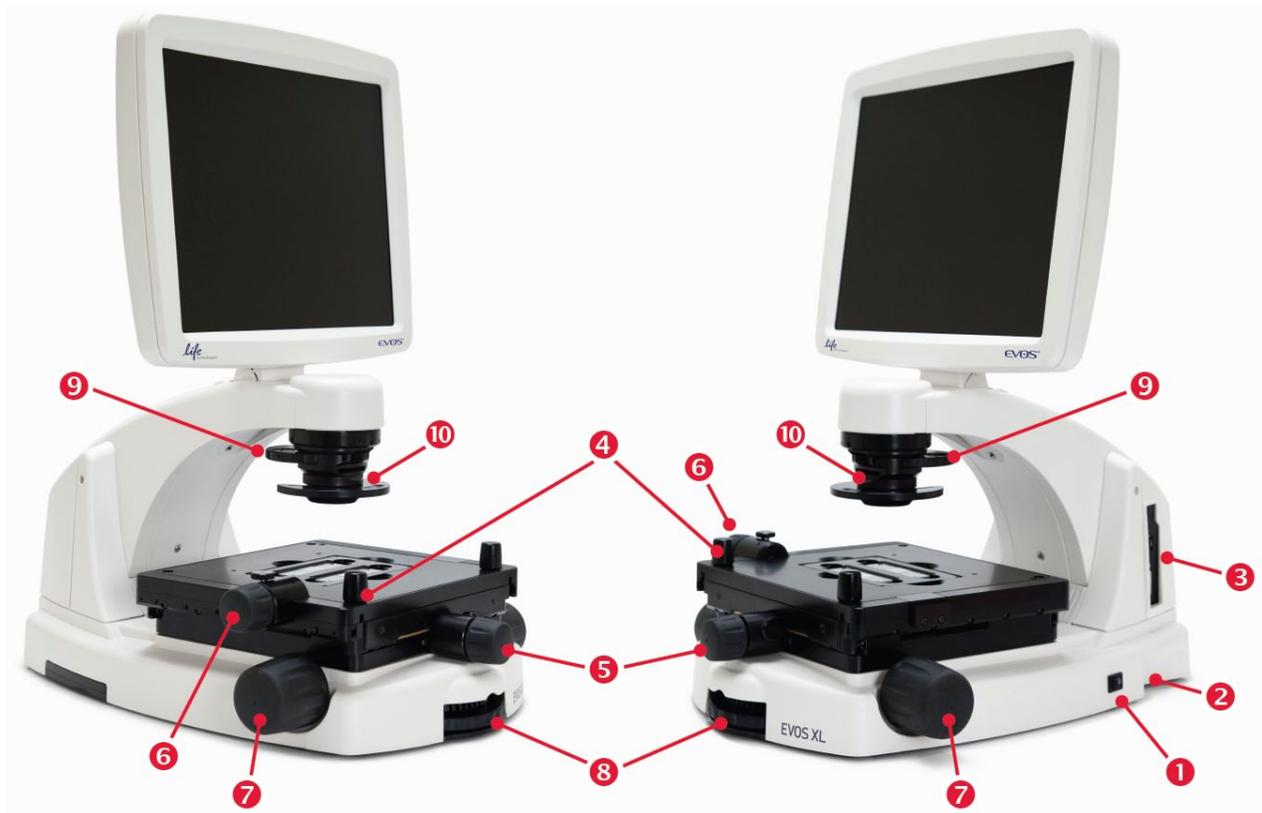
Note: See “Controls Glossary” on page 34 for more details about onscreen and mechanical controls.

Onscreen Controls



- | | |
|---------------------------|--------------------------------|
| 1 Login button | 6 Scalebar 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 button |

Mechanical Controls

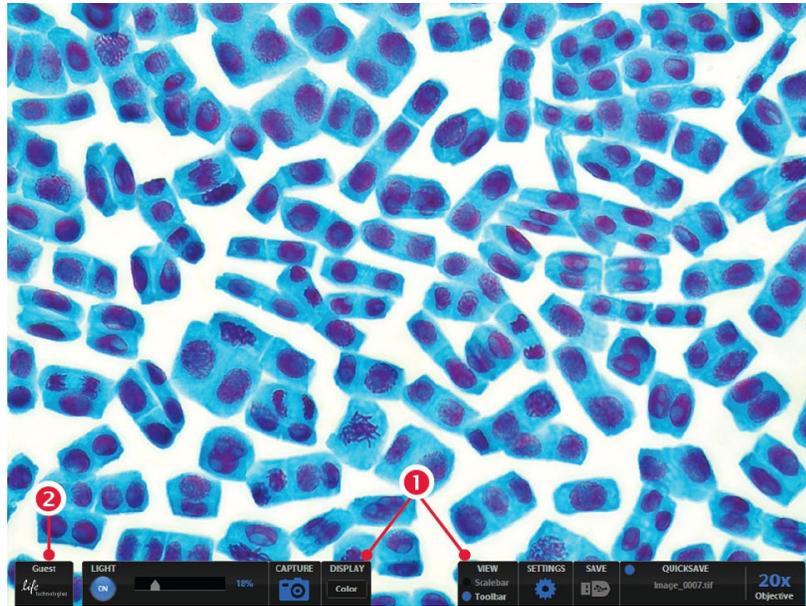


- | | |
|----------------------------------|-----------------------------|
| 1 Power switch | 6 Stage Y-axis knob |
| 2 Power input jack | 7 Focusing knobs |
| 3 USB and DVI ports | 8 Objective selection wheel |
| 4 Coarse stage positioning knobs | 9 Phase annuli selector |
| 5 Stage X-axis knob | 10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

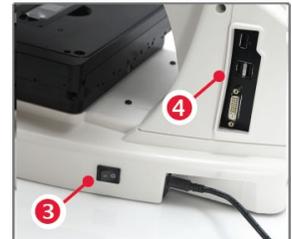
3. Basic Operation

The EVOS[®] XL Imaging System uses both mechanical and software controls for operation. Mechanical controls include the stage X-Y axis knobs, focusing 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 “Quick Reference Diagrams” (page 10) as needed. See also “Controls Glossary” (page 34) 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** on 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.

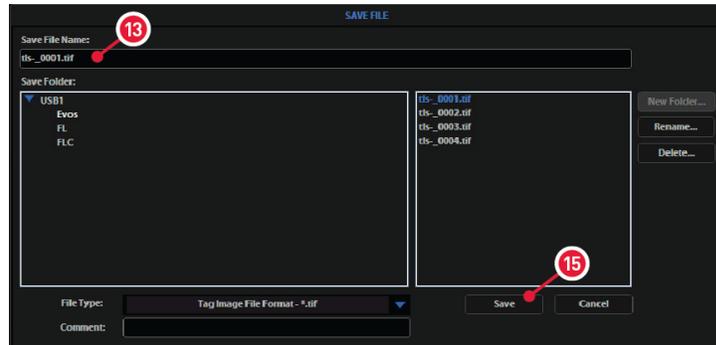
7. Turn on illumination using the **Light ON/OFF** toggle **8** in the left control bar.
8. Focus the sample using the focusing knobs **9**.
9. Adjust the illumination intensity if necessary, using the **Illumination** slider **10** on the left control bar or the mouse scroll wheel.



Note: Overexposed pixels will appear red. To get the maximum level of brightness without any overexposed areas, dim the illumination until the red highlights disappear.



10. Click the **Capture** button **11**, located 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 box” will pop up.



12. Click in the **Save File Name** text field **13** to enter the file name. A “virtual keyboard” will pop up. After entering the file name, click the **Accept** button **14** at the lower right of the keyboard.



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



Note: See “Saving Images and Working with Files” (page 17) for more information.

4. Advanced Operation

Logging In/Creating New User Logins

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

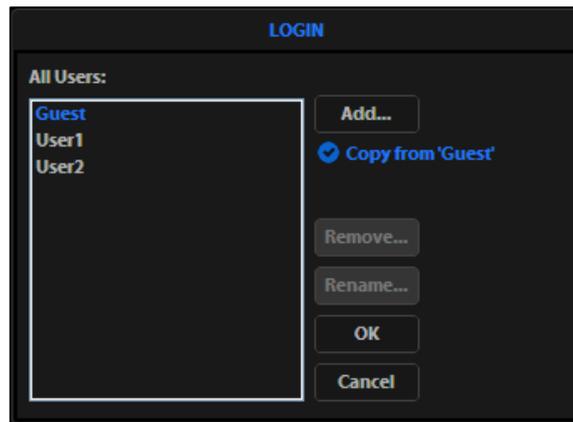
To use this feature, set up a user profile for each regular user. You may also assign user IDs for experiments in progress.



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

Log in with an Existing Profile

1. Click the **Login** button at the bottom left of the screen (this is the Life Technologies logo with the current user profile indicated above).
2. Login dialog box opens. Select the desired user profile and click **OK**.



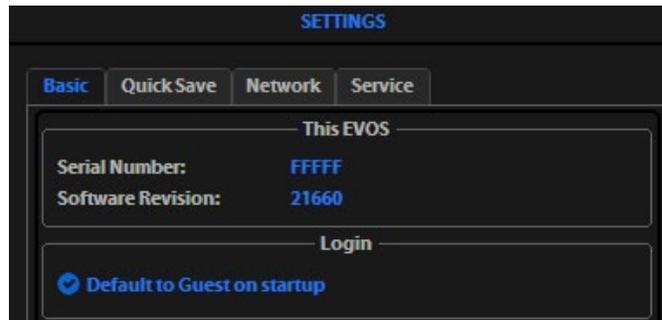
Note: No password is necessary to log in.

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, and click **Add**. The virtual keyboard will pop up so you can name the new profile.
3. To create a new user profile without copying any settings, deselect **Copy from** option, click **Add**, and 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 will save your settings to memory.
5. To remove a user profile, highlight it and click **Remove**. A confirmation dialog box will pop up. 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

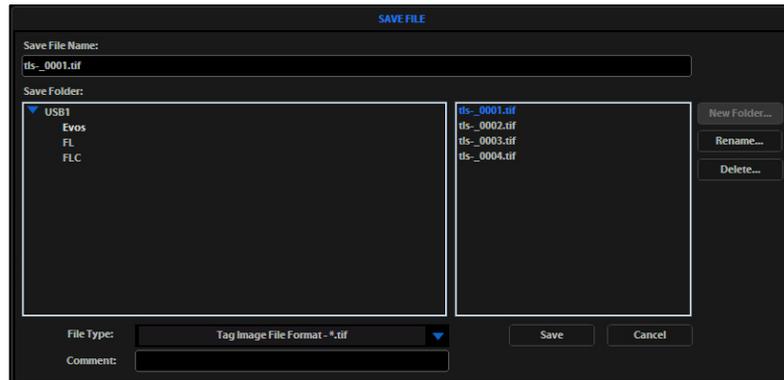
The default user login is Guest; to set the default login as the last active user, go to the **Basic** tab of the Settings dialog box and uncheck the “**Default to Guest on startup**” option.



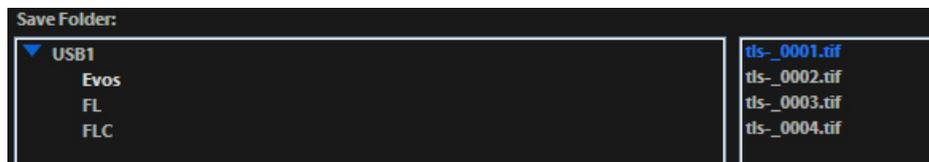
Note: For multiple users, we recommend leaving the “Default to Guest on startup” option checked.

Saving Images and Working with Files

1. When you click the **Save** button, the “Save File” dialog box appears.

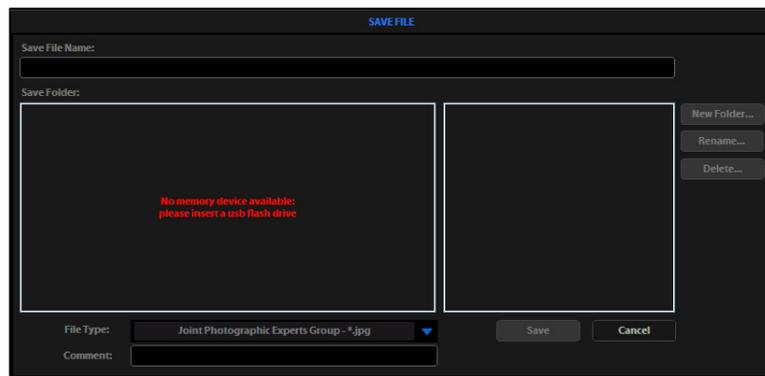


In the “Save Folder list” and the “Saved files list”, selected items appear blue.



If a USB keyboard is installed, the virtual keyboard will not appear. Note that pressing the Enter key on a physical keyboard is like pressing the Save button in the Save file dialog box.

If there is no USB flash drive or network connection in place, an information message will appear in red. Click the **Cancel** button to clear this message.



2. Click in the **Save File Name** text field to enter a file name. If you are using the virtual keyboard, click **Accept** after entering the text.

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

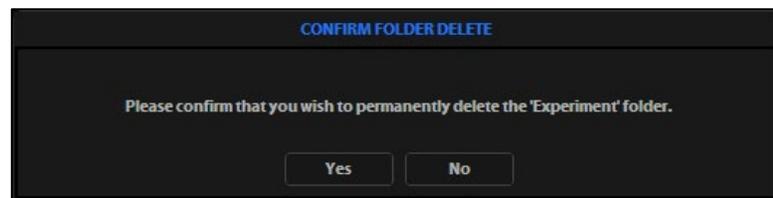
A "Save As confirmation dialog box" will open. It is not possible to recover an overwritten file.

3. Click on the **name of a folder** in the "Save Folder list" to select the destination for the new image.
4. To create a new folder, first click the **name of the parent folder**, and then click the **New Folder** button. This will activate the virtual keyboard (if it is needed) so you can enter a folder name and, if desired, date.



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

5. Select a file format (.tif, .png, .jpg or .bmp) from the **File Type** drop-down menu.
6. Click in the **Comment text field** to enter a comment and date (optional).
7. Click the **Save** button to save the file.
8. To delete a file or folder, highlight the item on the list and click the **Delete** button. A confirmation dialog box will pop up. It is not possible to recover a deleted file.

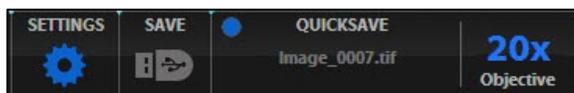


9. To rename a file or folder, highlight the item on the list and click the **Rename** button. The virtual keyboard will pop up; you can use the **Clear** button to reset to a blank field.

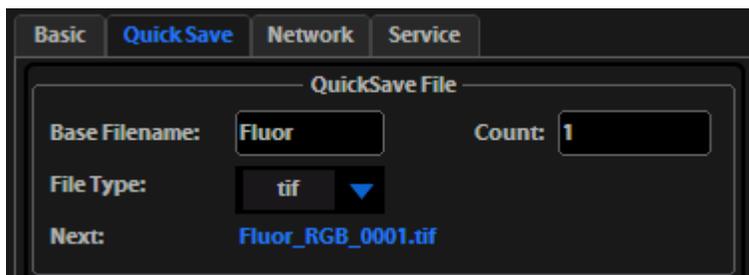
Using the QuickSave Option

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

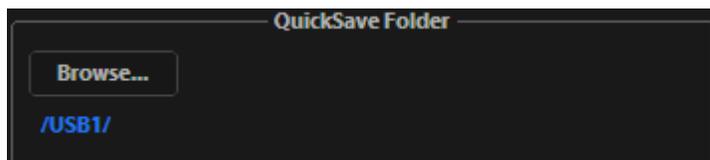
1. Click **Settings** to open the “Settings dialog box”, and then select the **QuickSave** tab.



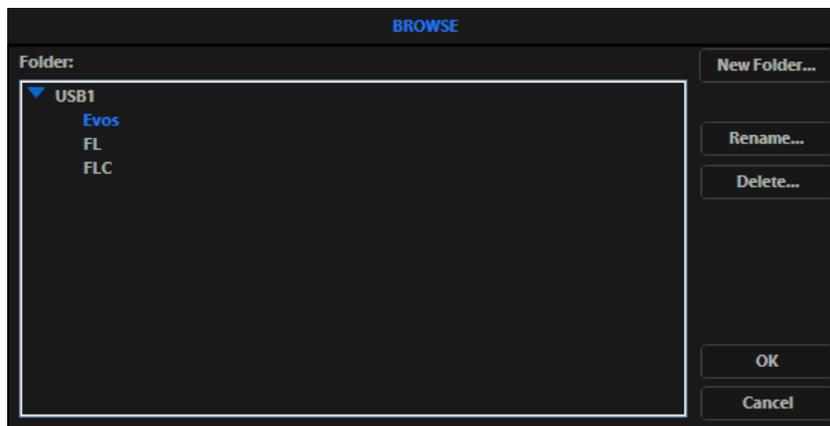
2. Click in the **Base Filename** text field and enter a name that describes the capture session. The blue “Next” file name will reflect the information entered.



3. Click in the **Count** text field to enter the starting number, if you do not want to start at 1. The blue “Next” file name will reflect the information entered.
4. Select a file format (.tif or .png) from the **File Type** drop-down menu.
5. Click **Browse** to select a destination folder for the Quick Save files. In the “Browse popup”, highlight the desired folder and click **OK**.



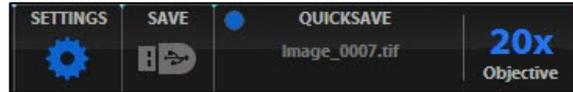
6. To create a new folder, first click the name of the desired parent folder, and then click **New Folder**. Enter a folder name and date, if desired. After creating the new folder, click **OK** to close the Browse popup.





Note: Clicking the **Date** button anywhere within a text field will 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 the **Capture** button, click **Save**. The image will be saved as specified in the QuickSave settings.

Recording 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.

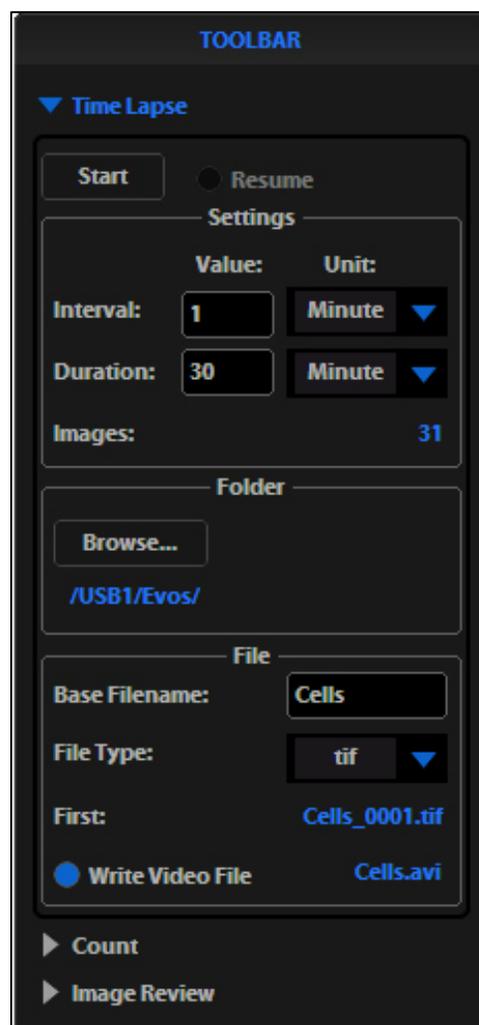
Start a Time Lapse Session

1. Once the specimen 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** text field and enter a value. Choose a unit of measure for the capture interval from the **Interval Unit** drop-down menu.
4. Click the **Duration** text field and enter a value. Choose a unit of measure for the duration of the capture session from the **Duration Unit** drop-down menu.

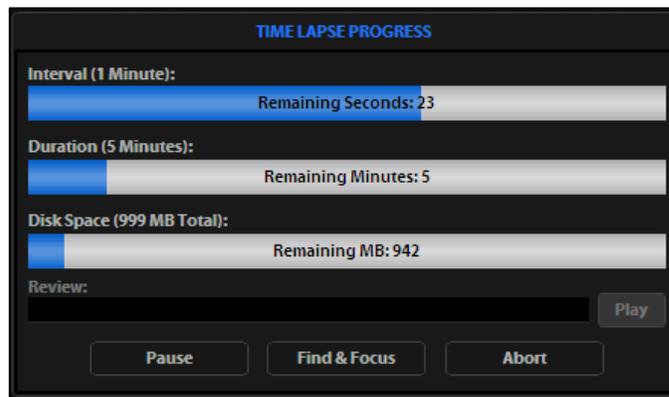


Note: The Images field shows the total number of images for the session.

5. To save the session in a folder other than the default location, click **Browse** to select the destination.
6. In the **Browse** popup, highlight the desired folder and 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** popup highlight the desired folder and click **OK**.
9. Under File, click the **Base Filename** text field to enter a name, and then choose a file type (.png or .tif) from the **File Type** drop-down menu.
10. To create a video (.avi) file, select **Write Video File**.



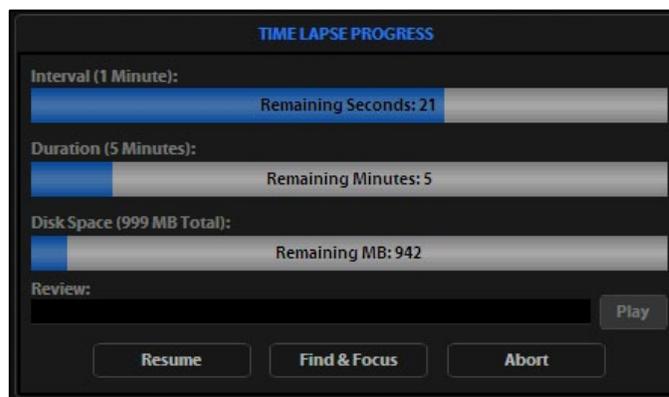
11. Click **Start** to begin the time lapse session. The system will display the Time Lapse Progress popup as long as the session is active.



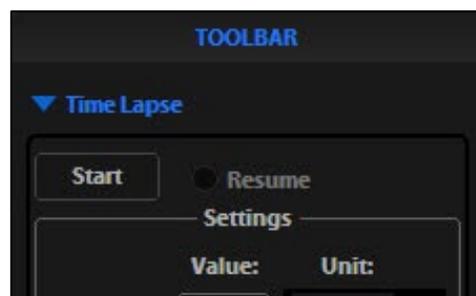
Note: The **Review** slider lets you review the images already captured during the current session. Clicking **Play** shows all the images in sequence.

Pause and Restart a Time Lapse Session

In the Time Lapse Progress popup, click **Pause** to suspend the time lapse captures. The progress popup will dim, and a **Resume** button will replace the **Pause** button.

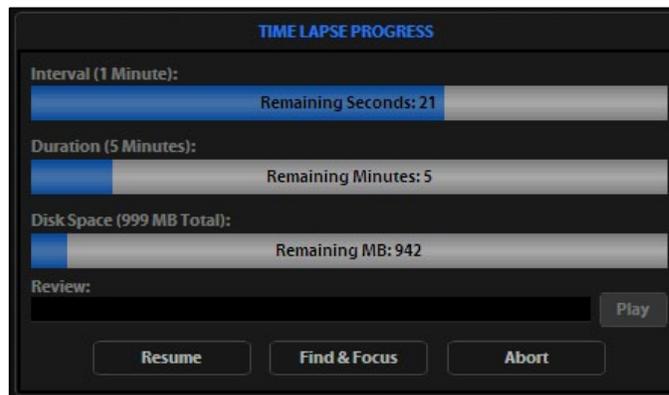


Alternatively, to pause and adjust the settings, click **Find & Focus**. Click **Start** to resume the time lapse capture sequence, or uncheck the Resume option and start a new time lapse session.



Abort a Time Lapse Session

In the progress popup, click **Abort**. A dialog box will pop up, giving you the option to delete or keep the files already saved. Clicking **Cancel** will resume the session.



Counting 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 simply by saving the tagged image, with the Count tool displaying the totals.

Count Procedure

1. Acquire an image. See “Basic Operation” (page 12) for detailed instructions.
2. Open the **Toolbar** and expand the **Count tool**.
3. Click in a **Label text field** to enter a name for that label. You may use up to six labels.
4. Under Settings, you may choose the desired grid size using the **Grid size drop-down menu** or leave the **Show Grid option** inactive.
5. Select a **Label button** and 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 it, or choose the **Delete mode** and left-click it. You may also use the **Clear All** button to delete all tags for all labels.
8. To save an image showing the labels, counts, and percentages as shown in the Count tool, select the **Save Image with Toolbar option** and click **Save** on the right toolbar. Deselecting this option will produce 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 “Using Digital Zoom” (page 26). After zooming, reactivate the Count tool by deselecting Hide Tags or reopening the tool.

Reviewing Images

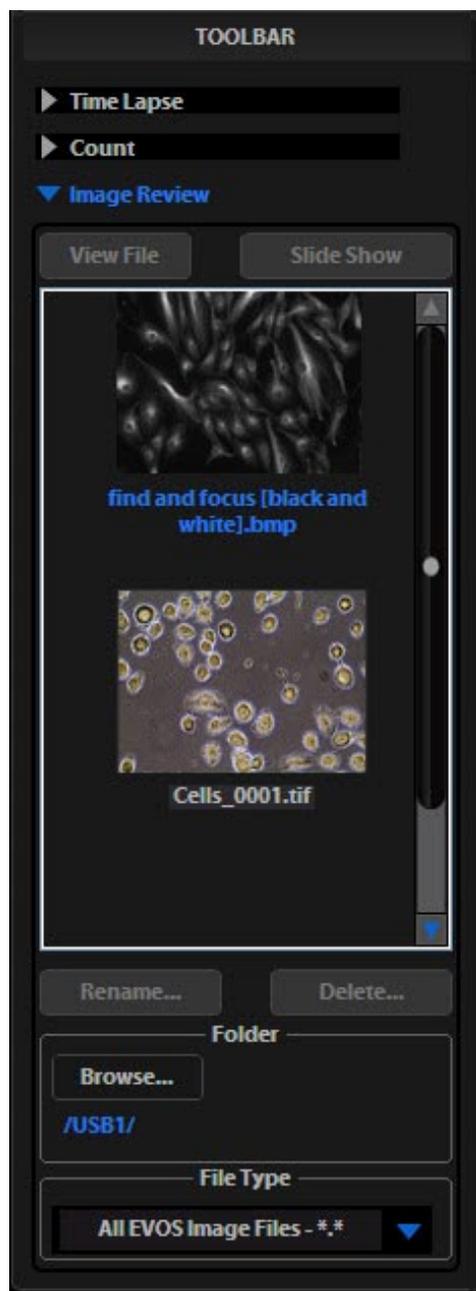
Image Review Tool The *Image Review* tool allows you to review still images or play video files from the USB drive or network connection. You may also use this tool to rename or delete saved files.

- Reviewing Images**
1. Open the **Toolbar** and 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 will be empty.



Note: The File Type drop-down menu 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 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**. Hiding the file closes the image review window. Double-clicking the thumbnail image will also 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 “Using Digital Zoom” (page 26) for more detailed instructions.
7. To rename a file, select it and click **Rename**. The Virtual Keyboard will pop up. Enter the new file name and click **Accept**.
8. To delete a file, select it and click **Delete**. A confirmation dialog box will pop up. It is not possible to recover a deleted file.
9. Click **Slide Show** to display each image thumbnail within the image review window continuously.



Using Digital Zoom

The EVOS[®] XL Imaging System can zoom the image onscreen, quickly allowing a closer look. Simply double-click live or captured images to zoom them.

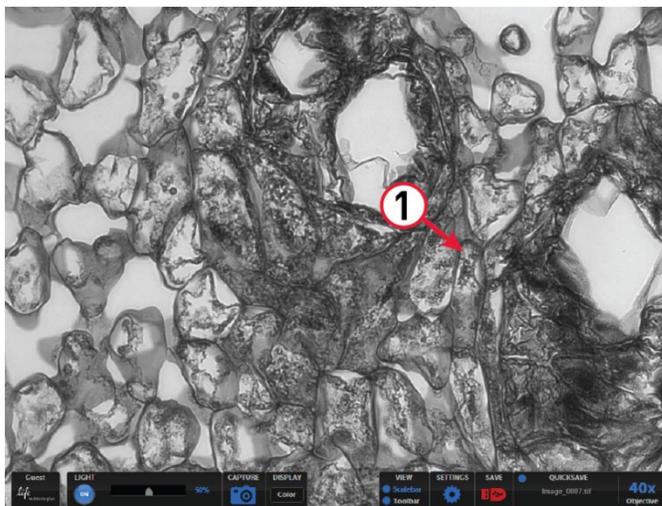
In the images below, the numbered arrows indicate click points. Also note that the zoom factor display appears over the objective selected display.

Zoom and Recenter Live Images



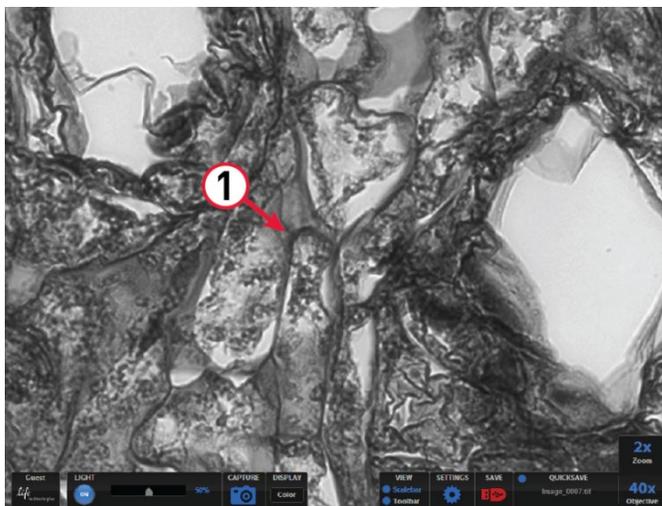
Note: Live images can only zoom to 2×. To zoom an image at higher levels, you must first capture it.

1. Double-click the area of interest **1** in the image onscreen. EVOS[®] imaging system will display a view zoomed 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 will place points from the outer edges of the screen as close to the center as possible). You may re-center repeatedly.

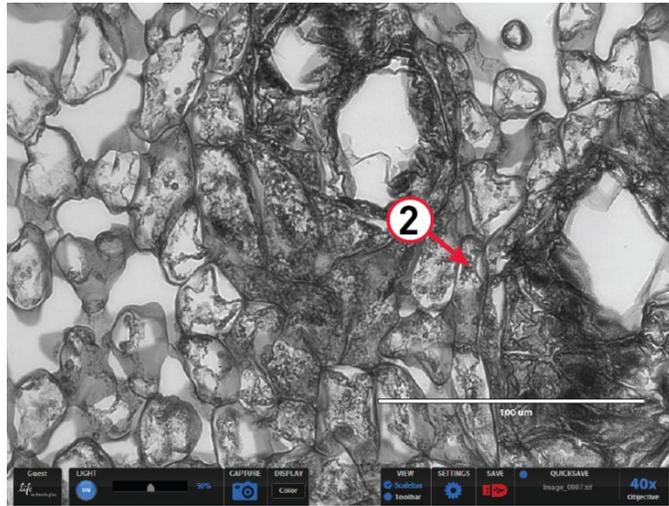


Live 40× image zoomed 2×, re-centered

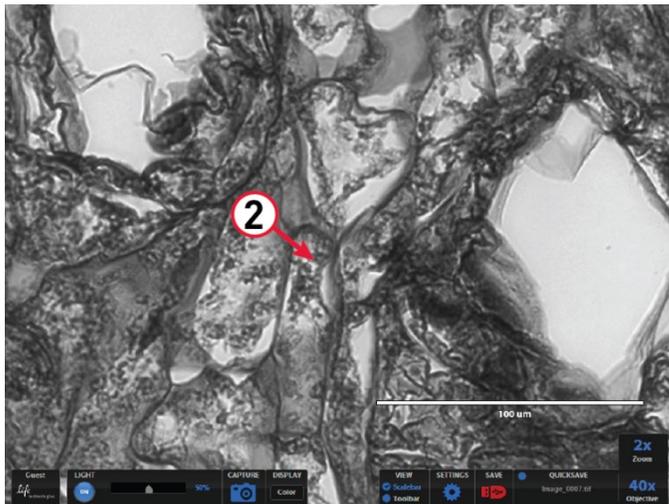
3. Right-click anywhere on the image to restore the view to unzoomed magnification.

Zoom Captured Images

1. Double-click the area of interest **2** in the image onscreen. A view zoomed 2x, centered on the point clicked, will appear.

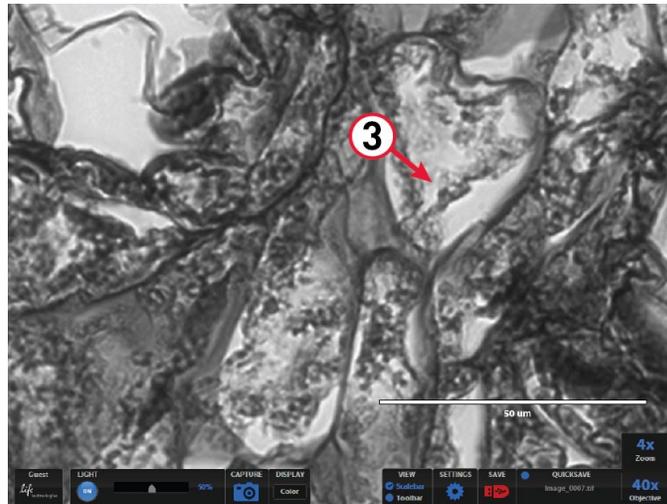


Captured image at 40x magnification, with scalebar



Captured 40x image zoomed 2x

- In the enlarged image, double-click again on any point **3** to double the digital zoom level. The enlarged image will center around the point clicked.



Captured 40× image zoomed 4×

- 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 8×

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



Note: Capturing and saving a zoomed image will result in a file showing the actual magnification, not the zoomed magnification. If the scalebar is active, it will appear in the file.

Connecting 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.

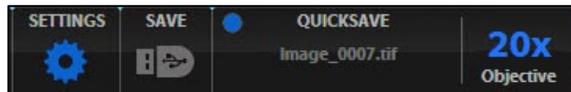
Items Needed for Ethernet Connection

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

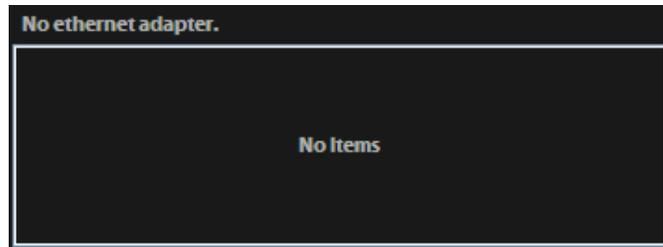
- ▶ Ethernet cable
- ▶ USB-to-Ethernet adapter

Logging 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 Life Technologies logo in the bottom left corner of the screen. See “Logging In/Creating New User Logins” (page 15) for more information.
3. Click the **Settings** button to open the Settings dialog box, and 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.”

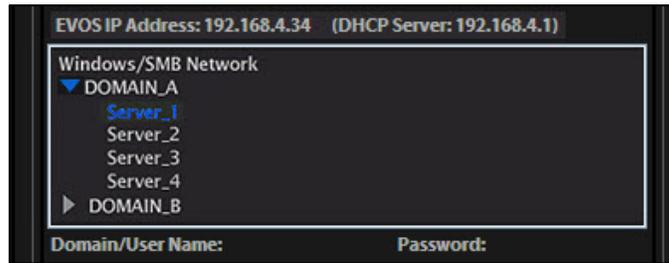


Double-check the physical connections and click **Refresh Network**. During the refresh, a progress icon will appear.

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**.

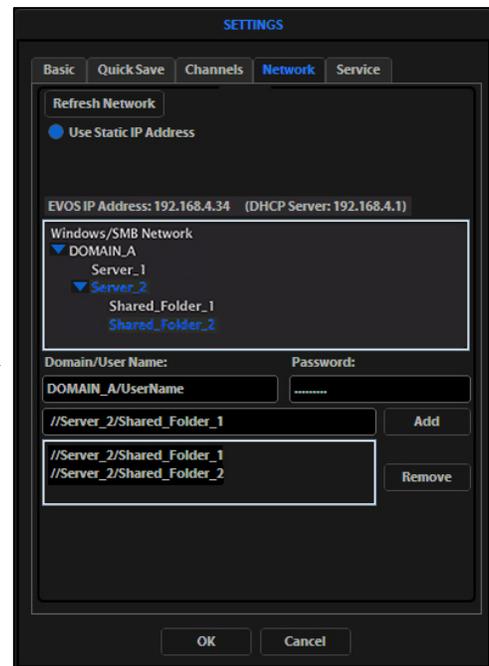
- The upper list box of the Network page will display the top level (available domains) of the Windows/SMB network file tree. Click the **triangle icon**, or double-click the **domain name**, to expand a domain and display the available servers.



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.

- Enter your network domain, user name, and password in the login fields and select a server to view the top level of shared folders on that server. You may now navigate below the top-level shared folders on the Network page.
- After the server accepts your login, EVOS® XL Imaging System will display the list of available shared folders on the selected server. Select a shared folder and click **Add** to include it in the list of possible file destinations.

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



Note: You may 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 his or her own EVOS® user ID. See “Logging In/Creating New User Logins” (page 15) for more details on EVOS® user IDs.

Your EVOS® user ID will remember your network login (it is encrypted in the instrument’s non-volatile memory). All your connections and login information will be hidden from other EVOS® user profiles.

- If you need to remove a shared folder from the destinations list, select the folder name and click **Remove**.
- Click **OK** to close the Settings dialog box.

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

All your selected network destinations, as well as any USB flash drives currently plugged in, will appear in the Browse popup. These locations will also be available in the Save dialog box and through the Browse button in the Time Lapse and Image Review tools.



Updating Software

Periodically, Life Technologies 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 56).

Download Software Update

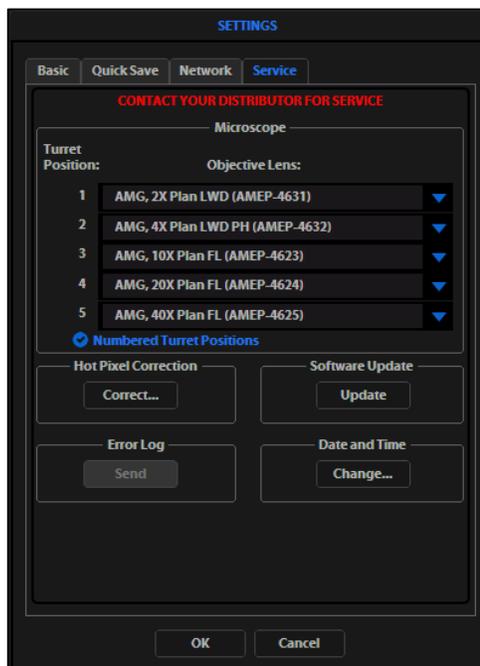
Software updates are available from the EVOS® XL Imaging System product page at www.lifetechnologies.com/evosxl.

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 process.
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.

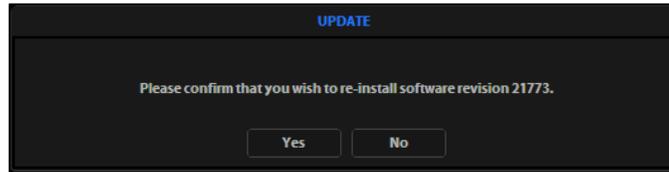
Alternatively, you can get the latest software and documentation updates from your local EVOS® distributor or by contacting Technical Support (page 56).

Install Software Update

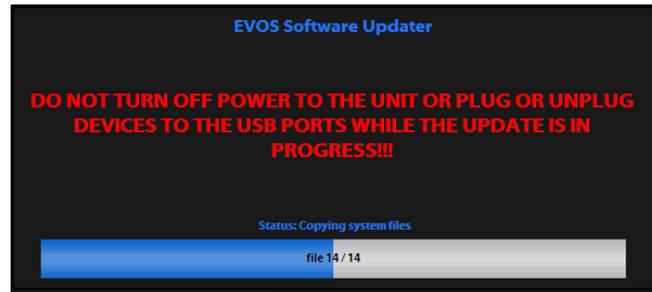
1. Plug the USB stick into the data port on the lower right side of the EVOS® support arm.
2. Click **Settings** to open the Settings dialog box, and then select the **Service tab**.
3. Click **Update** in the **Service tab**. A verification progress bar should appear. If a missing update notification pops up, be sure the USB with the update file is fully plugged in. Click **OK** and then click **Update** again.



- After file verification, an update confirmation dialog will pop up. Check the revision details and click **Yes** to start the update.



- The screen will display update progress. When the update is complete, the main EVOS® screen will reappear.

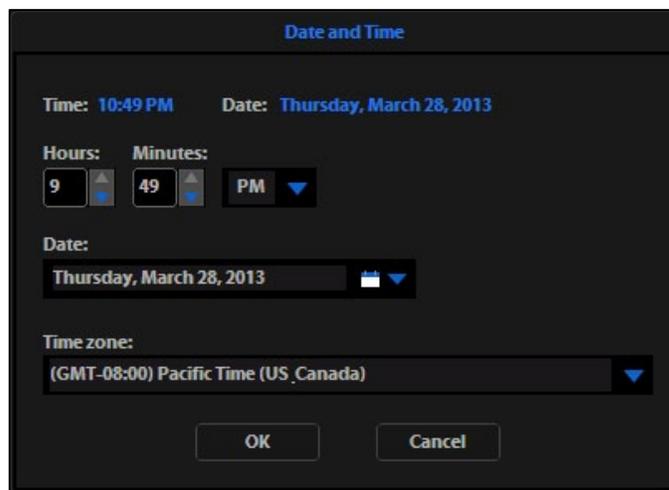


IMPORTANT! Do not power off, unplug the USB stick, or add/remove any devices during the update.

Setting 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.

- Click **Settings** to open the Settings dialog box, and then select the Service tab.
- Click the **Change** button under **Date and Time** in the Service tab.
- In the Date and Time popup, use the **arrows** and the **drop-down menus** to set the time, date, and time zone.



- Click **OK** in the Date and Time popup.
- Click **OK** in the Settings dialog box. The new settings will take effect immediately.

5. Controls Glossary

This section lists all the onscreen and mechanical controls in detail. To see the most commonly used controls in context, see “Quick Reference Diagrams” (page 10).

 **Note:** This glossary is not alphabetized. Onscreen items are listed from left to right.

Onscreen Controls

Login Button

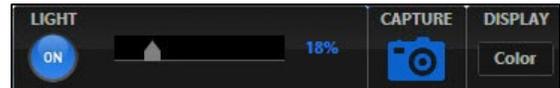
The **Login** button (Life Technologies logo, bottom left) allows for logging in and creating or changing user profiles. This button also displays the current user profile (in this example, “Guest”).



Left Control Bar

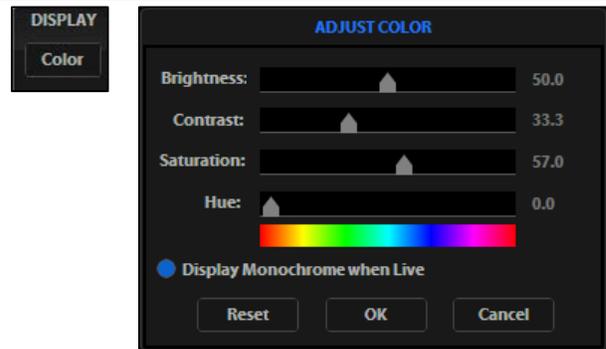
The following functions are available in the **left control bar** (bottom left):

- LIGHT ON button
- Illumination slider
- Image capture button
- Color Adjustment button



Adjust Color Dialog Box

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



Right Control Bar

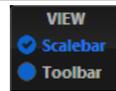
The following functions are available in the **right control bar** (bottom right):

- ▶ View: Scalebar option
- ▶ View: Toolbar option
- ▶ Settings button
- ▶ Save button
- ▶ QuickSave option
- ▶ Objective selected display



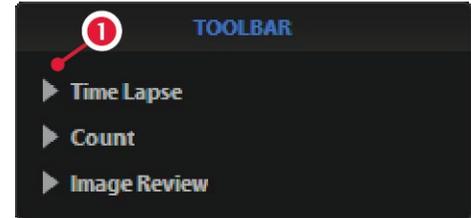
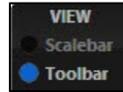
View: Scalebar Option

The **Scalebar** option (right control bar) is a toggle button that displays or hides the Scalebar tool. This option is only available after an image is captured. To move the Scalebar, simply 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 to open each tool.



Time Lapse Tool

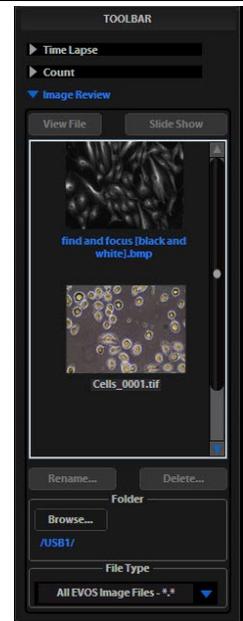
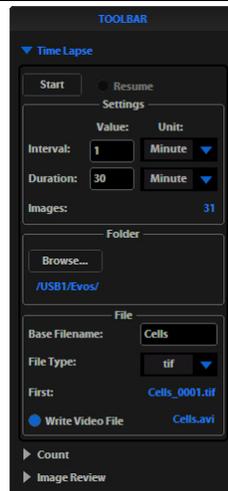
The **Time Lapse** tool allows you to set up the interval/duration and the file name/destination for time lapse sessions. See "Recording Time Lapse Images", page 21.

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 "Counting Cells", page 24.

Image Review Tool

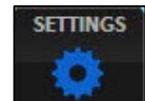
The **Image Review** tool allows you to review still images or play video files from the USB drive or network connection. You may also use this tool to rename or delete saved files. See "Reviewing Images", page 25.



Settings Buttons

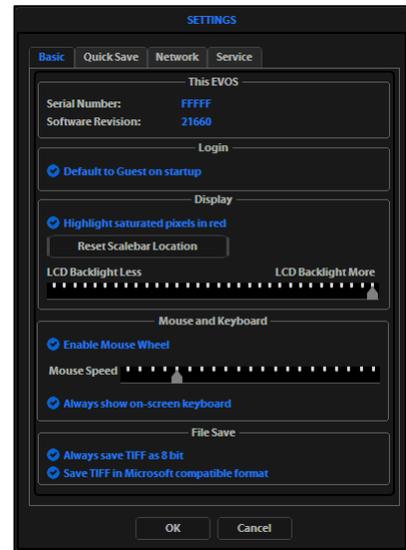
The **Settings** button (right control bar) opens the Settings dialog box. Within the Settings dialog box, the following options are available:

- ▶ 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 Scalebar Location** moves the Scalebar 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

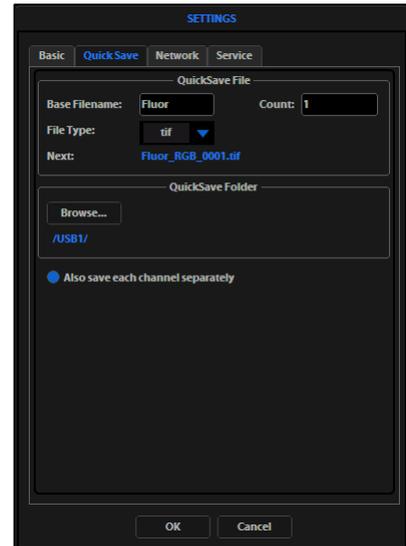
(Not shown)

Allows you to set up connections to shared folders via Ethernet. See "Connecting the EVOS® XL Imaging System to a Network", page 29.

Service Tab

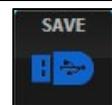
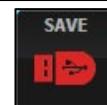
(Not shown)

Allows for maintenance functions; contact your distributor if service is needed.



Save Button

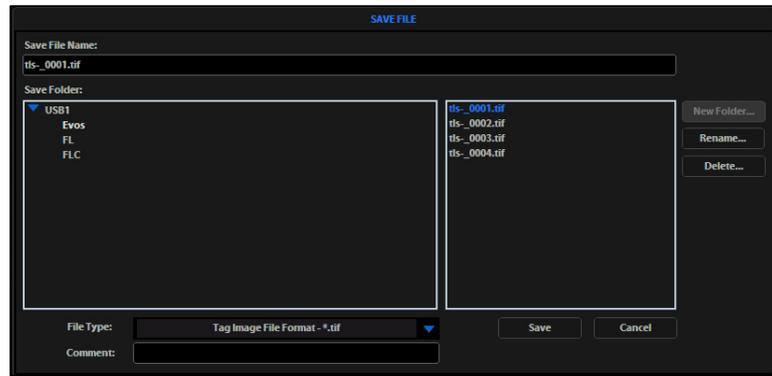
The **Save** button (right control bar) saves the current image to the USB flash drive or network folder. A red USB icon indicates that the current image has not been saved yet. After a file is saved, the USB icon turns blue.



Save File Dialog Box

The **Save File** dialog box (popup) allows options for naming and filing captured images. The following items are available in the Save File dialog box:

- ▶ **Save File Name** text 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: Drop-down menu allows .tif, .png, .jpg or .bmp formats.
- ▶ **Comment** text field: Click to enter a comment and date (optional).



Virtual Keyboard

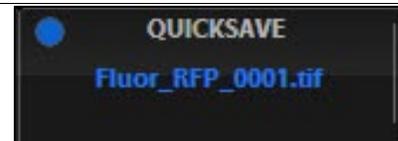
The **Virtual keyboard** popup allows text entry anytime a text field or text-related button is selected. Where applicable, a Date button is available to include the current date in the text field. Click the Accept button when you have finished entering the text.



Note: You may plug in a USB keyboard for text input. When a keyboard is connected, the virtual keyboard will not pop up 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 36.



Selected Objective

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



Selected Objective



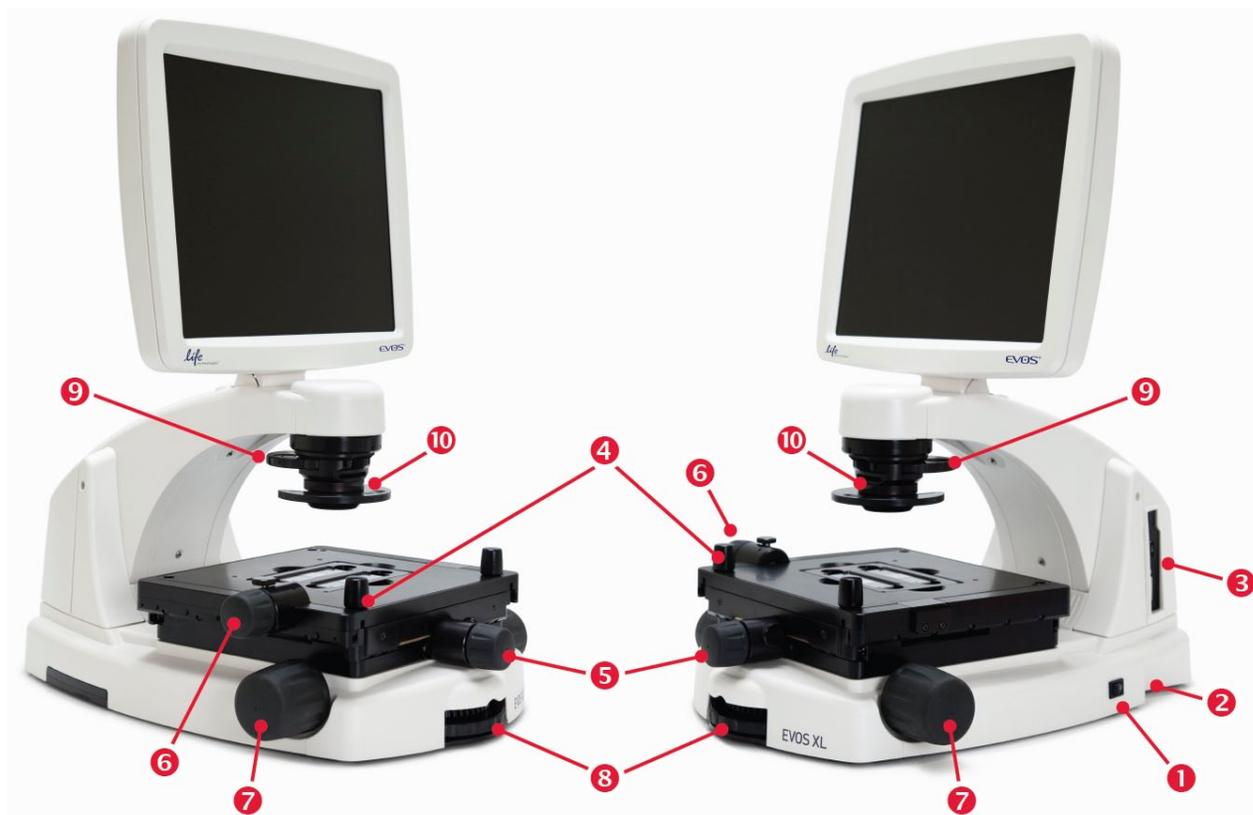
Objective turret between positions

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 an image.



Mechanical Controls



- | | |
|----------------------------------|-----------------------------|
| 1 Power switch | 6 Stage Y-axis knob |
| 2 Power input jack | 7 Focusing knobs |
| 3 USB and DVI ports | 8 Objective selection wheel |
| 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 specimen 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 specimen 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 specimen 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.

Focusing Knobs Use the focusing knobs to bring the specimen into focus.

Objective Selection Wheel Turn the objective selection wheel to change magnifications. The objective turret will click 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 will click 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 box, the mouse scroll wheel will adjust the illumination intensity. Roll the scroll wheel away from you for brighter illumination, or roll it toward you for dimmer illumination.

6. 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 indicated in the Sterilization Procedures below.
- 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 Life Technologies.
- 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 dampened with 70% ethanol.
- When moving EVOS® XL Imaging System, be sure to lock the stage with the stage lock pin as shown on page 6 to prevent the stage from sliding.

Sterilization Procedures

To sterilize the EVOS[®] XL Imaging System, please 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, focusing knobs, objective selection wheel, housing) with paper towels or Kimwipes dampened with 70% ethanol or 4,000 ppm hydrogen peroxide (H₂O₂).



IMPORTANT! Do not allow sterilization 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 sterilization 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 sterilize the condenser, do not apply 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 sterilization 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 www.lifetechnologies.com/evos or contact Technical Support (see page 56).

Image Quality Issues

| Problem | Possible Solutions |
|--|---|
| Image is too dim (at higher magnifications) | <ul style="list-style-type: none">• Set the phase annuli selector to the BF position.• Remove condenser slider, if one is in place. |
| Specks, dots, or blurs on image | <ul style="list-style-type: none">• Follow instructions under “Objective Lens Care” (page 40) to clean objectives. |
| Uneven focus across screen | <ul style="list-style-type: none">• Position specimen so that it lies flat on the stage; be sure the specimen’s thickness is even. |
| Difficulty focusing on coverslipped specimen on standard slide | <ul style="list-style-type: none">• 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 | <ul style="list-style-type: none">• 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 specimen over objective.• Verify power supply is connected and power switch is on. |
| LCD screen is red, or red patches cover parts of the screen | <ul style="list-style-type: none">• 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 “Updating Software”, page 32, for more information.

| Problem | Possible Solutions |
|--|--|
| Image does not respond to changes in focus or stage position | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> Verify that the objective selection wheel is clicked into a position. |
| Scalebar does not appear when clicked | <ul style="list-style-type: none"> Capture image first; scalebar is only available after capturing an image. |
| Save button does not respond when clicked | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> Remove stage lock pin. Check stage brakes (on the stage knobs) and loosen as needed. |
| Vessel does not sit securely on moving stage | <ul style="list-style-type: none"> 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 online at www.lifetechnologies.com/evosxl or by contacting Technical Support (see page 56).). |
| Mechanical stage drifts during time lapse sessions | <ul style="list-style-type: none"> Tighten the stage brakes (on the stage knobs) before starting a time lapse session (see page 21). |
| Mechanical stage tension is loose | <ul style="list-style-type: none"> Tighten the stage brakes (on the stage knobs) as desired to increase tension. |

Appendix B: Specifications



Note: Specifications are subject to change without notice. Go to the EVOS® XL Imaging System product page online (www.lifetechnologies.com/evosxl) to download the latest production information.

| | |
|-----------------------------------|---|
| 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 (see page 56). 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 | <ul style="list-style-type: none"> • 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 100-240V, 50-60Hz; Output 12 VDC/4.15A  |
| 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: 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 Life Technologies 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 Life Technologies 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 Life Technologies instruments (see “Safety Symbols” on page 48).

Symbols on Instruments

Electrical Symbols on Instruments

The following table describes the electrical symbols that may be displayed on Life Technologies 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 Life Technologies instruments. Each symbol may appear by itself or in combination with text that explains the relevant hazard (see “Safety Labels on Instruments” on page 49). 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 Life Technologies electrical and electronic products placed on the European market after August 13, 2005.

| Symbol | Description |
|---|--|
|  | <p>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).</p> <p>European Union customers: Call your Customer Service representative for equipment pick-up and recycling. See www.lifetechnologies.com for a list of customer service offices in the European Union.</p> |

Safety Labels on Instruments

The following CAUTION, WARNING, and DANGER statements may be displayed on Life Technologies 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 réglementation 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 Life Technologies 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 Life Technologies. |
|  | 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 Life Technologies 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)” on page 56.

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)” on page 56.)
- 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/bmb14/bmb14toc.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 Life Technologies.

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, go to www.lifetechnologies.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 (techsupport@lifetech.com)
- 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 www.lifetechnologies.com/sds.



IMPORTANT! For the SDSs of chemicals not distributed by Life Technologies 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.lifetechnologies.com/termsandconditions. If you have any questions, please contact Life Technologies at www.lifetechnologies.com/support.

Headquarters

5791 Van Allen Way | Carlsbad, CA 92008 USA | Phone +1 760 603 7200 | Toll Free in USA 800 955 6288

For support visit lifetechnologies.com/support or email techsupport@lifetech.com

lifetechnologies.com

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