USER GUIDE

EVOS® XL Core

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 Core 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 28).

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 36.

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

1. Setup

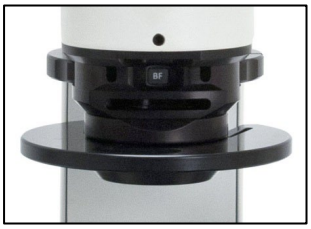
Standard Items Included

Before setting up your new EVOS® XL Core 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 36).

- EVOS® XL Core Imaging System, includes fixed stage* and 4X / 10X / 20X objectives
- Wireless mouse
- Power adaptor
- USB flash drive (includes User Guide and Quick Start Guide)
- Condenser shield, removable
- Glass stage plate (packed in bubble wrap)
- Dust cover

* The attachable Mechanical Stage is an optional feature available separately from Life Technologies. For ordering information, contact your distributor or Technical Support (see page 36).





Condenser shield, removable

Operating Environment

- Place the instrument 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 LCD housing to allow for proper ventilation and prevent overheating of electronic components.
- Set up the EVOS® XL Core 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°C–32°C (40°C–90°F).
- Relative humidity range: 30–90%.

IMPORTANT! EVOS® XL Core 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.

Power Supply

1. Turn the power switch ❶ to the "O" (OFF) position before connecting the power adapter.
2. Connect the power adapter ❷ to the power jack on the back of the instrument base and plug the cord into an outlet.

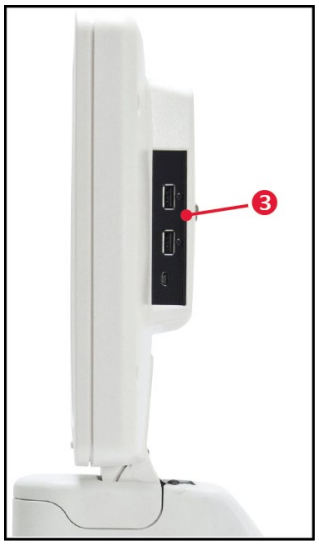




IMPORTANT! Always use the correct power supply. The power adapter specifications appear on the serial number label and in "Appendix B: Specifications" (page 22). Damage due to an incompatible power adapter is not covered by warranty.

Wireless Mouse and USB Flash Drive

1. Plug the mouse receiver into either of the USB ports ❸ located on the LCD back (right side).
2. Follow the mouse manufacturer's instructions to install the battery, and then switch on the mouse.



USB Flash Drive

Insert a USB flash drive into the remaining USB port located on the LCD back (right side).

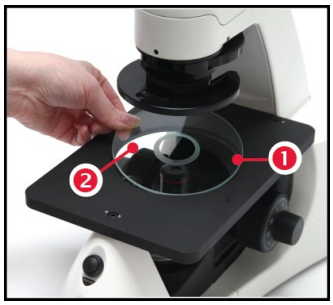
Note: If the flash drive has a data lock feature, be sure it is unlocked.

Optional: Attachable Mechanical Stage

Follow the procedure in "Appendix C: Installing the Attachable Mechanical Stage" (page 23) to install the mechanical stage.

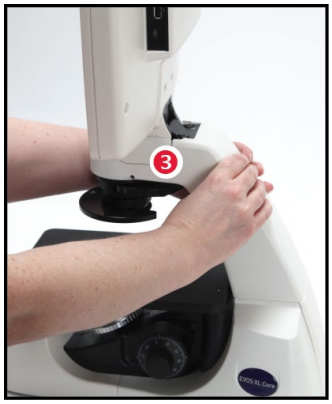
Glass Stage Plate

Unpack the glass stage plate ❶ and insert it into the stage opening ❷ (if a mechanical stage is installed, move it all the way back to expose the stage opening).



Moving/Transporting EVOS®

1. Remove glass stage plate ❶ and carry it separately.
2. Lift the instrument by grasping it firmly with both hands under the support arm ❸, balancing the weight as shown below.
3. To transport EVOS® XL Core 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! EVOS® XL Core Imaging System should not be subjected to sudden impact or excessive vibration. Handle the instrument with care to prevent damage.

Installing EVOS® in a Cell Culture Hood

The small footprint of the EVOS® XL Core Imaging System, its simple power connection, and its easily-viewed display make it quick to install and convenient to use in a cell culture hood.

Dimensions

The EVOS® XL Core Imaging System will fit in cell culture hoods that are at least 18 inches (457 mm) deep. If your cell culture hood is smaller, it may be necessary to turn the instrument at a slight angle to fit.

	ENGLISH	METRIC
DEPTH	16.0 in	40.6 cm
WIDTH	12.5 in	31.8 cm
HEIGHT, TRANSPORT	13.5 in	34.3 cm
HEIGHT, DISPLAY	21.0 in	55.3 cm

Installation

Note: See the illustrations on page 8 for more details about moving the EVOS® XL Core Imaging System.

1. Remove the glass stage plate and carry it separately.
2. Switch the EVOS® XL Core Imaging System off and disconnect the power cord.
3. Tilt the LCD screen back until it is nearly parallel with the tabletop.
4. Lift the instrument by grasping it firmly with both hands on the support arm just behind the condenser.
5. Gently place the instrument on a lab cart and transport it to the cell culture hood.



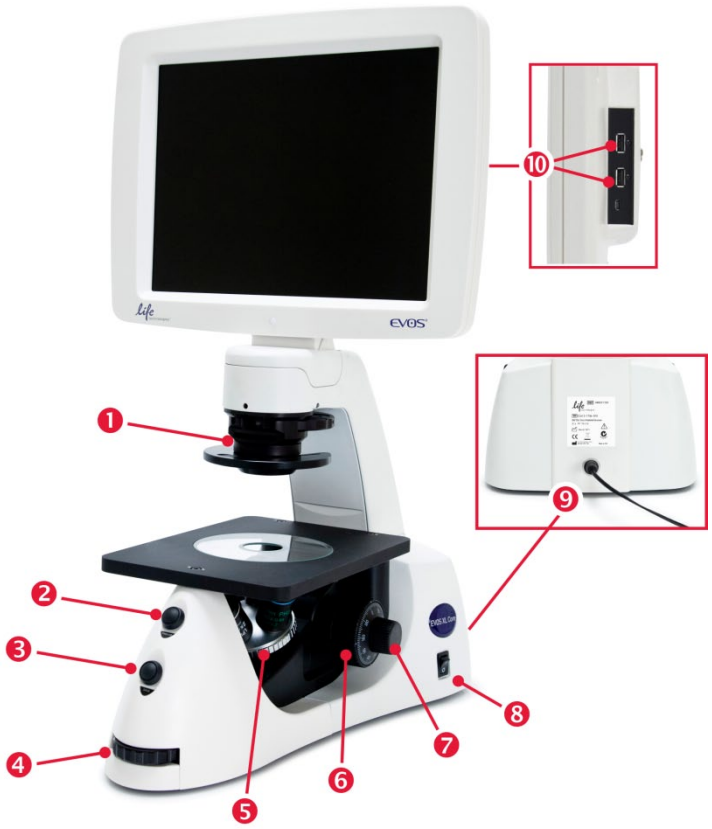
Note: Verify that the hood sash is raised enough for the instrument to slide underneath (approximately 14.5 inches or higher).

6. Lift the instrument as before and move it into the hood.
7. Tilt the LCD monitor upright.
8. Replace the glass stage plate, connect the power cord, and switch the EVOS® XL Core Imaging System ON.

2. Quick Reference: Instrument Contols

Note: See "Controls Glossary" on page 16 for more details about onscreen and manual controls.

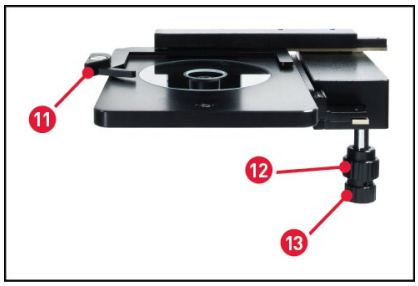
Manual Controls



1. Phase turret
2. Freeze button
3. Save button
4. Illumination wheel
5. Objective turret
6. Coarse focus knob
7. Fine focus knob
8. Power switch
9. Power input jack
10. USB ports

Mechanical Stage Controls

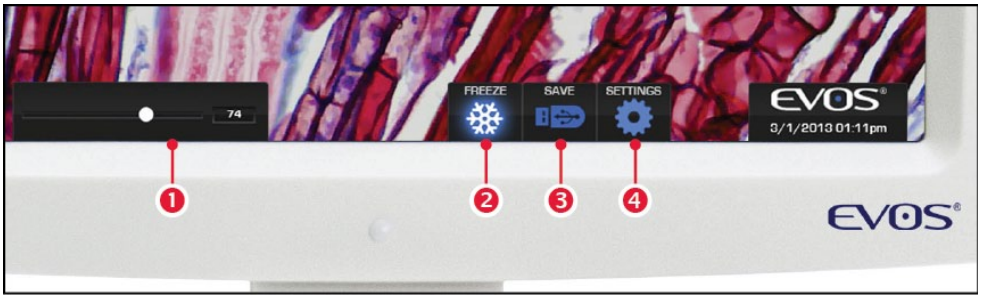
The attachable mechanical stage is an optional feature. See "Appendix C: Installing the Attachable Mechanical Stage" (page 23) for installation and removal.



11. Stage clip
12. Stage Y-axis knob
13. Stage X-axis knob (mechanical stage)

Onscreen Controls

Roll over the bottom of screen with the mouse to activate the onscreen controls.



1. Illumination Slider
2. Freeze/Live toggle
3. Save button
4. Settings button

Note: Onscreen controls are only available when a mouse is installed.

3. Operation

Basic Operation

The EVOS® XL Core Imaging System has both manual and onscreen operation controls. Manual controls include the illumination wheel, focus knobs, freeze and save buttons, objective turret, and the mechanical stage X-Y axis knobs.

Onscreen controls appear at the bottom of the screen when the mouse rolls over the controls area (see page 11). Using a mouse is optional; you can operate the EVOS® XL Core Imaging System using only manual controls.

Note: See "Quick Reference: Instrument Controls" (page 10) for the location of the instruments controls, as needed. See also "Controls Glossary" (page 16) for more details.

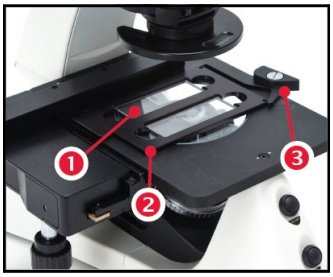
1. Turn on the instrument using the power switch on the right side of the instrument base.

   Note: Startup takes approximately one minute. If the display remains black after startup, adjust the illumination slider or wheel to turn on the illumination.

2. Plug a USB flash drive into one of the USB ports on the right side of the LCD.
3. Place slides with coverslips face up on the sample stage.

   For fixed stage models, place the sample vessel directly on the glass stage plate.

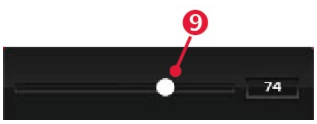
   For mechanical stage models, secure the sample ❶ in a vessel holder ❷ with the stage clip ❸ over the stage plate.



   Note: Refer to **www.lifetechnologies.com/evosxlcore** or contact Technical Support (page 36) for a list of vessel holders available for separate purchase.

4. Set the objective turret ❹ to the desired magnification.
5. Turn the phase turret to the position ❺ that corresponds to the selected objective and contrast method.
6. Bring the sample into focus using the coarse ❻ and fine-focus ❼ knobs.
7. Adjust the illumination intensity if necessary, using the illumination wheel ❽ or the onscreen illumination slider ❾.





8. Use the manual ❶ or the onscreen ❸ Freeze/Live toggle to acquire the image.
9. Use the manual ❷ or the onscreen ❹ Save button to save the image.
10. If you use the onscreen button and Quick Save is not enabled, the virtual keyboard will pop up so you can enter a file name (Quick Save is automatically enabled with the manual save button).

    During the save process, the Save File indicator will appear onscreen. Wait until the file is completely saved before operating any manual or onscreen controls or removing the USB drive.
11. Click the onscreen Freeze/Live toggle or the manual Freeze button to return to live viewing.





Note: The onscreen Freeze/Live toggle ❸ switches between Freeze and Live settings. Click **Freeze** to capture an image before saving it. Click **Live** to return to real-time viewing.



Note: To set up Quick Save and/or specify the file format, see "Settings" (page 14).

Settings

The Settings popup provides various controls to customize display performance and image file names and formats.



The Settings button 1 toggles to display or hide the Settings popup.

Note: If the power is switched off before saving the settings, the system will revert to the most recently saved settings.

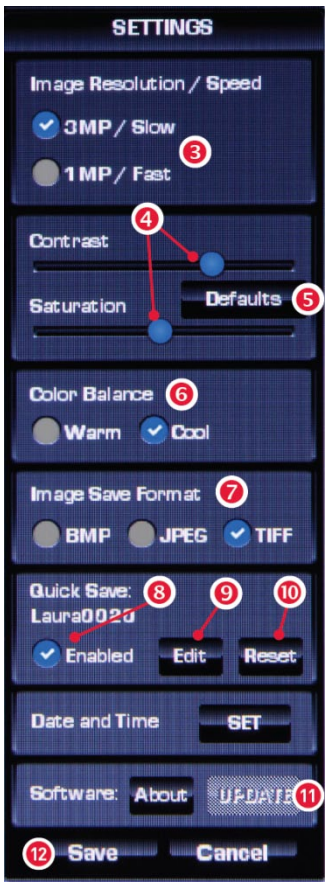


Image Resolution/Speed

These buttons 3 provide two optimized settings:

- 3MP/Slow produces sharper onscreen images
- 1MP/Fast is helpful for quick scanning

Contrast & Saturation

Use the sliders 4 to customize these display attributes. The changes will appear immediately, but they will not be saved unless you click the Save button 12 at the bottom of the popup.

The Defaults button 5 will reset contrast and saturation levels to factory settings.

Color Balance

Click these buttons 6 to adjust the color balance. Changes will appear immediately, but they will not be saved unless you click the Save button 12 at the bottom of the popup.

Image Save Format

Select a file format (.tif, .jpg or .bmp) for saving your image using these buttons 7.

Quick Save Settings

The Quick Save option 8 allows for a custom base file name; each file name also includes a three-digit sequence number.

When Quick Save is enabled, a single click of the onscreen Save button 2 saves the file under the custom base file name. The manual Save button (see previous page) uses the same base file name.

1. In the Settings menu, click the Edit button 9 under the Quick Save option and enter the base file name in the virtual keyboard.

Note: To prevent the system from overwriting files, Quick Save will use the next available sequence number if the USB installed contains any files with the same base file name.

2. To reset the sequence to zero, click the Reset button 10.
3. Click the Enabled button 8 to enable or disable the Quick Save option.

Software Update

The Update button 11 is inactive unless a USB drive with an update is installed. See "Software Updates" (page 15) for update instructions.

Software Updates

Periodically, Life Technologies adds functionality and other improvements to the EVOS® user interface. We recommend keeping your EVOS® XL Core 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 36).

Download Software Update

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

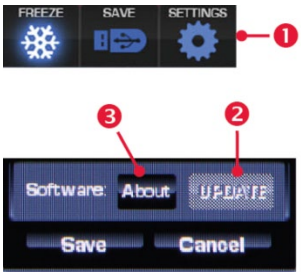
Download the update directly to the top level of a USB flash drive with at least 30 MB available. Do not open or rename the file on your computer; EVOS® XL Core Imaging System will verify and install it during the update process.

Download the current user guide for the EVOS® XL Core 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 36).

Install Software Update

1. Plug the USB flash drive into either one of the USB ports located on the LCD back (right side).
2. Click the Settings button ❶ to display the Settings popup.
3. Click the Update button ❷ near the bottom of the Settings popup and follow the onscreen instructions.



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

4. When update is done, reboot the system by powering it off and on.
5. Click the About button ❸ to confirm you are running the current software version.

4. Controls Glossary

Note: This section describes all the onscreen and manual controls in detail. To see the most commonly used controls in context, see "Quick Reference: Instrument Controls" (page 10).

Onscreen Controls

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

Illumination Slider

The illumination slider controls the illumination intensity when the mouse is installed. To turn off illumination, slide all the way to the left.



Freeze/Live Button

The Freeze/Live button toggles between Freeze and Live settings. Click **Freeze** to capture an image before saving it. Click Live to return to real-time viewing.



Save Button

The Save button saves the current frozen image to USB flash drive. The icon is gray when no USB is plugged in. A green USB icon indicates that a flash drive has been inserted. A red USB icon indicates that a save is in progress and the flash drive should not be removed. After the file is saved, the USB icon will turn back to green and the flash drive is safe to remove.



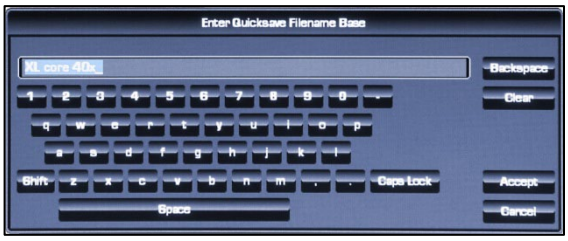
Settings Button

The Settings button displays or hides the Settings popup. See "Settings" (page 14) for an itemized explanation of the Settings popup options.



Virtual Keyboard

The virtual keyboard popup allows text entry for file names. Click the **Accept** button when you have finished entering the file name. The Clear button resets the text field.



Onscreen clock

The onscreen clock shows date and time and can easily be set. Double click on the time to reveal the settings and simply use the **+** or **–** icons to increase or decrease the values. Click **Set** to save changes.



Manual Controls

This glossary is not alphabetized. Manual controls are listed in the order they are normally used, with a separate section for the optional Attachable Mechanical Stage (page 24).

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 Ports	Plug the mouse and USB flash drive into the USB ports.
Illumination Wheel	Use the illumination wheel to control illumination intensity.
Coarse & Fine Focus Knobs	Use the coarse focus knobs and fine focus knobs to bring the specimen into focus.
Coarse Focus Tension Control Ring	Turn the coarse focus tension control ring clockwise (toward the back of the instrument) to tighten the tension. Turn the ring counterclockwise to loosen the tension.
Objective Turret	Turn the objective turret to change magnifications. The objective turret clicks into place at each position.
Phase Turret	Set the phase turret 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 (for brightfield observations) • 4/10 PH (for phase observations at 4× or 10×) • 20/40× PH (for phase observations at 20× or 40×)
Freeze & Save Buttons	Use the Freeze button to capture an image before saving and return to live view after saving. The Save button saves the file with the current settings (Quick Save base file name and selected image format).
Mouse Scroll Wheel (not shown)	Unless the cursor is over a popup, the mouse scroll wheel can control illumination intensity. Roll the scroll wheel away from you for more illumination or toward you for less.

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 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 or contact Technical Support (page 36) 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 surface as needed with paper towels dampened with Kimwipes or 70% ethanol. You may remove the mechanical stage (if installed) for cleaning. See "Appendix B: Installing the Attachable Mechanical Stage" (page 23) for removal and installation instructions.

Sterilization Procedures

To sterilize the EVOS® XL Core 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 (stage top, focus knobs, objective turret, housing) with paper towels or Kimwipes dampened with 70% ethanol or 4,000 ppm hydrogen peroxide (H_2O_2).

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 Core Imaging System. Always wipe surfaces wit*h 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 Core Imaging System should not be subjected to UV sterilization. UV degrades many materials, including plastic. Damage from UV exposure is not covered un*der the manufacturer's warranty.*

Appendix A: Troubleshooting

Image Issues

Problem	Possible Solutions
Image is too dim, even at brightest setting (particularly at higher magnifications)	• Set the phase turret to the BF position. • If a condenser slider from a different EVOS® instrument has been inserted into the condenser, remove the slider. It is not necessary to use sliders with this instrument.
Specks, dots, or blurs on image	• Follow the instructions under "Objective Lens Care" (page 18) to clean the objectives.
Uneven focus across screen	• Position the 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	• 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	• If the image is black but the blue LED below the LCD screen is on, adjust the illumination slider or wheel. • Move the objective turret so that light shines through the objective. • Verify that the phase turret on the condenser is not stuck between settings. • Center the specimen over the objective. • Verify the power supply is connected and the power switch is on (the blue LED below the LCD screen indicates that the power is on).
Image does not respond to changes in focus or stage position	• Click the LIVE button to return to real-time observation (note that a red USB icon on the Save button indicates there is an unsaved frozen image, which will be lost unless it is saved before clicking LIVE).
Onscreen Save button does not respond when clicked	• If the USB icon on the Save button appears gray, plug in a USB. If the system does not recognize a USB that is already plugged in, the problem is likely with that particular USB's format, unless the flash drive's data lock is set. Either unlock the flash drive or try using different USB.
Onscreen controls are absent	• Follow instructions under "Wireless Mouse" (page 7) to install the wireless USB mouse. The onscreen controls are only active when a mouse is installed. • Roll over the bottom of the screen with the mouse to activate the onscreen controls.
Mouse does not work	• See "Mechanical Issues" (page 21).

Mechanical Issues

Problem	Possible Solutions
Entire mechanical stage shifts loosely over fixed stage	• Tighten screws under stage. See "Appendix B: Installing the Attachable Mechanical Stage" (page 23).
Vessel does not sit securely when mechanical stage moves	• Use the correct vessel holder for the application (refer to the EVOS® Vessel Holders spec sheet, in the documentation USB included with the instrument packaging).
Mouse does not work	• Verify the wireless mouse receiver has not been removed from the USB drive. • Check the battery and replace as needed. • Remove any nearby wireless devices that may be interfering with the mouse's signal.



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 (page 36).

Appendix B: Specifications

Model	EVOS® XL Core Imaging System (Cat. no. AMEX1100) 
Optics	Infinity-corrected optical system; RMS-threaded objectives with 45 mm parfocal distance
Objectives	4× / 10× / 20×; Plan LWD Phase, infinity optional 2× (no phase) & 40× Ph available
Objective turret	4-position; manual control
Illumination	LED (50,000+ hour life); adjustable intensity
Contrast Methods	Transmitted light (brightfield and phase contrast)
Condenser	3-position turret for brightfield and phase contrast; 60 mm working distance
Stage	Fixed stage (optional mechanical stage available)
Focus Mechanism	Coaxial focus knobs with tension control Coarse focus: 38 mm/rev Fine focus: 0.2 mm/rev, precision 0.002 mm
LCD display	12.1-inch color, 1024 × 768 pixels; adjustable tilt
Camera	1/2-inch, 2048 x 1536, 3.1 Megapixels, COLOR
Image acquisition	Embedded operating system with imaging software for image capture and save via mouse or front-mounted manual buttons
Captured images	24 bits/pixel, full color TIFF, JPG or BMP 2048 × 1536 pixels
Output ports	2 USB 2.0 ports
Power supply	AC Adapter; Input 100-240V, 47-63Hz; 0.58A max; Output 12 VDC/2.0A 24W max
Dimensions	Operating height: 53.3 cm (21.0 in) Storage/transport height: 36.8 cm (14.5 in) Depth: 40.6 cm (16.0 in) Width: 31.8 cm (12.5 in)
Weight	9.1 kg (20.1 lbs)

Appendix C: Installing the Attachable Mechanical Stage

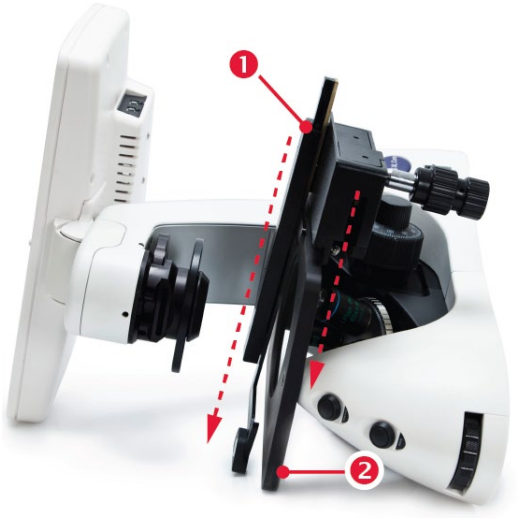
The mechanical stage is an optional accessory. You may purchase it separately for use with the EVOS® XL Core Imaging System.

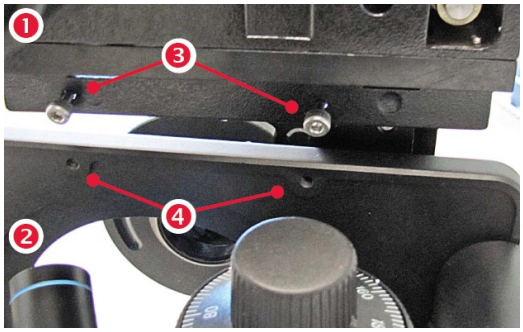
Refer to the product page **www.lifetechnologies.com/evosxlcore** or Technical Support for more information (see page 36).

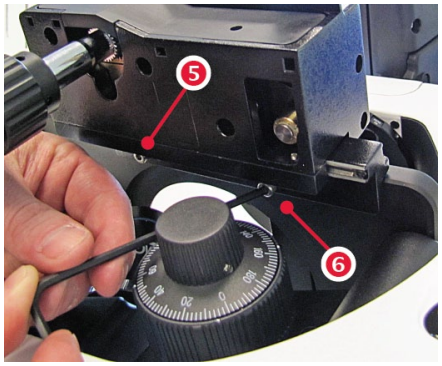
Installation/ Removal

Follow this procedure to attach the mechanical stage to the fixed stage. To remove the stage, do the steps in reverse order.

5. Remove the glass stage plate (not shown) and set aside.
6. Tilt the LCD all the way back and gently lay the instrument on its left side.
7. Slide the mechanical stage ❶ into position over the right side of the fixed stage ❷ .
8. Align the mechanical stage so that the two screws ❸ under the mechanical stage ❶ align with two holes ❹ under the fixed stage ❷ .
9. Tighten the left screw ❺ by hand first.
10. Use the hex key to tighten the right screw ❻ (behind the focus knob). Then fully tighten the left screw ❺ with the hex key.
11. Stand the instrument upright.
12. Replace the glass stage plate. See “Glass Plate” (page 8) for details.



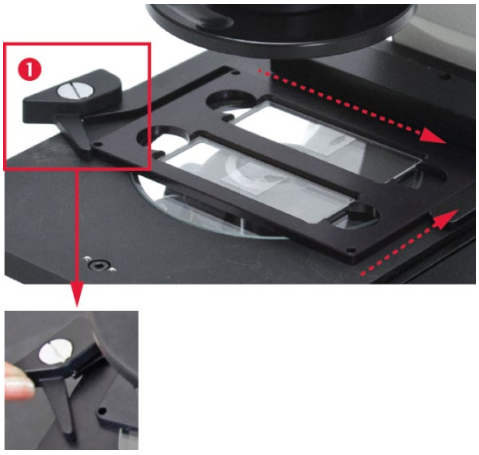




Stage Clip

Use the stage clip to secure vessel holders or large samples (i.e., a T-75 flask or multi-well vessel) to the mechanical stage. When properly secured, the sample moves with the stage as you turn the X-axis and Y-axis knobs.

1. Pull the stage clip ❶ open and place the vessel holder or sample in the back right corner of the mechanical stage opening. Verify that the edges are straight and the sample is level.
2. Gently release the stage clip to free the vessel holder.



Stage Y-Axis Knob

Use the stage Y-axis knob ❷ for front-back movements to position the specimen within the field of view.

Stage X-Axis Knob

Use the stage X-axis knob ❸ for left-right movements to position the specimen within the field of view.



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
- Laser 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 28).

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 29). 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
	**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. Go to **www.lifetechnologies.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 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 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 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 (SDSs)” on page 36.

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 (SDSs)" on page 36.)
- 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 Core 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 Core 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 Life Technologies.

Australian EMC standards

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

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**.

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