

EVOS™ FL and EVOS™ FL Color Imaging Systems

For Fluorescence and Transmitted Light Applications

Catalog Numbers AMF4300, AMEFC4300

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A.0	09 October 2017	Update branding, legal/regulatory language, reorganize content.
1.0	08 April 2013	Basis for this revision.

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About this guide

Audience	This user guide is for laboratory staff operating, maintaining, and analyzing data using the EVOS™ FL or the EVOS™ FL Color Imaging Systems.
User attention words	Three user attention words appear in this 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.



This symbol indicates information specific to the color camera version.

The EVOS™ FL Imaging System is factory-configured with a monochrome (EVOS™ FL) or color camera (EVOS™ FL Color). Throughout this User Guide, any operational differences between the two versions of the instrument have been noted.

- **Monochrome cameras** are commonly used for high-performance fluorescence applications, and provide the best sensitivity for detection of faint fluorescence signals.
 - **Color cameras** have lower fluorescence sensitivity but have the advantage of being able to differentiate structures by color in transmitted light (for example, imaging stained tissue samples).
-

Safety Alert Words	Four safety alert words appear in Thermo Fisher Scientific user documentation at points in the document where you need to be aware of relevant hazards. Each alert word— IMPORTANT , CAUTION , WARNING , DANGER —implies a particular level of observation or action, as defined below:
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IMPORTANT! – Provides information that is necessary for proper instrument operation, accurate installation, or safe use of a chemical.



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



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



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

Except for **IMPORTANT!** safety alerts, each safety alert word in a Thermo Fisher Scientific document appears with an open triangle figure that contains a hazard symbol. These hazard symbols are identical to the hazard symbols that are affixed to Thermo Fisher Scientific instruments (see “Safety symbols” on page 52).

1. Product information

Product description

EVOS™ FL Imaging System	<p>The Invitrogen™ EVOS™ FL Imaging System (Cat. No. AMF4300) is a fully integrated, digital, inverted imaging system for four-color fluorescence and transmitted-light applications.</p> <p>It combines precision optics, a 15 inch high-resolution LCD display, and a highly sensitive Sony ICX445 monochrome CCD camera (1280 × 960 pixel resolution, 1.3 Megapixels) to acquire images seamlessly through the intuitive user interface using a mouse for easy control.</p>
EVOS™ FL Color Imaging System	<p>The Invitrogen™ EVOS™ FL Color Imaging System (Cat. No. AMEFC4300) is a fully integrated, digital, inverted imaging system for four-color fluorescence and transmitted-light applications.</p> <p>It combines precision optics, a 15 inch high-resolution LCD display, and a highly sensitive Sony ICX285AQ color CCD camera (1360 × 1024 pixel resolution, 1.4 Megapixels) to acquire color images seamlessly through the intuitive user interface using a mouse for easy control.</p>
Smart LED illumination technology	<p>All EVOS™ fluorescence imaging systems utilize our unique, proprietary LED light cubes. The LED light cubes output remarkable intensity over a short light-path that delivers superior fluorophore excitation. Each light cube contains a precisely matched set of optical components to optimize the position, evenness, and intensity of the light beam. Digitally controlled LED light sources allow adjustment of illumination levels, dramatically improving control over photobleaching. Hard-coated filters give sharper edges and significantly higher transmission efficiencies than traditional soft-coated filters.</p>
Product use	<p>For Research Use Only. Not for use in diagnostic procedures.</p>

Standard items included

- EVOS™ FL or EVOS™ FL Color Imaging System
- Power adapter and power cord
- Dust cover
- USB flash drive (preconfigured with instrument documentation)
- Accessories kit:
 - Mouse
 - Sliders
 - Light shield box
 - UV shield assembly (includes mount, shield, screws, and L-shaped hex key)
 - Light cube access cover (includes LED light cube installation tool; must be installed before using the instrument)
- LED light cube lock
- Condenser shield



Sliders



Light shield box



UV shield assembly



Light cube access cover



LED light cube lock



Condenser shield

Hardware controls



- | | |
|----------------------------------|------------------------------|
| ① Power input jack | ⑨ Stage Y-axis knob |
| ② Power switch | ⑩ Y-axis stage brake |
| ③ Mechanical "glide" stage | ⑪ Condenser slider slot |
| ④ Focusing knobs | ⑫ Monitor |
| ⑤ Objective selection wheel | ⑬ Phase annuli selector |
| ⑥ Stage X-axis knob | ⑭ Light cube selection lever |
| ⑦ X-axis stage brake | ⑮ USB and DVI ports |
| ⑧ Coarse stage positioning knobs | |

Explanation of hardware controls

Power input jack	Plug the power adapter into the power input jack.
Power switch	Set the power switch to “—” to turn the instrument on or “O” to turn it off.
USB and DVI ports	Plug the mouse and flash drive into the USB ports. Use the DVI port for digital output to a projector or other display.
Coarse stage positioning knobs	Use the coarse stage positioning knobs to position the sample within the field of view, particularly at low magnifications.
Stage X-axis knob	Use the stage X-axis knob for fine left-right movements to position the sample within the field of view, particularly at high magnifications.
X-axis stage brake	To secure the stage in place for time-lapse image captures, tighten the X-axis stage brake.
Stage Y-axis knob	Use the stage Y-axis knob for fine front-back movements to position the sample within the field of view, particularly at high magnifications.
Y-axis stage brake	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 sample into focus.
Objective selection wheel	Turn the objective selection wheel to change magnifications. The objective turret will click into place at each position.



Note: An exclamation point will appear instead of the current objective’s magnification if the objective selection wheel is not in position.



In position



Between positions

Light cube selection lever	Move the light cube selection lever to change light channels. The lever will click into place for each of the 4 positions.
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Note: The channel indicator bar across the top of the screen displays the active channels for each lever position.

Phase annuli selector	Set the phase annuli selector to the position that corresponds with your selected objective for phase or brightfield observations. The selector will click into place for each position.
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Condenser slider slot	Insert the appropriate slider to enhance image quality.
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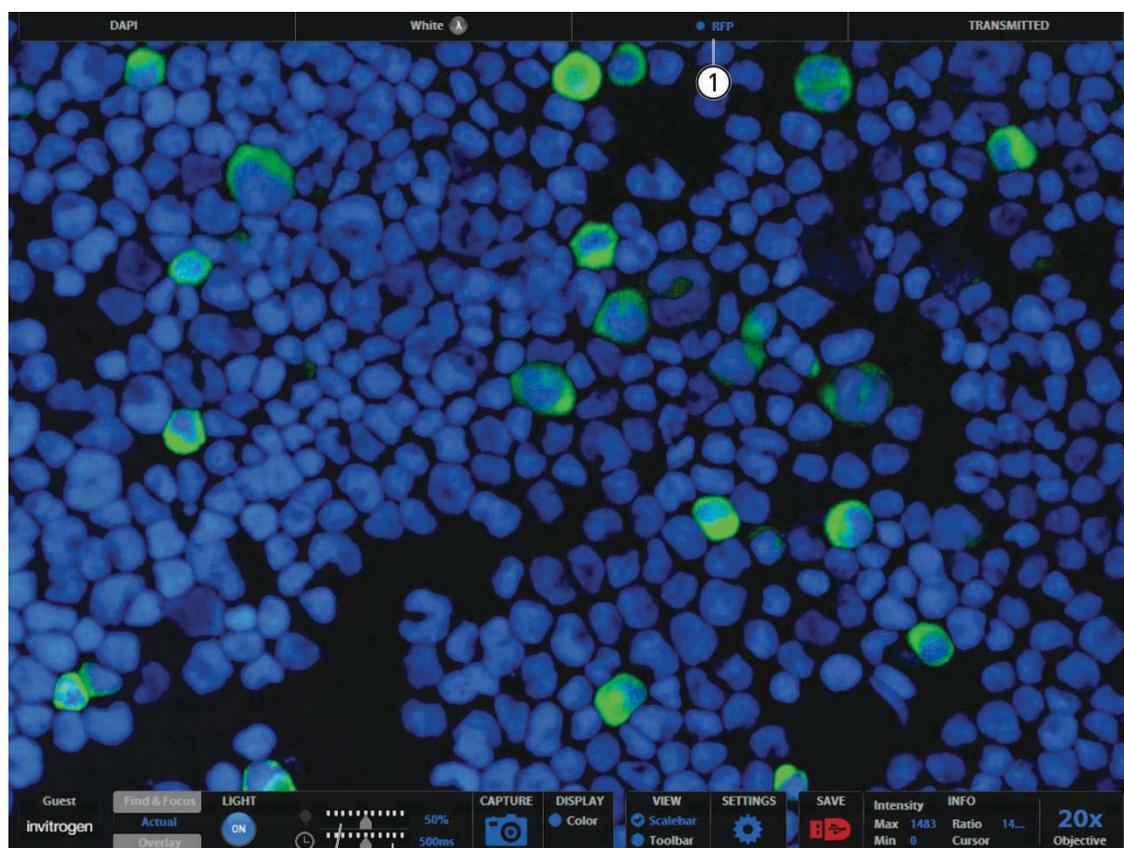
Note: See “Basic operations” (page 18) to learn more about EVOS™ sliders.

User interface (UI) controls

UI controls are software-driven controls for using the FL menu system.



Note: Periodically, Thermo Fisher Scientific adds functionality and other improvements to the EVOS™ user interface. We recommend keeping your EVOS™ FL Imaging System up to date with the latest software. If you have any questions about software updates, contact your local distributor. If you do not have your distributor information, refer to the EVOS™ FL Imaging System product page at thermofisher.com/evosfl or contact Technical Support (page 60) for instructions on how to perform the software updates.



- ① Channel indicator bar (active channel highlighted)
- ② Login
- ③ Control bar tabs
 - Find & Focus
 - Actual – Exposure time slider
 - Overlay – Overlay color dialog
- ④ Light ON/OFF
- ⑤ Illumination slider
- ⑥ Exposure time slider
- ⑦ Image capture
- ⑧ Color option
- ⑨ Scalebar/Toolbar options
- ⑩ Settings
- ⑪ Save
- ⑫ Info display bar
- ⑬ Selected objective

Explanation of UI controls

Channel indicator bar	The channel indicator bar highlights the active channel (i.e., the light channel that is currently selected).
Login button	The Login button allows for logging in and creating or changing user profiles. This button also displays the current user profile (for example, "Guest").
Control bar tabs	<p>Find & Focus</p> <p>Use the Find & Focus tab to view the sample with either transmitted light (to minimize photobleaching) or fluorescence, and to acquire images. This feature displays 10 frames per second for focusing and capturing images at longer-exposure, high-quality settings.</p> <p>Actual</p> <p>Use the Actual tab with fluorescence channels to view the image at the actual exposure time used for high quality image capture. With Actual tab selected, the EVOS™ FL Imaging System responds more slowly to stage position and focus changes, depending on the user-selected exposure time for the camera.</p> <p>Exposure time slider: Use this slider to manually select the exposure time that will be used during image capture</p> <p>Overlay</p> <p>Use the Overlay tab to select and overlay multiple fluorescence channels as a single multicolor image.</p> <p>Overlay color dialog: The Color adjustment button (left control bar) opens the Adjust color dialog where you can fine-tune your live image Brightness, Contrast, Saturation, and Hue before capture.</p>
Light ON/OFF button	Use this button to turn on the light source selected (for example, GFP).
Illumination slider	Use this slider to adjust the illumination. TIP: For quick adjustments, use the mouse wheel to brighten and dim.
Exposure time slider	Use to turn on the selected light source (for example, GFP).
Image capture button	Captures the image on the screen.
Color display	Use to add a pseudo color to your monochrome image.
Scalebar/Toolbar options	<p>Scalebar</p> <p>The scalebar option is a toggle button available after an image is captured that displays and hides the scalebar. Once displayed, the scalebar can be selected and dragged on-screen to the desired position.</p> <p>Toolbar</p> <p>The toolbar option includes Transfection (page 21), Time lapse (page 23), Count (page 27), and Image review (page 33) tools. Click the small gray triangle to open each tool.</p>

Settings button	Opens the Settings dialog.
	 Note: See “Optional settings” (page 35) for a complete overview of the settings.
Save image button	Use to save the onscreen image to a USB flash drive or network folder. The USB icon turns from red to green once the image has been saved.
	 Note: A red USB icon indicates that the current image has not been saved.
Info display bar	<p>Shows the following context-sensitive data in the Find & Focus and Actual tabs:</p> <ul style="list-style-type: none"> • Intensity (Max and Min) • Ratio (Max to Min) • Cursor position
	 Note: In Overlay, the info display shows the Quick Save option with the Quick Save file name and the current objective selected.
	 The color camera version shows the QuickSave option instead of the info display bar.
Objective selection field	Displays the magnification of the currently selected objective.

Specifications

Optics	Infinity-corrected optical system; RMS-threaded objectives with 45 mm parfocal distance	
Objectives	Objectives included vary per order. Contact Technical Support (page 60) for a full list of objectives supported.	
Objective turret	5-position; front-mounted control	
Light cubes	<p>Light cubes included vary per order. Specifications for our most popular light cubes are listed below. Contact Technical Support (page 60) for a full list of LED light cubes supported.</p> <ul style="list-style-type: none"> • DAPI: 360 nm excitation, 447 nm emission • GFP: 470 nm excitation, 525 nm emission • RFP: 530 nm excitation, 593 nm emission 	
Illumination	LED (50,000-hour life); adjustable intensity	
Contrast methods	Fluorescence and transmitted light (brightfield and phase contrast)	
Condenser	Includes 3-position with brightfield and phase contrast annuli	
Condenser working distance	60 mm	
Mechanical “glide” stage	XXY 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	XXZ-axis focusing controls, 480 μm/rotation. XX-Interchangeable vessel holders available for most common shapes and sizes
LCD display	15 in color, 1024 × 768 pixels; adjustable tilt	
Image acquisition	Onboard microprocessor; built-in software for image acquisition via mouse control	
Camera	Monochrome: Sony ICX445 monochrome CCD, 1/3 in 1280 × 960, 1.3 Megapixels	Color: Sony ICX285AQ color CCD, 2/3 in 1360 × 1024, 1.4 Megapixels
Captured images	Monochrome camera: 16-bit monochrome TIFF or PNG (12-bit dynamic range); 24-bit color TIFF or PNG; jpeg, bmp (1280 × 960 pixels)	Color camera: 16-bit color TIFF or PNG (12-bit dynamic range); 24-bit color TIFF or PNG; jpeg, bmp (1360 × 1024 pixels)
Output ports	3 USB and 1 DVI (digital output)	
Power supply	AC Adapter; Input 100–240 V, 50–60 Hz; Output 12 VDC/4.15 A	
Dimensions	<p>Operating height: 57.8 cm (22.75 in)</p> <p>Storage/transport height: 32.4 cm (12.75 in)</p> <p>Depth: 47.0 cm (18.5 in); Width: 35.5 cm (14.0 in)</p>	
Weight	15.3 kg (33.7 lbs)	

2. Install the EVOS™ FL Imaging System

Unpack the instrument

Before setting up the EVOS™ FL 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 (page 60).



Note: All steps **MUST** be completed **BEFORE** using the instrument.

To remove the instrument from the packaging, lift the instrument by grasping it firmly with both hands under the support arm and place it on a level surface away from vibrations from other pieces of equipment.



Grasp under support arm with both hands to lift the instrument



Note: Make sure to set aside packaging and foam for future transport and storage. To move or transport the instrument, the stage pin and light cube lock must be re-installed. Always be sure the instrument is properly cushioned and braced to prevent damage.

Operating environment

- Allow at least 5 cm (2 in) free space at the back of the instrument to allow for proper ventilation and to prevent overheating of electronic components.
- Operating temperature range: 4°–32°C (40°–90°F).
- Relative humidity range: 30–90%.
- For best image quality, avoid setting up the EVOS™ FL Imaging System near direct light sources. Place the light shield box on the stage over the sample to reduce the effects of ambient light and improve image quality.



Light shield box on stage



IMPORTANT! The EVOS™ FL Imaging System should not be subjected to UV decontamination. UV degrades many materials, including plastic. Damage from UV exposure is not covered under the manufacturer's warranty.

Desktop setup

1. Lift the EVOS™ FL Imaging System as described (page 14) and place it on the table.
2. Tilt the LCD monitor upright.
3. Remove the stage pin, connect the power cord, mouse and, if desired, keyboard.

Hood setup



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

1. Lift the EVOS™ FL Imaging System as described (page 14) and place it inside the culture hood.
2. Tilt the LCD monitor upright.
3. Remove the stage pin, connect the power cord, mouse and, if desired, keyboard.

Install the instrument

Remove stage lock pin



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

Pull firmly to remove this pin, making sure to store the stage pin for future use. Always re-secure the mechanical stage with the stage pin before moving or transporting the instrument.

Remove light cube lock



Note: Before using the mechanical stage for the first time, you must remove the stage lock pin from the back right-hand corner of the stage plate. For information about adding optional LED light cubes, see “Change the LED light cubes”, page 44.

1. Move the stage back to allow access to the light cube lock, which is centered under the back of the stage.
2. Loosen the thumbscrew to remove the light cube lock, making sure to store the light cube lock for future use. Always re-secure the light cube lock before moving/transporting the instrument.
3. Place the light cube access cover into the opening and tighten thumbscrew.



IMPORTANT! Before changing light channels, ALWAYS verify the light cube lock has been removed. Applying force to the light cube selection lever while the lock is in place may seriously damage the mechanism. This type of damage is not covered by the manufacturer’s warranty.

Connect the power supply



IMPORTANT! Always use the correct power supply. The power adapter specifications appear on the serial number label (front of LCD hinge) and in “Specifications”, page 13. Damage due to an incompatible power adapter is not covered by warranty.

1. Verify the power switch is in the “O” (OFF) position before connecting the power adapter.
2. Connect the power adapter to the power jack on the right side of the instrument base, attach the cord to the adapter, and plug the cord into an outlet.

Plug in mouse and USB flash drive

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

Connect DVI cable



Note: A DVI port is available for output to a projector or other display (DVI cable not included). This port produces digital output only; EVOS™ FL Imaging System is compatible with either a DVI-D or DVI-I display.

Connect the DVI cable to the DVI port on the instrument.

Install UV shield



Note: The UV Shield is provided as a safety feature and should always be installed whenever the unit is in operation. The UV shield is removable for access to the condenser sliders used in transmitted light mode. Simply unhook it from the screws on the UV mount.

Secure the shield in place, as shown in the following figure.



Secure the UV shield in place

Verify condenser shield installation

The condenser shield is pre-installed and helps reduce the potential effects of overhead lighting on your image.



Condenser shield, removable

After completing all of the installation steps (pages 14–17), your instrument is ready to power on. Continue to “Basic operations” (page 18) to get started.

3. Basic operations



Note: Before using the mechanical stage for the first time, you must remove the stage lock pin from the back right-hand corner of the stage plate. For information about adding optional LED light cubes, see “Change the LED light cubes” (page 44).

Brightfield/Phase operations

1. Set the magnification using the objective selection wheel on the front of the instrument.
2. Move light cube selection lever towards you until the active channel on screen reflects “transmitted”.
3. Turn the phase annuli selector to the position that corresponds to the selected objective and contrast method.
4. Insert the desired condenser slider into the slot on the condenser assembly for optimal image quality.



Note: A variety of sliders can be inserted into the instrument condenser to improve image quality.

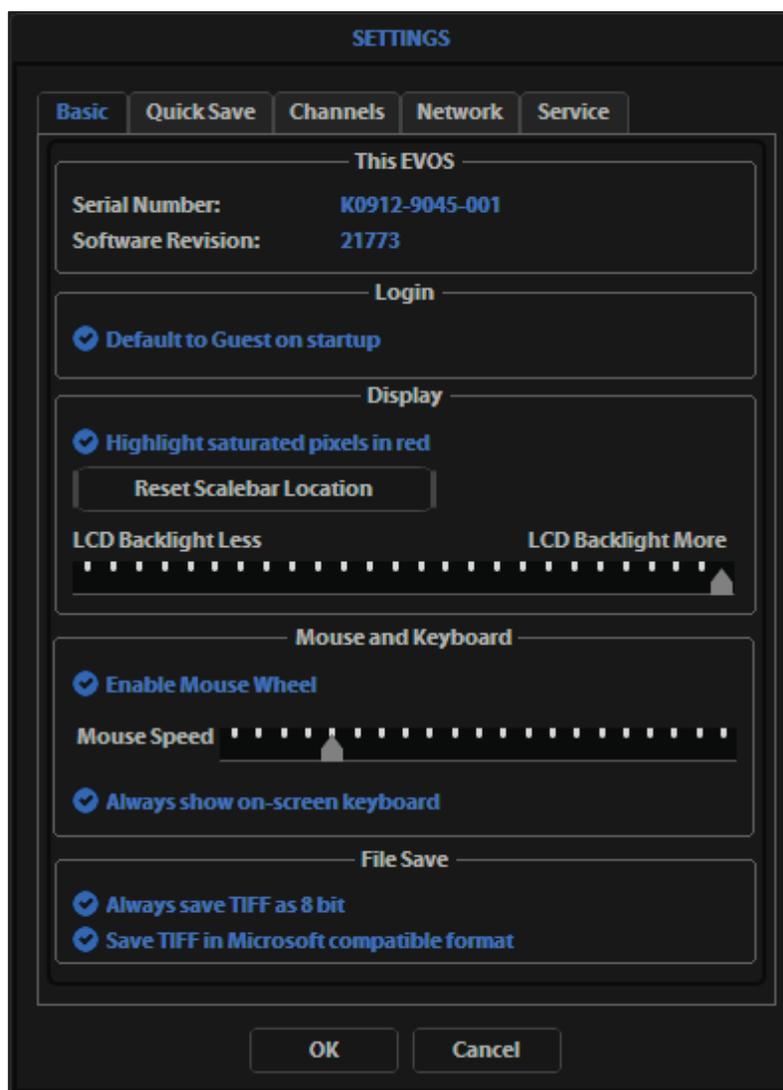


Insert the condenser slider into the condenser

5. Turn on illumination using the LIGHT ON button.
6. Focus the sample using the focusing knobs.
7. Adjust the illumination intensity if necessary.



Note: The instrument is pre-configured with an overexposed pixel feature. Overexposed pixels appear red. To obtain the maximum level of brightness without any overexposed areas, dim the illumination until the red highlights disappear. To disable this feature, go to the **Settings > Basic** tab.



Settings > Basic tab

8. Click **Capture** to acquire the image.

Fluorescence operations

1. Set the magnification using the objective selection wheel on the front of the instrument.
2. Move light cube selection lever until the active fluorescent channel on screen reflects the desired light cube (i.e., "GFP").
3. Place the light shield box on the stage, over the sample. This is important for optimal image quality.



Note: If your application requires access to the sample, work in a dark room and use the block slider to block light reflected from the condenser.

4. Follow steps 4–7 under "Brightfield/Phase operations" (page 18).

Optional: Multi-channel overlays

1. Follow the steps above to capture an image in each desired channel (i.e., "GFP", "RFP", "DAPI")
2. Click the **Overlay** tab to display the multi-channel image in color.



Note: See "Working with images" (page 26) for more information.

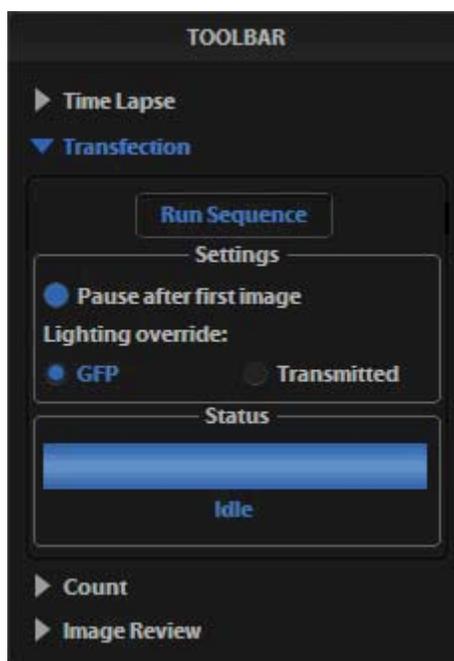
Helpful tips

- To display the image with pseudo colors, turn on the color option.
- To display the image in grayscale, turn off the color option - this often shows more detail than a color image.
- Find & Focus uses a shorter exposure time (100 ms) and lower illumination (approximately 60%) compared to image capture settings. This minimizes photobleaching and phototoxicity effects. When you capture an image, illumination and exposure time automatically adjust for best image quality and then reset to lower levels after the capture.
- The Actual tab provides full-powered illumination and actual exposure times for live viewing of the samples.

4. Advanced operations

Transfection

1. Choose a light cube, focus on the sample, and adjust the lighting. See “Fluorescence operations” (page 20) for detailed instructions, if needed.
2. Open the **Toolbar** and expand the **Transfection tool**.



Transfection tool



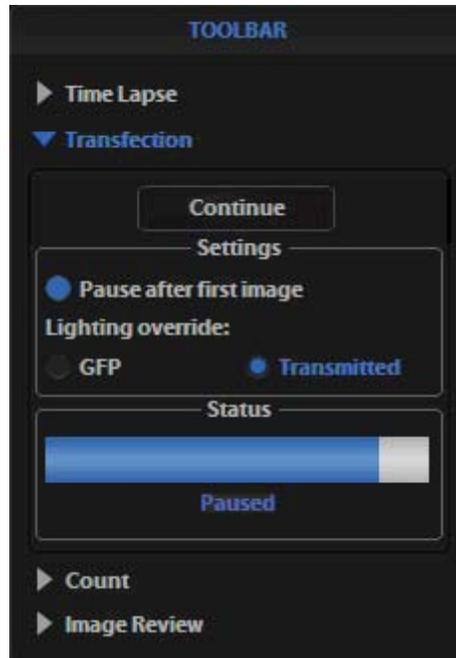
Note: The **Pause after first image** option allows you to adjust focus, if necessary, before capturing the transmitted light channel.

-
3. Click **Run Sequence**.



Note: Check the focus and lighting prior to running the sequence. The sequence always starts with the fluorescence channel and finishes with the transmitted light channel.

4. If the **Pause** option is selected, adjust focus, then click **Continue**.



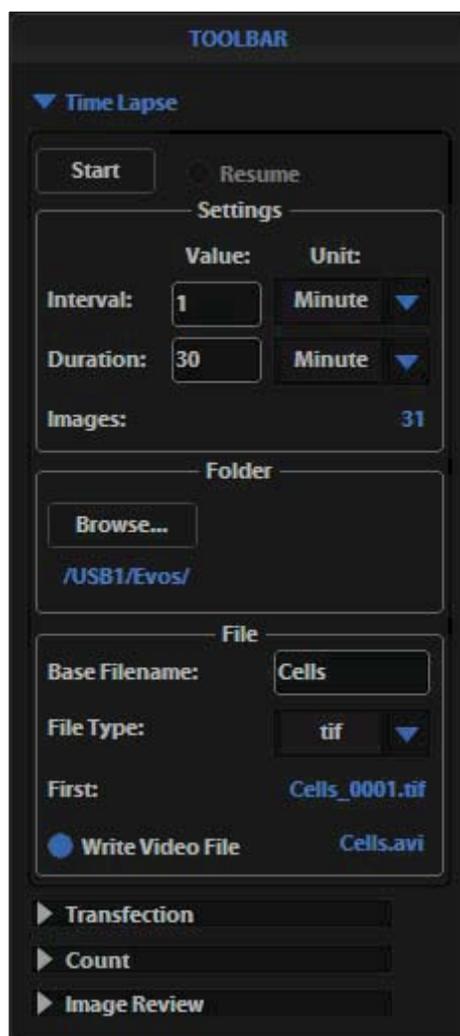
Note: If **Pause** is deselected, the dual-channel image displays with the **Overlay** tab selected.

5. Adjust the brightness and contrast settings as desired, then save the image. See “Save image” (page 29) for detailed instructions.

Time lapse



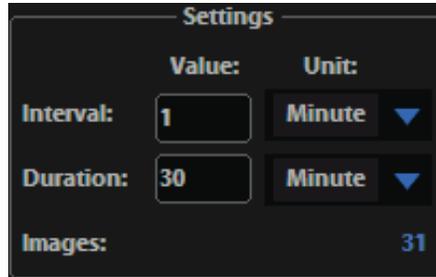
Note: The Time lapse feature allows you program the instrument to record time lapse images. To create a video (.avi) file, select the **Write Video File** option prior to running the time lapse session (lower left corner of the Time Lapse Toolbar window).



Time lapse tool

Set up time lapse parameters

1. After the sample is focused and ready, tighten the stage brakes to prevent the stage from drifting during the session.
2. Open the **Toolbar** and expand the **Time lapse** tool.
3. Click the **Interval** field and enter a numeric value (defines the frequency of image capture). Use the drop-down to choose a unit of measure (e.g., minutes) for the interval entered.



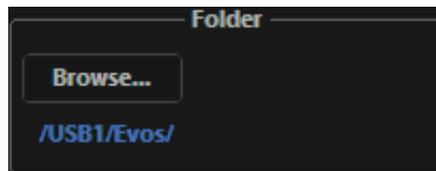
4. Click the **Duration** field and enter a numeric value (defines the period of time for which the experiment will run). Use the drop-down to choose a unit of time (e.g., hours) for the duration entered.



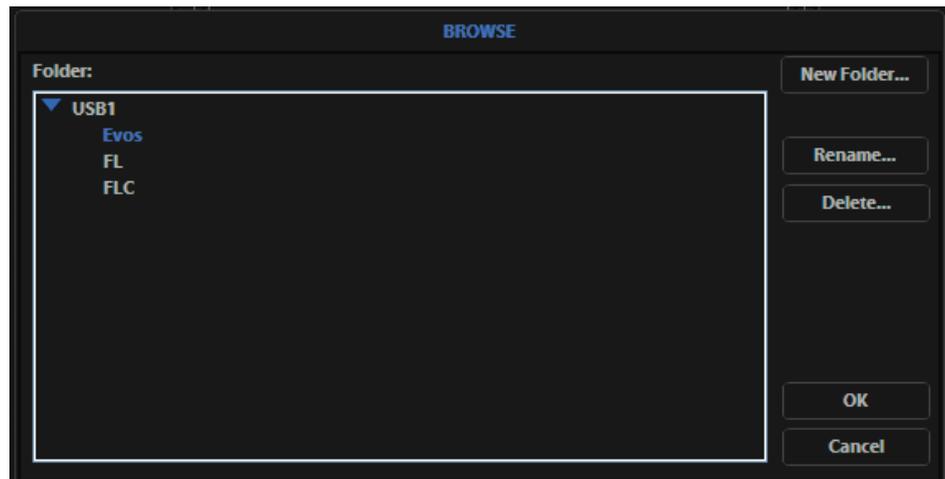
Note: After parameters have been selected, the software automatically calculates the approximate number of images.

Save time lapse files

1. Click **Browse** to select the destination.

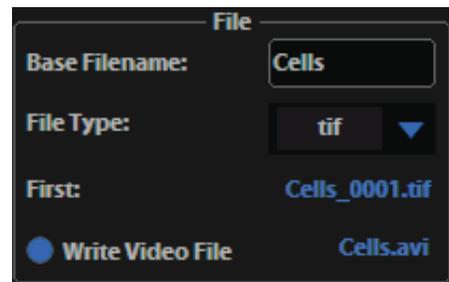


2. In the Browse window, select the desired folder, then click **OK**.



Note: If there is no USB flash drive or network connection in place, a warning message appears. Insert a USB flash drive, and then click **Cancel** to clear the message.

3. Click the **Base Filename** field to enter a name under File, and then choose a file type (.png or .tif) from the **File type** drop-down.

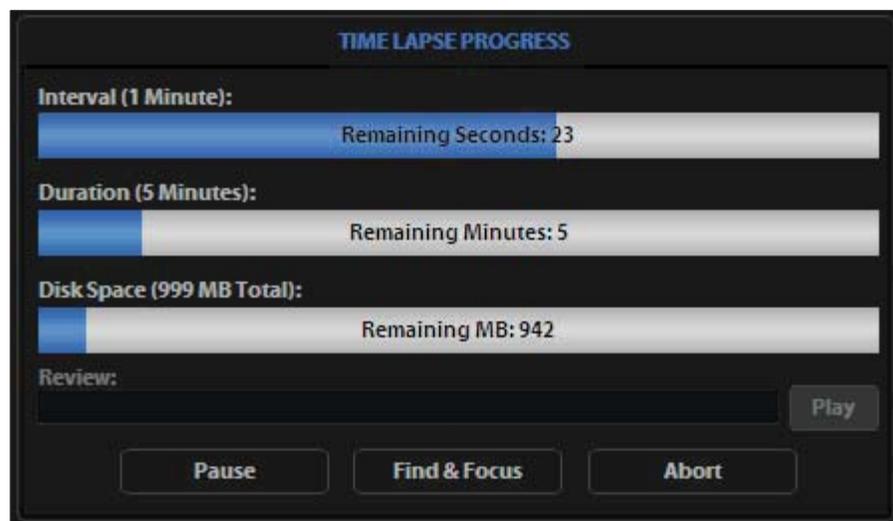


Note: This saves the files using the following naming convention:

Base File Name Selected_Number of file.tif (the number of the first file saved starts at "0001").

Launch time lapse session

1. Click **Start** to begin the time lapse session. The Time Lapse Progress window is displayed as long as the session is active.



Time Lapse Progress window



Note: If there is not enough space available on the external storage device, an error message appears. If this message appears, replace the storage device and/or change the parameters selected.

2. To suspend the time lapse session, click **Pause**.
3. Use the **Review** area to review the images already captured during the current session, or press **Play** to show all images captured in the current session.
4. Click **Find & Focus** to pause the actual session to make adjustments to the focus and illumination.
5. Click **Start** after adjustments have been made to resume the time lapse capture sequence or uncheck **Resume** and start a new time lapse session.
6. Click **Abort** to stop the current session at any time. If selected in error, click **Cancel** to resume the time lapse session.

5. Working with images

Live/Captured zoom feature and Scalebar option

Live/Captured zoom feature

1. Double-click the area of interest in the image onscreen. A 2x zoomed image, centered on the point clicked, will appear.
2. Right-click anywhere on the image to restore the view to the default magnification.

Live zoom feature

- Live images can only zoom to 2x.
- Double-click on any point in the enlarged image to re-center the image. (The system places points from the outer edges of the screen as close to the center as possible.)
- You can re-center repeatedly.

Captured zoom feature

- Capturing and saving a zoomed image results in a file showing the actual magnification, not the zoomed magnification. If the scale bar is active, it will appear in the saved file.
- To double the digital zoom level, double-click again on any point in the enlarged image. You can 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.

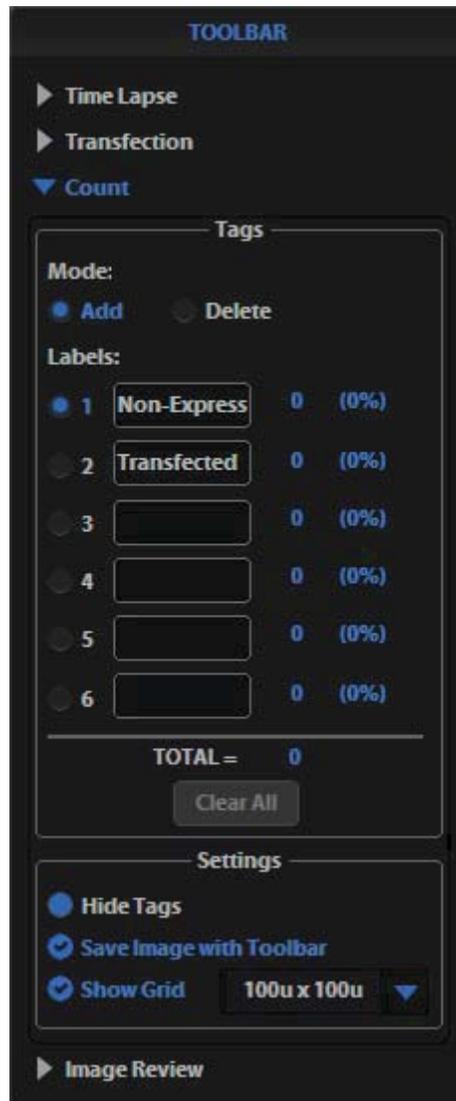
Scalebar option

- The Scalebar 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, click-drag it to the desired location.

Count

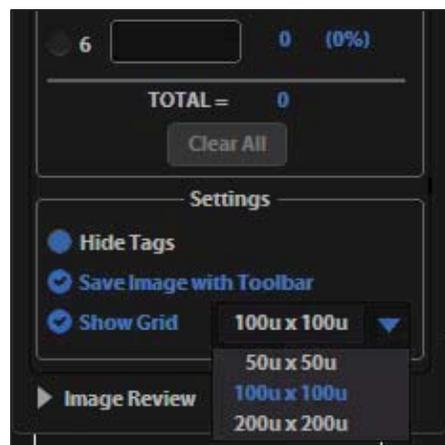
The Count tool streamlines cell counting by marking items with up to 6 labels onscreen. As you tag items, the system keeps a running tally of counts with percentages for each label assigned. To document your results, save the tagged image with the Count tool displaying the totals.

1. Acquire an image (see “Basic operations”, page 18).
2. Open the **Toolbar** and expand the **Count tool**.
3. Click in **Label** field to enter a label. You can enter up to 6 labels.



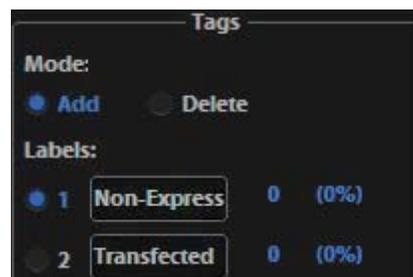
Count tool

- Under **Settings**, you can choose a **grid size** in the drop-down or leave the **Show Grid** option inactive.



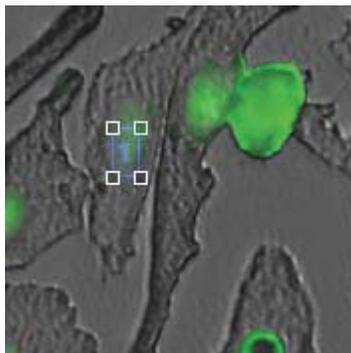
- Click the radio button next to the desired label and left-click at each point onscreen to tag the items for that category.

You can switch the labels as desired; the instrument will tag as specified for the selected label.



Note: To use Digital Zoom while counting cells, first suspend the Count tool, then select the Hide Tags. When the tags are hidden, use the left mouse button to double-click and Zoom as described in “Live/Captured zoom feature and Scalebar option” (page 26). After zooming, reactivate the Count tool by deselecting Hide Tags setting.

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



Selected tag; drag to move

- To delete a tag, select **Mode > Delete** radio button, then left-click the tag to be deleted. You can also use the **Clear All** button to delete all tags for all labels.
- To save an image showing the tags on-screen and data recorded in the count tool, select **Save Image with Toolbar** option, then click **Save**.

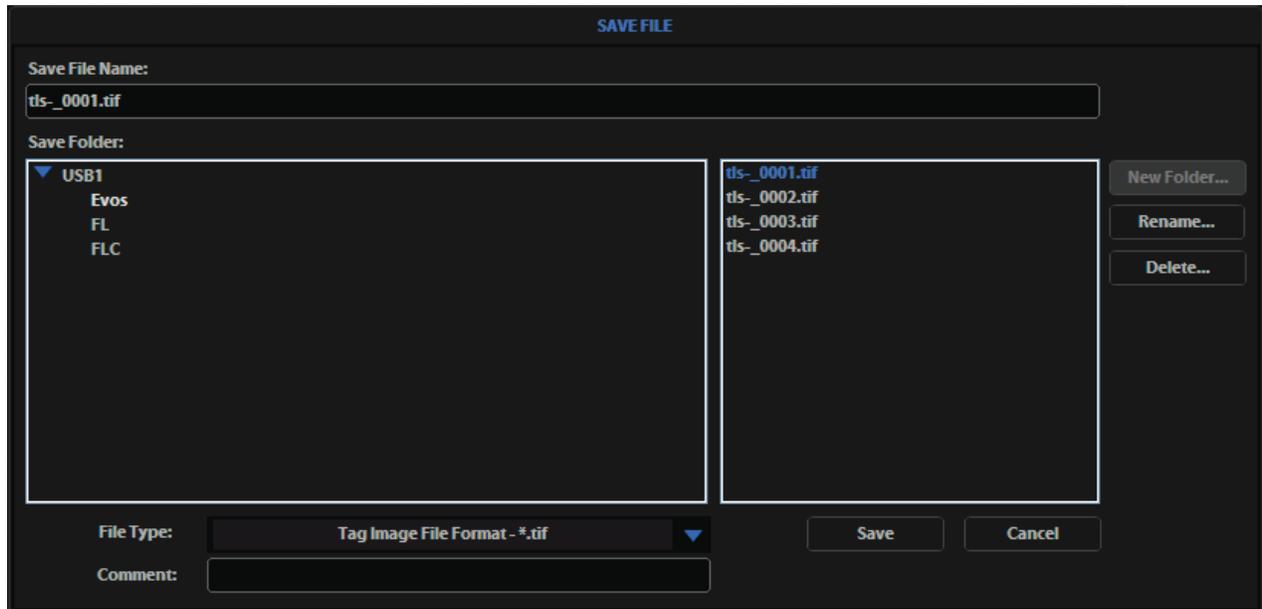


Note: Deselecting this option produces an image saved with the tags only.

Save image

Save

1. After capturing your image (see “Basic operations”, page 18), click **Save**. The Save File dialog appears.



Note: If there is no USB flash drive or network connection in place, a warning message appears. Insert a USB flash drive, then click **Cancel** to clear the message.

2. Select the **Save File Name** field, enter the desired file name, then click **Accept**.



Note: To overwrite a file, select the name of the file from the saved files list, instead of clicking on the Save File Name field. A Save As confirmation dialog opens. It is not possible to recover an overwritten file.

3. To select the destination for the new image, click on the name of a folder in the Save Folder list.
4. To create a new folder, first click the name of the parent folder, then click **New Folder** to enter a folder name.
5. Select a **file format** (.tif, .png, .jpg or .bmp) from the **File Type** drop-down.



Note: To save a 16-bit image, select .tif or .png and make sure that the Scalebar and Color options are off.

File types .jpg and .bmp (as well as images of all types with the Scalebar, or Color options engaged) only save at an 8-bit depth.

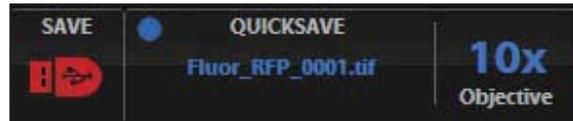
6. Click **Save** to save the image.

Helpful tips

- Click the **Comment** field to enter a comment and date.
- The **Date** button can be used within a file or folder name. Click the **Date** button anywhere within a text field to automatically insert the current date (MM-DD-YYYY) wherever the cursor is in that field.
- In the Save Folder and the Saved Files lists, selected items appear in blue.
- If a USB keyboard is installed, the virtual keyboard will not appear. Pressing the Enter key on a physical keyboard is equivalent to pressing the Save button in the Save file dialog.
- Saved image files include the date/time stamp. To ensure accurate date/time information, verify the settings before your capture session. See “Date/Time settings” (page 35) for instructions.
- To delete a file or folder, highlight the item on the list, then click **Delete**. A confirmation dialog will open. It is not possible to recover a deleted file.
- To rename a file or folder, highlight the item on the list, then click **Rename**. The virtual keyboard will open; you can click **Clear** to reset to a blank field.

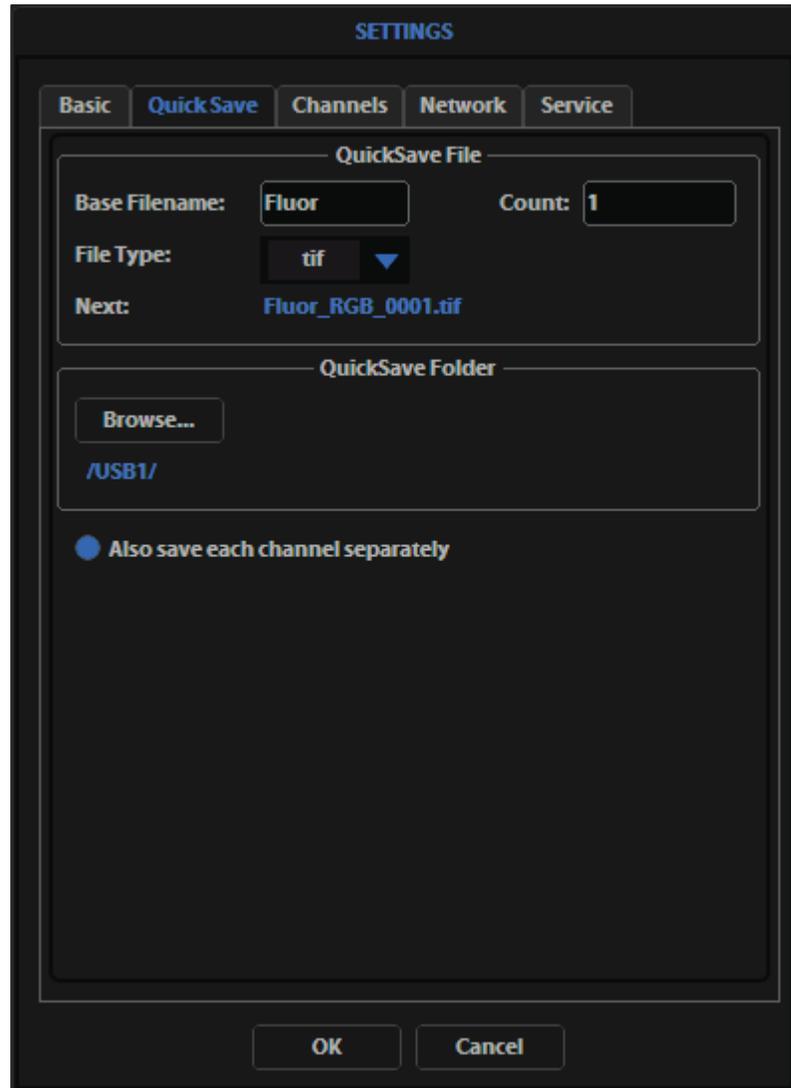
QuickSave

QuickSave option allows you to save multiple images under a single base file name. Specify the settings, then select the QuickSave option, and the system will save each image with a single click of the Save button.



QuickSave option on the control bar

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



Settings > QuickSave tab

2. Click in the **Base Filename** field, then enter a name that describes the imaging session. The “Next” file name will reflect the information entered.
3. Click in the **Count** field to enter the starting number, if you do not want to start at 1. The “Next” file name will reflect the information entered.
4. Select a **file format** (.tif or .png) from the **File Type** drop-down.
5. Click **Browse** to select a destination folder for the QuickSave files. In the Browse window, highlight the desired folder, then click **OK**.

6. To create a new folder, first click the name of the desired parent folder, then click **New Folder** and enter a folder name (date is optional) (see “Save” on page 29).
7. After creating the new folder, click **OK** to close the Browse window.
8. Select **Also save each channel separately** to save multiple channels for each image (within an overlay image).

This creates up to five files per captured image, named according to the following conventions:

BaseName_ChannelCaptured_0001.tif (Overlay image).

9. Click **OK** to accept the QuickSave settings.
10. Select the **Overlay** tab, then click the radio button to enable QuickSave.



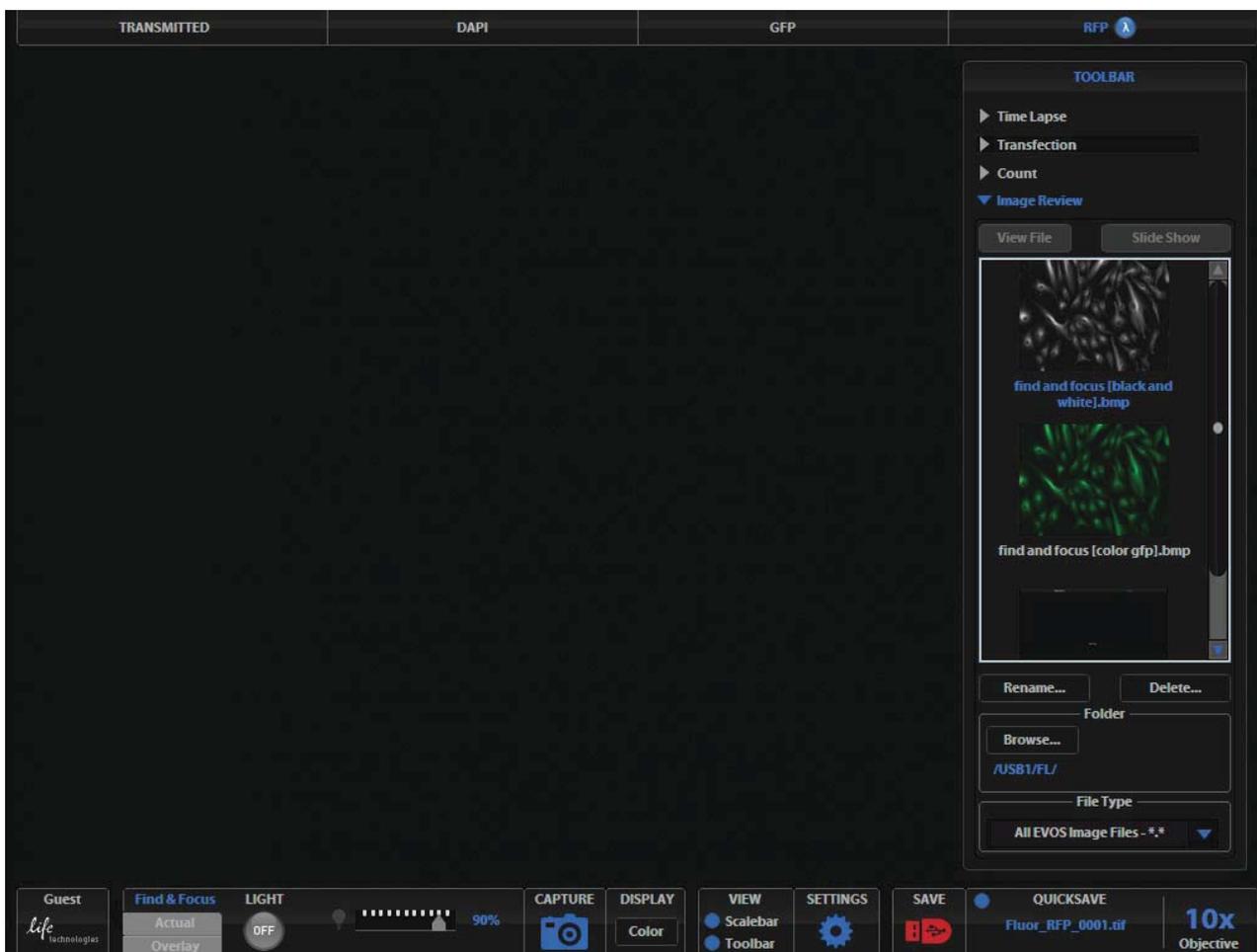
Note: The color camera version displays the QuickSave option in all tabs.

11. After acquiring an image (see “Basic operations”, page 18), click **Save**.
The image is saved as specified in the QuickSave settings.

Review images (Image Review tool)

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

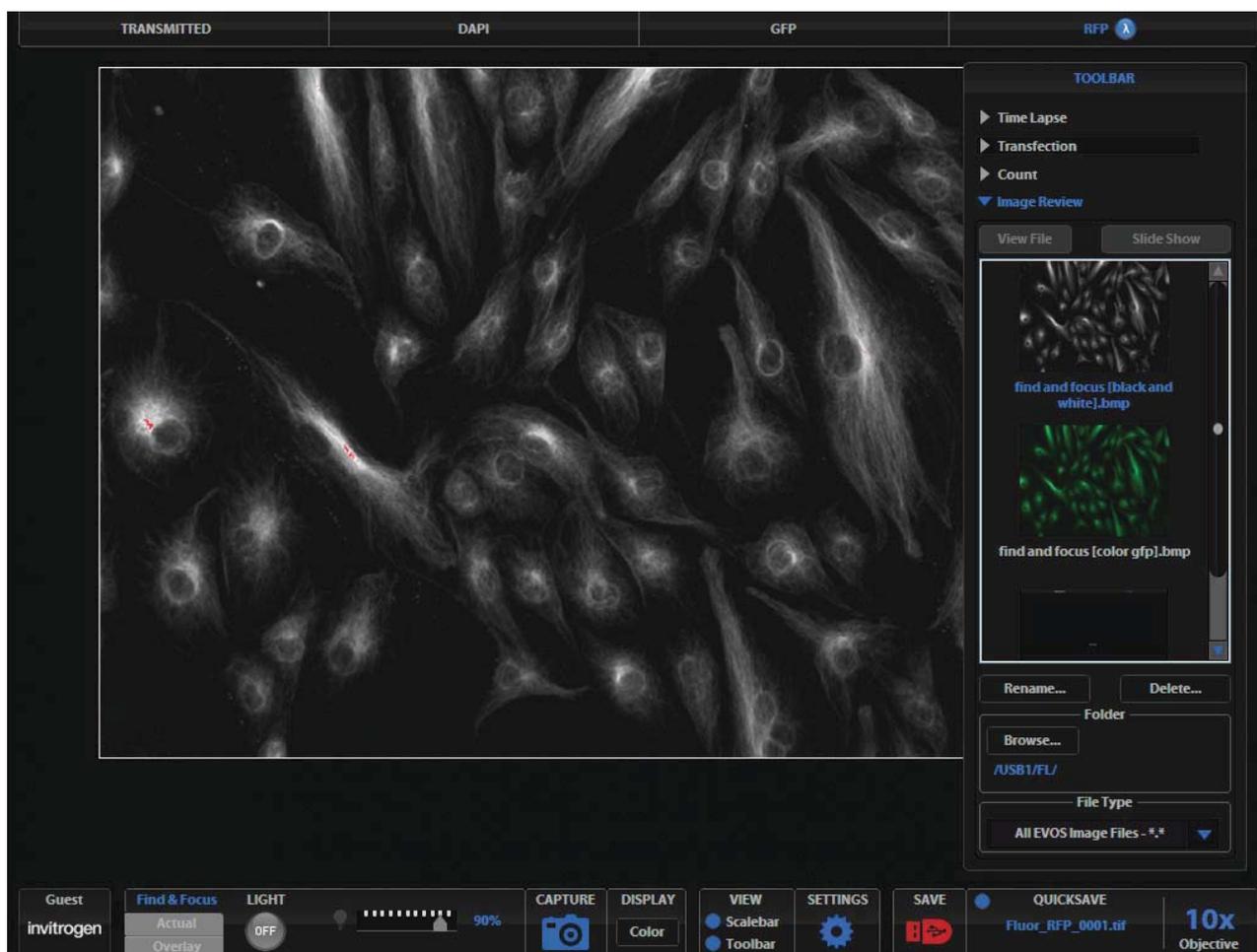
1. Open the **Toolbar** and expand the **Image Review** tool.
2. The **preview list** displays thumbnail images for all viewable files in the selected directory (the top-level USB directory is selected by default). If there are no viewable files in the directory, the preview area will be empty.



Note: The File Type drop-down 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.

- 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.



Note: Double-clicking the thumbnail image also toggles between displaying and hiding the file.

- To zoom the image in the review window, double-click the area of interest. To restore normal magnification, right-click the zoomed image. See “Live/Captured Zoom feature and Scalebar option” (page 26) for detailed instructions.
- To rename a file, select it, then click **Rename**. Enter the new file name using the virtual keyboard, then click **Accept**.
- To delete a file, select it, then click **Delete**. A confirmation dialog will open. It is not possible to recover a deleted file.
- Use the **Slide Show** button to display each image thumbnail within the image review window continuously.

6. Optional settings

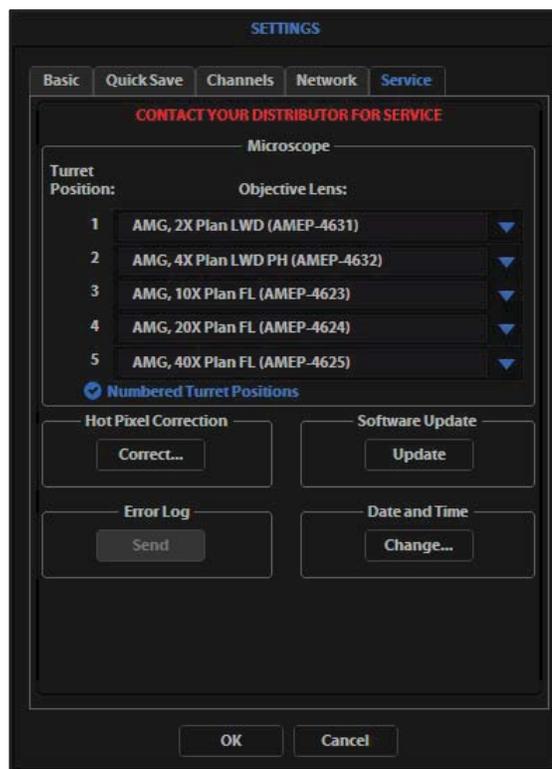
Date/Time settings



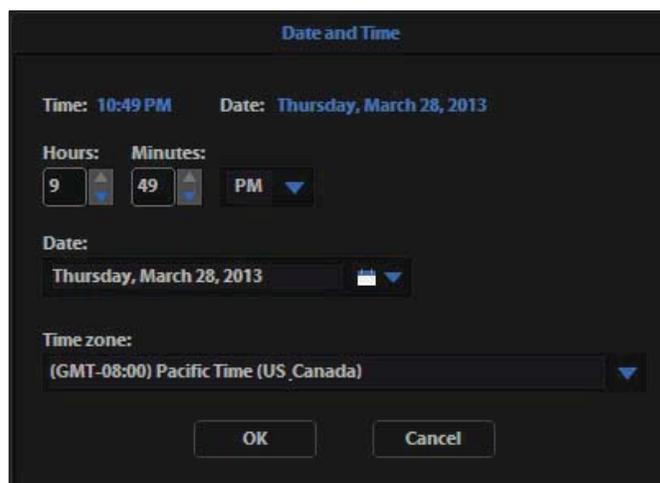
Note: Changing settings in the Service tab affects the instrument's performance. If service beyond the date/time setting is needed, please contact your EVOS™ distributor or Technical Support (page 60).

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

1. Click **Settings** to open the Settings dialog, and then select the **Service** tab.
2. Click **Change** under Date and Time.
3. In the Date and Time window that opens, use the arrows and the drop-downs to set the time, date, and time zone, then click **OK**.
4. Click **OK** in the Settings dialog. The new settings take effect immediately.



Settings > Service tab



Date and Time window

Configure network settings

You can connect the EVOS™ FL Imaging System to a Windows/SMB network via an Ethernet cable 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 in order for EVOS to find it. Contact your network administrator for help if a physically connected EVOS cannot find the SMB network.

Materials needed for the Ethernet connection

To set up the network connection, you need the following materials (not included with the EVOS™ FL or the EVOS™ FL Color Imaging System):

- Ethernet cable
- USB-to-Ethernet adapter



Note: For best results, use one of these compatible USB-to-Ethernet adapters:

- Belkin model F5D5050
- Cisco Linksys model USB300M
- D-Link model DUB-E100
- TRENDnet model TU-ET100C
- TRENDnet model TU2-ET100

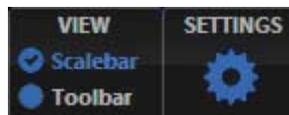
Log in the network

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. Make sure that you are logged in under your own EVOS™ user ID. The current user ID is displayed above the Thermo Fisher Scientific logo in the bottom left corner of the screen.



User ID set to Guest profile

3. Click **Settings** to open the Settings dialog, and then select the **Network** tab.

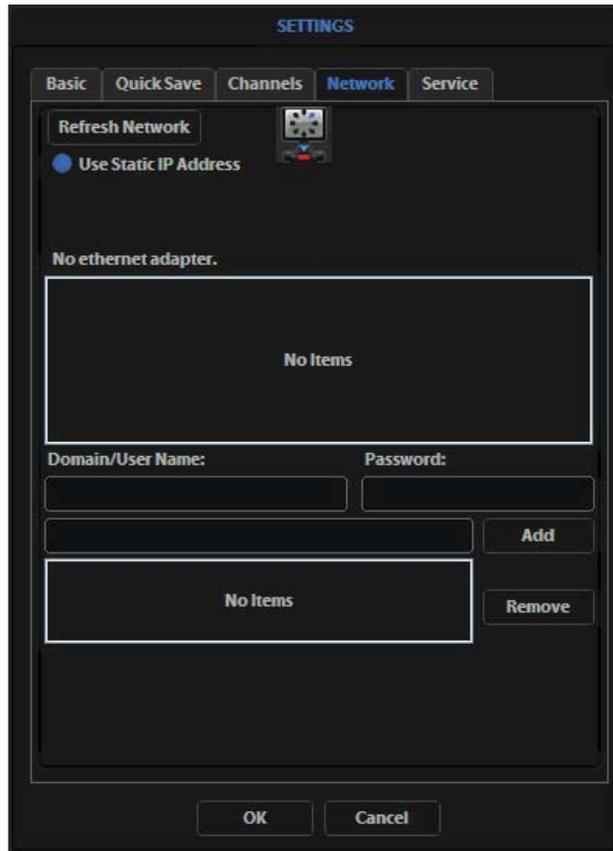


Settings button

- The list field on the top of the Network page displays 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.

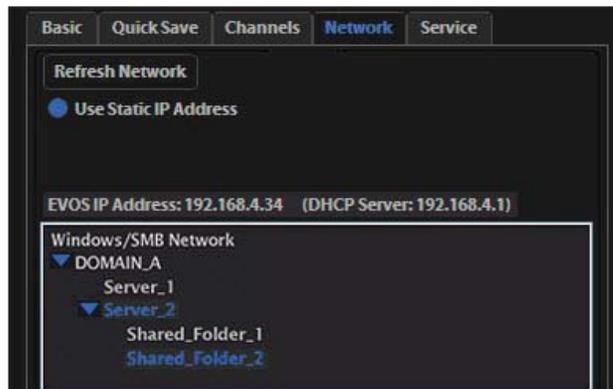


Note: If a domain, server, or shared file appears on the file tree without a triangle icon, and you are not able to expand or open it, your permission to access that item is restricted.



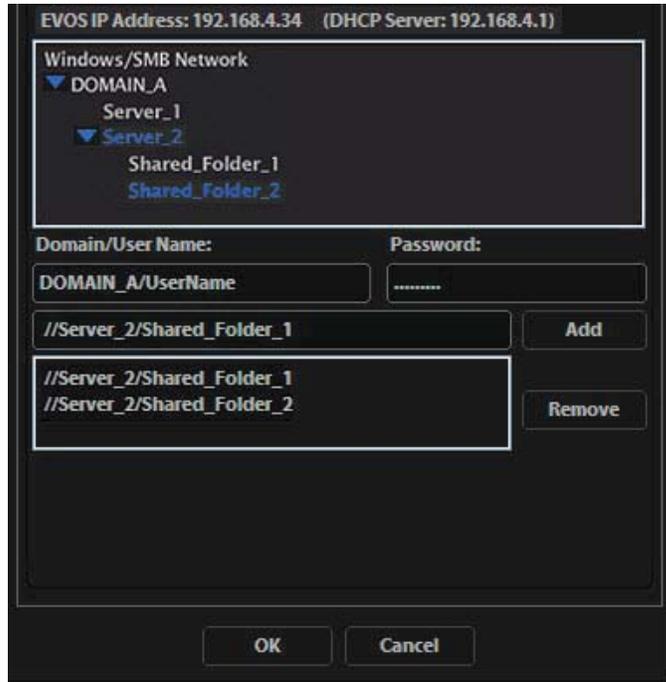
Refreshing the network connection

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



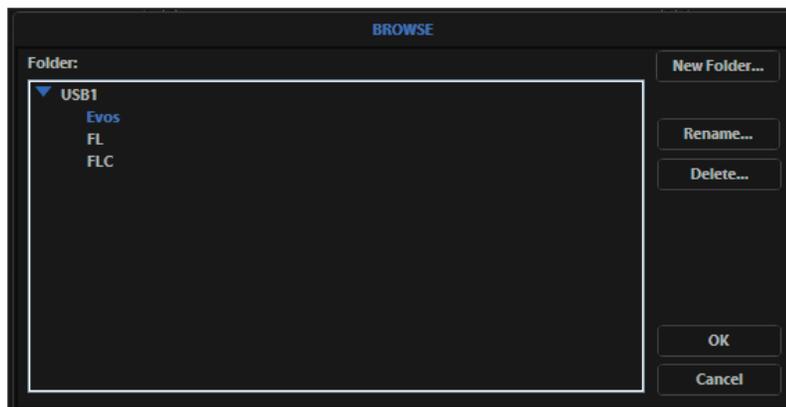
Windows/SMB Network

- After the server accepts your login, the EVOS™ FL Imaging System displays the list of shared folders available on the selected server.



Adding shared folders

- Select a shared folder, then click **Add** to include it in the list of possible file destinations. You can also type in the file path, then click **Add**.
The folder appears on the list below the Add button. If it does not, contact your network administrator for help.
- If you need to remove a shared folder from the destinations list, select the folder, then click **Remove**.
- Click **OK** to close the Settings dialog.
- To verify your list of network destination folders, go to the QuickSave tab and click the Browse button to display the QuickSave Browse window.



QuickSave Browse window



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

Helpful tips

- The EVOS™ imaging system tries to establish a connection for about 30 seconds. If there is a problem with the connection, the Network page displays “No Items.”
- If you have trouble connecting, double-check the physical connections, then 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 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**.

Manage users

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

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



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

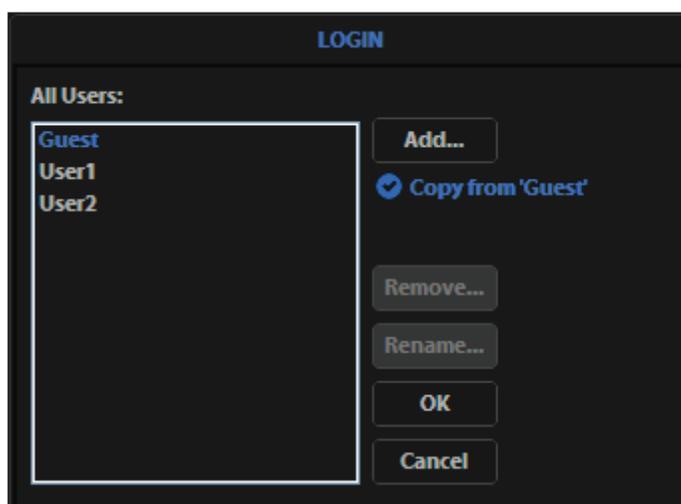
Add or remove a user profile

1. Click the **Login** button at the bottom left of the screen. This is the Invitrogen logo with the current user profile indicated above it.



Login button

2. Deselect the **Copy from <name>** option, then click **Add** to enter a user name.



Login dialog

3. Click **OK** to log in under that name and adjust the user settings as desired. When you switch off, the instrument saves your settings to its memory.



Note: To copy an existing profile, highlight the profile in the user list, select the **Copy from <name>** option, then click **Add**. The virtual keyboard opens for you to enter a name for the new profile.

4. To remove a user profile, click to highlight it, then click **Remove**. A confirmation dialog will open.

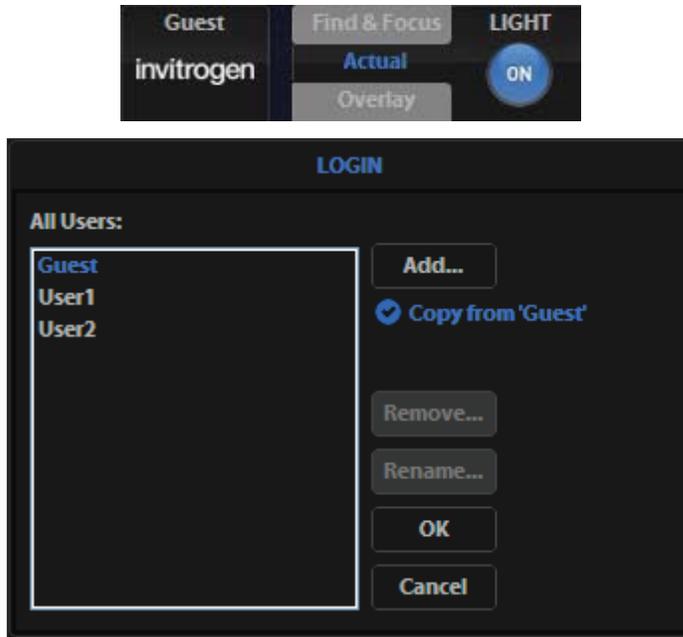


Note: Deleting the user profile removes all its associated settings from the instrument memory.

5. To rename a user profile, click **Rename**, then enter the new name.

Log in with an existing profile

Click the login button, select the desired user profile, then click OK.



Change the default login

The default user login is **Guest**. To set the default login as the last active user, go to **Settings > Basic** tab, then uncheck the **Default to Guest on startup** option.



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

7. Maintain the EVOS™ FL Imaging System

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 “Decontaminate the instrument”, page 42.
- If liquid spills on the instrument, turn off the power immediately, then wipe the instrument dry.
- Do not exchange objectives between instruments unless you know that the components have been approved and recommended by Thermo Fisher Scientific.
- After use, cover the instrument with the supplied dust cover.



IMPORTANT! Always use the correct power supply. The power adapter specifications appear on the serial number label (front of LCD hinge) and in the Specifications chapter of this user guide (page 13). Damage due to an incompatible power adapter is not covered by warranty.

Decontaminate the instrument

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

1. Turn the power OFF.
2. Using a soft, dry, lint-free cloth, wipe off any dust from the LCD display.
3. 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.

4. Lightly wipe the working surfaces of the instrument (stage top, focusing knobs, objective selection wheel, housing) with paper towels or Kimwipes™ laboratory wipes dampened with 70% ethanol or 4000 ppm hydrogen peroxide (H₂O₂).



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



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



IMPORTANT! Do not subject the EVOS™ FL Imaging System to UV decontamination. UV degrades many materials, including plastic. Damage from UV exposure is not covered under the manufacturer’s warranty.

Update the software

Periodically, Thermo Fisher Scientific adds functionality and other improvements to the EVOS™ user interface. We recommend keeping your EVOS™ FL 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 60).

Download software update

Software updates are available from the EVOS™ FL Imaging System product page at thermofisher.com/evosfl.

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™ FL Imaging System will verify and install it during the update process.
2. Download the current user guide for the EVOS™ FL 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 60).

Install software update

1. Plug the USB flash drive into the data port on the lower right side of the EVOS™ support arm.
2. Click **Settings** to open the Settings dialog, and then select the **Service tab**.



Note: Changing settings in the Service tab affects the instrument's performance. If service beyond the software update is needed, contact your EVOS™ distributor. If you do not have your distributor information, contact Technical Support (page 60).

3. Click **Update** in the Service tab. A verification progress bar appears.
If a missing update notification appears, make sure that the USB flash drive with the update file is fully plugged in. Click **OK**, then click **Update** again.
4. After file verification, an update permission dialog opens. Verify the revision details, then click **Yes** to start the update.
5. The screen displays the update progress. When the update is complete, the main EVOS™ screen reappears.



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

Change the LED light cubes

Install a light cube

Optional LED light cubes are available; contact Technical Support (page 60) for details. Each LED light cube is coded to allow the EVOS™ FL Imaging System to automatically recognize it in any position.



WARNING! UV LIGHT HAZARD! The EVOS™ FL and EVOS™ FL Color Imaging Systems use a Class 3B ultraviolet LED for the DAPI channel. **Before changing the LED light cubes, power off the instrument.**

1. Turn the power switch to the “O” (OFF) position before removing or changing light cubes.



Power switch

2. Move the stage back to allow access to the light cube access cover, which is centered under the back of the stage.



Light cube access cover (under stage)

3. Loosen the thumbscrew to remove the light cube access cover, then remove the light cube tool under it.



Light cube tool (under the access cover)

4. Move the light cube selection lever to the position you want for the new cube.
5. Use the light cube tool to loosen the two slotted screws.



Loosen slotted screws with tool

6. Screw the threaded end of the light cube tool into the hole in the center of the light cube.



Light cube tool attached to light cube

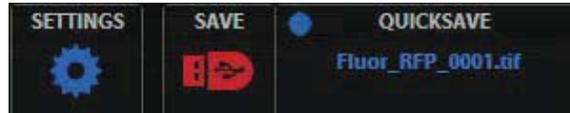
7. Use the tool to tilt the light cube slightly toward you, then lift out the light cube gently out of the instrument. Remove the tool from the cube.
8. Attach the tool to the new light cube, then lower the new cube into position so that the electronic connection aligns properly (facing the back of the instrument) and the cube sits squarely in place.
9. Use the light cube tool to gently tighten the two slotted screws so that the screw heads sit flush with the ridges on the light cube.
10. Slide the tool into its storage slot.
11. Replace the light cube access cover and ensure the thumbscrew is tightened.
12. Turn the power switch to the " | " (ON) position.

Assign custom channel display colors

You may assign custom display colors for each light cube in the Channels tab of the Settings dialog.

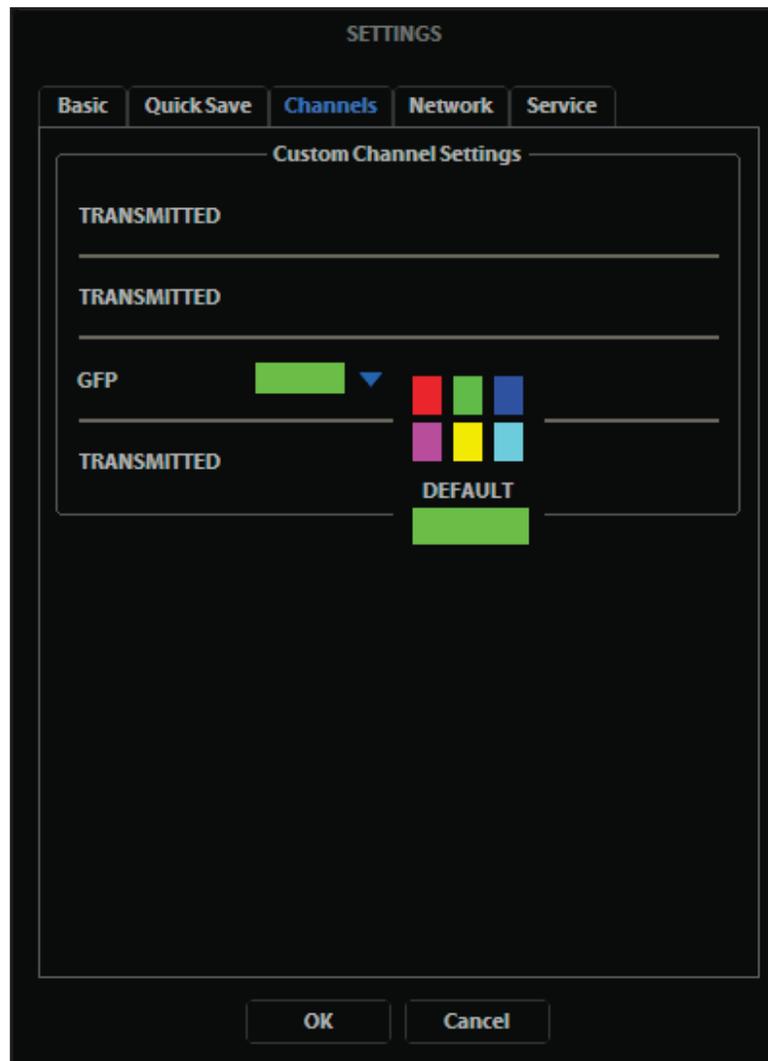
C **Note:** The color camera version does not include this feature.

1. Click the **Settings** button to open the Settings dialog (Figure 38), then select the **Channels** tab.



Settings button

2. Select the appropriate color from the drop-down for each light cube you wish to customize.



Assigning custom channel display colors
(not applicable for the color camera version)

3. Click **OK** to accept the custom color assignments. The display change takes effect with the next image acquired in the customized channel.

Appendix A: Troubleshooting



Note: For additional technical support, contact your local EVOS™ distributor. If you do not have your distributor information, contact Technical Support (page 60).

Image quality issues

Problem	Possible solutions
Misaligned overlay image	Re-capture images in each channel.
Transmitted light 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.• Remove light shield box, if it is in place.
Uneven focus across screen	Position sample flat on the stage; be sure the sample's thickness is even.
Trouble focusing on coverslipped sample on a 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 to 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 sample over objective.• Verify power supply is connected and power switch is on.
LCD screen is red, or red patches cover parts of the screen	<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



Note: We recommend keeping your EVOS™ FL or EVOS™ FL Color Imaging System up to date with the latest software. For more information, see “Update the software”, page 43.

Problem	Possible solutions
Image does not respond to changes in focus or stage position	Click the Light ON button (note that a red USB icon on the Save button indicates that 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 light cube selection lever is clicked into a position. • Verify that the objective selection wheel is clicked into a position.
Scalebar does not appear when clicked	Capture an image first; scalebar is only available after capturing an image.
Save button does not respond when clicked	Click Capture first; it is only possible to save an image that is captured. The USB icon on the Save button is red when there is a captured image to save.
DVI output does not work on an external LCD monitor or projector	<ul style="list-style-type: none"> • Power the instrument 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 only an analog input (DVI-A) will not display the digital output from the EVOS™ system.
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™ system to be able to find it.

Mechanical issues

Problem	Possible solutions
LED light cube selection lever does not move	<ul style="list-style-type: none"> • NEVER force lever! • Remove LED light cube lock and replace with light cube access cover (page 44).
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	Use the correct vessel holder for the application (refer to the EVOS™ Vessel Holders spec sheet, included on the USB flash drive).
Mechanical stage drifts during time lapse sessions	Tighten the stage brakes (on the stage knobs) securely before starting a time lapse session.
Mechanical stage tension is loose	Tighten the stage brakes (on the stage knobs) as desired to increase tension.

Appendix B: 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

Safety conventions used in this document

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

Definitions



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



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



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



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

Except for **IMPORTANT!** safety alerts, each safety alert word in Thermo Fisher Scientific document appears with an open triangle figure that contains a hazard symbol. These hazard symbols are identical to the hazard icons that are affixed to Thermo Fisher Scientific instruments (see “Safety symbols” on page 52).

Symbols on instruments

Electrical symbols on instruments

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

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

Safety symbols

The following table describes the safety symbols that may be displayed on Thermo Fisher Scientific instruments. Each symbol may appear by itself or in combination with text that explains the relevant hazard (see “Safety labels on instruments” on page 53). These safety symbols may also appear next to DANGERS, WARNINGS, and CAUTIONS that occur in the text of this and other product-support documents.

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

Environmental Symbols on Instruments

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

Symbol	Description
	<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 thermofisher.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 Thermo Fisher Scientific instruments in combination with the safety symbols described in the preceding section.

Hazard symbol	English	Français
	CAUTION! Hazardous chemicals. Read the Safety Data Sheets (SDSs) before handling.	ATTENTION! Produits chimiques dangereux. Lire les fiches techniques de sûreté de matériels avant toute manipulation de produits.
	CAUTION! Hazardous waste. Refer to SDS(s) and local regulations for handling and disposal.	ATTENTION! Déchets dangereux. Lire les fiches techniques de sûreté de matériels et la 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 Thermo Fisher Scientific qualified service personnel.	AVERTISSEMENT! Pour éviter les risques d'électrocution, ne pas retirer les capots dont l'ouverture nécessite l'utilisation d'outils. L'instrument ne contient aucune pièce réparable par l'utilisateur. Toute intervention doit être effectuée par le personnel de service qualifié venant de chez Thermo Fisher Scientific.
	DANGER! Class 3B visible and/or invisible laser radiation present when open. Avoid exposure to beam.	DANGER! Rayonnement visible ou invisible d'un faisceau laser de Classe 3B en cas d'ouverture. Evitez toute exposition au faisceau.
	CAUTION! Moving parts. Crush/pinch hazard.	ATTENTION! Pièces en mouvement, risque de pincement et/ou d'écrasement.

General instrument safety

	 WARNING! PHYSICAL INJURY HAZARD. Use this product only as specified in this document. Using this instrument in a manner not specified by Thermo Fisher Scientific may result in personal injury or damage to the instrument.
Moving and lifting the instrument	 CAUTION! PHYSICAL INJURY HAZARD The instrument is to be moved and positioned only by the personnel or vendor specified in the applicable site preparation guide. If you decide to lift or move the instrument after it has been installed, do not attempt to lift or move the instrument without the assistance of others, the use of appropriate moving equipment, and proper lifting techniques. Improper lifting can cause painful and permanent back injury. Depending on the weight, moving or lifting an instrument may require two or more persons.
Moving and lifting stand-alone computers and monitors	 WARNING! Do not attempt to lift or move the computer or the monitor without the assistance of others. Depending on the weight of the computer and/or the monitor, moving them may require two or more people. Things to consider before lifting the computer and/or the monitor: <ul style="list-style-type: none">• 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: <ul style="list-style-type: none">• 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 60.
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 60.)
- 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™ FL Imaging System or the EVOS™ FL Color 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™ FL Imaging System and the EVOS™ FL Color Imaging System have an installation (overvoltage) category of II, and are classified as portable equipments.

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); available at www.cdc.gov
- Occupational Safety and Health Standards, Bloodborne Pathogens (29 CFR§1910.1030; www.access.gpo.gov/nara/cfr/waisidx_01/29cfr1910a_01.html)
- Your company's/institution's Biosafety Program protocols for working with/handling potentially infectious materials.
- Additional information about biohazard guidelines is available at: www.cdc.gov

In the EU:

- Check your local guidelines and legislation on biohazard and biosafety precaution, and the best practices published in the World Health Organisation (WHO) Laboratory Biosafety Manual, third edition www.who.int/csr/resources/publications/biosafety/WHO_CDS_CSR_LYO_2004_11/en/

Safety and Electromagnetic Compatibility (EMC) Standards

This section provides information on:

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

U.S. and Canadian Safety Standards



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

European Safety and EMC Standards



The **CE Mark** symbolizes that the product conforms to all applicable European Community provisions for which this marking is required. Operation of the instrument is subject to the conditions described in this manual. The protection provided by the instrument may be impaired if the instrument is used in a manner not specified by Thermo Fisher Scientific.

Australian EMC standards



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

Documentation and support

Obtaining support

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

At the website, you can:

- Access worldwide telephone and fax numbers to contact Technical Support and Sales facilities
- Search through frequently asked questions (FAQs)
- Submit a question directly to Technical Support (thermofisher.com/support)
- Search for user documents, SDSs, vector maps and sequences, application notes, formulations, handbooks, certificates of analysis, citations, and other product support documents
- Obtain information about customer training
- Download software updates and patches

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



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

Limited product warranty

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



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