

Procedure	Use Of Zoe Fluorescent cell imager
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Name(s) of person performing the work	Users (Lab manager & Lab Technician & Tenants & Licensee's)		
Name & position of assessor	Khwaja Islam & Laboratory Manager	Signature	
Date of assessment	05/01/2021	RA Number	BioE 0043

Outline of procedure / activity:

Operator must be trained in the use of the Zoe Fluorescent cell imager to guarantee safe daily use. Untrained Personnel are not be allowed to operate the Zoe Fluorescent cell imager Users should operate Zoe Fluorescent cell imager according to instructions in the manual. User must always ensure that power cable is in good condition, no wires exposed.

The ZOE Fluorescent Cell Imager is an inverted imaging system with bright field and three fluorescent channels (emitting in blue, green, and red colour), suitable for routine cell culture and imaging applications. All channels are fully integrated and optimized for most commonly used fluorescent proteins and dyes; no calibration or installation is needed. It is a stand-alone instrument and a PC is not needed to operate it.

The intuitive touch screen allows researchers to visualize their samples and capture cell images with the integrated digital complementary metal-oxide semiconductor (CMOS) camera. Images stored in the internal memory can be edited, overlaid into multicolour merges, and/ or exported to a USB flash drive using one of the two USB ports. The integrated light shield removes the need for a dark room and allows visualization of fluorescence in ambient light on the bench, where researchers work with cells. The screen viewing angle can be adjusted easily and optimized to a user's body height.

Each LED light source provides thousands of hours of reliable illumination that are instantly ready after power on. They provide cool, even, and continuous illumination; their brightness can be adjusted by the user to reduce sample photo bleaching.

Focusing is conducted manually using coaxial coarse/fine focus knobs located on the instrument base in an ergonomically deduced position, thus minimizing the strain on the user's hands.

The ZOE Cell Imager's 20x lens is mounted in a proprietary manner that results in a large field of view, one that is approximately equivalent to that of a 4x objective lens (0.70 mm²). Using the pinch-to-zoom gesture, researchers can instantly change magnification while retaining resolution of 1 pm.

Applications of the ZOE

- Estimate cell confluence
- Observe general cell health and morphology
- Monitor cell growth and proliferation
- Capture bright field or fluorescence images of cells
- Visualise expression of fluorescent proteins
- View immuno-fluorescent localization of proteins
- Estimate transfection efficiency

Operation

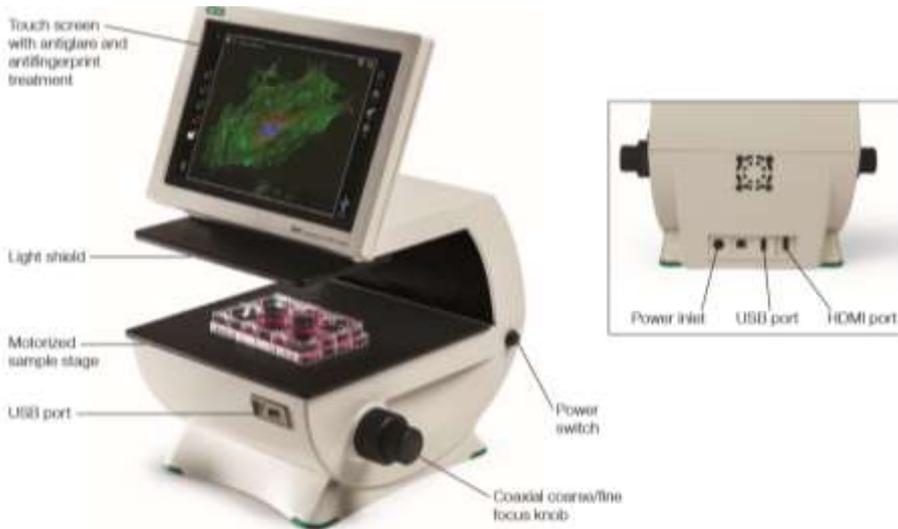


Fig. 1. Elements of the ZOE Fluorescent Cell Imager. Though not shown in full instrument image, both left and right sides have focus knobs. (They can be seen in inset image of the back of the instrument.)

Menus on the touch screen can be customized. To change the default instrument settings, tap the 13 icon located in the upper left corner of the screen (Figure 2) and select Settings.

1. In the Settings window that opens, tap the option you want to modify.
2. Make the desired modifications and tap **El** to exit

Options on the following menus can be modified



Fig. 2. Elements of the touch screen when the ZOE Fluorescent Cell Imager is powered on. White icon shows imager is in Position mode; other modes are grayed out.

Camera

The default values for Gain, Exposure time, LED Intensity, and Contrast can be changed. The instrument must be powered off and turned back on for new values to become active.

Preferences

The following options can be modified:

Image File Format — captured images are stored as JPEGs. Alternatives include TIFF and RAW, but the large files of these formats slow down the operating system.

Image File Name Format — default file name format is Colour Serial number Time stamp. Alternatively, Colour Prefix Time stamp allows you to use a custom prefix (for example, Hela).

Add scale bar to captured image — tap **Yes** to add a scale bar to captured images; tap **No** to disable the function.

Attach underlying single colour images to merge — tap **Yes** to export underlying single-color images along with the merge file; tap **No** to disable the attach function during export to a USB flash drive.

Automatic export of image files to USB drive — enable automated image export to inserted USB flash drive. Images will be saved to both the USB drive and the internal memory.

Sleep Mode — determine how long the unit should stay fully on after a user interaction. In sleep mode certain functionalities are turned off to preserve power. The ZOE Cell Imager comes fully back on within 20 seconds when the screen is touched.

Date and Time

The date/time stamp is used to track images stored in the internal memory. The date and time should be set before using the imager. Resetting the date/time after the cell imager has been used will not affect already stored image **System**

The following information is available in this menu option:

- Legal information
- Android version
- Kernel version
- Vision board drive version
- Driver board firmware version
- Galileo software version
- Firmware update
- System test posting

Firmware update

To update firmware on the instrument:

1. Insert a USB flash drive with the firmware update file into USB port. The firmware file must be saved in the root directory of the USB flash drive
2. Tap **Firmware update** in the System option of the Settings menu.
3. When the instrument recognizes and validates the firmware file, it proceeds with the update.

Note: If the USB flash drive with firmware file is not inserted, a message prompting you to do so will be displayed. If the update file is not saved in the root directory, a "No update file present." message displays.

4. Tap **Enter** to continue updating.
5. When the update is successfully completed, the ZOE Cell Imager automatically restarts.

Note: Three types of update files may be available: a Vision board driver update, Driver board firmware, and/or ZOE software.

If both the Vision board driver and ZOE software are updated at the same time, the Vision board driver will be updated first. When that is completed the instrument automatically restarts itself and repeats steps 2-5 to update the ZOE software.

Cleaning

Standard ethanol (70%) or other cleaning agents recommended for cleaning of laboratory equipment can be used for cleaning and disinfection of the unit. These cleaning instructions apply only to the outer case and not the LCD screen. For screen: Use a soft, lint free cloth lightly moistened with 70% isopropyl alcohol. Wipe dry immediately, cleaning the screen with excessive force can damage it

Substance or item handled	Associated Hazard (s)	Existing Control Measures	Risk (L/M/H)	Further Action required	Risk (L/M/H)
Mains connection socket with power switch	Electrical hazard - Electrical shock – danger of death	Only switch on the device if the device and power cable are undamaged. Only trained personal are allowed to use the machine. Instrument is earthed, protective earth connection for the machine is provided using 13A plug fitted to the machine (RCD protected). Make sure it has been PAT tested. Regular visual checks of power cords for fault, fraying or wear and regular electrical safety check. Any faults reported and repaired before use. Always handle any components of the system with care and with clean, dry hands. Do not clean, open the housing, or access any electrical parts while the instrument is connected to the mains.	L	No further action required if the existing control measures are adhere to.	L
USB drive	USB may be infected with computer virus thus damaging performance of cell counter	Check USB drive is not infected by virus before inserting into cell counter. Only use own USBs, do not borrow from other's.	L	No further action required if the existing control measures are adhered to.	L

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Potential hazards

Persons potentially at risk:

Only the user or others near by

Action in event of an accident or emergency:

1. **Fire:** raise the fire alarm and evacuate the area.

Arrangements for monitoring effectiveness of control:

Daily inspection of equipment by lab technician.

Annual preventative maintenance carried by external contractor.

Instruction and training given to all operators which is reviewed annually.

Existing operators receive annual refresher training.

Annual pat testing by external contractor.

Arrangements for monitoring effectiveness of control:

Review of the Risk Assessment:

Date of review		Name of reviewer	
Date of next review		Signature	

Have the control measures been effective in controlling the risk?

Yes	No
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Have there been any changes in the procedure or in the information available which affect the estimated level of risk from the listed substances

Yes	No
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What changes to the control measures are required?

