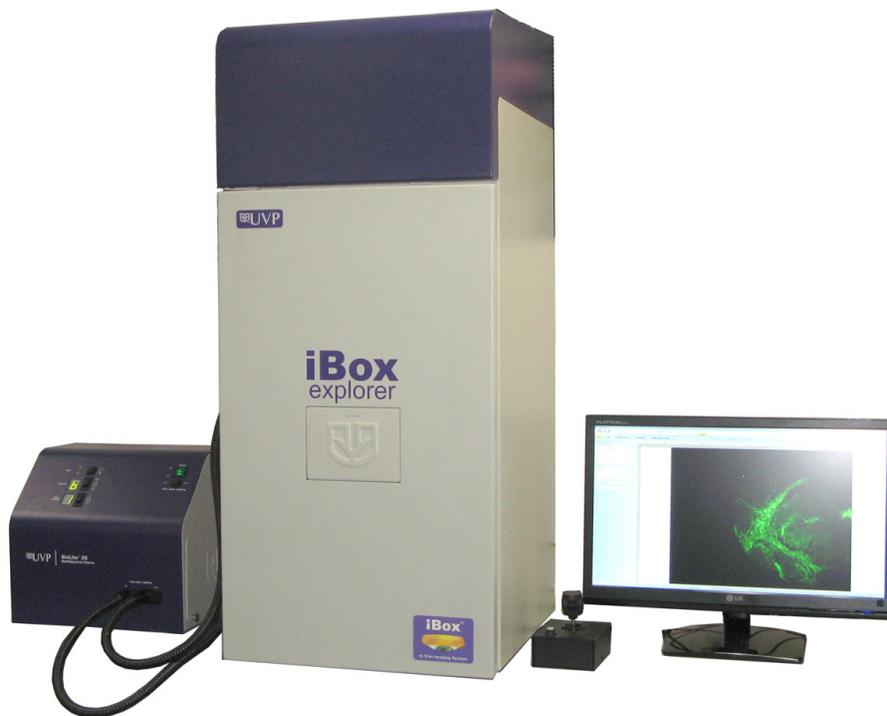


iBox® Explorer™ Fluorescence Imaging Microscope

Instruction Guide



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Introduction

The iBox Explorer Fluorescence Imaging Microscope is designed to automate research with one-touch, pre-set or user-defined PC controls for accurate, repeatable imaging and analysis of animals and plants. The iBox Explorer incorporates a light-tight darkroom with VisionWorks®LS software for automated control. The system provides the ability to micro image cells and organs subcutaneously and within the body cavity of living mice.

The darkroom has a door-mounted viewing window, four-position emission filter slider with three emission filters included and a software- and joystick-controlled imaging platform. The system comes with dual-path directed lighting for exciting samples with the BioLite™ Xe light engine. The BioLite Xe offers an eight-position filter wheel, six-position intensity selector, and a direct lighting source using fiber optic bundles to tightly control the output spectrum for consistent, repeatable measurements. Two excitation filters are included, one each for excitation of GFP (Green Fluorescent Protein) and RFP (Red Fluorescent Protein).

The iBox Explorer system comes equipped with a warming plate with internal heating elements that maintains the warming plate surface at a constant 38°C.

The iBox Explorer includes a highly sensitive CCD camera with high magnification optics, providing real-time, live preview images.



iBox Explorer Imaging Microscope

Safety Information

Do not use this equipment in a manner other than as stated in these instructions.

This equipment is designed for use in the laboratory environment by personnel knowledgeable in safe laboratory practices. Proper precaution must be taken, as potential electrical and mechanical hazards are inherent in this use of this equipment.

CAUTION: UVP's warming plate is designed for the safety of users. Care should be taken when operating the unit, as the warming plate will be hot.

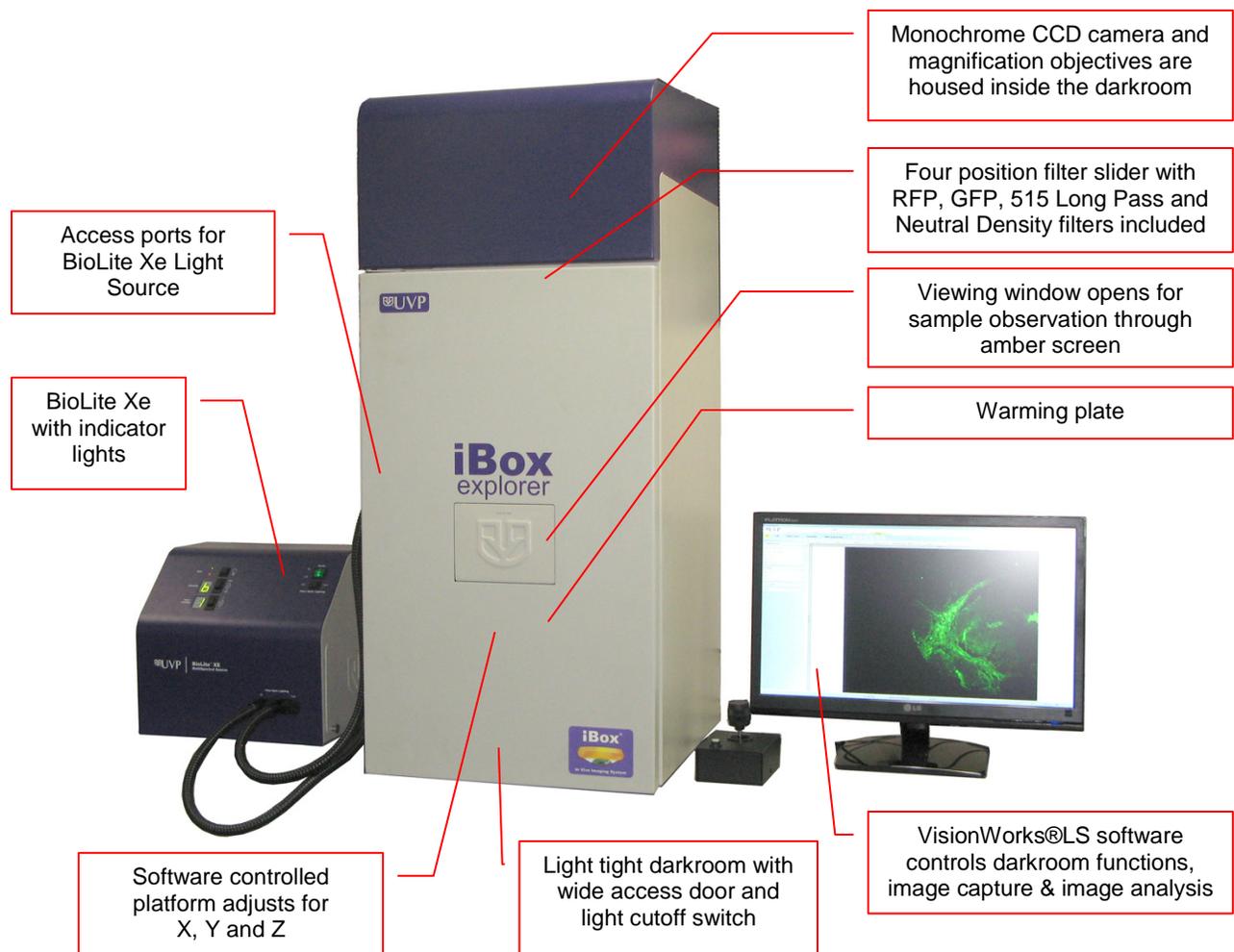
Components

The iBox Explorer Imaging Microscope is comprised of the following equipment:

- Darkroom Cabinet
- Joystick
- CCD Camera/Optics (internal and not visible)
- Sample Viewer Window and Internal Amber Screen
- Motorized Platform
- Warming Plate
- Emission Filters (GFP, RFP, 515 Long Pass, Neutral Density)
- Excitation Filters (GFP, RFP)
- BioLite Xe Multispectral Light Source
- VisionWorksLS Software

Please review the packing slip for a complete equipment list. System components may vary.

Note: The system may additionally include a computer and monitor.



Specifications

Power Requirements:

100-230V 6.3 Amps at 120 Volts

Mains supply voltage fluctuations are not to exceed 10 percent of the nominal supply voltage

Pollution degree: 2

Installation category: II

Altitude: Up to 2000m

Ambient Temperature: 5°C to 40°C

Humidity: Maximum relative humidity of 80% for temperatures up to 31°C, decreasing linearly to 50% maximum relative humidity at 40°C

Darkroom Cabinet

The iBox Explorer is constructed of aluminum and fabricated to provide a light tight chamber.

Darkroom Dimensions: 17.5" W x 20" D x 42" H

Four Position Filter Slider

The filter slider accommodates up to four removable emission filters. The iBox Explorer system includes RFP (Red fluorescent protein), GFP (Green fluorescent protein), and 515 Long Pass and Neutral Density emission filters. The VisionWorksLS software controls the selection of filters. Additional filters are available through UVP.

CCD Camera and Objectives

The high-sensitivity CCD camera and fast optics, housed in the top of darkroom, generate high resolution images. The camera and motorized optics are controlled by the VisionWorksLS software.

Magnification

The iBox Explorer contains a combination of relay and objective lenses, providing magnifications of 0.5 x, 2.5 x, 4.5 x, 8.8 x and 16.5 x.

Viewer Window

The viewer window, built into the darkroom door, opens for sample viewing.

Motorized Platform

The motorized platform, controlled by the joystick, can be finely adjusted in the X, Y, and Z dimensions. The platform can be moved in the X direction 100mm, in the Y direction 100mm, and in the Z dimension 100mm.

Warming Plate

The warming plate creates a constant temperature of 38°C for the warming of animal specimens. The dark background creates an ideal imaging surface while maintaining a constant temperature for the specimen.

VisionWorksLS Software

The VisionWorksLS acquisition software controls the darkroom functions and lighting as well as the motorized optics and camera, and is operational on both 32-bit and 64-bit Windows operating systems.

BioLite Xe Multispectral Source

The BioLite Xe provides a dual path excitation source for specimens. GFP and RFP filters come standard with the BioLite Xe, and custom filters for specific applications are also available. Refer to "Replacement Parts and Accessories" for ordering information.

Installation

Installing the Software

- Insert the VisionWorksLS CD (not network CD) into the computer.
- Click on the “**Install**” button for VisionWorksLS.
- Click **OK**, **Next**, agree to “I accept terms of licensing agreement”, then **Next**. Leave all options in their default settings. Then click **Next**, **Next**, **Install**, and finally **Finish**.

Registering the Software

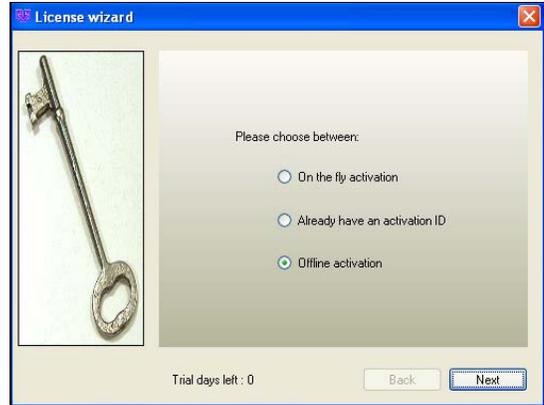
Open the Software

- Double click the VisionWorksLS software icon on the desktop.
- To activate the software, registration is required. To immediately activate the software online, choose **On the fly activation**. If the computer is not connected to the Internet, please select **Offline activation** and proceed to the following page of this manual, or call UVP to register the software.
- Click **Next** to continue.
- The **Already have an activation ID** option is useful when reloading the software after receiving an initial activation code.
- Complete all required information on the form.
- Fill out the Serial Number located on the CD. The number should be four sets of six numbers.
- Once you have completed the form, click on **Get Activation No.** and then click on **Activate** once the Activation Number appears in the box.



- If the computer is not connected to the Internet, click **Offline activation** to register the software. This allows the user to obtain the activation code and enter it at another time.
- Click **Next** to continue.

- Click the link provided and complete the form to obtain instructions. Click **Finish**.



Installing the Hardware

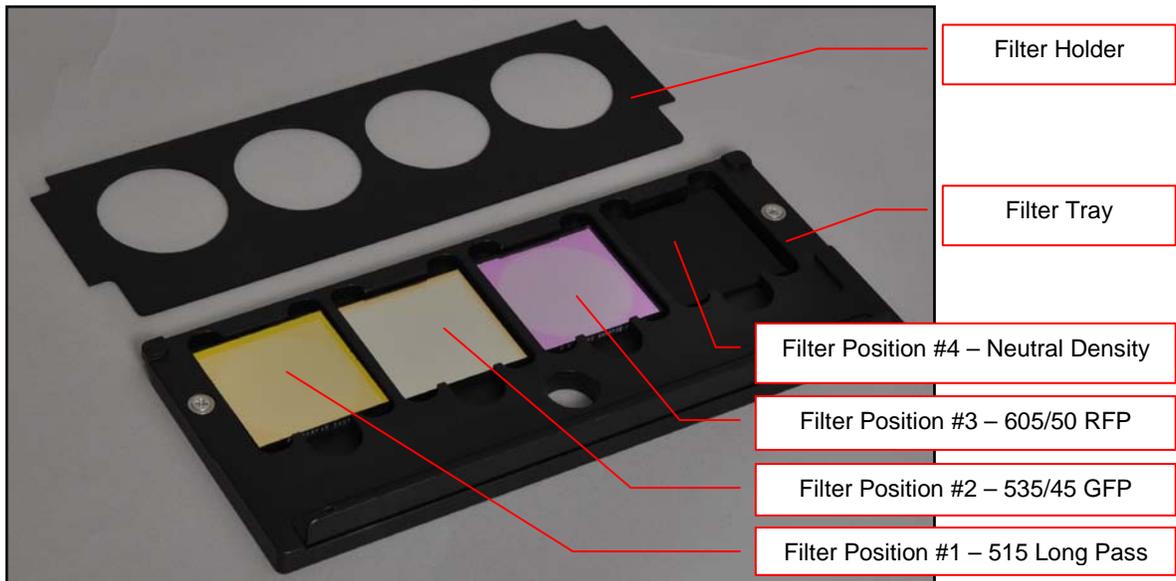
Darkroom Setup

- When unpacking and setting up the darkroom, two people are required to move the darkroom.
- Place the darkroom on a flat surface which can provide adequate support for up to 120 pounds.

NOTE: This system is designed for indoor use only.

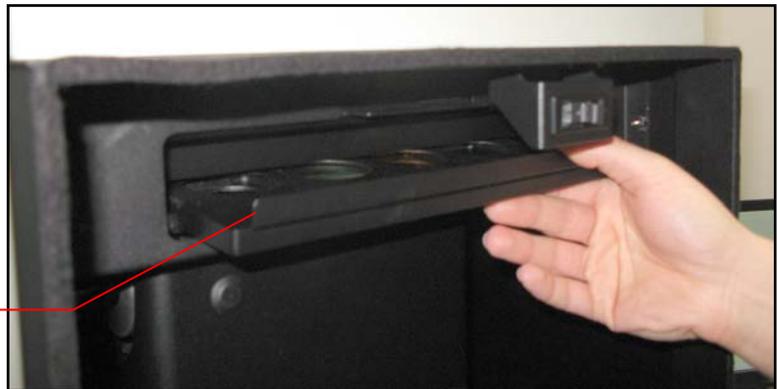
Darkroom Filter Setup

- Place the filters into the filter tray in the appropriate position as noted below. Once all filters are in place, position the magnetic filter holder over the filter tray to hold the filters in place.



- Open the darkroom door and slide the filter tray into position with the lip facing up.

Lip facing up



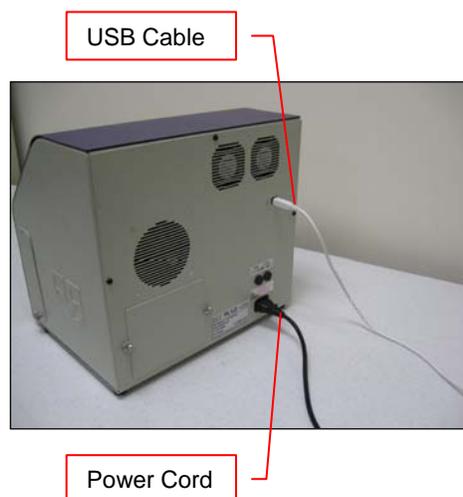
Camera Assembly

- The system will come shipped with the camera and objectives installed from the factory. No additional assembly is required.

BioLite Xe Multispectral Light Source Setup

Note: Image shown may be different from the product you receive.

- Position the BioLite Xe to the left of the darkroom.
- To insert the bulb, remove the plate on the bottom of the unit. The bulb will come with a male connector on one end and a female connector on the other. Connect the male connector from the bulb to the female connector in the BioLite Xe, and vice versa. **CAUTION: DO NOT TOUCH THE GLASS OF THE BULB!**
- Reconnect the plates to the bottom and back of the unit.
- Plug the power cord into the receptacle on the back of the unit and to a power outlet.
- Connect the USB cable to the back of the unit and to the computer.



Filters are installed in their black casing at the UVP factory.

- To insert the filter/holder into the filter wheel, hold the assembly so that it is positioned vertically with the ridge to the top left as shown in the photo.
- The filter/holder ridge is then positioned closest to the front of the unit.

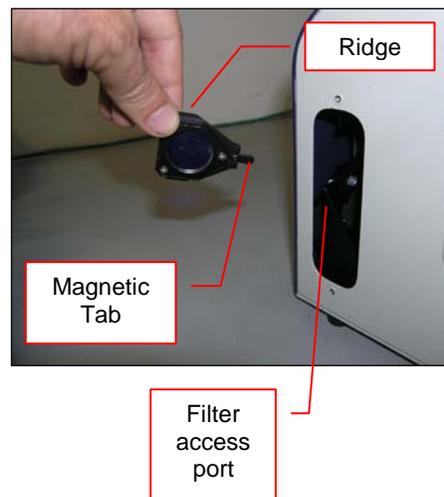
Filter access port



- Manually rotate the filter wheel to select the desired filter position.

1. Load the **GFP filter in position number one** as noted on the BioLite Xe filter wheel.
2. Load the **RFP filter in position number two** as noted on the BioLite Xe filter wheel.

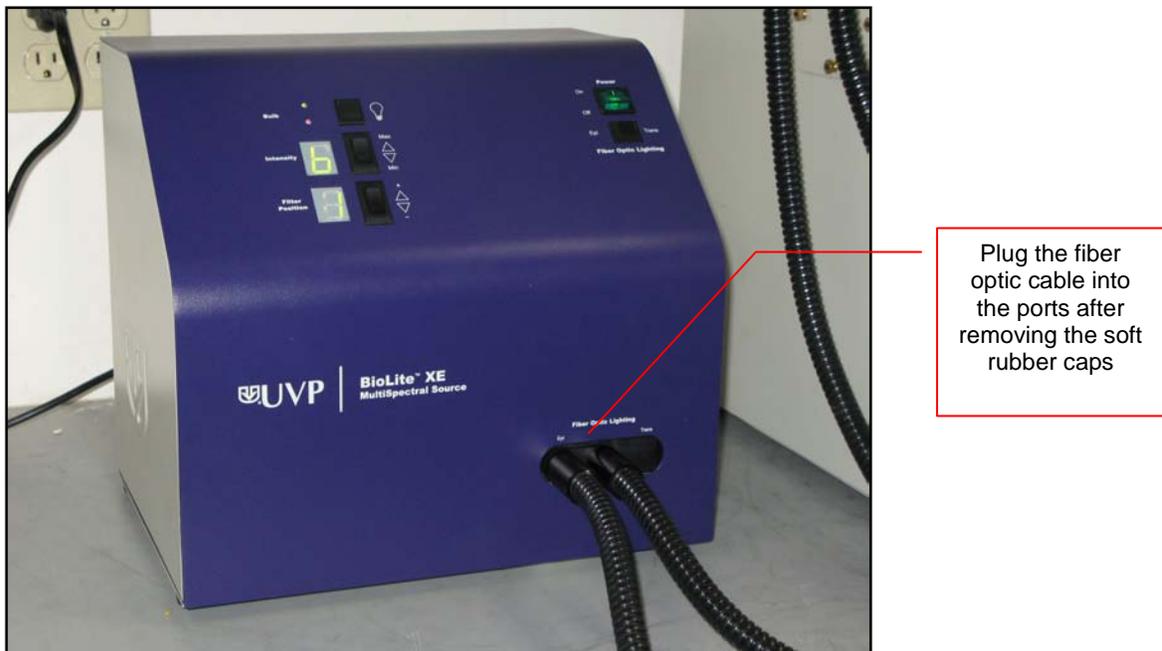
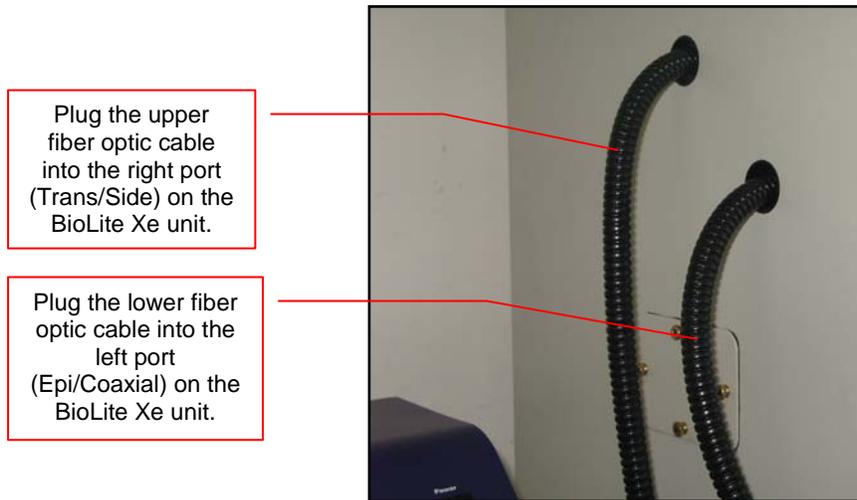
NOTE: Do not force the filter assembly inside the BioLite Xe wheel slot. First check to ensure that the orientation of the filter assembly is correct.



Fiber Optic Cable Connection

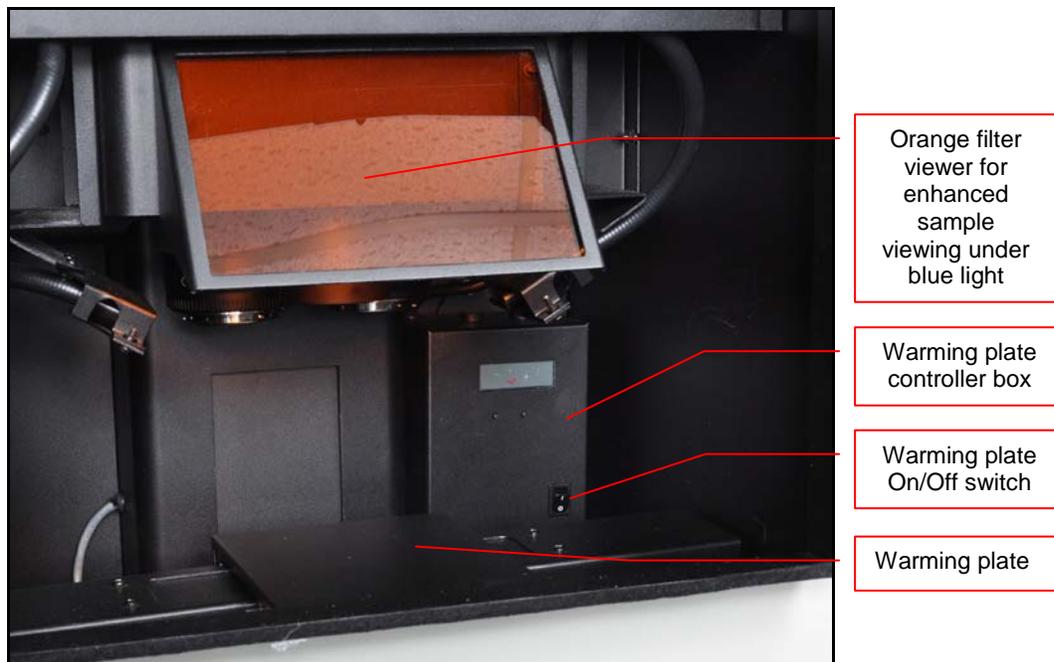
The iBox Explorer has two black fiber optic cables coming out of the left side of the unit.

- Remove the soft rubber cap from the tip of each of the black fiber optic cables.
- Plug the lower fiber optic cable into the left port (Epi/Coaxial) on the BioLite Xe unit.
- Plug the upper fiber optic cable into the right port (Trans/Side) on the BioLite Xe unit.



Platform Stage/Warming Plate

The platform stage contains a built-in warming plate. The warming plate plugs into the port provided inside the darkroom, and is able to be shut off using the switch on the warming plate control box.



Additional iBox Explorer Connections

- Plug the USB cable into the back of the darkroom cabinet and the other end into the computer. This cable allows the user to control all iBox Explorer hardware including magnification, camera, platform and filter selection through VisionWorksLS.
- Plug the joystick cable into the back of the darkroom cabinet.
- Plug the power cord into the back of the darkroom cabinet and the other end into a wall outlet.
- Turn the darkroom ON (power button is located on the top right side of the darkroom).

NOTE: Be sure to click the “Disconnect” button in VisionWorksLS before disconnecting any hardware from the computer.

Loading Drivers

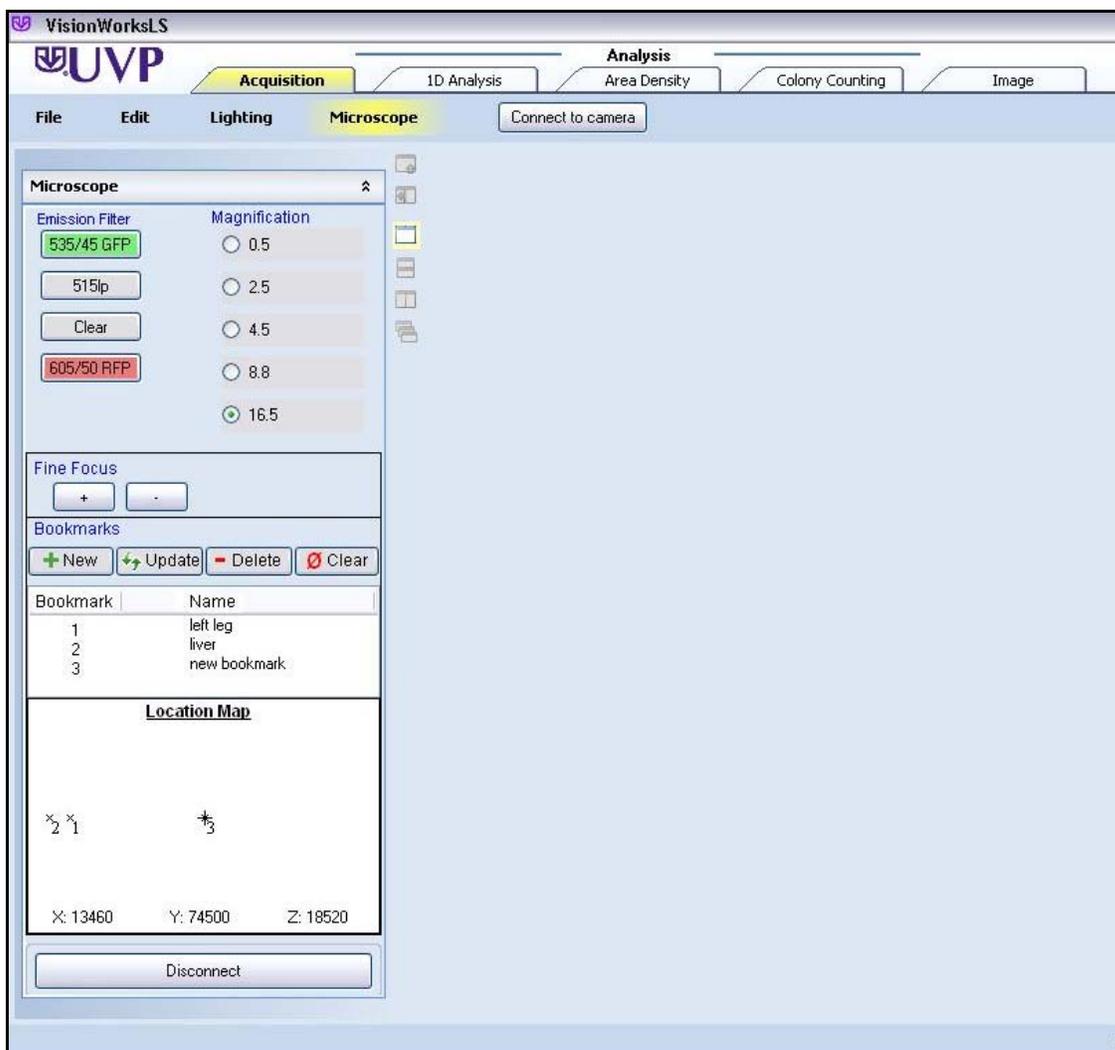
- Open the VisionWorksLS software.
- Turn the darkroom ON if not already powered on (power button is located on the top right side of the darkroom).
- Install the camera driver:
 - When the camera is first connected to the computer, the Found New Hardware wizard will open. Select Install from a list or specified location (Advanced) and click the Next button.
 - Select Don't Search. I will choose the driver to install. Then click the Next button.
 - Click the **Have Disk...** button and browse to the C:\Windows\system32\drivers folder. Select the AltaUSB.inf file and select Open and then OK to install the camera.
 - Select Finish.
- Install the darkroom driver:
 - Load the small disk that was shipped with the system to enable functionality of the darkroom.
 - **NOTE:** If you do not have a tray-loading CD/DVD drive with an inset for loading a smaller disk, please contact UVP Technical Support for further assistance.

Operation

Preparing the System

- Turn on the darkroom and the BioLite Xe prior to opening the software to enable the hardware connection.
- Open VisionWorksLS software which controls the iBox Explorer system and the BioLite Xe.
- To operate the darkroom controls, open the VisionWorksLS software and click on the Acquisition tab. The software operates the objectives (lenses), emission filters, and BioLite lighting.
- The purpose of the Action Tabs is to enable quick selection of major tasks.
 - **Acquisition:** Options to change camera, darkroom, lens etc. settings to obtain an image
 - **Image:** Options to apply image filters, brightness & contrast, pseudocolors, annotations, and other tools to alter the appearance of the image

NOTE: 1D Analysis, Area Density and Colony Counting tabs are shown in the software, but are grayed out as they are not applicable.



Preparing to Capture Images

Platform Stage/Warming Plate

The platform stage/warming plate creates a constant temperature of 38°C to warm and prevent hypothermia in animal specimens. Place the specimen on the fixed warming plate of the iBox Explorer, where the dark background creates an ideal imaging surface while maintaining a constant temperature for the specimen.

For samples that do not require heat, it is possible to disable the warming component of the platform stage by moving the switch on the warming plate control box to the “off” position.

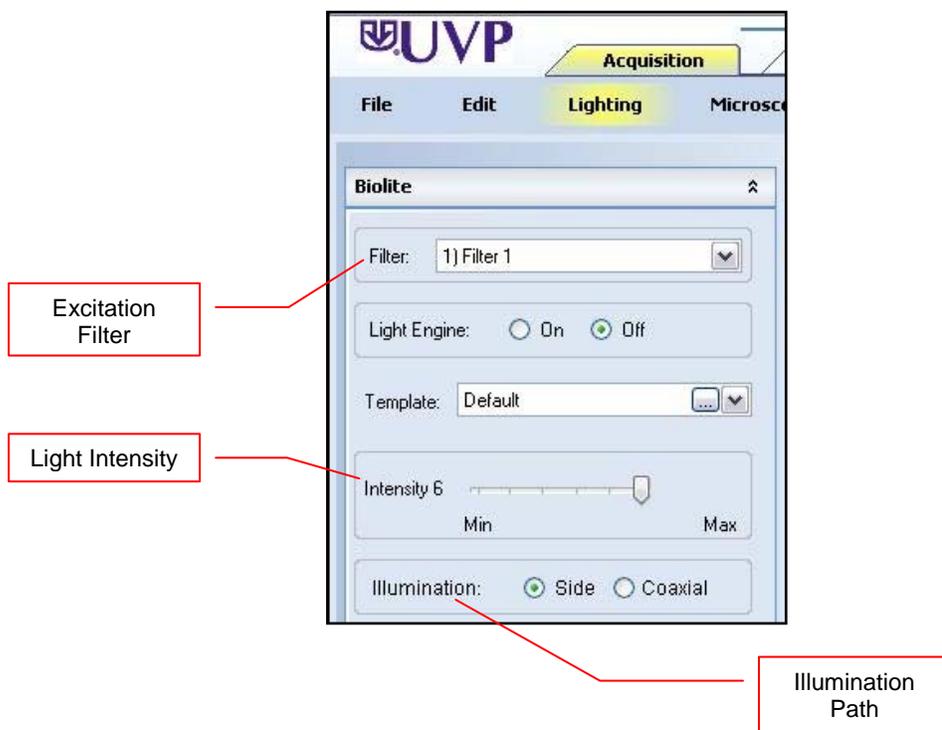
Selecting Excitation Filters and Lighting

VisionWorksLS provides automated control of the BioLite Xe excitation filters and lighting via the **Lighting** menu. Note that it is possible to control the BioLite Xe manually via the controls on the front of the unit; however, this is not recommended.

- Select from one of eight excitation filters (GFP and RFP are included) using the “Filter” drop-down menu shown.
- Select the “On” radio button next to “Light Engine”.
- Light intensity is selected via the “Intensity” slider, with intensities ranging from 1 (minimum) to 6 (maximum). The relative outputs for each setting are:

<u>Setting</u>	<u>Relative Intensity</u>
6	100%
5	50%
4	40%
3	25%
2	12%
1	0%

- Select the illumination path through the “Illumination” menu (either side or coaxial lighting).



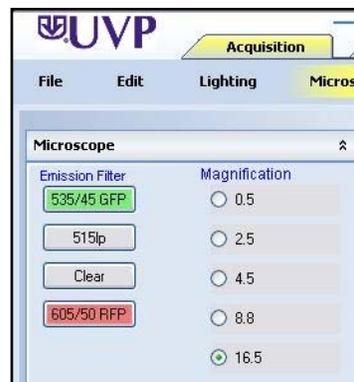
Selecting Emission Filters

Filter selection is controlled via the **Microscope** menu. Select the appropriate Emission Filter from the available buttons (note that the Clear/Neutral Density filter simply reduces the total amount of light that is allowed to pass through the filter).

Selecting Microscope Magnification

Microscope magnification is controlled via the **Microscope** menu. There are five magnification objectives to choose from for imaging. Select the desired magnification objective from the available radio buttons.

For initial focusing, it is recommended to begin at the 0.5 x setting, focus the image, and then move to the next higher magnification. Additionally, parfocusing allows the user to focus at a higher magnification then move to a lower magnification without losing focus.



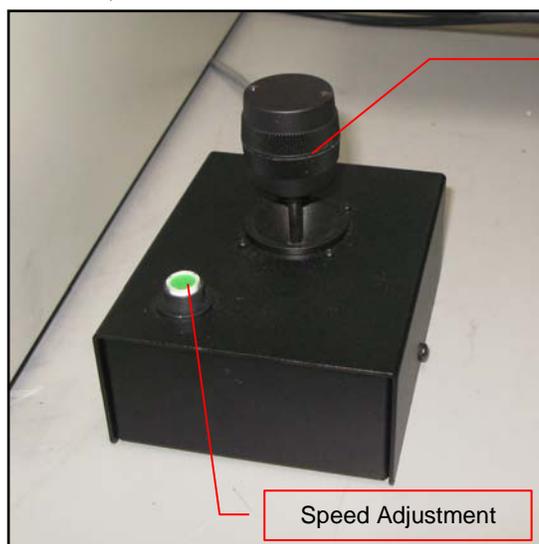
Camera Control

The camera and its various settings are controlled via the **Camera** menu button. Here, the user can select from a variety of settings, including exposure time, binning, and templates.

Adjusting the Platform Tray

The platform tray position is adjusted using the joystick.

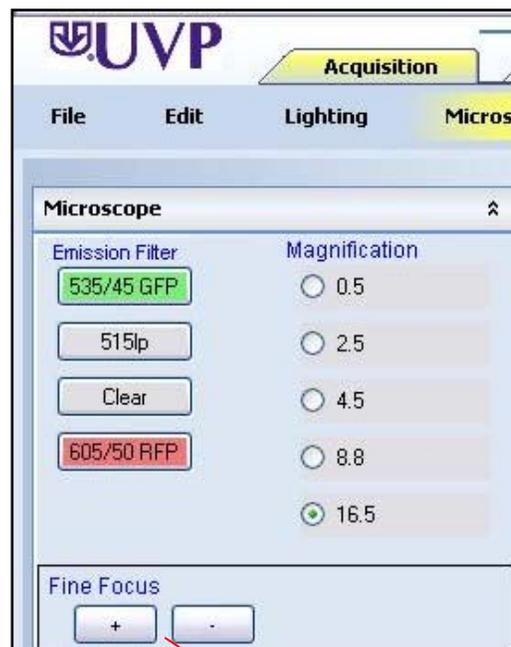
- Adjust the platform tray height by twisting the joystick handle left and right.
- Adjust the X and Y movement (left and right, or forward and back) by moving the joystick handle right and left, fore and aft.



Joystick

Speed Adjustment

- While twisting the joystick handle will cause quick vertical movements of the platform tray, the "+" and "-" buttons under the **Microscope** menu on VisionWorksLS are used for minor vertical adjustments of the tray. This allows for detailed focusing adjustments.
- The green button on the joystick box is used to toggle between slow and quick platform movement.



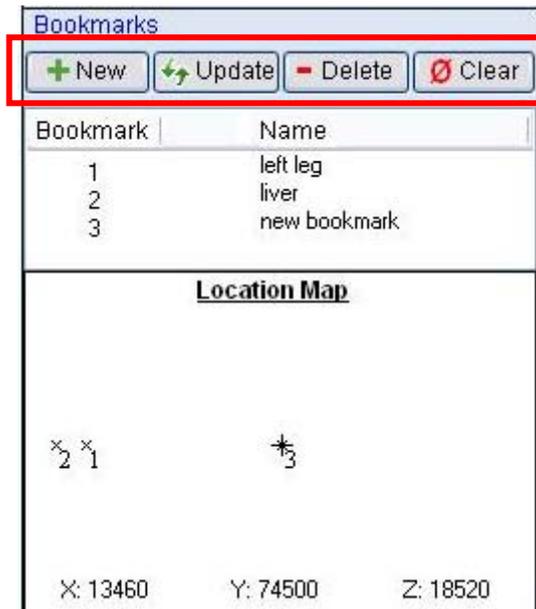
Fine Focus

Bookmarks

Using the VisionWorksLS Bookmarks feature, it is possible to temporarily store various platform positions. When the user desires to store the current platform position, click the “New” button under the “Bookmarks” section of the “Microscope” tab. Enter a name for the bookmark for reference.

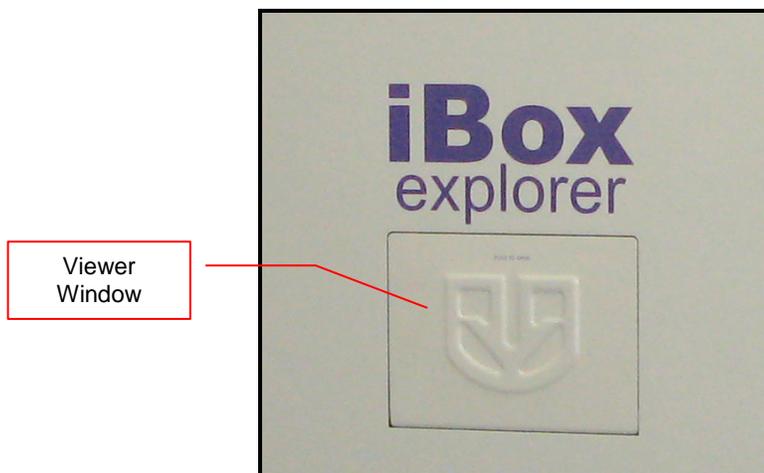
- “**New**” allows the user to save a new bookmark.
- “**Update**” allows the user to update the name or location of an existing bookmark.
- “**Delete**” allows the user to delete the selected bookmark.
- “**Clear**” deletes ALL stored bookmarks.

NOTE: Once VisionWorksLS is closed, all bookmarks will be deleted.



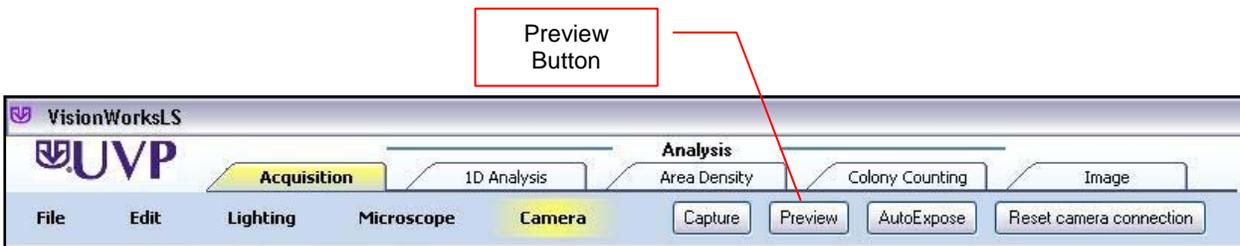
Viewer Window

The Viewer Window is located on the front of the darkroom door and has a pressure-sensitive clasp. Press firmly at the top of the cover to open the viewer. The window provides a view to the imaging platform surface through the amber screen for visibility of samples without opening the door.

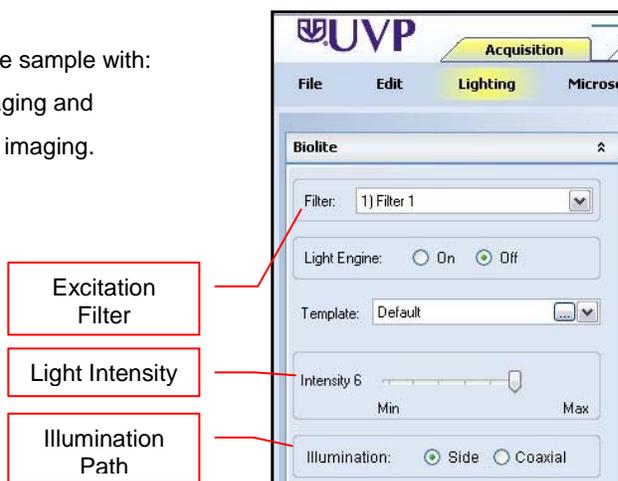


Capturing Images

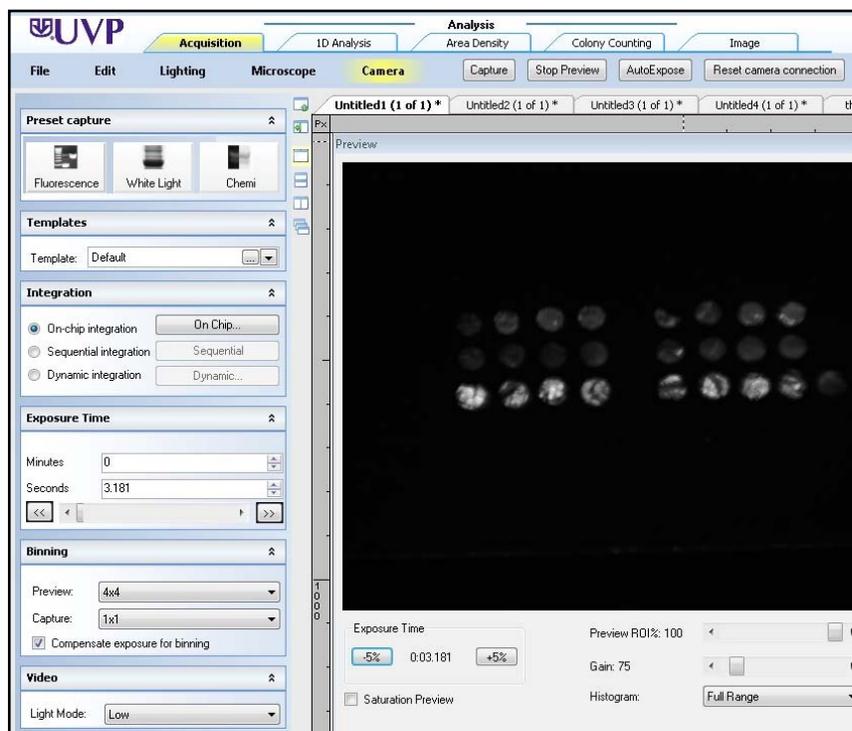
- Prior to image capture, use the **Preview** button to adjust image focus, exposure, location, etc.



- For excitation lighting, use the BioLite Xe to view the sample with:
 - Side lighting for low magnification imaging and
 - Coaxial lighting for high magnification imaging.
- Use the VisionWorksLS software to:
 - Select the appropriate filter and
 - Select the desired intensity.



- Adjust the position of the stage using the joystick as described in **Adjusting the Platform Tray**.
- Adjust the exposure time, binning and region of interest (ROI) while in the Preview window.
- Begin by focusing with the lowest magnification. Then, increase the magnification by one level and fine focus the image. Repeat this process until the desired magnification is achieved. Again, the Bookmarks tool is available to temporarily store locations and magnifications at those locations.



Service Procedures

Care and Cleaning

CAUTION: Warming plate surface can be very warm. Let the plate cool prior to cleaning the unit.

To clean the unit:

- Unplug the unit from the power source prior to cleaning.
- Use mild soap and water with a soft cloth or sponge to clean the exterior of the unit.
- Mild isopropyl alcohol or bleach can be used to clean the surface of the unit.

CAUTION: If cleaning agents other than those recommended by UVP are used, a hazard may result as a reaction with parts or material contained in the warming plate. Please contact UVP's Technical Assistance Department (contact information listed below) if there are questions regarding the materials used for decontamination or cleaning.

Return Procedure

A **Returned Goods Authorization (RGA)** number must be obtained from UVP Customer Service before returning any product or component.

Troubleshooting

No Power to the Darkroom

Check the main power cord connections to the darkroom.

Fuses are located in the back of the unit.

- Remove the fuse by using a flathead screwdriver to turn the fuse counter clockwise.
- Pull the fuse out.
- Visually inspect the filament inside the fuse to determine if it is still functional. If the filament has blown, insert a new fuse.
- Use a screwdriver to turn the fuse clockwise to lock.

Replacement Parts and Accessories

Replacement parts and accessories part numbers are shown below. To order accessories or replacement parts, contact UVP's offices listed under Technical Support.

Part Description

Fuse, 3.2 Amp
 Power Cord, 100V/115V
 Power Cord, 230V
 Additional or Replacement Excitation/Emission Filters
 Four-Position Filter Holder Assembly

Part Number

56-0002-05 – Qty 2
 46-0023-38
 46-0023-39
 Contact UVP for Details
 76-0400-01

Thermal printer, digital archive quality 256-grayscale (Mitsubishi)	89-0069-06 (115V)
Thermal printer, digital archive quality 256-grayscale (Mitsubishi)	89-0069-07 (230V)
Thermal printer, digital archive quality 256-grayscale (Sony for Europe)	89-0069-15 (230V)
Thermal paper, Mitsubishi (4 rolls – 800 images)	89-0038-01
Thermal paper, Sony high gloss (5 rolls – 1000 images)	89-0174-01
Thermal paper, Sony glossy (5 rolls – 1000 images)	89-0031-01

Anesthesia Unit: The anesthesia system is an optional component designed to safely anesthetize one small animal at a time with Isoflurane inside the darkroom. The patented non-rebreathing technology safely prevents backflow of gases into the darkroom.



Technical Support

UVP offers expert technical support on all of UVP's products. If there are any questions about the product use, operation or repair, please contact UVP's offices at the locations below. Or go to UVP's web site and click the Tech Support > Bioluminescence Systems.

NOTE: A Returned Goods Authorization (RGA) number must be obtained from UVP's Customer Service prior to returning any product.

If you are in North America, South America, East Asia or Australia:	If you are in Europe, Africa, the Middle East or Western Asia:
Call (800) 452-6788 or (909) 946-3197 , and ask for Technical Support during regular business days, between 7:00 am and 5:00 pm, PST.	Call +44(0) 1223-420022 , and ask for Customer Service during regular business days between 9:00 am and 5:30 pm.
E-mail your message to: info@uvp.com or techsupport@uvp.com	E-mail your message to: uvp@uvp.co.uk
Fax Technical Support at (909) 946-3597	Fax Customer Service at +44(0) 1223-420561
Write to: UVP, LLC. 2066 W. 11 th Street, Upland, CA 91786 USA	Write to: Ultra-Violet Products Ltd. Unit 1, Trinity Hall Farm Estate, Nuffield Road, Cambridge CB4 1TG UK

Warranty

UVP's products are guaranteed to be free of defects in materials, workmanship and manufacture for one (1) year from date of purchase. Consumable and disposable parts including, but not limited to tubes and filters, are guaranteed to be free from defects in manufacture and materials for ninety (90) days from date of purchase. Transilluminators carry a two (2) year warranty from date of purchase. If equipment failure or malfunction occurs during the warranty period, UVP shall examine the inoperative equipment and have the option of repairing or replacing any part(s) which, in the judgment of UVP, were originally defective or became so under conditions of normal usage and service.

No warranty shall apply to this instrument, or part thereof, that has been subject to accident, negligence, alteration, abuse or misuse by the end-user. Moreover, UVP makes no warranties whatsoever with respect to parts not supplied by UVP or that have been installed, used and/or serviced other than in strict compliance with instructions appearing in this manual.

In no event shall UVP be responsible to the end-user for any incidental or consequential damages, whether foreseeable or not, including but not limited to property damage, inability to use equipment, lost business, lost profits, or inconvenience arising out of or connected with the use of instruments produced by UVP. Nor is UVP liable or responsible for any personal injuries occurring as a result of the use, installation and/or servicing of equipment.

This warranty does not supersede any statutory rights that may be available in certain countries.

iBox and VisionWorks are registered trademarks of UVP, LLC.
BioLite and Explorer are trademarks of UVP, LLC.