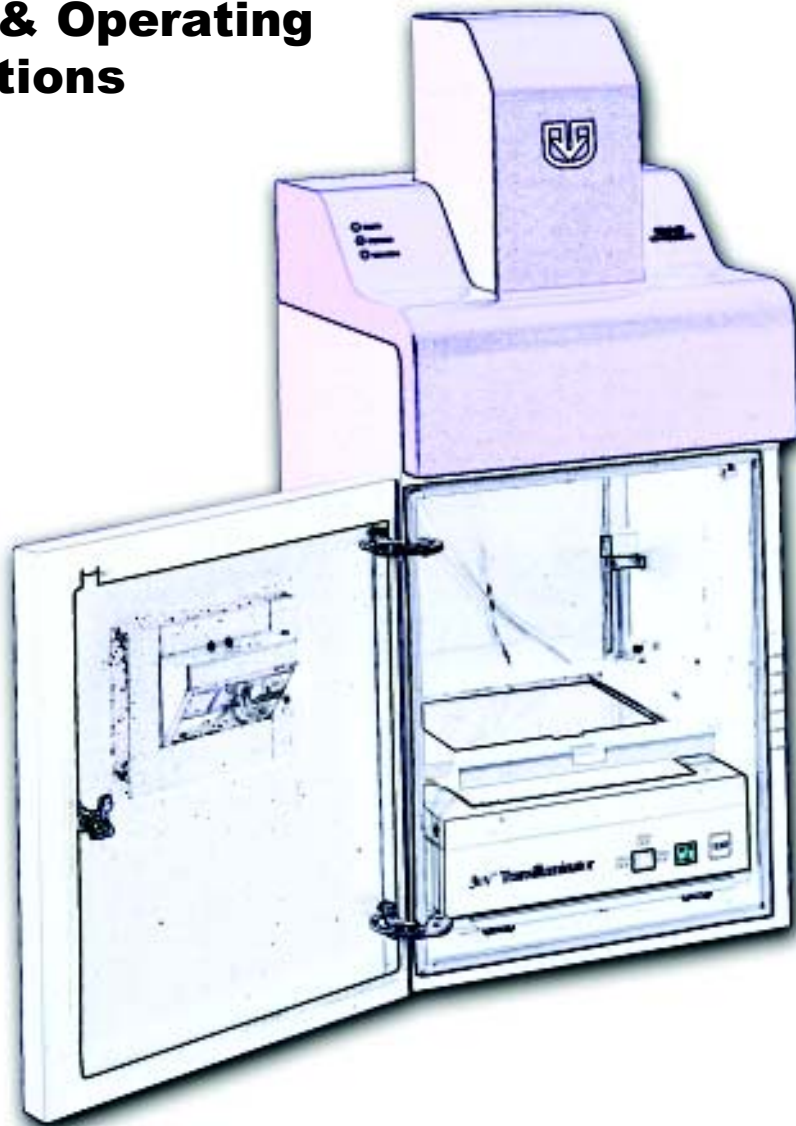


BioSpectrum®AC Imaging System

Set-Up & Operating Instructions



IMPORTANT:

Please read these instructions before setting up and operating your BioSpectrum AC system to familiarize yourself with operation procedures.



BioSpectrumAC Imaging System

Set-Up & Operating Instructions



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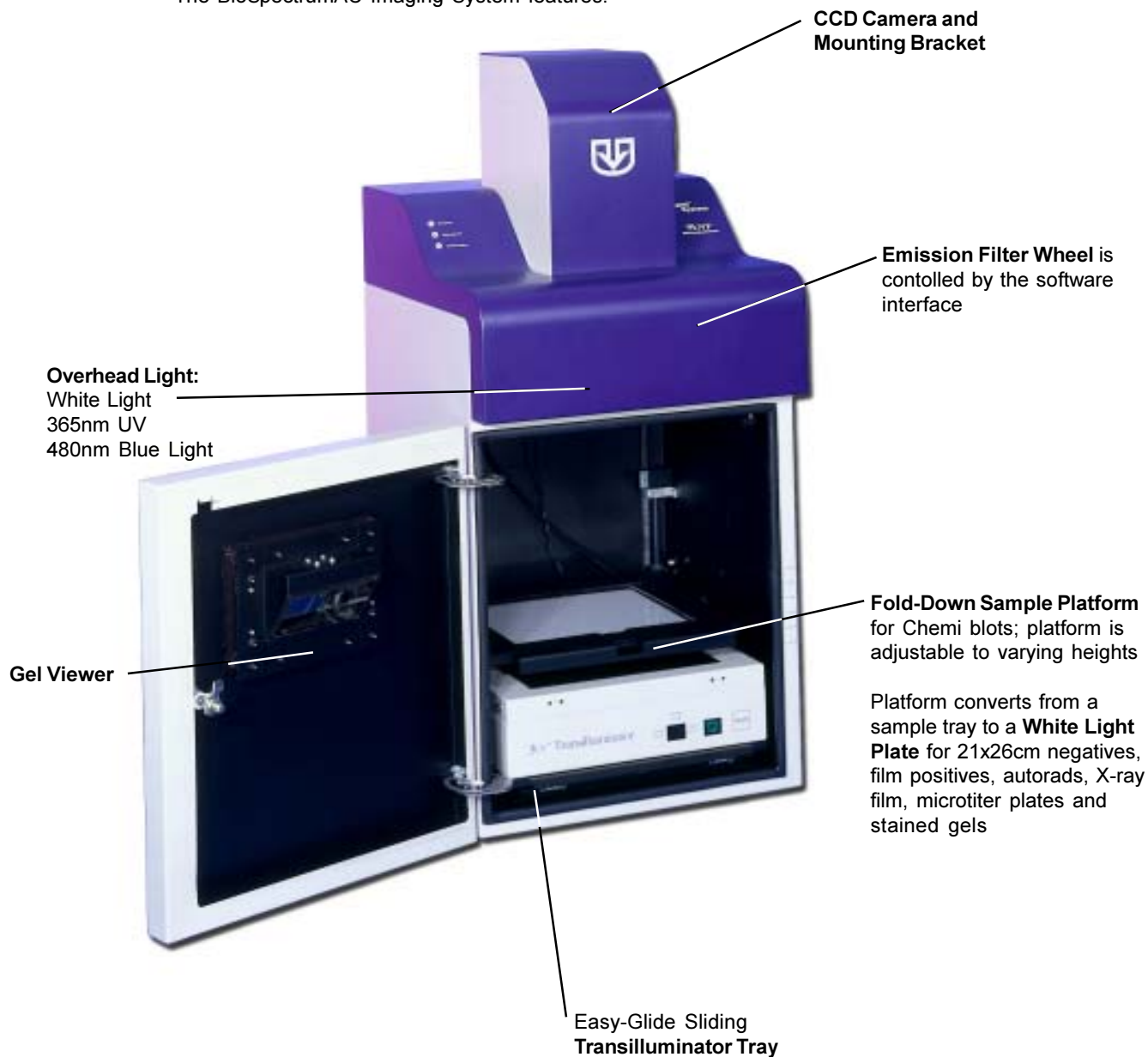
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Introduction

The BioSpectrumAC Imaging System is designed with efficient computerized controls specifically for low light and fluorescence imaging. Because of its light-tightness, it is particularly suitable for chemiluminescent applications. The special design accommodates a Benchtop Transilluminator on the sliding tray for easy access. For chemiluminescent applications, swing the chemi sample platform down for sample positioning. Additionally, the darkroom provides users added flexibility due to the filter wheel and overhead UV.

The BioSpectrumAC Imaging System features a specially designed CCD camera and mount for securely connecting the camera to the darkroom. Camera specifications are not discussed in this manual. Contact UVP or see other documentation included with your system for camera operating and set-up instructions. Transilluminators are ordered separately and also include their own documentation.

The BioSpectrumAC Imaging System features:



Components

The BioSpectrumAC Imaging System is comprised of the following equipment. Your system may or may not include a computer:

- Darkroom Cabinet
- Filter Wheel
- CCD Camera
- Gel Viewer
- Sample Platform
- Overhead Lighting
- Transilluminator Tray

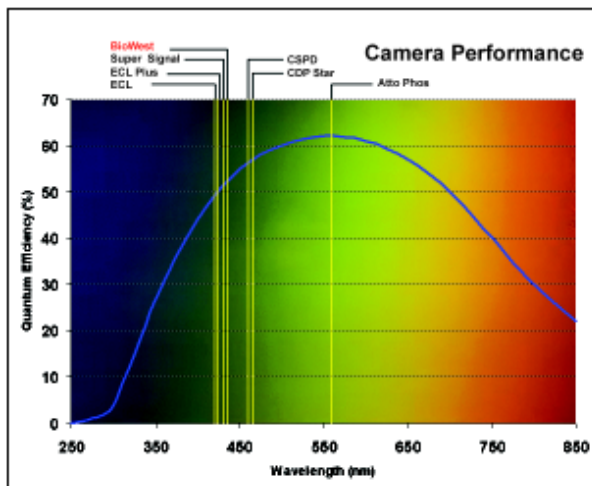
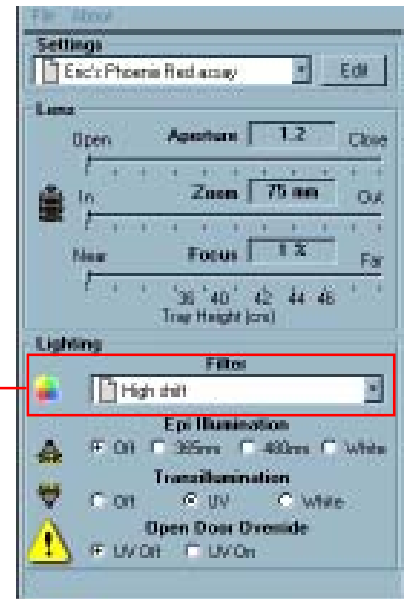
Darkroom Cabinet

The BioSpectrumAC Imaging System is manufactured of aluminum construction and fabricated to provide a light-tight chamber.

Darkroom Dimensions: 36.25"H x 17.5"W x 16.75"D
(921 x 445 x 425 mm)

Filters

The five-position filter wheel is designed for viewing many fluorescent and visible color stains. Refer to Set-Up Instructions for installation of the filters. Once filters are installed, easily select a filter from the software interface. The filter wheel is securely mounted into the darkroom for a clean, protected environment. The design allows for changing filters as required for various applications.



BioSpectrumAC Imaging System Camera Performance



Camera and Lens

CCD Camera and Lens

The cooled CCD camera, housed in the top of darkroom, generates extremely fast optics and high sensitivity for capturing high resolution images. The camera's motorized zoom lens is controlled by the BioSpectrumAC Imaging System software.

Gel Viewer

The viewer opens for safe viewing of samples. The acrylic window allows viewing without exposure to ultraviolet radiation.

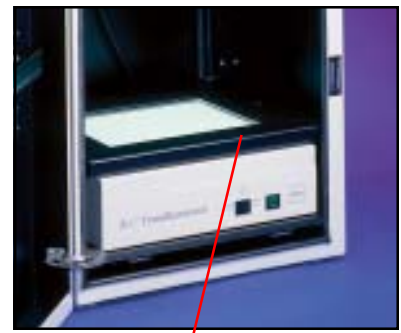


Gel Viewer

Sample Platform and White Light Plate

The sample platform folds down for placement of chemi blots. Swing the platform up for access to the transilluminator surface.

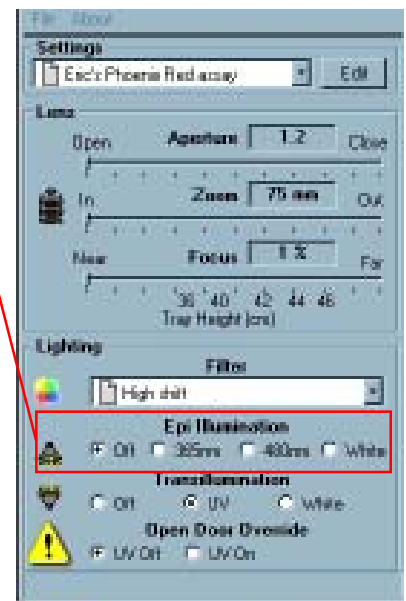
A white light plate is built into the sample platform. Remove the top of the platform for white light illumination.



Sample Platform and White Light Plate

Epi Illumination

Overhead lighting includes 365nm UV, Visi-Blue™ 480nm and white light. Lighting is controlled via the software interface.



Transilluminator Tray

The tray slides forward and back for easy access to the transilluminator surface. See transilluminator documentation for specific transilluminator operating instructions.

NOTE: When using the transilluminator with the darkroom door open, UV exposure safety precautions, including protective eyewear and clothing, must be observed to prevent harmful ultraviolet radiation exposure.



Transilluminator Tray

Set-Up Instructions

DO NOT ATTEMPT TO CONNECT ANY WIRING WHILE THE EQUIPMENT IS CONNECTED TO ANY POWER SUPPLY.

CAUTION!

Do not install the BioSpectrumAC Imaging System in places with high moisture, dust or high temperature. Do not use any oil or petroleum based cleaner for the cabinet. Use only mild soap or detergent solution for cleaning. Ensure that the system is turned OFF during cleaning.

Emission Filters

Emission filters are square, 50mm. The filters are not pre-installed at the UVP factory. Prior to installing the filters, ensure that the darkroom is in a fixed and permanent location as filters may slide in movement.

Filters are packed individually. Take caution when unwrapping and handling filters.

Locate filter wheel (fig. 1) in the darkroom's camera well. Each filter location is numbered for a corresponding filter. Placement of filters is as follows:

<i>Location</i>	<i>Filter</i>	<i>Wavelength</i>	<i>Part Number</i>
1	Clear	None	None
2	Optional	None	None
3	SYBR Green	515-570nm	38-0219-01
4	SYBR Gold	485-655nm	38-0221-01
5	Ethidium Bromide	570-640nm	38-0220-01

Using a finger, rotate the wheel to the appropriate filter location and gently place filter over the opening. Repeat the procedure until all filters are inserted.



Fig. 1. Filter wheel

Camera and Bracket

NOTE: Camera and bracket may be different than pictured here. Refer to separate Camera Manual for assembly instructions.

Install camera and bracket prior to connecting the main power connectors.

1. To attach the camera bracket to the top of the darkroom, first place the black rubber light sealing gasket over the four screw holes (fig. 5). Place the bracket (fig. 6) over the gasket, aligning the four holes on the bottom of the bracket with the holes in the gasket, positioning the bracket as shown in fig. 7). Screw in the 4 screws (provided) to attach the camera

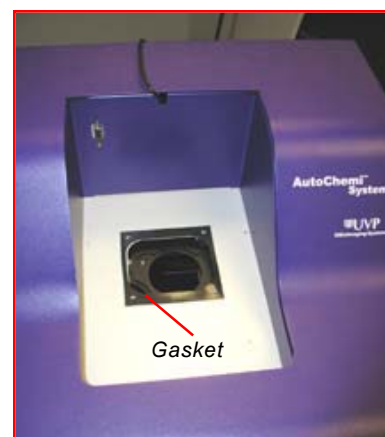


Fig. 5. Gasket placement.

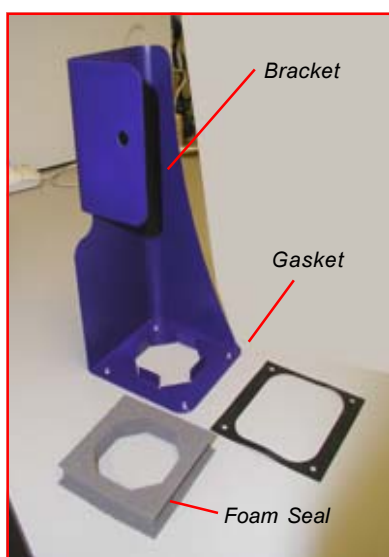


Fig. 6. Camera mounting bracket.



Fig. 7. Bracket assembly.



Fig. 8. Foam seal.

mounting bracket and gasket to the darkroom (fig. 7). Place the foam seal over the bracket base and around the bracket prongs (fig. 8).

2. Connect the camera and lens, aligning the camera and lens as shown in fig. 9. If necessary, loosen the black ring at the top of the lens to align and then retighten the ring.
3. Remove the lens cover.
4. Slide the camera/lens assembly into the bracket (fig. 10), positioning the camera with the black plate forward. Secure the camera to the mounting bracket with the knob.

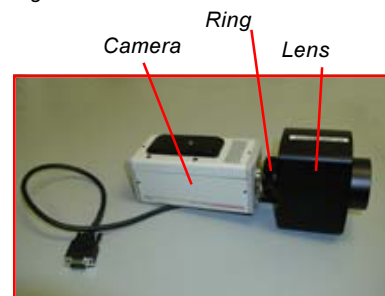


Fig. 9. Camera and lens assembly.



Fig. 10. Camera and bracket connection.

5. Locate the **darkroom cable** extending out of the camera well and connect to the top of the camera (fig 11).
6. Connect the **lens cable** to the darkroom body inside the camera well (fig. 12).

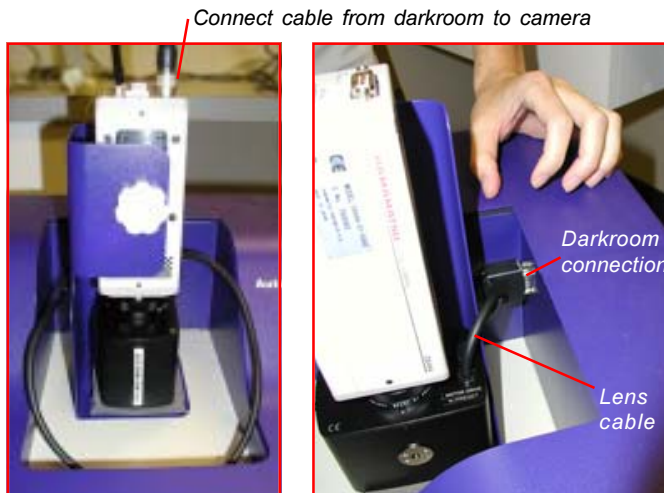


Fig. 11. Cable connections. Fig. 12. Darkroom lens connector.

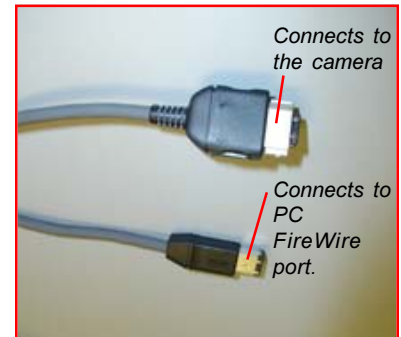


Fig. 13. FireWire Cable.

7. Fig. 13 shows the **Firewire cable**. Connect the cable to the camera (fig. 14). See instructions for Connecting to a PC for additional set-up instructions of the Firewire cable.
8. Place the protective cover over the camera assembly (fig 15).



Fig. 14. Firewire cable.

Darkroom and Transilluminator

The darkroom powers the motorized lens, overhead darkroom illumination, the white light plate and the transilluminator.

Connect the power cord to the main power port (fig. 16) which is located on the back top of the darkroom.

If using a transilluminator, place it on the roll-out tray located at the bottom of the darkroom. Connect the built-in power cord in the interior of the darkroom to the transilluminator.

For shipping purposes, the sample platform is secured to the back wall of the darkroom to prevent movement in shipping. To release the platform, use a Philips head screw driver to remove the screws on two sides of the platform (fig. 17).



Fig. 15. Protective camera cover.



Fig. 16. Main power connection.



Fig. 17. Sample platform.

BioSpectrumAC Imaging System Software Interface

An BioSpectrumAC Imaging System System shipped with a computer has the software interface installed at the UVP factory. If no computer is included with the system, a software CD is included for installation on your computer. Refer to installation instructions included with the CD.

Connecting to a PC

If your system includes a PC, the computer will be configured with the Firewire Board and software at the factory. Follow the instructions below to connect the cables and dongle.

To install software, Firewire board and dongle on your own computer:

- Load the VisionWorksLS Acquisition and Analysis Software
- Load the BioSpectrumAC Imaging System interface software
- Load the drivers from the capture support CD
- Shut the computer down
- Connect the dongle security key to the computer's USB port
- Install the Firewire board into the PC
- Connect the Firewire cable from the camera to the PC FireWire port (fig. 18)
- Connect the serial cable from the computer to the darkroom (fig. 19)
- Turn the darkroom ON (power button is located on the top right side of the darkroom) to ensure computer communicates with the darkroom
- Restart your computer; the software will automatically detect the new hardware

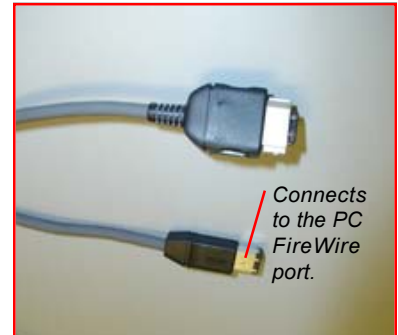


Fig. 18. FireWire Cable.



Fig. 19. Serial cable.

Operating Instructions

Operation

The master power switch is located on the upper right side of the darkroom. Connect power as described in the Set-Up Instructions. Turn the master power switch on. Once the power is switched on, power is applied to all internal components and to the power port for the jumper power cable that supplies power to the transilluminator.

To operate the darkroom controls, open the BioSpectrumAC Imaging System software control interface. The software operates the motorized zoom lens, emission filters, overhead lighting and transillumination components.

Description of the BioSpectrumAC System Software

Interface Dialog Box

Settings

The **Settings** section of the dialog box shows the current user settings for the Lens and Lighting functions.

Lens

The motorized **Lens** is controlled by the BioSpectrumAC Imaging System Interface. The lens is motorized for adjusting aperture, zoom or focus settings. The lens is set at the factory with the default set to zoom all the way in (High shift). To change these settings, refer to “Using the BioSpectrumAC Imaging System Interface Center” for instructions.

Emission Filter Wheel

The **Filter Wheel** is designed with five-positions for viewing samples with the 400 - 655nm emission filters. Select from:

- SYBR Green (515-570nm)
- SYBR Gold (485-655nm)
- Ethidium Bromide Red (570-640nm)
- Clear (empty)
- Optional (empty)

Refer to the section “Using the BioSpectrumAC Imaging System Interface Center” for instructions on using or replacing filters.

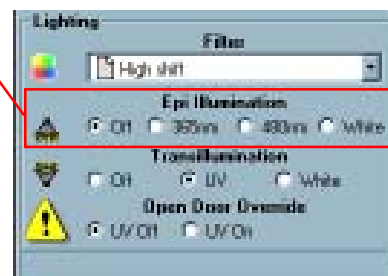
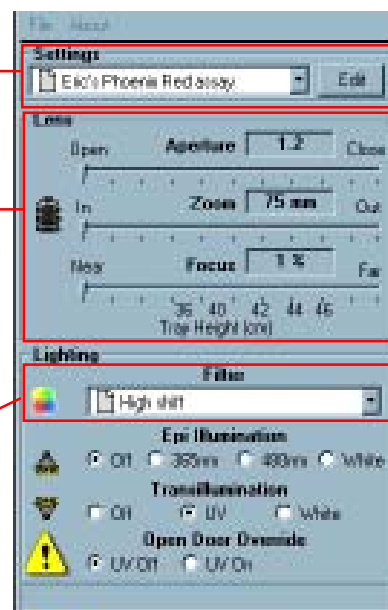
Epi Illumination

The **Overhead Light** control has four positions: off, 365nm UV, Visi-Blue™ 480nm and fluorescent white light.

Off - Place the overhead light switch in the Off mode when not using the darkroom for applications requiring epi-illumination.

365nm or 480nm - When UV is selected, the red light on the darkroom will illuminate to alert the user that the UV light is in operation. The overhead UV automatically turns off when the darkroom door is open.

White - Overhead white light illuminates when “white” is selected.



Select overhead 365nm, 480nm or white light

Transillumination

To change transillumination settings, access the **Transillumination** controls via the software interface:

Off - This button setting puts the transilluminator in the Off mode. Use this switch when the transilluminator is not required such as when capturing chemi blots.

UV - Select to turn the UV transillumination on. The darkroom is preset at the UVP factory with the transilluminator to automatically shut off when the darkroom door is opened.

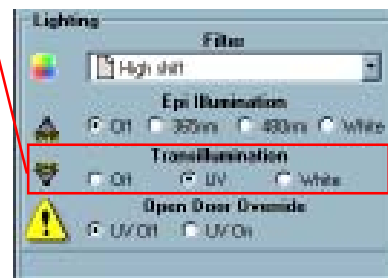
White - Select to turn the white light plate on.

A built-in timer is set to automatically shut off the transilluminator after 10 minutes. This is designed to prevent overexposure. To change this setting, go to File > UV Timeout. Select desired shut-off setting.

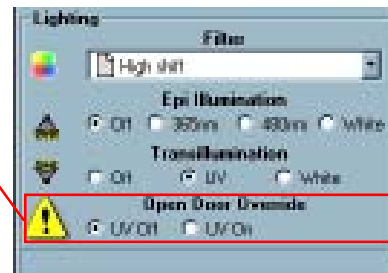
Open Door Override

UV Off - The darkroom is preset at the factory with a safety switch setting to automatically shut off the transilluminator when the door opens to prevent user exposure to UV.

UV On - Transilluminator safety control switch override. **NOTE: Users should wear protective clothing and eyewear when the darkroom is in the "UV On" mode to prevent exposure to the UV.**



Transillumination - select off, UV or white light plate



Open Door Override

Sample Platform and White Light Plate

When the **Sample Platform** is not needed, it folds backwards against the back of the darkroom cabinet for access to the transilluminator.

Pull the platform down into a horizontal position as shown in the picture (Fig. 12) which shows the platform with the white light plate exposed. When the white light plate is not required, place the black cover plate (included) over the white light plate. The sample platform provides a surface for placement of chemiluminescent blots with minimum background noise interference.

The platform adjusts to preset distances from the camera/lens as indicated on the door frame. Slide the platform up or down using two hands and carefully slipping it into the grooved slots in the back of the darkroom.



Fig. 12. Sample Platform and White Light Plate

Transilluminator Tray

The **Transilluminator Tray** accommodates a UVP Benchtop UV Transilluminator (contact UVP for product information). The tray moves forward or back for easy access to the transilluminator. **NOTE:** When using the transilluminator with the darkroom door open, UV exposure safety precautions, including protective eyewear and clothing, must be used to prevent exposure to harmful UV radiation.



Transilluminator Tray

Gel Viewer

The **Gel Viewer** is located on the front of the darkroom door and has a pressure-sensitive clasp. Press firmly to open the viewer. The window is UV blocking while providing a clear view to the transilluminator or platform surface for visibility of samples without opening the door.



Gel Viewer

Using the BioSpectrumAC Imaging System Software Center Interface

About the BioSpectrumAC Imaging System Center

The BioSpectrumAC Imaging System Center displays the settings for your camera control in an easy-to-read window. The window is movable and can be minimized to continue with your analysis.

The BioSpectrumAC Imaging System Center is preset with powerful imaging settings for acquiring your data. The **Settings** are imaging parameters that are user-definable allowing you to save your camera settings. Your **Settings** allow you to easily save and recall the Aperture, Zoom, Focus, Filter, and Lighting settings used for comparative analysis, documentation, publication, and quality control archives. All **Settings** are saved in the “**My Settings**” window.

Settings Functions

Getting to the “My Settings” window from the BioSpectrumAC Imaging System Center:

1. From the BioSpectrumAC Imaging System Center Click the Edit Button
2. The My Settings window will open

To return to the BioSpectrumAC Imaging System Center:

If you make a change to the settings, click the OK button at the bottom of the My Presets window. If no changes are required, click close/cancel.

Warning: This will accept the any changes that are currently displayed on the My Settings window.

Selecting a setting from the BioSpectrumAC Imaging System Center:

To select a new setting by clicking on the dropdown menu, add a new preset or edit an existing preset.

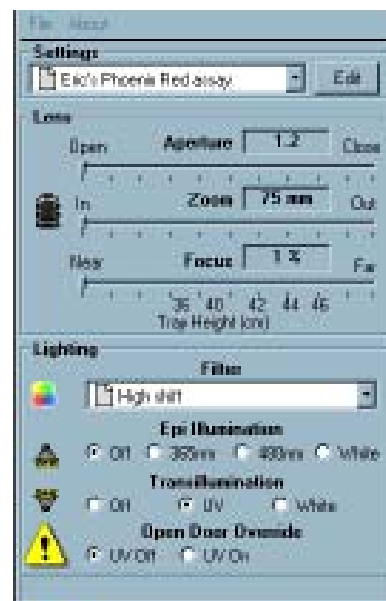
1. Click on the down arrow next to the Settings window
2. Highlight and click the setting of choice
3. Look at your image and acquire when ready

If the image needs adjustment make the changes in the BioSpectrumAC Imaging System Center and acquire when ready.

To add a new setting from the BioSpectrumAC Imaging System Center:

Adjust your Lens and Lighting settings on the BioSpectrumAC Imaging System Center to acquire a satisfactory image.

1. Click the Edit button in the main BioSpectrumAC Imaging System window.
2. In the “My Settings” window: Click the New Button.
3. Type in a name for the new setting.
4. Click OK.



5. Click the Sync button to synchronize the BioSpectrumAC Imaging System Center with the “My Settings” window.

If you are finished click OK to return to the BioSpectrumAC Imaging System Center.

Or add another Setting:

1. Click Save
2. Click the New Button.
3. Type in a name for the new setting.
4. Click OK.
5. Click the Sync button to synchronize the BioSpectrumAC Imaging System Center with the “My Settings” window.

If you are finished click OK to return to the BioSpectrumAC Imaging System Center.

When you have returned to the BioSpectrumAC Imaging System Center select the Settings from the menu and acquire your image.

Editing Non Default Settings from the “My Settings” window:

From the “My Settings” window you can Replace the current settings, Edit the existing Settings, Add a New Settings, or Delete the current Settings.

To Edit the current settings:

1. Click the Sync Button to synchronize the BioSpectrumAC Imaging System Center with the “My Settings” window.
2. Click the OK Button to return to the BioSpectrumAC Imaging System Center.

If you are finished click OK to return to the BioSpectrumAC Imaging System Center.

To add a New Setting:

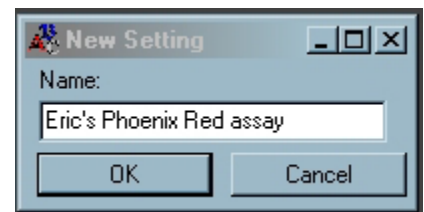
1. Click the New button
2. Type in a name for the new setting.
3. Click OK.
4. Click the Sync button to synchronize the BioSpectrumAC Imaging System Center with the “My Settings” window.

If you are finished click OK to return to the BioSpectrumAC Imaging System Center.

To Delete the current Setting:

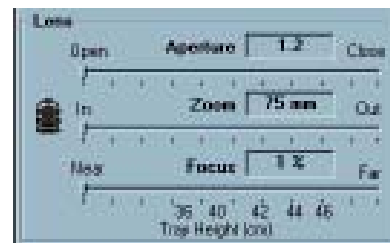
1. Click the Delete Button
2. Click Yes on the Delete Setting warning

If you are finished click OK to return to the BioSpectrumAC Imaging System Center.



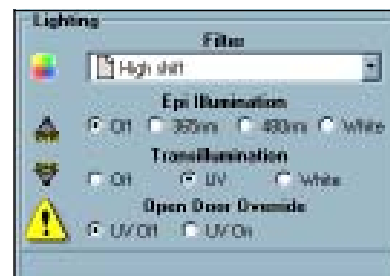
Lens Settings

In the lens area, the **Aperture** can be adjusted by moving the slider to the left to let more light into the camera or to the right to decrease the amount of light into the lens. The **f-stop** is shown above the slider. The **Zoom** slider controls the magnification of the lens by moving the slider to the left to increase the size of the image or to the right to decrease the size of the image. The **Focus** slider controls the near/far focus of the lens. Sliding the control from left to right will adjust the focus from near to far. Distance is displayed as a percentage where 100% is equal to the distance from the lens to the transilluminator. The tray height is conveniently listed below the focus slider and corresponds to the tray height on the darkroom.



Lighting

In the **Lighting** section, filter and illumination controls are adjustable by a drop-down window and radio buttons. The filter drop-down menu selects one of five filter positions: Green (515-570nm), Gold (485-655nm), Red (570-640nm), Clear and Option. The Lighting section also controls the overhead illumination and transillumination of the BioSpectrumAC Imaging System. The Open Door Override is included to allow you to turn off the UV light when the darkroom door is opened or to leave the UV light on for sample manipulation while wearing protective eyewear.



Filters

The **Filter** drop-down menu can be edited to include new user customizable filter sets. The filter set can be edited should an optional filter set be requested.

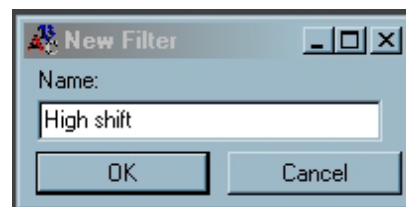
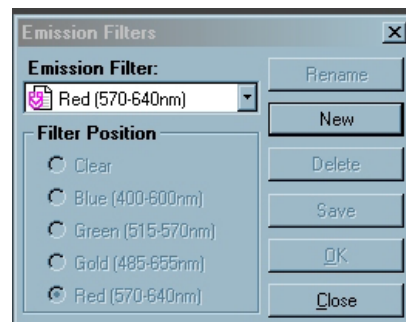
To edit a Filter from the BioSpectrumAC Imaging System Center

1. Click on the Edit button in the BioSpectrumAC Imaging System window.
2. Click on the Filters button to bring up the Emission Filter Window.
3. Click on the New button and type in the name of the new filter.
4. Click OK
5. Select the Filter Position (the filter you are replacing) of the new filter.

If you are not replacing any other filters click OK.

If you are replacing other filters:

1. Click on save.
2. Click on the New button and type in the name of the new filter.
3. Click OK.
4. Select the Filter Position (the filter you are replacing) of the new filter.
5. Click OK to close the filter window



Replacement Parts

To order replacement parts for the BioSpectrumAC Imaging System, contact UVP's offices. Contact information is listed on the next page.

<i>Part Description</i>	<i>Part Number</i>	<i>Qty.</i>
Tube, 13 watt, cool white	34-0086-01	1 each side
Tube, 13 watt, 365nm BLB UV	34-0085-01	1 each side
Tube, 13 watt, blue	34-0084-01	1 each side
Power Cord, 100V/115V	46-0023-38	
Power Cord, 230V	46-0023-39	
Filter, SYBR Green, 50mm square	38-0219-01	
Filter, SYBR Gold, 50mm square	38-0221-01	
Filter, Ethidium Bromide, 50mm square	38-0220-01	

Troubleshooting

No power to darkroom cabinet

1. Recheck main power cord connections to the both the BioSpectrumAC Imaging System and the wall power (surge protector).
2. Check the fuse located on the main power port. If the darkroom continues to blow fuses, call UVP Technical Support Department.

Transilluminator will not turn on

1. Be sure the darkroom cabinet's door is completely closed. There is a UV exposure safety cut-off switch that turns the transilluminator off when the darkroom cabinet's door is opened.
2. Be sure the darkroom cabinet's main power switch is lit. If not, refer to "No power to darkroom cabinet" above.
3. Be sure the transilluminator switch is on. When the switch on the transilluminator is lit green, the unit is receiving power.
5. Call UVP Technical Support Department with any technical questions. Refer to the Technical Support section for contact information.

Technical Support

UVP offers technical support for all of its products. If you have any questions about the product's use, operation or repair, please call or fax UVP Customer Service or Technical Support at the following:

If you are located 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 Bioluminescence Imaging Systems Technical Support. Tech Support assistance is available during regular business days, between 7:00am and 5:00 pm PST.	Call +44(0) 1223-420022 and ask for Bioluminescence Imaging Systems Technical Support. Support is available during regular business days, between 8:30am and 5:30 pm UK time.
E-Mail your message to: techsupport@uvp.com	E-Mail your message to uvp@uvp.co.uk
Fax your questions to: (909) 946-3597	Fax your questions to: +44(0)1223-420561
Write to: Bioluminescence Imaging Systems Technical Support UVP, Inc. 2066 W. 11th Street Upland, CA 91786 USA	Write to: Bioluminescence Imaging Systems Technical Support Ultra-Violet Products Ltd. Unit 1, Trinity Hall Farm Estate, Nuffield Road Cambridge CB4 1TG UK

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

Products available from UVP

VisionWorks@LS Software
Ultraviolet Transilluminators
UV/White Light Transilluminators
Visi-Blue Transilluminators and Plates
White Light Transilluminators and Plates
Gel Tools
UV Crosslinkers
UV Viewing Cabinets
UV Lamps
Ultraviolet Intensity Meters
Hybridization Ovens
HEPA/UV PCR Workstations



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