

GelDoc-It^{®2} & ChemiDoc-It^{®2} Imagers

Installation and User Instructions



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Introduction

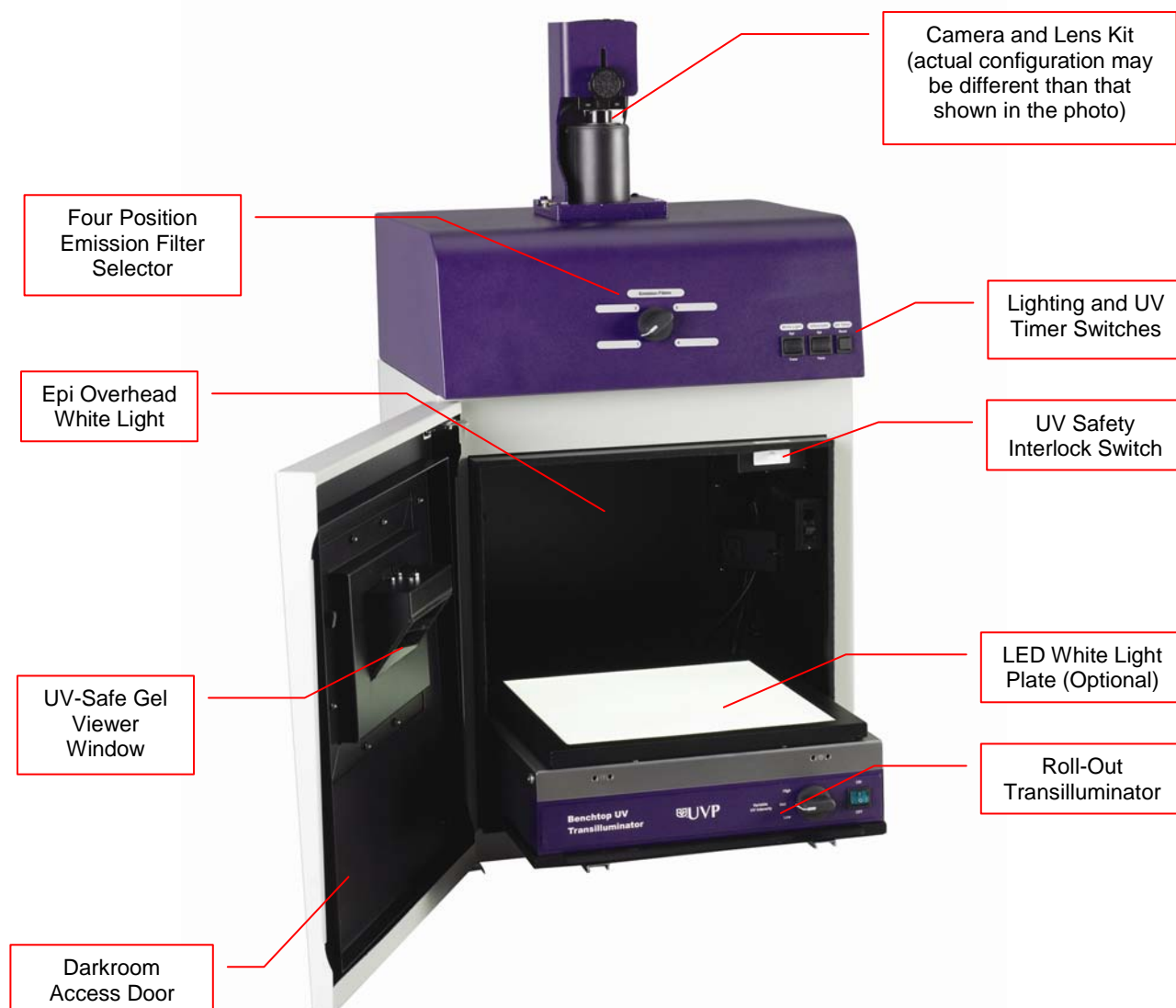
The **GelDoc-It² Imager** is designed as a high resolution imager capable of capturing, documenting and analyzing fluorescent gel images.

In addition to gel documentation capabilities, the **ChemiDoc-It² Imager** is equipped with a cooled, scientific-grade CCD camera allowing users to capture, document and analyze chemiluminescent blot images, including Western blots.

The GelDoc-It² and ChemiDoc-It² Imagers incorporate a light-tight darkroom with VisionWorks[®]LS software for image acquisition and analysis functions. The darkroom has a UV-blocking gel viewer window, built-in overhead epi white lighting, a UV transilluminator and a four-position emission filter wheel with an ethidium bromide (EtBr) emission filter included as standard.

System Components

Refer to the packing slip and pictured components for parts included with the system.



Minimum Computer Requirements

Processor:	Pentium class, 1.6 GHz or higher
RAM:	1 GB (2GB Preferred)
Display:	1024 x 768
Operating System:	Microsoft Windows XP Service Pack 2 or Newer (32-bit or 64-bit)
Internet Browser:	Microsoft Internet Explorer 6.0 or later
Computer USB Ports:	Computer must come equipped with a minimum of three USB ports; additional peripherals (mouse, keyboard, printer, etc.) may require additional USB ports.

Cameras

GelDoc-It²: The GelDoc-It² is equipped with the **GelCam 310** camera, a scientific-grade monochrome CCD camera with a resolution of 2.0MP (1600x1200) with USB 2.0 PC interface.

ChemiDoc-It²: The ChemiDoc-It² is equipped with the **Chemi 415**, **OptiChemi™ 610** or **MegaCam 810** scientific-grade monochrome CCD camera. All cameras are Peltier cooled and offer full 16-bit file bit depth:

The **Chemi 415** camera has 1.4MP (1360x1024) resolution with Peltier cooling to 35°C below ambient. The Chemi 415 has a peak quantum efficiency of 62% and is capable of binning from 1x1 to 8x8.

The **OptiChemi 610** camera has 3.2MP (2184x1472) resolution with Peltier cooling to 50°C below ambient. The OptiChemi 610 has a peak quantum efficiency of 86% and is capable of binning from 1x1 to 10x10.

The **MegaCam 810** camera has 8.1 MP (3296x2472) resolution with Peltier cooling to 35°C below ambient. The MegaCam 810 has a peak quantum efficiency of 50% and is also capable of binning from 1x1 to 8x8.

All camera settings are factory pre-set for optimum performance when viewing gels, films or membranes under low light level conditions. Contact UVP Technical Support prior to making any adjustments to the camera settings.

Lens Kit (Motorized or Manual)

The zoom lens used with the **GelCam 310** and **Chemi 415** cameras comes in two configurations:

- The motorized lens is controlled via VisionWorksLS Software.
- The manual lens requires manual user adjustment.

Some lenses may be fitted with a close-up diopter. The diopter is used for focusing on objects at the focal length of the GelDoc-It²/ChemiDoc-It² darkroom.

Ethidium Bromide (EtBr) Emission Filter

The ethidium bromide (50mm square) UV-blocking bandpass interference filter blocks UV and IR radiation emitted from the transilluminator. The filter is placed in the filter wheel below the camera assembly. The filter allows visualization of fluorophores from 580-630nm, targeting the ethidium bromide emission peak of 605nm.

Additional filters are available for other specific fluorophores. Filters can also be removed when imaging non-fluorescent media (including chemiluminescent blots, protein gels, colony plates, etc.) in order to produce brighter images. Contact UVP for ordering information.

Darkroom

The darkroom is light tight to provide optimal imaging conditions. Darkroom features include:

- Overhead white light
- Roll-out transilluminator tray
- UV-safe gel viewer window built into the darkroom door
- Side pocket for storage of materials
- Four position emission filter wheel
- Brackets for installing optional UV handheld lamps for epi (overhead) UV illumination
- Built-in power ports for transilluminator and optional overhead UV handheld lamps
- Built-in power cord for optional LED White Light Plate
- UV safety interlock switch with manual override to disable UV transillumination and optional UV epi illumination when darkroom door is opened

Transilluminator

The GelDoc-It² and ChemiDoc-It² Imagers can accommodate UVP's Benchtop and FirstLight transilluminator models. UVP offers a variety of transilluminator configurations, including Benchtop models with multiple wavelengths and variable intensities as well as the highly uniform, patented FirstLight[®] transilluminator. Refer to the packing slip for the transilluminator included with your system.

Note: For UV protection and to extend the life of the UV transilluminator, the system incorporates a ten-minute transilluminator shutoff timer. The timer shuts off the transilluminator after ten minutes of operation. A push button on the front of the darkroom allows the user to reset the timer. Alternately, the timer can also be reset by opening and closing the darkroom door.

Fluorescent Focus Target

The UVP Fluorescent Focus Target fluoresces when placed on a UV transilluminator or when exposed to overhead UV. The Target provides sharp fluorescent images to aid in adjusting the lens and camera settings for ideal imaging results.



Fluorescent Focus Target

Optional Equipment

UVP offers a variety of optional equipment to support the needs of varying laboratory environments. Refer to "Replacement Parts and Accessories" at the end of this manual for optional equipment part numbers.

Thermal Printer

The thermal printer provides archive quality, 256 grayscale prints and five optional cost-effective print sizes.



Thermal Printer

UV Handheld Lamps for Overhead Lighting

Two 4-watt ultraviolet lamps can be connected inside the darkroom to provide epi UV illumination. These lamps can be switched on or off using the switch on the front of the darkroom and can also be removed from the darkroom and used as standalone handheld lamps (as seen in the image to the right).



UV Lamp

LED White Light Plate

The LED White Light Plate emits high uniformity with less than 5% coefficient of variance (CV). Plug the LED White Light Plate directly into the power supply within the system darkroom, or store it in the exterior darkroom side pocket when not in use.



LED White Light Plate

Converter Plates

An alternate to the LED White Light Plate, the **UV/White Converter Plate** allows imaging of non-fluorescent stained media with an ultraviolet transilluminator. The converter plate is specially coated to convert 302nm UV output to white light rather than using a separate white light box or plate.

The **Visi-Blue Converter Plate** (not shown) converts UV to a safe 460-470nm blue wavelength designed for use with blue excitation samples and SYBR Green, SYPRO Orange and GFP stains.



UV/White Converter Plate

Setup Instructions

Components

When unpacking the GelDoc-It² and ChemiDoc-It², the following items will be included:

- GelDoc-It² or ChemiDoc-It² darkroom
- Transilluminator
- Camera with lens and bracket
- Ethidium Bromide (EtBr) emission filter
- Electrical and computer cables
- VisionWorksLS Software

WARNING: Do not attempt to perform any setup procedures while the system is plugged in or powered on unless otherwise instructed.

CAUTION: Do not install the system in areas with high moisture, dust or high temperatures. Keep the equipment away from motors or any other large magnetic equipment apparatus.

Connecting the Power Cables

1. Inside the darkroom, place the transilluminator on the roll-out tray. Connect the transilluminator to one end of the jumper cable. Connect the other end of the jumper cable to the interior of the darkroom. Turn the UV transilluminator's main power switch (green switch) **ON**.
2. If installing the LED White Light Plate, place the plate on top of the UV transilluminator and connect the power cord coming from inside the darkroom to the back of the Plate.
3. If installing epi UV handheld lamps, place the lamps in the brackets located at the top of the darkroom. Plug the handheld lamps into the outlets provided inside the darkroom. Place the power switches located on the outside of the handheld lamps in the **ON** position.
4. Connect the main power cord from the back of the darkroom to a surge-protected power outlet.

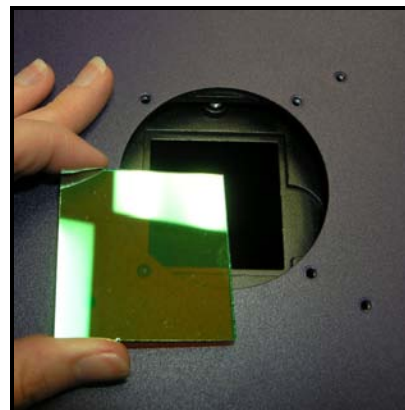
Installing the Emission Filter

To install the 50mm² ethidium bromide (EtBr) filter:

1. Carefully remove filter from the protective plastic case, holding the filter at the edges to prevent placing fingerprints on the glass surface.

Note: It may be necessary to remove the base and camera assembly to insert new filters (photograph shows camera and base removed).

2. The filter wheel is located inside the top of the darkroom. Before placing the filter in the filter wheel, ensure that the text on the edge of the filter is positioned so it is right side up when facing the installer.
3. Place the filter in the filter wheel.
4. Write the name of the filter on the appropriate label at the front of the darkroom.



Additional and replacement emission filters are available through UVP. Refer to the **Replacement Parts and Accessories** section of this manual for ordering information.

Camera Setup

High sensitivity, scientific-grade CCD cameras are designed for use with UVP's GelDoc-It² and ChemiDoc-It² Imagers. This section covers the components and steps required to UVP's cameras. The following cameras are covered in this manual (refer to the packing list for the camera included with your specific system):

- GelCam 310 (**GelDoc-It²**)
- Chemi 415 (**ChemiDoc-It²**)
- OptiChemi 610 (**ChemiDoc-It²**)
- MegaCam 810 (**ChemiDoc-It²**)

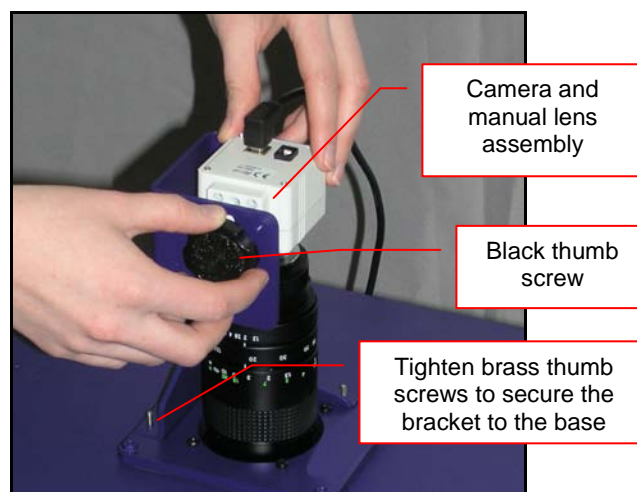
GelCam 310 Camera

Specifications	GelCam 310
Type	CCD, Monochrome
Resolution	1600 x 1200
Bit Depth	16-bit
PC Interface	USB

GelCam 310 Camera with Manual Lens

The GelCam 310 camera, zoom lens and diopter are assembled at the UVP factory.

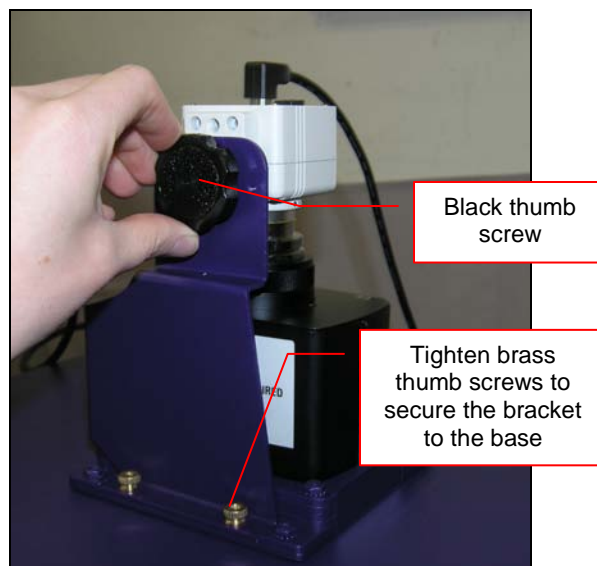
1. Remove the cap from the lens (if in place).
2. Using the four brass thumb screws provided, secure the bracket to the base on the darkroom.
3. Slide the camera and lens assembly into the camera bracket. Slide the lens through the center hole in the black rubber gasket. The gasket forms a seal around the lens.
4. Insert and tighten the black thumb screw in the central hole of the camera to secure the camera to the bracket.
5. Plug the camera cable into the top of the camera but do not plug the other end of the USB cable into the computer until VisionWorksLS software has been installed.



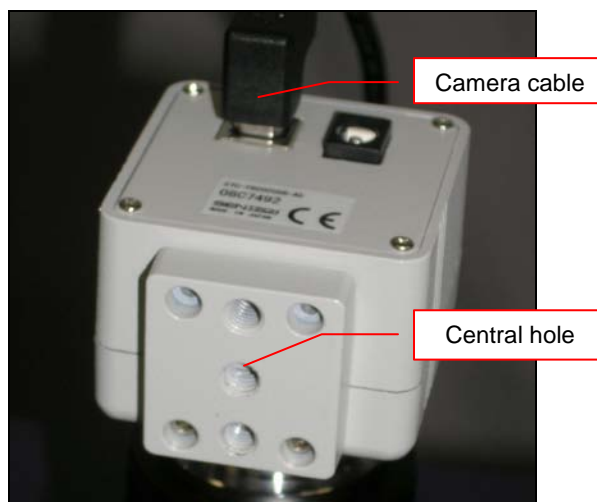
GelCam 310 Camera with Motorized Lens

The GelCam 310 camera, zoom lens and diopter are assembled at the UVP factory.

1. Remove the cap from the lens (if in place).
2. Using the four brass thumb screws provided, secure the bracket to the base of the darkroom.
3. Slide the camera and lens assembly into the camera bracket.



4. Insert and tighten the black thumb screw in the central hole of the camera to secure the camera to the bracket.
5. Plug the camera cable into the top of the camera but do not plug in the other end of the USB cable until VisionWorksLS software has been installed.



6. Mount the lens control box on the hook located at the back of the darkroom.

Power switch for the Lens Control Box



7. Plug the serial cable from the motorized lens into the lens control box.



8. Connect the USB cable to the PC connection port on the lens control box. Leave the other end of the USB cable unplugged until installation of VisionWorksLS is complete.
9. Connect the power supply to the lens control box and into the power outlet.



Power supply on the
Lens Control Box

PC Connection on the
Lens Control Box

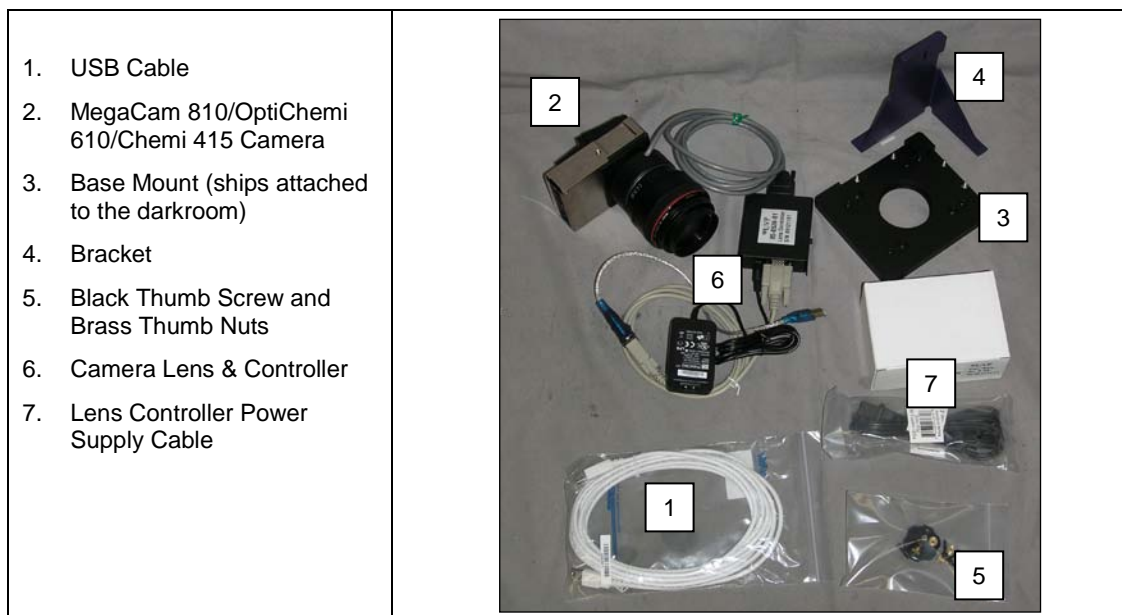
MegaCam 810, OptiChemi™ 610 and Chemi 415 Cameras

Specifications	MegaCam 810	OptiChemi 610	Chemi 415
Type	CCD, Monochrome	CCD, Monochrome	CCD, Monochrome
Resolution	3296 x 2472	2184 x 1472	1360 x 1024
Bit Depth	16-bit	16-bit	16-bit
Quantum Efficiency	50% peak	86% peak	62% peak
Cooling	-35°C from Ambient	-50°C from Ambient	-40°C from Ambient
Binning	Yes, 1x1 thru 8x8	Yes, 1x1 thru 10x10	Yes, 1x1 thru 8x8
PC Interface	USB	USB	USB

Components

Note: Some components may not be shipped with all systems.

Note: The MegaCam 810, OptiChemi 610 and Chemi 415 cameras use many of the same components and are installed in a similar manner. Therefore, the installation instructions herein will refer to all three cameras interchangeably.



Hardware Installation

The photograph shows the parts required for assembly of the MegaCam 810 and Chemi 415 camera kits with the automated lens on the ChemiDoc-It² Imager. The OptiChemi 610 camera will have a different appearance but will be installed in the same manner.

Note: The image above shows the 50mm f/1.2 lens (6). Another lens and/or lens controller may be shipped with the system.

1. Attach the camera bracket (4) to the base mount with the brass thumb nuts (5).
2. If not already removed, take the lens cap off the lens. Do not unscrew the lens cap, as it will simply pull straight off.
3. Place the camera/lens assembly in the hole in the base mount. Then, use the black thumb screw (5) to secure the camera in place, attaching it through the hole at the top of the bracket (4).

Note: When looking at the darkroom from the front, the MegaCam 810, OptiChemi 610 and Chemi 415 cameras attach to the bracket with the Black Thumb Screw at the right of the system. The USB and power cables will extend from the front of the camera, facing the user.

Software Installation

Installing VisionWorksLS Software

1. Insert the VisionWorksLS CD (not network CD) into the computer.
2. Click on the **Install** button for VisionWorksLS.
3. 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

1. Double click the VisionWorksLS software icon on the desktop.
2. 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, select **Offline activation** and proceed to the following page of this manual, or call UVP to register the software.
3. Click **Next** to continue.
4. The **Already have an activation ID** option is useful when reloading the software after receiving an initial activation code.
5. Complete all required information on the form.
6. Fill out the Serial Number located on the CD. The number should be four sets of six numbers.
7. Once the form is completed, click on **Get Activation No.** and then click **Activate** once the Activation Number appears in the box.

The 'On The Fly Registration' form has a blue title bar. It contains several input fields for registration information: First Name, Last Name, Position, Company, Email, Address1, Address2, State/Province, Postal/Zip Code, Country, Phone, and Fax. There are also fields for Serial Number and Configuration ID (which is pre-filled with '14A053E45E0A7140AB29B9632A013536'). An 'Activation Number' field is shown with an orange background. At the bottom, there are 'Get Activation No.', 'Activate', and 'Cancel' buttons. A red asterisk note at the bottom left states: '* This fields are required for the activation process'.

8. 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.
9. Click **Next** to continue.
10. Click the link provided and complete the form to obtain registration instructions. Click **Finish**.



Installing GelCam 310 Camera Drivers

1. Open the VisionWorksLS software suite.
2. Plug the 90 degree USB cable from the camera into the USB port.
3. The computer should display **Found New Hardware**. Click **Yes, Next, Install from a list, Next, Don't search, Next**, double click on **Show all Devices**, click **Have disk**, and then **Browse**.
4. Browse to the **C:\Windows\system32\drivers** folder and select the **STUSB.inf** file.
5. Select **Open** and then **OK** to install the camera.
6. Select **Finish**.

Note: The installation may cause a warning message stating that the drivers are "not verified by Microsoft". Select **Continue Anyway** and the drivers will be installed correctly.

Installing MegaCam 810, OptiChemi 610 and Chemi 415 Camera Drivers

All of the software required to operate the MegaCam 810 and Chemi 415 cameras as well as their respective lens controllers is embedded within VisionWorksLS. Therefore, once VisionWorksLS has been installed, plug in the camera and lens controller. No additional drivers or software are required.

Using the System

Powering Up the System

Once plugged in to a surge-protected wall outlet, the GelDoc-It² and ChemiDoc-It² systems are always powered on. Power to specific system components, including epi and transillumination lighting, is controlled by switches located on the front of the unit.

If using the GelDoc-It² system with the GelCam 310 camera, turn on the power switch for the Lens Control Box (see “Camera Setup” for more information).

The **White Light** and **Ultraviolet** power switches are three-way rocker switches. Selecting the upper switch position will turn on the corresponding epi illumination. Selecting the lower switch position will turn on the corresponding transillumination. Finally, selecting the middle switch position will turn off the lighting.

UV Timer

For UV light protection and to extend the life of the UV transilluminator, there is a ten-minute transilluminator **UV Timer** installed in the system. The timer shuts off the transilluminator after ten minutes of operation. Press the button on the front of the darkroom to reset the timer.

NOTE: When the darkroom door is opened and closed again, the UV timer is automatically reset.



Using the Filters

When installing emission filters in the GelDoc-It² and ChemiDoc-It², the user should note the location of the emission filter selector knob located on the front of the system (pictured below). After installing all filters, write the name of the filter in the white area next to the filter numbers (1-4).

To change to a different filter, turn the filter selector knob to the desired location. Ensure that the knob clicks into place to verify that the filter is positioned correctly.



Using the Transilluminator

To use the UV transilluminator or LED White Light Plate, ensure that the components are plugged into the system (see “Connecting the Power Cables”).

Using the power switches located on the front of the unit, select either **White Light: Trans** or **Ultraviolet: Trans** depending upon application. When using the UV transilluminator, ensure that the green power switch on the front of the transilluminator unit is in the **ON** position.

NOTE: Do not attempt to use both the White Light and Ultraviolet transillumination sources simultaneously as system damage may occur.

NOTE: For UV light protection and to extend the life of the UV transilluminator, there is a ten-minute transilluminator **UV Timer** installed in the system. See “UV Timer” for more information.

Refer to the Transilluminator manual for additional instructions on using the transilluminator.

Using the Overhead (Epi) Lighting

To operate the built-in overhead white light, use the power switch located on the front of the unit to select **White Light: Epi**.

To operate the optional overhead (epi) UV illumination, ensure that the optional UV handheld lamps are plugged into the back of the darkroom interior and are mounted to the brackets at the top of the darkroom. Also ensure that the power switches, located on the handheld lamps, are in the **ON** position. Use the power switch located on the front of the system to select **Ultraviolet: Epi**.

Using the UV Gel Viewer Window

The **UV Gel Viewer Window**, built into the darkroom door, allows users to view the interior of the darkroom without opening the entire darkroom door.

To open the Window, press firmly on the top of the Window cover to release the pressure-sensitive clasp and open the viewer. The Window glass is UV blocking while providing a clear view to the transilluminator surface for sample viewing without opening the darkroom door.

NOTE: Close the UV Gel Viewer Window prior to capturing a light-sensitive image such as a chemiluminescent blot.

Capturing Images and Using Templates

Image Focusing

Manual Lens (GelCam 310 with Manual Lens)

Prior to capturing an image, prepare the image focus:

1. Turn on the transilluminator and place the **Fluorescent Focus Target** (see “System Components”) on the transilluminator surface. **NOTE:** The darkroom has a UV safety switch that turns off the transilluminator and optional UV handheld lamps when the door is open. After closing the door, open the **UV Gel Viewer Window** to ensure that the transilluminator is on and that all other lighting is off.
2. With VisionWorksLS open, preview the image. Adjust the camera settings, including exposure time, to enhance the image of the sample. To adjust the settings, go to the Acquisition Action Tab and click on the Camera Menu Button. Adjust the exposure time from the Exposure Time section of the Camera Menu.
3. Rotate the lens f-stop adjustment (top ring) so that the image is bright enough to be seen on the screen.
4. Rotate the lens focus adjustment (bottom ring) on the lens. Adjust the focus so that the image appears clear on the screen.
5. Rotate the zoom lens adjustment (middle ring) on the lens so that the image is ideally zoomed. Readjust the focus ring (bottom ring) on the lens, making the image clear. Adjust the zoom so that the object of interest is within the image preview area.

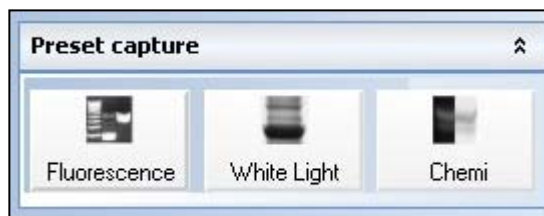
Motorized Lens (GelCam310 w/Motorized Lens, MegaCam 810, OptiChemi 610 and Chemi 415)

Prior to capturing an image, prepare the image focus:

1. Turn on the transilluminator and place the **Fluorescent Focus Target** (see “System Components”) on the transilluminator surface. **NOTE:** The darkroom has a UV safety switch that turns the transilluminator and optional UV handheld lamps off when the door is open. After closing the door, open the **UV Gel Viewer Window** to ensure that the transilluminator is on and that all other lighting is off.
2. Open VisionWorksLS software, click on the Acquisition Action Tab, and then click on the Lighting Menu Button. Adjust the aperture, zoom (if applicable) and focus controls from the Lens Control section of the Lighting Menu until an ideal image is seen.
3. Adjust the camera settings, including exposure time, to enhance the image of the sample. To adjust the settings, go to the Acquisition Action Tab and click on the Camera Menu Button. Adjust the exposure time from the Exposure Time section of the Camera Menu.

Using the Preset Capture Buttons

1. Place the sample or focus target on the surface where the sample will be imaged.
2. Click on the White Light Preset Button.
3. If the image needs adjustment, start the image preview by clicking on the Preview button and move the sample as needed.
4. Slightly adjust the aperture, exposure time, zoom (if equipped) and focus until an ideal image has been achieved.
5. Use the Chemi or Fluorescent Preset Capture buttons to capture an image of the chemiluminescent blot or fluorescent gel.
6. If needed, adjust the aperture and/or exposure time to capture an ideal image.



Capturing Images Without Using the Preset Capture Buttons

1. Depending on the sample type, place the sample on the chemi tray, transilluminator or white light plate.
2. For a chemiluminescent sample, turn off all darkroom lighting, place the black chemi tray on top of the transilluminator and place the sample on the tray. For a fluorescent gel sample, turn on the UV transilluminator.
3. Adjust the capture settings in VisionWorksLS.
4. Click the **Capture** button.

Recommended Settings for Short Exposures and Focusing

1. Increasing the **Binning** will increase the camera's refresh rate and sensitivity. However, it also exponentially decreases overall image resolution. Binning works by combining smaller pixels into one larger pixel. For example, 2x2 binning will take a 2x2 area of pixels (4 pixels all together) and combine them into one large pixel, 4x4 binning will combine a 4x4 area of pixels (16 pixels all together) into one large pixel, and so forth, thus increasing image sensitivity but decreasing overall image resolution.

In most cases, 4x4 preview binning is recommended for general focusing and the fastest possible frame rates. (**NOTE:** Binning is not available on 300-series cameras)

2. Decrease the preview exposure time to 15-100ms.
3. Always focus at a lower (faster) f-number than the capture setting. Increasing the f-number will increase the "depth of field," creating a better focus on the target.

Capturing Longer Image Exposure with the Least Noise

1. **Binning** can be ideal for very dim images where high sensitivity is needed. Binning of at least 2x2 is recommended for exposures over 1-2 minutes.
2. Ensure that the camera has had an adequate amount of time to cool before taking long exposure images. This can be verified by referencing the "CCD Temperature" status in the lower-left corner of VisionWorksLS.



Take a test image with a short exposure (less than 1 minute) to ensure adequate focus before starting longer (greater than 1 minute) exposures.

Using Templates

Set Up and Save Camera Templates

NOTE: Without using templates, camera settings can be manually adjusted directly in the software. For additional information on using templates, refer to the software Help files or the VisionWorksLS software manual.

Chemi Blot Pre-Capture Positioning: For this application, use a preview binning of 4x4, a capture binning 1x1 and an exposure time of 0.2sec. Have the darkroom door cracked open to let in some ambient light.

Chemi Blot with Fast Capture and Lower Resolution: For this application, use a preview binning of 8x8, a capture binning of 4x4, and an exposure time of 15sec. This setting is useful for quick screening; the time can be increased or decreased depending on the intensity of the signal from the blot.

For better resolution, set the preview binning to 8x8, the capture binning to 2x2, and the exposure time to 60sec. The preview is the same and the exposure time is intermediate, but the final image is of higher resolution than when using 4x4 binning.

Chemi Blot with Slower Capture and Higher Resolution: For this application, use a preview binning of 8x8, a capture binning of 1x1, and an exposure time of 5min. This will result in the best possible capture resolution. However, the exposure takes longer because the image is unbinned.

Set Up Darkroom Templates

NOTE: Without using templates, darkroom settings can be manually adjusted directly in the software.

Chemi Blots: Place a business card on the chemi tray in the BioSpectrum darkroom. Set the lens to the fastest f-stop (the lowest aperture number) and focus on the business card with the darkroom door cracked open, no emission filter in place, no lighting on, and either the lens zoomed or the lift platform positioned to fit the blot.

To Process a Blot

1. Place the Western blot on a hinged transparency or in clear plastic bag.
2. Position the blot on the black chemi tray.
3. Pre-focus and position the blot with the lights off, the door cracked open and the lens set to the fastest f-stop (the lowest aperture number). Use the “Chemi Blot Pre-Capture Positioning” template discussed earlier.
4. Apply the chemi substrate on the blot (front side up). Then, close the hinged transparency over the blot and smooth out any bubbles. Reposition the blot in the field of view if needed. Close the darkroom door.
5. Immediately start previewing with the “Chemi Blot with Fast Capture and Lower Resolution” template. Let the blot develop inside the darkroom while watching the preview. When approaching maximum signal (which should take 2 to 3 minutes) use the “Chemi Blot with Lower Capture and Higher Resolution” template to capture the image.
6. Light emission will drop off quickly, so capture several images as quickly as possible.
7. Save and archive original files for future quantitative analysis.
8. After creating a copy of an image file, use the image invert function in VisionWorksLS, adjust the image histogram for optimal viewing, and burn the changes to a new file.

Note: Capture and image processing steps are described in more detail in the LS software manual and in the software help files.

Service Procedures

Return Procedure

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

Replacement Parts and Accessories

To order accessories (including additional emission filters) or replacement parts for the GelDoc-It System, contact UVP's offices.

Part Description	Part Number
UV Handheld Lamps:	
UV Handheld Lamp, 254/365nm, 4 watt (115V)	95-0021-12 (2 Recommended)
UV Handheld Lamp, 254/365nm, 4 watt (230V)	95-0021-10 (2 Recommended)
Fuses:	
Fuse, 3.15A (for Darkroom)	56-0022-04 (2 Recommended)
Fuse, 2A (for Transilluminators)	56-0002-01 (2 Recommended)
Fuse, 1A (for GelCam 310 Motorized Lens Controller Box)	56-0022-02 (2 Recommended)
Emission Filters:	
Filter, Ethidium Bromide, 50mm Square	38-0220-01
Filter, SYBR Green, 50mm Square	38-0219-01
Filter, SYBR Gold, 50mm Square	38-0221-01
Transillumination Accessories:	
LED White Light Plate	95-0476-01
White Light Converter Plate, 21x26cm	38-0191-01
Visi-Blue Converter Plate, 21x26cm	38-0200-01
Gel Accessories:	
Gel-Cutter	85-0002-01
Gel-Ruler	85-0003-01
Gel-Scooper	85-0006-01
Gel-Tray, small	85-0007-01
Gel-Sentry DNA Preparation Plate	97-0076-01
Fluorescent Standard Step Tablet	33-0014-02
Protective Equipment:	
Spectacles, UV Blocking (UVC-303)	98-0002-01
Goggles, UV Blocking (UVC-503)	98-0002-02
Faceshield, UV Blocking (UVC-803)	98-0002-04

Troubleshooting

No Power to the Darkroom or Transilluminator

1. Recheck the main power cord connection to the GelDoc-It²/ChemiDoc-It² darkroom as well as the power cables between the darkroom and transilluminator, LED White Light Plate or optional UV handheld lamps.
2. Check fuses, located at the back of the unit near the power port. A flat-head screwdriver will be required. Turn the fuseholder cap counterclockwise and the fuse holder will pop out. Inspect the thin wire within the glass fuse to see if there is a break in the wire. If so, replace the fuse(s). If fuses are blowing repeatedly, contact UVP Technical Support for additional troubleshooting.

A Partial Image Appears on the Screen

1. Ensure that the filter wheel is not off center by turning the filter wheel selector until it fully engages or “clicks” into place.
2. Remove the camera/lens combination and verify that the emission filter is fully seated in the filter wheel.

Transilluminator Will Not Turn On

1. In addition to the **Ultraviolet: Trans** power switch on the front of the GelDoc-It²/ChemiDoc-It² darkroom, the transilluminator itself has a power switch. Make sure that the green transilluminator power switch, located on the front of the transilluminator, is in the **ON** position.
2. For UV protection and to extend the life of the UV transilluminator, there is a ten-minute transilluminator shutoff timer installed in the system. The timer shuts off the transilluminator after ten minutes of operation. Push the reset button on the front of the darkroom to reset the timer.

Error Messages Appear on the Screen

1. An error message that is related to the VisionWorksLS software interface or Microsoft Windows may appear on the screen. If the message is related to Microsoft Windows, such as a reminder to activate or update the copy of Windows, please contact your system administrator for assistance.
2. If an error message appears repeatedly and your system administrator does not recognize it as a Microsoft Windows error, contact UVP Technical Support for further assistance.

Care and Cleaning

Use only mild soap or detergent solution for cleaning. Do NOT use oil- or petroleum-based cleaners for the cabinet. Ensure that the system is turned **OFF** and unplugged during cleaning.

Technical Support

UVP offers free lifetime technical support on all of its products and software. Should you have any questions regarding the product's use, operation or repair, contact UVP's offices at the locations below, or visit www.uvp.com.

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 Customer Service 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	E-mail your message to: uvp@uvp.co.uk
Fax Customer Service, and send it to (909) 946-3597	Fax Customer Service, and send it to: +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.