GelMax™ Imager

Installation and User Instructions

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81-0351-01 Rev STD

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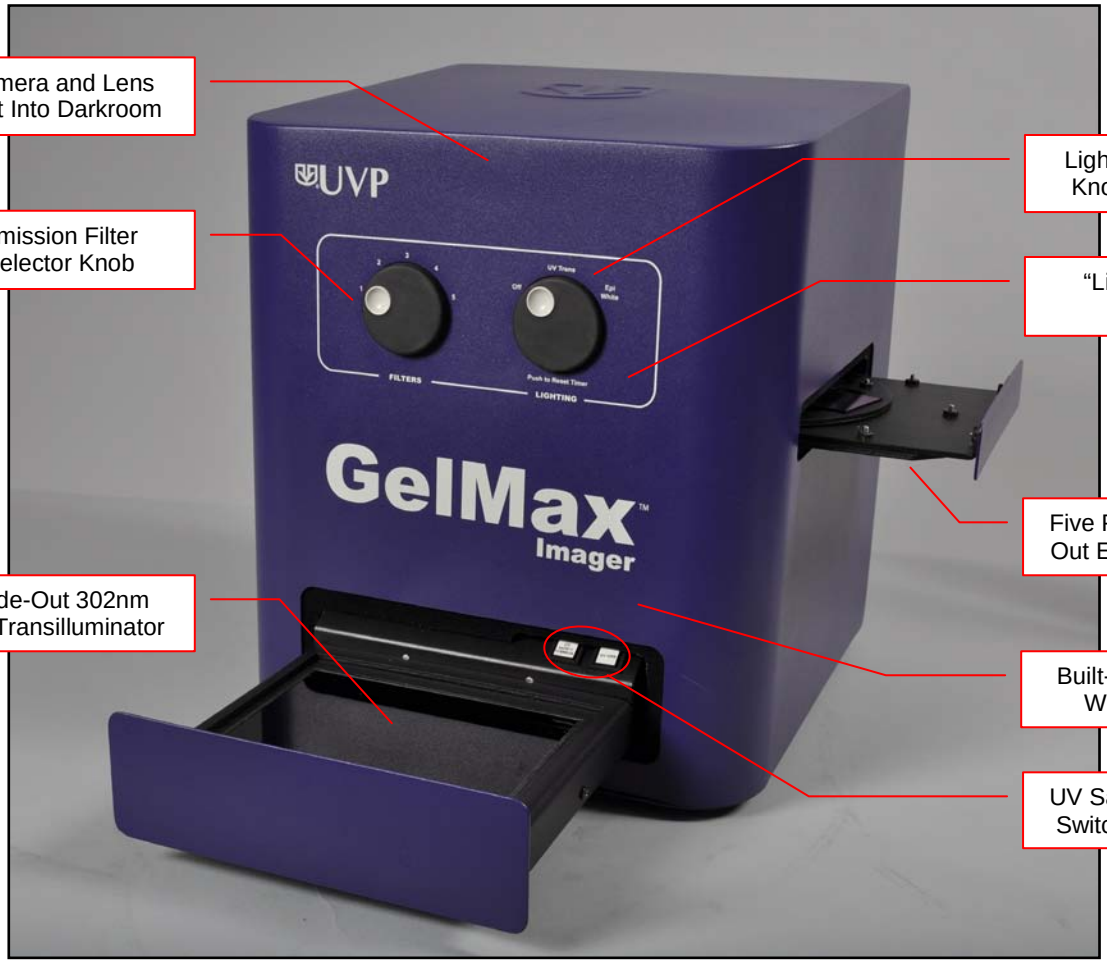
Introduction

The **GelMax Imager** is a compact, high resolution imager capable of capturing, documenting and analyzing fluorescent and colorimetric gel images. The darkroom has built-in overhead epi white lighting, a five-position motorized slide-out emission filter wheel with an ethidium bromide (EtBr) filter included as standard, and an integrated slimline, long life, slide-out 302nm UV transilluminator. Interchangeable Sample Plates fit snugly on top of the built-in UV transilluminator, converting the transilluminator's light to longwave 365nm UV, white light, or 460/470nm Visi-Blue™ blue light. A solid black plate is included for samples not requiring transillumination.

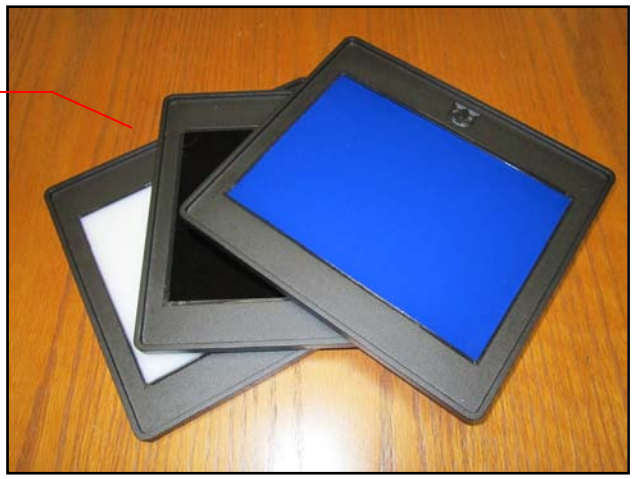
Many system functions are controlled via front-mounted rotary knobs, including lighting and emission filter selection. Camera functions are controlled and images are acquired, edited, saved and analyzed using the Doc-It®LS software package, included as standard with the GelMax Imager.

System Components

Refer to the packing slip and schematic shown below for specific parts and components included with the GelMax Imager.



365nm UV, White Light, and Visi-Blue, Interchangeable Sample Plates (Black Plate not shown)



Specifications

Power Requirements:	100/115V, 60Hz; 2.0 Amps 230V, 50Hz; 2.0 Amps 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

Operating System Requirements

- Windows 7 or XP, 32-bit or 64-bit
- Internet Explorer 6.0 or higher
- Intel Pentium Processor or equivalent, 1.6 GHz or higher
- 2 GB of RAM or greater
- 200 MB of available hard disk space for the program, more for data
- CD-ROM drive
- One Universal Serial Bus (USB) port for connecting the GelMax unit
- Color monitor, supporting at least 1024 x 768 resolution and 16-bit or better colors; 24-bit or 32-bit color is strongly recommended

NOTE: For 21 CFR Part 11 support functionality, the computer partition must be formatted with NTFS. Refer to the Doc-ItLS software manual for instructions.

Standard Equipment

Darkroom

The GelMax darkroom is light tight, providing optimal imaging conditions. Darkroom features include:

- Epi (overhead) LED white light
- Slide-out five position emission filter wheel
- Slide-out, long life transilluminator with UV safety interlock switch and manual override to enable transillumination when the transilluminator is not closed

Doc-ItLS Acquisition and Analysis Software

UVP's Doc-ItLS software loads directly onto the user's existing computer. The software controls the camera acquisition functions, enhancement and reporting features, and analysis capabilities for 1D and colony counting functions. For information on the installation and use of the software, refer to "Installing the Doc-ItLS Acquisition and Analysis Software" in this manual or to the Doc-ItLS Software help files.

UV Transilluminator

A long life, slimline 302nm UV transilluminator is integrated into the front slide-out transilluminator tray. The transilluminator provides highly uniform 302nm UV transillumination across an 11.5 x 16cm imaging area. The transilluminator is designed to accommodate a variety of Interchangeable Sample Plates, as described below.

CAUTION: All UVP transilluminators are powerful sources of UV radiation that will cause damage to unprotected eyes and skin. Before operating, be sure all personnel in the area are properly protected.

Refer to “Replacement Parts and Accessories” in this manual for UV-blocking spectacles, goggles and faceshield ordering information.

Interchangeable Sample Plates

In addition to the 302nm UV transillumination provided by the built-in transilluminator, four **Interchangeable Sample Plates** are available to provide additional transillumination options. Once in place, these Plates can provide 460/470nm Visi-Blue blue, white, or 365nm longwave UV transillumination. Included as standard is a solid, non-translucent black plate for placement of samples which don’t require transillumination.

A Sample Plate Holder is available to store the Interchangeable Sample Plates neatly next to the GelMax Imager. See “Replacement Parts and Accessories” for ordering information.

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 slide-out filter wheel on the side of the Imager. The filter allows visualization of fluorophores from 580-630nm, targeting the ethidium bromide emission peak of 605nm.

Additional and custom filters are available for other specific fluorophores. See “Replacement Parts and Accessories” or contact UVP for ordering information.

Fluorescent Focus Target

The UVP Fluorescent Focus Target fluoresces when placed on the UV transilluminator. 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

Setup Instructions

Components

When unpacking the GelMax Imager, the following items will be included as standard:

1. GelMax Imager
2. Ethidium bromide (EtBr) emission filter
3. Power and USB cables
4. Doc-ItLS Software
5. Supporting documentation
6. One or more Interchangeable Sample Plates (the Solid Black Interchangeable Sample Plate is included as standard)

Place the darkroom on a flat surface which can provide adequate support for up to 50 pounds.

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

If the equipment is used in a manner other than as specified by UVP, the protection provided by the equipment may be impaired.

CAUTION: This system is designed for indoor use only. 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 apparatuses.

Connecting the Power and USB Cables

Plug the square end of the USB cable into the back of the GelMax. Plug the other end into an available USB port on the user's computer.

Plug the main power cable into the back of the GelMax and the other end into a surge-protected power outlet. Set the power switch on the back of the system to the **ON** (**I**) position.

Note: It is recommended to leave the power switch on the back of the system in the **ON** position except when the system will not be used for an extended period of time (one day or longer).

Note: Do not position the system so that it is difficult to access the power cable and operate the main power switch at the back of the unit.

Installing Emission Filters

To install the 50mm square ethidium bromide (EtBr) filter and any other emission filters:

1. Carefully remove the filter from the protective plastic case, holding the filter at the edges to prevent placing fingerprints on the glass surface.
2. The filter wheel is located on the user's right side of the darkroom. Press in on the slide-out filter wheel door. The door will pop out slightly. Pull the filter wheel assembly out until it stops.
3. Using the Emission Filter Selector Knob, rotate the filter wheel to the desired position. Use the chart to determine the ideal Emission Filter Selector Knob position for installing filters:

To Install a Filter in Position #:	Place the Emission Filter Selector Knob in Position #:
1	5
2	1
3	2
4	3
5	4

4. Place the included ethidium bromide filter in emission filter wheel Position #1.

   NOTE: Before placing the filter in the emission filter wheel, ensure that the text on the edge of the filter is positioned so the text is right side up.

5. Once all filters have been loaded, slide the filter wheel assembly back into the system. Press the filter wheel assembly door until the assembly locks into place.

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

Installing the Doc-ItLS Acquisition and Analysis Software

NOTE: The following provides a brief instruction for installing Doc-ItLS software. For instructions on using the software, refer to the Doc-ItLS help files.

1. Insert the CD into the CD-ROM drive. The installation program should automatically start. If the installation program fails to start, navigate to the CD-ROM drive and double-click **setup.exe** to launch Doc-ItLS.
2. Follow instructions from the Wizard screens as they appear, clicking **Next**, **Accept** or **Finish** as appropriate.
3. If prompted to restart the computer, click **No**. Rather, restart the computer by choosing **Restart** from the Windows Start menu.
4. Double-click the UVP icon on the computer’s desktop.
5. If connected to the Internet, activate the software by choosing **On the fly activation**. Complete all of the required information on the form and fill in the Serial Number (located on the CD). Click on **Get Activation No.** and then click on **Activate** when the Activation Number appears in the box.
6. Close the software.

NOTE: If not connected to the Internet, call UVP Technical Support at (800) 452-6788 to complete the activation process.

Using the System

Powering Up the System

Set the power switch on the back of the system to the **ON** (**I**) position. Once plugged in to a wall outlet and the power switch on the back of the system is placed in the **ON** (**I**) position, the GelMax Imager is always powered on.

The **"Lighting On"** indicator on the front of the unit will glow green when the system's epi white or transillumination are on.

Note: It is recommended to leave the power switch on the back of the system in the **ON** position except when the system will not be used for an extended period of time (one day or longer).

Selecting Emission Filters

See the "Installing Emission Filters" section of this manual for instructions on installing individual emission filters.

Once all filters have been installed and with the system powered on, rotate the Emission Filter Selector Knob to the desired filter position. The emission filter wheel will automatically rotate to the appropriate position within the system. Note that the filter wheel only rotates in one direction, so it is normal for the system to take longer to reach certain filter positions than others.

Selecting Illumination Sources

With the system powered on, rotate the Lighting Selector Knob clockwise one detent to select Transillumination. Rotate the knob clockwise an additional detent to select Epi White (Focus) light. The **"Lighting On"** indicator on the front of the unit will glow green when the system's epi white or transillumination are on.

NOTE: For UV protection and to extend the life of the UV transilluminator and epi white lighting, the system incorporates an automatic 10-minute lighting shutoff timer. The user will know that the shutoff timer has turned off power to the lighting source when the lighting selector knob is either on Transillumination or Epi White (Focus) and the **"Lighting On"** indicator is not glowing.

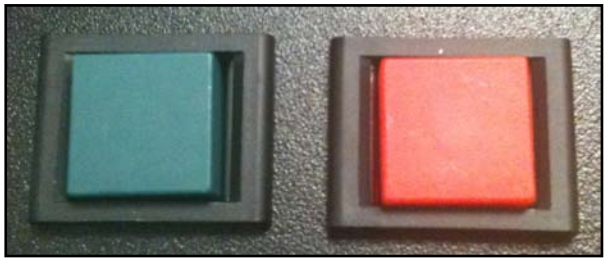
To reset the lighting timer, press in firmly on the Lighting Selector Knob. This will reset the 10-minute lighting shutoff timer for an additional 10 minutes.

Using the Transilluminator

The GelMax Imager contains an integrated slimline, long life, slide-out 302nm UV transilluminator. To access the transilluminator, press in on the slide-out transilluminator door on the front of the Imager. The door will pop out slightly. Pull the UV transilluminator assembly out until it stops, and then place the sample and/or Interchangeable Sample Plate on the transilluminator surface. Once the sample is aligned, press the transilluminator in until the unit locks into a closed position.

NOTE: To avoid scratching or damaging the transilluminator surface, do not attempt to cut or perform excision directly on the filter glass surface. Rather, remove the sample, perform cutting or excision on a Gel-Tray or other surface, then replace the sample on the transilluminator surface.

The UV Transilluminator is designed with a UV safety interlock to automatically turn UV lighting off when the transilluminator is pulled out. To override this interlock, press the green override button located at the rear of the transilluminator module. To cancel the override, either press the red override cancel button or slide the transilluminator back into the GelMax unit (see image at right).



NOTE: All UVP transilluminators are powerful sources of UV radiation that will cause damage to unprotected eyes and skin. Before operating, be sure all personnel in the area are properly protected. Refer to "Replacement Parts and Accessories" in this manual for UV-blocking spectacles, goggles and faceshield ordering information.

Installing Interchangeable Sample Plates

To provide additional transillumination options, the GelMax Imager can accommodate a variety of **Interchangeable Sample Plates**. Available exclusively from UVP, these Plates are placed on top of the slide-out UV transilluminator surface to convert the standard 302nm transillumination to:

- 460/470nm Visi-Blue
- White Light, or
- 365nm Longwave UV

Also available is a solid, non-translucent, non-reflective black plate for the placement of samples not requiring transillumination.

To install an Interchangeable Sample Plate, slide out the UV transilluminator. With the UVP logo on the Sample Plate facing up and toward the rear of the transilluminator, place the Sample Plate on the transilluminator until it fits snugly into place. Place the sample to be imaged on top of the Plate, and slide the transilluminator unit into the GelMax Imager.

Focusing the Image

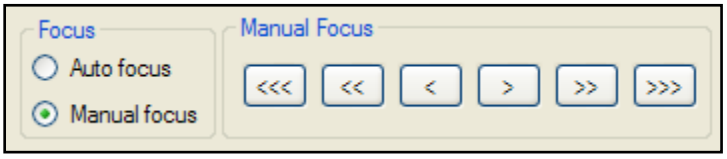
The GelMax Imager is configured with an auto focus camera and lens. However, some samples may not produce enough light or sharp enough details for the system to focus automatically. In this case, the user must manually focus the image.

To manually focus the image:

1. Place the sample on the transilluminator surface and rotate the Lighting Selector Knob clockwise two detents to select Epi White (Focus) lighting.

2. With the Doc-ItLS software open, click the **Preview** button at the top of the software interface.

3. Once the Preview window appears, select the radio button next to "Manual focus". Six manual focus buttons should appear as shown to the right.



4. Use the arrow buttons to manually focus the image. Begin by using the outer buttons with three arrows to attain a general focus, then use the inner buttons with two arrows and one arrow for finer focus control.

Once the focus is set manually, this setting is maintained even when the system is power cycled. Therefore, the system should not need to be focused again. However, if the focus setting is toggled back to Auto focus on the Preview screen, the manual focusing process will need to be completed again.

Note: Once manual focusing is completed, the depth of field capabilities of the system will keep the sample in focus even if a converter plate is installed or removed.

Service Procedures

Return Procedure

A **Returned Goods Authorization (RGA)** number must be obtained from UVP Customer Service before returning any product. See “Technical Support” below for contact information.

Replacement Parts and Accessories

To order accessories or replacement parts for the GelMax Imager, contact UVP’s offices.

Part Description	Part Number
Fuse, 2.0A	56-0022-03 (2 Recommended)
Power Cord, 100V/115V	58-0085-01
Power Cord, 230V	58-0085-03
Interchangeable Sample Plates:	
365nm Longwave UV Interchangeable Sample Plate	38-0381-01
460/470nm Visi-Blue Interchangeable Sample Plate	38-0381-02
White Light Interchangeable Sample Plate	38-0381-03
Solid Black Interchangeable Sample Plate	38-0381-04
Interchangeable Sample Plate Holder	20-1657-01
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
Additional Filters	Contact UVP
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 Transilluminator or Filter Wheel

1. Recheck the main power cord connection to the GelMax unit.
2. Check the fuses located at the back of the unit next to the power port. A small flat-head screwdriver or similar tool will be required.

   Push the left tab of the fuseholder to the right until the fuseholder’s left side pops out. Then, push the right tab toward the left until the right side pops out. The entire fuseholder can now be pulled out.

   Inspect the thin wire within each 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.

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 of 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	**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. 11th 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.

Doc-It is a registered trademark of UVP, LLC.
GelMax and Visi-Blue are trademarks of UVP, LLC.