

BioDoc-It® Imaging System

Installation and User Instructions



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System Introduction

BioDoc-It[®] Imaging System

The BioDoc-It Imaging System enables simple documentation of fluorescent and non-fluorescent gels, membranes, blots, film plates and assays with the ability to save images to a USB storage device for later quantitative analysis or enhancement for publication.

Images are saved in 8-bit TIFF or JPEG formats, allowing saved images to be read by most PC or MAC programs. The BioDoc-It Imaging System is a cost effective solution for capturing quality images in a compact standalone package, as no external computer is required.

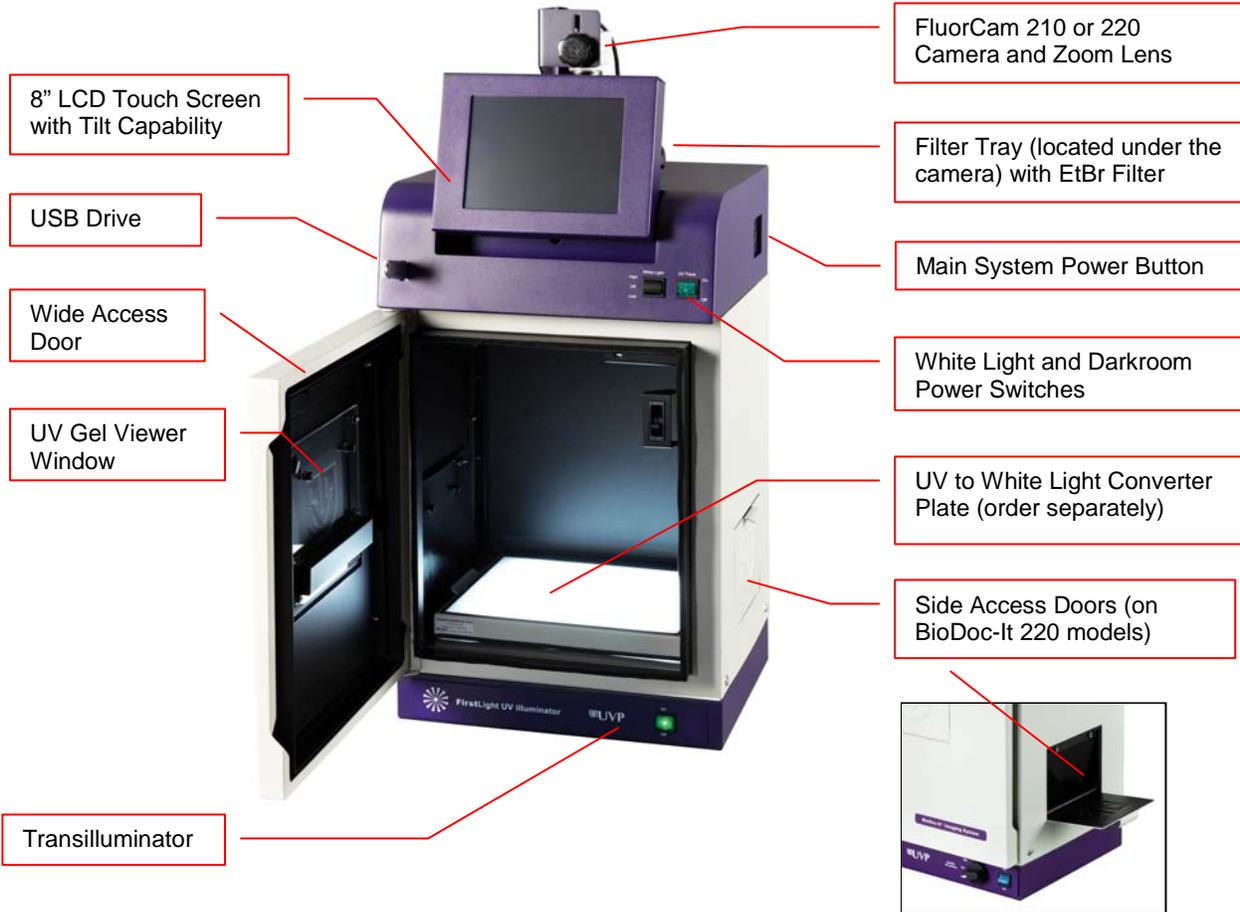
The BioDoc-It comes in two configurations:

- **BioDoc-It 220 Imaging System** includes a high resolution, 1.3 megapixel camera, 8-48mm zoom lens and side access doors.
- **BioDoc-It 210 Imaging System** includes a 0.3 megapixel camera and an 8-48mm zoom lens.

System Components

BioDoc-It Components

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



System Specifications

Camera

BioDoc-It 220 Models:

The BioDoc-It 220 is equipped with a FluorCam 220 Camera (resolution of 1.3MP).

BioDoc-It 210 Models:

The BioDoc-It 210 is equipped with a FluorCam 210 Camera (resolution of 0.3MP).

Both the FluorCam 220 and FluorCam 210 use a USB 2.0 PC connection. 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 before making any adjustments to the camera settings.



Lens

The BioDoc-It is equipped with an 8-48mm zoom lens fitted with a close-up diopter and step-up ring, allowing the camera to be held in a fixed position. The diopter is for focusing on objects at the focus length of the BioDoc-It Imaging System's darkroom.

Built-In Computer

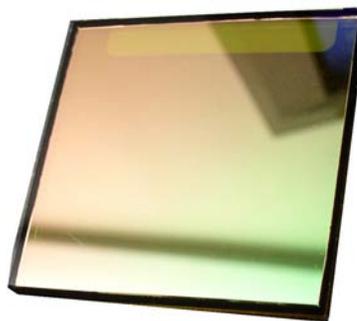
- **Internal Storage:** 60GB or more
- **USB 2.0 Ports:** 1 front, 4 in the back
- **USB Storage Device Capacity:** 1GB (minimum)
- **Software:** TS software

Ethidium Bromide Filter (EtBr)

The Ethidium Bromide (EtBr) filter (50mm sq) UV blocking band pass interference filter blocks UV and IR radiation emitted from the transilluminator. The filter is placed in the filter tray below the camera/lens assembly.

The filter allows visualization of fluorophores from 580-630nm, targeting the EtBr emission peak of 605nm.

The EtBr filter can be substituted for other specific fluorophore filters or removed when imaging non-fluorescent media (protein gels, colony plates, etc.) in order to produce brighter images.



Darkroom

Darkroom features include:

- UV gel viewer window
- Overhead white light
- Wide access door with UV safety interlock switch

Transilluminator

A transilluminator is included with the BioDoc-It system. UVP offers a variety of transilluminators, from benchtop models with 8-watt, single wavelength and single intensity to models with multiple wavelengths and high/low intensities. UVP also offers the high-end FirstLight®, a highly uniform, 302nm UV transilluminator.

LCD Touch Screen

The display is an 8-inch VGA color touch screen with tilt adjustment connected to the darkroom cabinet. The touch screen allows the user to preview, snap, save and print images, as well as select certain preference options, without the need to use an external mouse or keyboard. However, should the user desire, a mouse and/or keyboard (not included) can be used with the BioDoc-It.

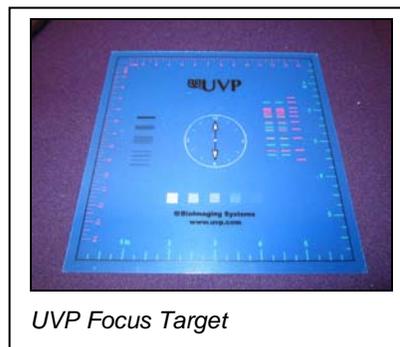
A stylus pen is included for increased pointer control for selecting software options on the touch screen.

UVP Focus Target

The UVP Focus Target fluoresces when placed on a transilluminator or when exposed to overhead UV. The target provides sharp, fluorescent images to aid in adjusting the focus of the camera.

Removable USB Stick

The removable USB stick, included with the system, has 8GB memory (minimum) and connects to the system to allow for saving and transferring of images.



UVP Focus Target

Optional Equipment

Refer to the **Replacement Parts and Accessories** section 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

Converter Plates

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.

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



UV/White Converter Plate

Setup Instructions

Components

- BioDoc-It Darkroom
- CCD Camera and Zoom Lens
- Camera/Lens Mounting Bracket and Hardware
- Power, Jumper and USB Cables
- Transilluminator
- USB Storage Device (1GB minimum)

WARNING: DO NOT ATTEMPT TO CONNECT ANY WIRING WHILE THE EQUIPMENT IS CONNECTED TO THE POWER SUPPLY!

CAUTION: Do not install the system in places with high moisture, dust, or high temperatures. Do not use any oil or petroleum based cleaners on the cabinet. Use only a mild soap or detergent solution for cleaning. Ensure that the system is turned OFF and is unplugged from its power source during cleaning.

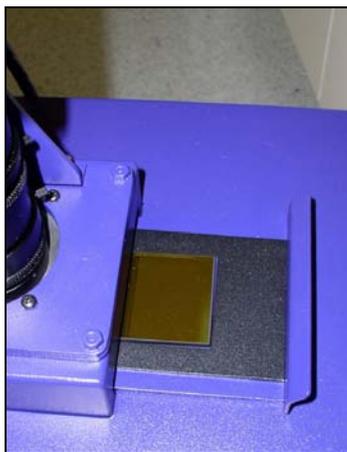
Keep the equipment away from motors or other large magnetic equipment apparatus.

Installing the Filter

Systems include a 50mm sq Ethidium Bromide (EtBr) filter.
To install the filter in the BioDoc-It darkroom:

1. Carefully remove the filter from the protective plastic case, holding the filter at the edges to prevent fingerprints.
2. The filter tray is located under the camera bracket on the top right side of the darkroom. Slide the tray open.
3. Place the filter inside the filter tray. Ensure that the text on the edge of the filter is positioned so it is right side up when facing the installer.

Additional filters are available. Refer to **Replacement Parts and Accessories** for ordering information.



Camera Setup

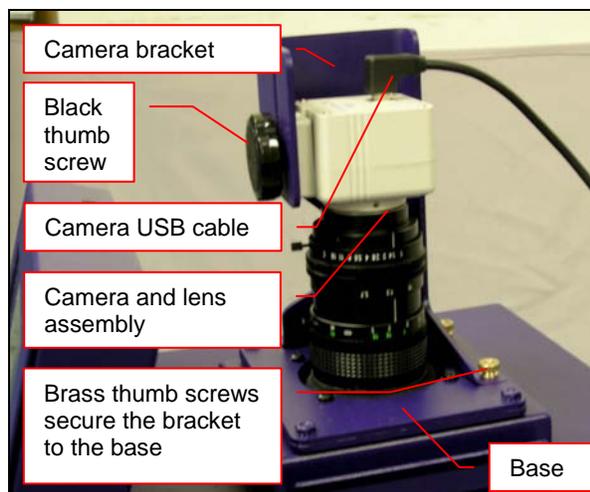
The camera and zoom lens are assembled at the UVP factory.

Note: The zoom lens shipped may appear different than the one pictured at right.

1. Remove the cap from the lens.
2. If not already assembled, attach the step-up ring and diopter to the lens. The step up ring and diopter will only fit one way.



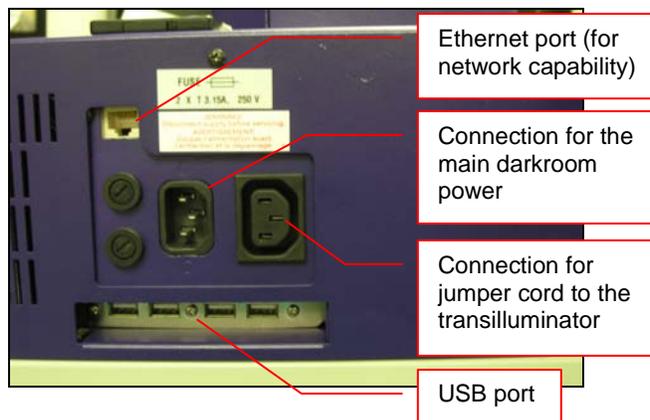
3. Using the four brass thumb screws provided, secure the bracket to the base.
4. Slide the camera and lens assembly into the camera bracket. Slide the lens through the center hole in the gasket on the base and use the gasket to form a light-tight seal around the lens.



5. Insert and tighten the black thumb screw and washer in the central hole in the camera to secure the camera to the bracket.



6. Plug the camera cable into the top of the camera and the other end into a USB port on back of the darkroom.
7. Connect the jumper cord from the darkroom to the transilluminator.
8. Connect the main power cord from the back of the darkroom to a surge-protected power outlet.



Connecting the System to a Network

The BioDoc-It has wired networking capability for saving and sharing files on a network. To set up the network connection, plug a networked Ethernet cable into the rear of the BioDoc-It. Then, minimize the TS software screen to access the Windows Start button and network setup functions by touching the **Windows logo** button on the lower-right corner of the TS software. Contact your organization's network administrator for further network configuration instructions. (**Note:** Connecting the BioDoc-It to a network is not required to operate the system)

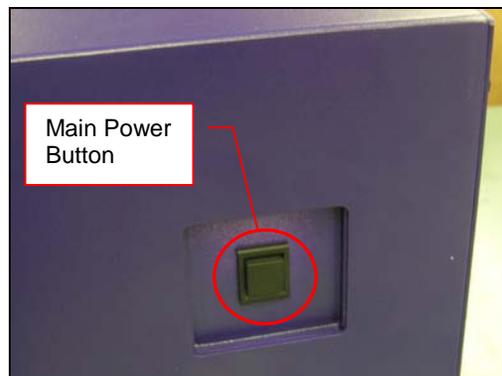
Stylus and Holder

The BioDoc-It screen is touch sensitive. Use the stylus included with the system to operate the software controls. For easy access to the stylus when operating the system, remove the tape from the back of the stylus holder and adhere it to the BioDoc-It. Slide the stylus into the holder.

Using the System

Powering Up the System

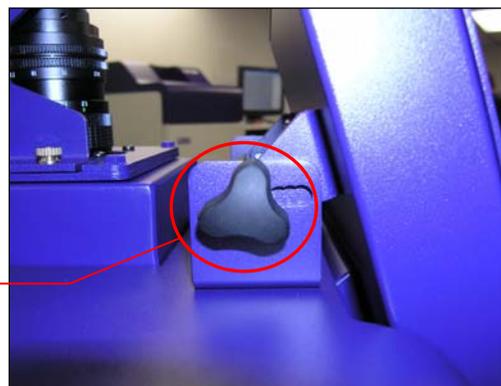
1. Ensure that the main power cord is connected from the back of the darkroom to a surge-protected power outlet.
2. Power up the system by pressing once on the **Main Power** button located on the right side of the unit. All internal components will now have power and the TS software will automatically load.
3. To power down the system, push the **Main Power** button.



Adjusting the Screen Angle

1. To adjust the angle of the screen, loosen the black rubberized knobs on each side of the monitor. Twist each knob counter-clockwise (note that the knobs will be turning opposite directions).
2. Tilt the screen to the desired angle.
3. Turn each knob clockwise to tighten.

Black Rubberized Knob



Operating the TS Software

Once the **Main Power** button is pressed, the system will go through the boot-up process. Upon completion, the LCD monitor will display the TS software screen similar to the one below:



To shut down the TS software, touch the **X** on the bottom left corner of the screen.

To turn the system off, press the **Main Power** button or power down from the Windows icon on the bottom right corner of the screen.

Refer to **Touch Screen Interface** in this manual for detailed instructions on using the software.

Using the Transilluminator

Once the BioDoc-It darkroom power is turned on, power is supplied to all components. This includes the jumper cable that supplies power to the transilluminator. To use the transilluminator, turn **ON** the two transilluminator power switches. One switch is on the front of the BioDoc-It unit and is labeled **UV Trans**. The other switch is located on the front of the transilluminator itself, directly below the darkroom door.

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



Using the UV Gel Viewer Window

The UV Gel Viewer Window has a metal cover to block out ambient lighting and to protect the UV-safe glass. The cover is held in the closed position by two small magnets built into the UV-safe glass. To open the window cover, pull down on the metal tab. The cover will pop open. To close the cover, pivot it up until it reengages with the two small magnets.

The glass is UV blocking while providing a clear, UV-safe view to the transilluminator surface for visibility of samples.

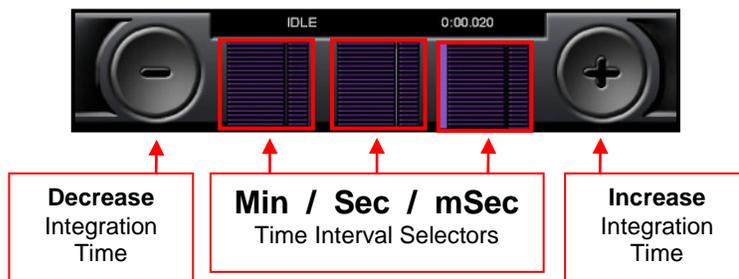
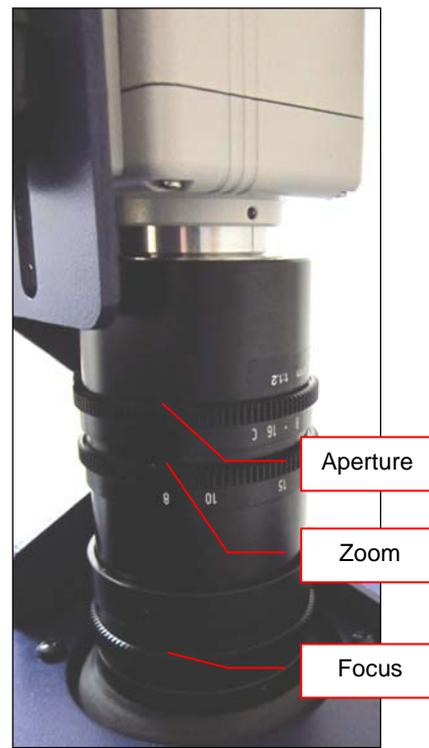
Metal tab



Image Focusing

Prior to capturing any images, prepare the image focus capabilities of the system:

1. Turn on the transilluminator and place the **UVP Focus Target** on the transilluminator surface.
NOTE: The BioDoc-It darkroom has a UV safety switch that turns the transilluminator off when the door is open. After closing the door, be sure the overhead white light switch is turned **OFF**.
2. Press the **LIVE** button on the TS software screen. While watching the LCD screen, rotate the **Aperture** adjustment ring on the lens so that the image is as bright as possible.
3. Using the integration time settings at the bottom of the screen, press the **mSec** time interval selector square. Then, use the **+** button to increase integration time until the desired brightness is achieved. Readjust the **Aperture** adjustment ring if needed.
4. Rotate the **Focus** adjustment ring on the lens. Adjust this so that the image appears in clear focus on the LCD monitor. **Note:** Once the proper zoom range is set, the lens will have to be refocused when zoomed in completely.
5. Rotate the **Zoom** adjustment ring on the lens so that the image is as large as possible. Readjust the **Focus** ring on the lens, making the image clear. Adjust the zoom so that the object of interest is within the picture on the LCD monitor.



Printer Setup

The thermal printer is an optional accessory. If this order did not include a thermal printer, move on to the next section. Otherwise, to set up the printer:

1. Plug the power cable from the printer into the power source.
2. Press the **Open** button to open the lid of the printer and load the paper by allowing the loose end of the roll to come off the top of the roll.
3. After shutting the printer lid, tear off the excess paper that is visible.
4. Plug in the USB cable from the printer into the BioDoc-It USB port.
5. With the BioDoc-It turned on, press the “Windows” button on the lower-right portion of the TS software screen.
6. To set the printer settings click “Start” at the lower left of the computer. Next, click “Printers and Faxes”, then right-click on the appropriate printer icon and select “Printing Preferences”.
7. Choose the following settings: High Density paper, 1280X1280, Portrait mode.
8. Click on the “Option” tab and click the “Enlarge Image to Fit Paper” box. Then, click “Apply” and “OK”.
9. Restart the BioDoc-it system.

If the thermal printer does not work correctly, contact UVP Technical Support for assistance. See the **Technical Support** section of this manual for contact information.

Touch Screen Interface

Setting User Preferences on the TS Software



Before capturing images, set up the user preferences by touching the **PREF (preferences)** button on the main screen. Select from the following tabs:

- Capture
- Postprocessing
- Saving

Capture Tab

Active Camera: The name of the attached camera will be shown.

Bit Depth: Select the bit depth. 16 bpp (bits per pixel) is shown for the Gel HR Camera.

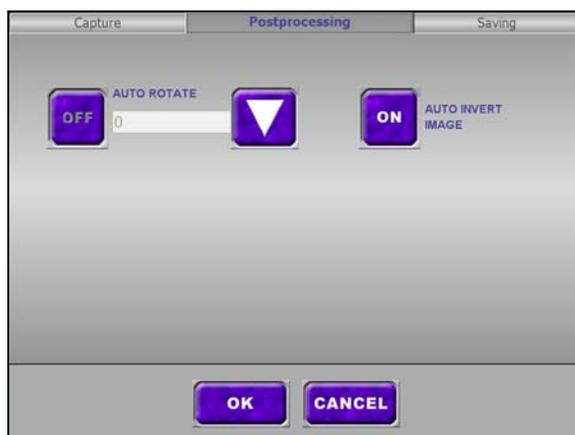
Display Time Stamp: Turn the time stamp on or off.



Postprocessing Tab

Auto Rotate: To rotate the image, click the OFF button and then the down arrow. Rotate options are: 0, 90, 180 or 270 degrees.

Auto Invert Image: Click ON to automatically invert the colors within the image.



Saving Tab

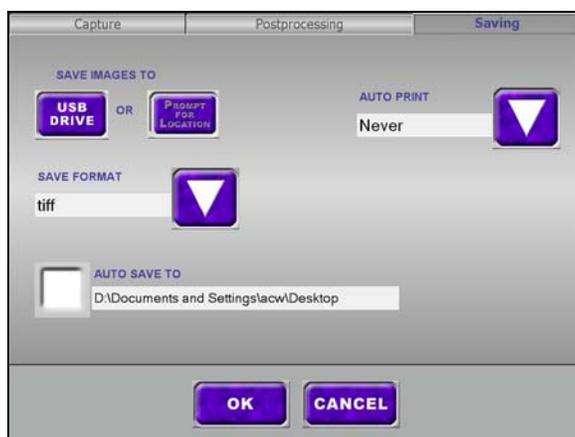
NOTE: If the auto save function is enabled, the image will automatically save when the **SNAP** button is pressed. If the auto save function is not enabled, press the **SAVE** button to save an image. A pop up screen will allow the user to save to the USB Drive or a different location with Prompt for Location function.

Save Images To: Select the location where images are to be saved. White highlight indicates which button is activated. The **USB DRIVE** will save the file to the USB drive if one is plugged in. If one is not plugged in, the user will be prompted to select a different location. **PROMPT FOR LOCATION** will ask the user to select a location when the **SAVE** button is pressed.

Save Format: Click the down arrow to select the file format. Save images as TIFF (16-bit), JPEG (8-bit) or GIF (8-bit) file formats.

Auto Save To: Click the white box to activate the auto save function. To change the folder to a different location, click in the folder field and a "Browse for Folder" window will pop up. Select a folder or make a new folder. Click **OK** to close the window. The selected folder will display in the auto save to box.

Auto Print: Select from Never, Always, or After Save



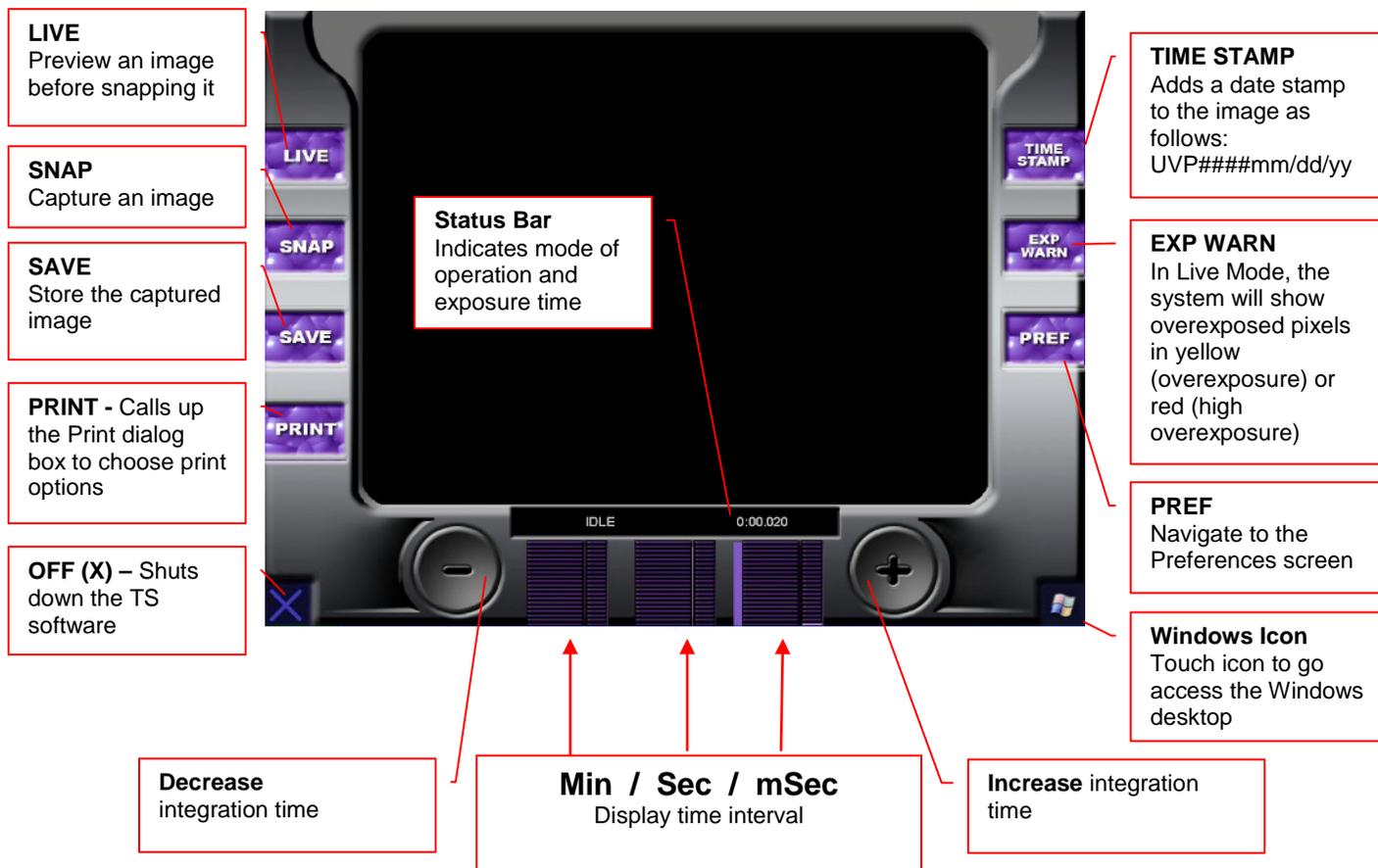
NOTE: These options will be reflected after capturing an image with the **SNAP** button, and not in **LIVE** mode.



Touch the **OK** button to save all preferences and go back to the main screen, or the Cancel button to go back to the main screen without saving changes.

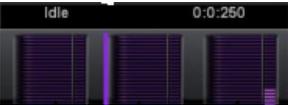
Identifying the Touch Screen Functions and Tools

Using the software touch screen allows convenient selection of image capture, save, print and other functions of the system. Callouts are provided below to briefly describe the buttons.



Using the Functions and Tools

Tool/Function	Procedure
	<ol style="list-style-type: none"> To see a preview of the image before snapping it, touch the LIVE button. LIVE mode will be indicated in the status bar.
Adjust exposure time 	<ol style="list-style-type: none"> Adjust the exposure time by first selecting the time interval. Touch on the corresponding bars, Minutes, Seconds, milliSeconds, from left to right, respectively. These bars will be animated in LIVE/SNAP mode to show progress as time elapses. Decrease or increase the time by touching the minus or plus button respectively.
	<ol style="list-style-type: none"> To view overexposed pixels, touch the EXP WARN button. Overexposed pixels will be identified with a yellow or red color, depending on the how saturated they are.
	<ol style="list-style-type: none"> To add a date stamp to the image, touch the TIME STAMP button. This will add UVP####mm/dd/yy at the bottom right corner of the image. This information is NOT burned into the image until the image is saved.

	<p>5. To snap (capture) the image, touch the SNAP button. NOTE: When using the SNAP button, if the Auto Save function is enabled, the image will automatically be saved.</p>
	<p>6. Touch the SAVE button to save the image to the location specified in the Preferences. The file name is assigned automatically by the software as UVP#####mddyyyy.*</p> <p>NOTE: Once an image is saved, the user cannot open the image with the software. TIFF images can be opened by VisionWorks or comparable software (contact UVP Tech Support for recommendations). JPEG and GIF files can be opened with many Microsoft or comparable programs.</p>
	<p>7. Print the image (if a printer is installed) by touching the PRINT button and clicking OK at the print dialog box.</p>
<p>Status bar modes</p>	<p>8. Status bar indicates the modes of operation: IDLE, LIVE or CAPTURE. Minutes, seconds, milliseconds bars display time progress. Each field (Min, Sec, Msec) displays the current exposure time and the start of the current exposure being taken. The large portion of each field indicates the current exposure status. The smaller portion to the right indicates the current exposure setting.</p>  <p style="text-align: center;">Min. Sec. MSec</p>
	<p>9. To go Microsoft Windows®, touch the WINDOWS ICON located at the bottom right corner of the screen. To turn off the system, shut down from Windows or push the MAIN POWER button.</p> <p>To close the software, click the X in the bottom left corner of the screen.</p>

Find and View Images

Managing Files

The TS System allows the user to save images in several locations. The location is selected in the PREF screen. The system has a built-in hard drive with at least 25 GB of storage space that can be used.

To save images in the USB drive, make sure a USB drive is plugged in. If one is not plugged in, the TS software will automatically prompt the user for a location.

Viewing Images

It is not possible to view saved images on the software screen. To view images captured and saved from the TS system, different software is required.

To view **8-bit JPEG or GIF** images, exit to Windows and open Windows Image Viewer or other comparable software program. To exit the TS software interface and go to Microsoft Windows, touch the **WINDOW ICON** located at the bottom right corner.

To view **16-bit TIFF** images, open VisionWorksLS or comparable program (contact UVP Tech Support for recommendations). VisionWorksLS may be included with the system. To check, go to **Start > All Programs > UVP > VisionWorks** or look for the VisionWorks icon on the desktop.

Connecting to a Network

Network Connectivity

The TS System has built-in networkability. While it is fairly simple to connect the device to the network, it is highly recommend to obtain assistance from your network administrator.

Follow the Microsoft or local standard network protocols for network configuration. To exit the TS software interface and go to Microsoft Windows, touch the WINDOWS ICON located at the bottom right corner of the main screen.

Install Drivers or Additional Software

Installing Drivers or Additional Software

In the event that additional drivers or VisionWorksLS software need to be installed on the system, exit the TS software interface and go to Microsoft Windows by pressing the WINDOWS ICON button located at the bottom right corner of the main screen.

To install drivers or additional software, copy to a USB storage device, open Windows Explorer in TS and run the desired program. The system can accept USB as a method of software installation.

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 or replacement parts for the BioDoc-It Imaging System, contact UVP's offices.

Part Description	Part Number
Filter, Ethidium Bromide, 50mm Square	38-0220-01
Filter, SYBR Green, 50mm Square	38-0219-01
Filter, SYBR Gold, 50mm Square	38-0221-01
White Light Converter Plate, 21x26cm	38-0191-01
White Light Converter Plate, 25x26cm	38-0191-04
Visi-Blue Converter Plate, 21x26cm	38-0200-01
Visi-Blue Converter Plate, 25x26cm	38-0200-04
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
Doc-It [®] LS Analysis Software	97-0185-02
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 BioDoc-It darkroom as well as the power cables between the darkroom and transilluminator.
2. Check the fuses located at the back of the unit next to 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.

Transilluminator Will Not Turn On

1. Make sure to turn **ON** the two transilluminator power switches and that both switches are glowing green. One switch is on the front of the BioDoc-It unit and is labeled **UV Trans**. The other switch is located on the front of the transilluminator itself, directly below the darkroom door.
If the switches do not glow green, refer to "No Power to the Darkroom or Transilluminator" above.
2. 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.
3. Be sure the transilluminator's power jumper cord is securely connected at both the ends of the cable.

Touch Screen Not Accurate

1. If touching or clicking on the buttons becomes inaccurate, the touch screen may need to be recalibrated. Please follow all instructions in the touch screen calibration instructions included in the TS software CD.

Error Messages Appear on the Screen

1. An error message that is related to the TS 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, 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.

Technical Support

UVP offers technical support on all of its products. If there are questions about the product's 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 > BioImaging Systems.

If in North America, South America, East Asia or Australia:	If in Europe, Africa, the Middle East of 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) 1223-42002 , and ask for Customer Service during regular business days between 9:00 am and 5:30 pm.
E-mail your message to: techsupport@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 two (2) years 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.