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Gel Doc ™ 2000
ChemiDoc™
ChemiDoc™ XRS

Hardware Instruction Manual



(Includes Universal Hood Catalog Number 170-8126)

P/N MI1708126AA Rev.C

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Important

Please read these instructions before operating the Universal Hood to become familiar with its operation.

Note: This instrument is suitable for research use only.

It must be used, therefore, only by specialized personnel that know the health risks associated with UV radiation and with the reagents that are normally used with this instrument. Use of the acrylic screen doesn't guarantee protection of the user from UV radiation. The use of protective eyeglasses or mask and gloves is strongly recommended.

Wichtig

Bitte lesen Sie die Anweisungen und machen Sie sich mit der Bedienungsweise vertraut , bevor Sie den Universal Hood benutzen.
Anmerkung: Dieses Geraet ist nur fuer Forschungszwecke geeignet.
Ausserdem ist die Benutzung nur fuer spezialisiertes Personal gedacht, das mit den Gesundheitsrisiken vertraut ist, die an die UV-Strahlung gebunden sind und den Reagentien, die normalerweise mit diesem Geraet benutzt werden.
Die Benutzung eines Plexiglasschutzschildes garantiert dem Benutzer keinen Schutz vor UV-Strahlung. Die Benutzung von Schutzbrille oder Schutzmaske ist strengstens empfohlen.

Warranty

The Universal Hood is warranted against defects in materials and workmanship for 1 year. If any defect occurs in the instrument during this warranty period, Bio-Rad laboratories will repair or replace the defective parts at its discretion without charge. The following defects, however, are specifically excluded:

- Defects caused by improper operation.
- Repair or modification done by anyone other than Bio-Rad Laboratories or an authorized agent.
- Use of spare parts supplied by anyone other than Bio-Rad Laboratories.
- Damage caused by accident or misuse.
- Damage caused by disaster.
- Corrosion caused by improper solvents or samples.

Garantie

Die Garantie fuer den Universal Hood betraegt 1 Jahr auf Herstellungs- und Materialfehler.
Bei Auftreten von Fehlern waehrend der Garantiezeit repariert oder ersetzt Bio-Rad Laboratories die fehlerhaften Teile auf eigene Kosten. Die folgenden Schaeden sind in jedem Falle ausgeschlossen:

- Schaeden durch unsachgemaesse Bedienung bedingt.
- Instandsetzungen oder Veraenderungen durch nicht authorisiertes Personal von Bio-Rad Laboratories
- Benutzung von Ersatzteilen, die nicht von Bio-Rad Laboratories geliefert wurden.
- Schaeden durch Naturkatastrophen verursacht.
- Schaeden durch unsachgemaessen und fehlerhaften Gebrauch verursacht.
- Korrosionsschaeden durch ungeeignete Loesungen oder Proben.

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Regulatory Notice

IMPORTANT: This Bio-Rad instrument is designed and certified to meet ENC1010, the internationally accepted electrical safety standards and EMC regulations. Certified products are safe to use when operated in accordance with the instruction manual. This instrument should not be modified or altered in any way. Modification or alteration of this instrument will:

1. Void the manufacturer's warranty.
2. Void the regulatory certifications.
3. Create a potential safety hazard.

NOTE: Bio-Rad Laboratories is not responsible for any injury or damage caused by use of this instrument for purposes other than those for which it is intended, or by modifications of the instrument not performed by Bio-Rad Laboratories or an authorized agent.

Richtlinien

WICHTIG: Dieses Geraet, von Bio-Rad Laboratories konstruiert, besitzt das Zertifikat ENC1010 anerkannt von dem internationalen elektrischen Sicherheitsstandard EMC und unterliegt dessen Richtlinien. Die Geraete sind sicher im Gebrauch, wenn die vorliegende Bedienungs- anleitung beachtet wird. Dieses Geraet darf auf keinen Fall veraendert werden. Eventuelle Veraenderungen fuehren zu:

1. Ungueltigkeit der Herstellergarantie
2. Ungueltigkeit des Zertifikats
3. Eventuelles Sicherheitsrisiko

Bemerkung: Bio-Rad Laboratories haftet nicht fuer Verletzungen an Personen oder Sachschaeden, hervorgerufen durch eine nicht vorhergesehene Benutzung des Geraetes. Ebenso uebernimmt Bio-Rad Laboratories keine Haftung fuer Veraenderungen, die von nicht authorisierten Personen durchgefuehrt wurden.

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General Precautions

- Please read the instruction manual carefully.
- The instrument must be used only for the intended purpose of gel documentation in research laboratories.
- When power is applied to the Universal Hood the source must be a grounded AC outlet.
- Do not pour liquids directly on or inside the instrument.
- Switch off all the lights immediately after use.
- Clean the transilluminator platen after use.

Generelle Vorsichtsmassnahmen

- Bitte die Bedienungsanleitung aufmerksam lesen.
- Das Geraet darf nur fuer die vorgesehenen Applikationen eingesetzt werden, d.h. Geldokumentation in Forschungslaboratorien.
- Fuer die Stromversorgung des Universal Hood muss eine geerdtete Steckdose benutzt werden.
- Keine Fluessigkeiten auf oder in das Geraet giessen.
- Die Lampe sofort nach dem Gebrauch ausschalten.
- Den UV-Filter des Transilluminators nach Gebrauch reinigen.

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Section 1 Introduction

The Bio-Rad Gel Doc 2000, ChemiDoc and the ChemiDoc XRS Gel Documentation systems are easy-to-use, high-performance systems. They use a CCD camera to capture images in real time, which allows you to more accurately position and focus the image. While using Bio-Rad TDS Quantity One software, acquired images can be optimized, annotated, analyzed, and printed to a video printer or your local or network printer.

The Bio-Rad Gel Doc 2000, ChemiDoc and the ChemiDoc XRS systems utilize a Universal Hood that is light tight, it contains UV and Epi-white light sources and all the power supplies needed to operate the Gel and ChemiDoc cameras. The ChemiDoc XRS camera has its own power supply.

1.1 Computer Requirements

This software will run under Windows 98, NT 4.0, 2000 or XP, or on a Macintosh PowerPC.
The amount of computer memory required for using the program is mainly determined by the size of the images you will scan and analyze. Images scanned at high resolution can be quite large. For this reason, we recommend that you archive images on a network file server or removable storage media.

1.2 PC

The following is the recommended system configuration for installing and running on a PC:

Operating system:	Windows 98 SE, Windows NT 4.0 with Service Pack 6, Windows 2000 Windows XP,
Processor:	Intel Pentium 333 MHz or better
RAM:	128 MB or more for Gel Doc 2000, ChemiDoc, ChemiDoc XRS, and VersaDoc systems.
Hard disk space:	3 GB or greater
Monitor:	17" monitor or better, 1024 x 768 resolution (absolutely required), True color.
Printer:	Optional.

1.3 Macintosh

The following is the recommended system configuration for installing and running on a Macintosh:

Operating system:	System 9.0 or higher, excluding Mac OS X.
Processor/Model:	PowerPC G3 processor or better.
RAM:	256 MB
Hard disk space:	3 GB
Monitor:	17" monitor, 1024 x 768 resolution (absolutely required), Millions of colors.
Printer:	Optional.

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Section 2 Important Safety Information

2.1 IMPORTANT NOTICE

Use of the Universal Hood involves UV illumination. Proper precautions must be taken to avoid eye and skin exposure to the UV radiation. This instrument is meant for use only by specialized personnel that know the health risks connected to UV radiation and to the reagents that are normally used with this instrument. The acrylic shield provides some UV protection. However, it does not guarantee complete protection, and it is designed to shield only the person working in front of the system.

	WARNING: The operator should wear appropriate safety glasses or a protective mask and gloves in addition to using the UV Safety Shield provided with this instrument.

Anmerkung: Dieses Geraet ist nur fuer Forschungszwecke geeignet.
Ausserdem ist die Benutzung nur fuer spezialisiertes Personal gedacht, das mit den Gesundheitsrisiken vertraut ist, die an die UV-Strahlung gebunden sind und den Reagentien, die normalerweise mit diesem Geraet benutzt werden.

Die Benutzung eines Plexiglasschutzschildes garantiert dem Benutzer keinen Schutz vor UV-Strahlung. Die Benutzung von Schutzbrille oder Schutzmaske ist strengstens empfohlen.

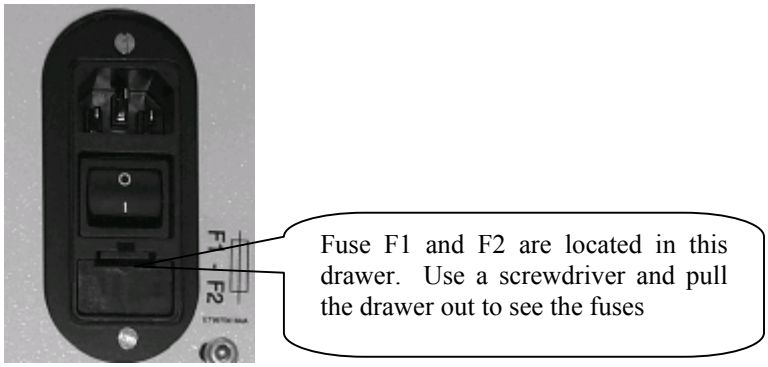
2.2 POWER SAFETY INFORMATION:

a) **Voltage Setting Information:** The Universal Hood has a universal power supply that automatically chooses the correct voltage for your country or region.

b) **Fusing:** The Universal Hood has two user serviceable fuses. These are located at the following location:

- F1 and F2 are located on the left rear panel and are a part of the power entry module, please see picture below for details:

Main power entry module



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Section 3 Product Description

3.1 CCD Camera

A CCD camera is placed on top of the Universal Hood for capturing images. The camera comes with a Motorized Zoom Lens (MZL) that allows a remote adjustment of the lens control functions viz. Zoom, Focus and Iris.

3.2 Darkroom Cabinet

The Universal Hood is designed to capture fluorescence and chemiluminescence images without using a photographic darkroom. The cabinet has a built-in white light Epi-illumination, a UV transilluminator and an optional white light transilluminator or a white light conversion screen. The drawer of the cabinet accommodates the built-in UV transilluminator

The lights in the darkroom cabinet turn off automatically after about 15 minutes. This time period can be extended indefinitely by pressing the HOLD button.

The Universal Hood comes with a built-in UV transilluminator that has a 302-nm UV wavelength to excite most fluorescent dyes used for gel imaging applications.

For White light applications, an optional UV/White light conversion screen (170-7940) or White light transilluminator (170-7950) are available.

3.3 PCI Digitizing Card

The systems require a PCI Digitizing Card to convert the video signal captured with the CCD camera to an image that can be displayed on your computer monitor. This card has to be inserted in the PCI slot of your Macintosh or PC computer.

3.4 Software

The software package that comes with the Gel Documentation systems (TDS Quantity One) can be used to annotate and document images, analyze molecular weights, video print, and perform a host of other applications. See the software manual for instructions on how to install and operate the software.

3.5 Thermal Printer (Optional)

The recommended thermal printer to be used with the Gel Documentation systems is the Mitsubishi P-91W (170-7251), with 256 gray levels.

3.6 Packaging

The Gel Doc 2000, ChemiDoc or ChemiDoc XRS systems consist of multiple boxes. Each box has a label describing the Catalog number and its contents. Please make sure that all the system components are in your shipment. Please unpack each box carefully and verify the contents. Each system includes the following:

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Part #	Descriptions
170-8100/170-8615	**Gel Doc 2000 System PC/MAC RS-170**
	or
170-8101/170-8616	**Gel Doc 2000 System PC/MAC CCIR**
170-8126	**Universal Hood 100/230 Vac (includes):** Universal Hood with Bracket, UV Shield, Spare fuses, Instruction Manual Power cable
170-7541/7540	**PCI Digitizing card, RS170/CCIR**
170-7546	**Integrating Cable**
170-8120	**Gel/Chemi Accessory Kit (includes):** Focusing Target, UV Ruler, Gel Cutter, Amber filter and filter adapter ring
170-7951/7952	**Gel Doc 2000 Camera w/MZL RS170/CCIR**
170-8601/8609	**TDS Q1 software PC/MAC**
170-7964/7963	**Cable, Serial, MZL, PC/MAC**
170-8102/170-8617	**ChemiDoc System PC/MAC RS-170**
	or
170-8103/170-8618	**ChemiDoc System PC/MAC CCIR**
170-8126	**Universal Hood 100/230 VAC (includes):** Universal Hood with Bracket, UV Shield, Spare fuses, Instruction Manual Power cable
170-7541/7540	**PCI Digitizing card RS170/CCIR**
170-7546	**Integrating Cable**
170-8120	**Gel/Chemi Accessory Kit (includes):** Focusing Target, UV Ruler, Gel Cutter, Amber filter and filter adapter ring
170-7953/7954	**ChemiDoc Camera w/MZL RS170/CCIR**
170-8601/8609	**Q1 software PC/MAC**
170-7964/7963	**Cable, Serial, MZL, PC/MAC**
170-8070/170-8071	**ChemiDoc XRS System PC/MAC**
170-8126	**Universal Hood 100/230 Vac (includes):** Universal Hood with Bracket, UV Shield, Spare fuses, Instruction Manual Power cable
170-8078	**ChemiDoc XRS Camera w/MZL (includes):** Camera, Motorized zoom lens, +1 Diopter, PCI Digitizing card, Controller Cable
170-8079	**Camera Bracket Assembly (includes):** Camera bracket, light tight adapter, black knob and washer to secure camera to the bracket
170-8080	**ChemiDoc XRS Accessory Kit (includes):** Includes Focusing Target, UV Ruler, Gel Cutter, Amber filter
170-8008	**Fluorescent Reference Plate**
170-8601/8609	**Software TDS Q1 PC/MAC**
170-7964/7963	**Cable, Serial, MZL, PC/MAC**

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Section 4 Getting Started

4.1 Selecting the Location of the Universal Hood

Since the Universal Hood has a complete fluorescence and chemiluminescence darkroom, it can be placed on any bench top. You should place the hood near the computer with the software that will control it. It is recommended that a trained Bio-Rad representative install this unit.

4.2 Assembling the System

4.2.1 Assembling the Universal Hood

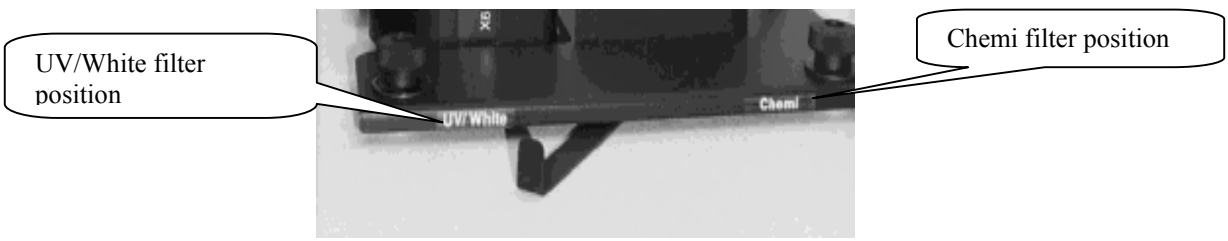
Important: **It is recommended that the Universal Hood is carried by at least two people holding the instrument from the bottom side. Be sure that the door and the drawer are correctly closed with the latch.**

Wichtig: **Es wird empfohlen , dass mindestens zwei Personen den Universal Hood transportieren und dabei das Geraet am Geraeteboden halten.**

a) Pull the cabinet carefully out of the box and place it in a suitable location.
b) Unscrew the four screws on top of the unit and save them for later use.
c) Remove the plastic wrapping.
d) Plug the female end of power cable to the cabinet. The power entry module is on the left side back of the cabinet.

Note: Please do not connect the other end of power cable to a power source until all connections are made.

e) Open the front door of the cabinet and remove the camera bracket by unscrewing the two wing nuts from the left panel. Be careful to avoid any damage to the UV transilluminator surface.
f) Use the included washers and knobs to loosely affix the camera bracket to the top of the Universal Hood only after the CCD camera is screwed on the bracket as shown in 4.2.2 (Assembling the CCD camera).
g) Open the accessory kit box (170-8120 or 170-8080).
   a. In case of 170-8120 take the Amber filter and thread it on to the 62-58 mm adapter ring and then install to the filter slider.
   b. In case of 170-8080 mount the 62 mm filter directly to the filter slider.
h) The filter slider facilitates the selection between the UV/White Light and Chemi filter positioning depending on the applications. The two selectable positions are indicated from two labels on the right side of the camera bracket.

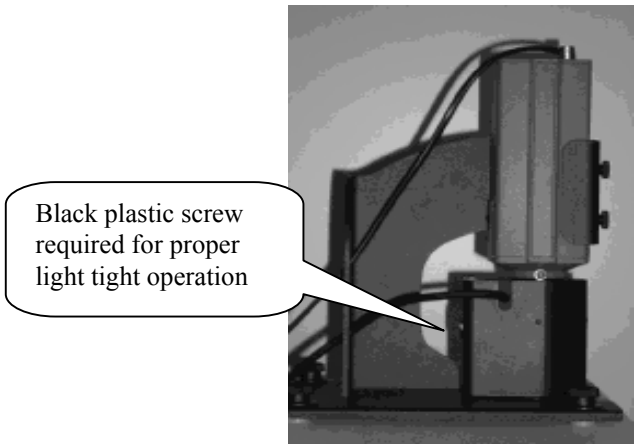


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4.2.2 Assembling the CCD camera

Gel Doc 2000 RS-170/CCIR Camera (170-7951/170-7952)

a) Carefully take the CCD camera assembly out of the box and hold the camera so that the two locking holes are facing you.
b) Place one plastic black screw into the rear flat side of the MZL.
c) Insert the CCD camera into the bracket from the open left side and fix it with one or two black screws. Place the bracket with the camera on the top of the Hood.
d) Verify that the MZL is adherent to the black gasket and fix the bracket with the four washers and knobs.
e) A completely assembled camera will look like the photo shown below:



Gel Doc CCD Camera assembled on the bracket

Please refer to the instructions included in **Appendix A** for a complete description of the cables connection.

ChemiDoc RS-170/CCIR Camera: (170-7953/170-7954)

a) Carefully take the CCD camera assembly out of the box and hold the camera so that the two locking holes are facing you.
b) Follow the above instructions (b-d).
c) A completely assembled camera will look like the photo shown below:



ChemiDoc CCD Camera assembled on the bracket

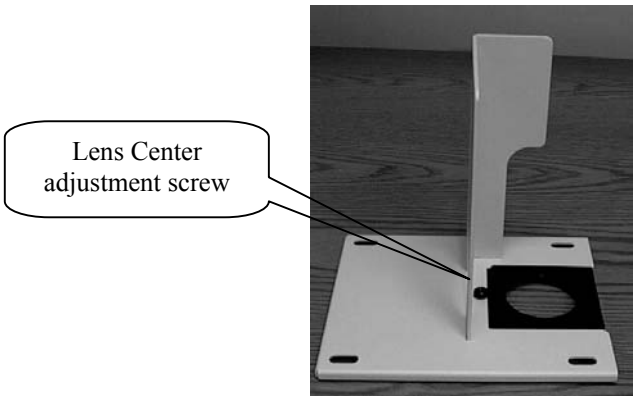
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Please refer to the instructions included in **Appendix B** for a complete description of the cables connection.

ChemiDoc XRS Camera: (170-8078)

NOTE: For this installation you will require Camera Bracket Assembly 1708079.

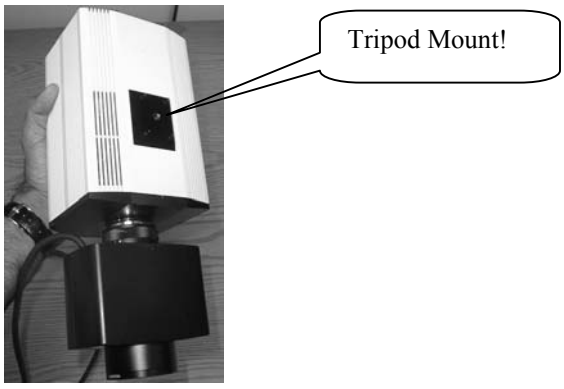
a) Carefully take the Camera bracket assembly out of the box and set it on a clean table as shown below:



Camera Bracket Assembly (170-8079)

b) Carefully take the CCD camera assembly out of the box. The Camera assembly package consists of a Cable, Power supply, Camera Assembly with Motorized Zoom lens and +1 diopter assembled to it and a PCI digitizing card.

c) Hold the camera so that the tripod mount is facing away from your hand (see picture below):



Camera Assembly 170-8078

d) Using the black knob and washer provided in the packaging for the Camera Bracket assembly, assemble the Camera assembly to the bracket. Do not completely tighten the knob to allow further adjustment to the Camera position in the bracket assembly.



Black Knob



Camera + Bracket Assembly

e) Lower the camera assembly so that the lens fits properly in the opening in the black adapter plate with a rubber gasket.

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f) Now adjust the camera position such that the following conditions are met:
   i. The lens body is flush against the rubber gasket on the adapter plate
   ii. The lens is well centered in the opening of the adapter plate as shown in the picture.

g) It may be required to adjust the black adapter plate on the bracket assembly to center the lens. To do this:
   i. Loosen the black thumbscrew (identified as "Lens center adjustment screw") on the bracket assembly
   ii. Adjust the black adapter plate so that the lens is centered in the opening as shown.
   iii. Tighten the black thumbscrew and tightly secure the black adapter plate to the bracket



i. The lens body should be completely flush against the rubber gasket



ii. The lens should appear centered in the black adapter plate as seen from the opening on the underside of the bracket.

h) Once the camera position is aligned as shown above, tighten the black knob to secure the camera to the bracket assembly.

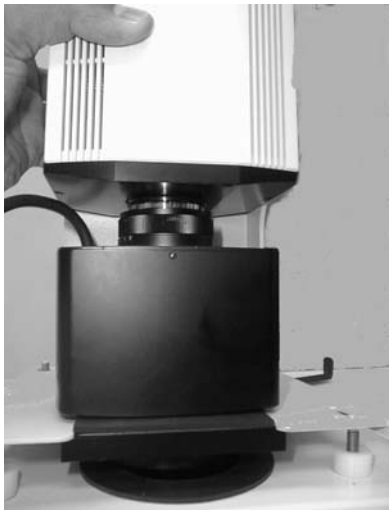


Tighten the black knob to secure the camera to the bracket assembly

i) Remove the four black knobs and washers from the camera bracket-mounting studs located on the top of the Universal Hood assembly.

j) Carefully place the Camera + Bracket assembly on top of the Universal Hood by making sure that the Lens goes into the opening located on the top. See picture for detail:

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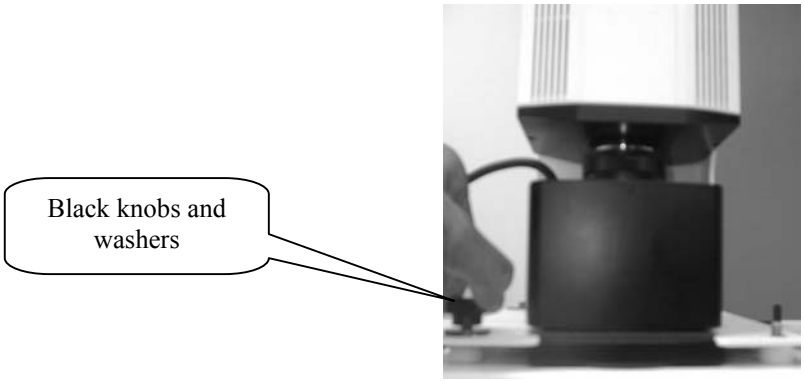
Place the Camera + Bracket assembly on top of the Universal Hood.

k) Adjust the bracket assembly such that the lens is centered in the opening of the hood as seen from inside the hood.



Center the lens in the opening of the hood as viewed from inside of the hood

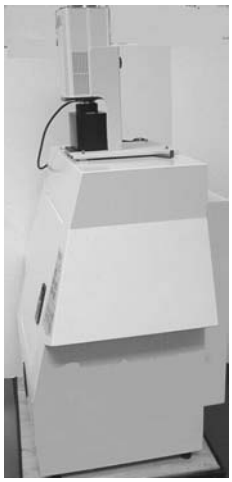
l) Secure the bracket to the hood at to the four studs located on top of the hood by using four black knobs and washers. See picture below:



Secure the bracket to the hood at four studs using the four knobs and washers.

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m) A properly installed ChemiDoc XRS Camera + Bracket assembly on a universal hood are shown in the following below:



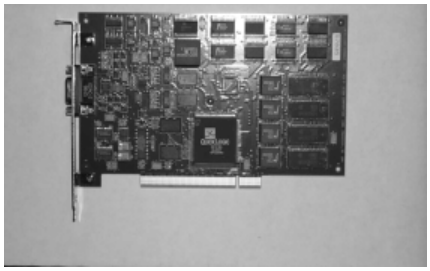
ChemiDoc XRS System

Please refer to the instructions included in **Appendix C** for a complete description of the cables connection.

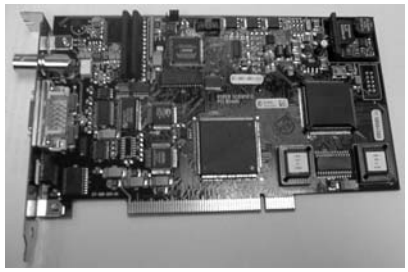
4.2.3 Installing the PCI Digitizing Card

NOTE: When installing the PCI Digitizing Card for the ChemiDoc XRS, please install the TDS Quantity One ™ software before installing the PCI Card into the PC. The drivers for this card need to be installed during the software installation. Please refer to Appendix D regarding driver installation.

a) Make sure that your computer is turned off. Remove the cover from the Computer. Install the digitizing card into one of the PCI slots in the computer (PC/MAC)
b) Close the cover.



PCI Digitizing card GEL/CHEMIDOC SYSTEMS



PCI Digitizing card CHEMIDOC XRS SYSTEMS

c) In case of the ChemiDoc XRS, connect the Camera Controller Cable to the PCI card as shown in the following picture:

NOTE: The other end of this cable is connected to the Camera

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Connect the Camera Controller Cable to the PCI card

4.2.4 Installing the software

Please refer to your software manual and release notes for proper software installation.

4.2.5 Connecting the cabling harnesses

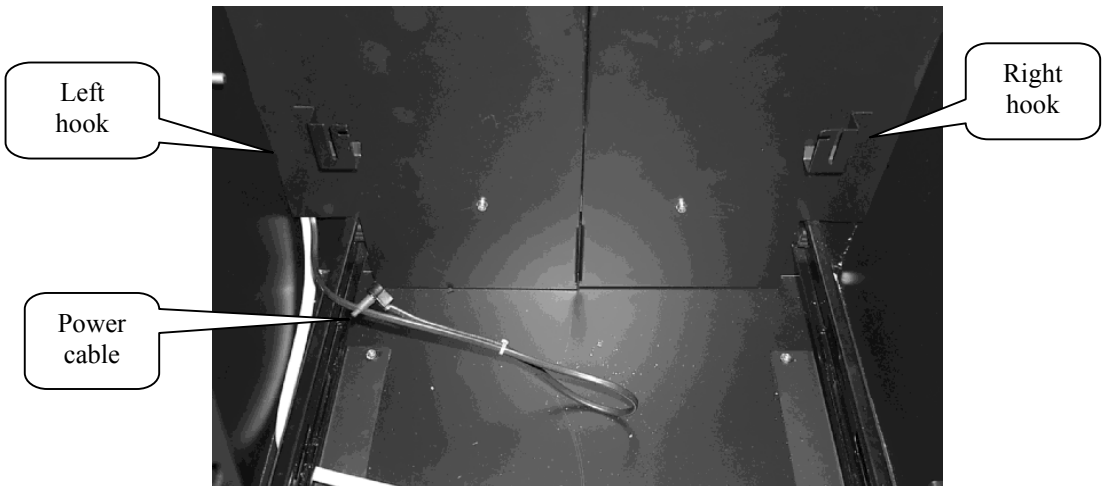
The connections are different if you are installing a Gel Doc 2000, ChemiDoc or a ChemiDoc XRS camera. Please refer to the instructions included in **Appendix A, B, C** (respectively) for Gel Doc 2000/ChemiDoc/ChemiDoc XRS cable wiring.

The Controls for the Motorized Zoom Lens can be operated from the membrane touch pad of the Universal Hood or from the PC using the buttons that appear in the window when the option Gel Doc 2000, ChemiDoc or ChemiDoc XRS is selected in the start screen of the TDS Quantity One program. To use this option it is necessary to connect the Universal Hood Serial port (DB25) on the back left side to the COM1 of the PC. The PC/MAC cable is included.

NOTE: In case when a MAC has a USB port instead of the Serial Port, use a USB to Serial Adapter (170-7959) to control the Lens via software

4.2.6 Installing the White Light Transilluminator (Optional)

The Universal Hood has two metal hooks on which the White Light Transilluminator can stand up when not in use. When WL Tran illuminated images need to be acquired the White Light Transilluminator can be positioned horizontally on the Trans UV surface. Refer to the below picture to locate the hooks and the power cable that has to be connected to the White Light Transilluminator. Remove the black rubber that covers the banana plug and insert it into the WL outlet. Be sure that the WL main switch is in the on position. The WL Trans on/off is then driven by the membrane touch pad.



Hooks and power cable of the WL Transilluminator

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4.2.7 Installing the Optional 17 mm or 25 mm wide-angle Lenses (ChemiDoc XRS only):

This installation guide covers installation of the optional lenses to the ChemiDoc XRS system (only). The following catalog numbers are covered under this category:

i. 1708072 Lens f 0.95, 25 mm, Wide angle
ii. 1708073 Lens f 0.95, 17 mm, Wide angle

The lens kit includes a lens and the Light Seal adapter ring. See pictures below:



25 mm Wide Angle Lens with Light Seal Adapter ring



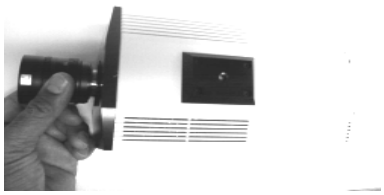
17 mm Wide Angle Lens with Light Seal Adapter ring

Setting Up the Lens:

1. Turn off the power to universal hood and camera
2. Disconnect the camera and lens cables
3. Remove the ChemiDoc XRS camera from the bracket.
4. Remove the existing Motorized Zoom Lens from the camera by turning the lens counterclockwise and Install the 25 mm or 17 mm Wide angle lens as the case may be to the camera as shown below:

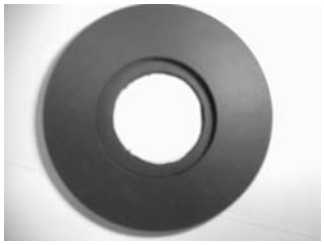


Remove existing Motorized Zoom Lens



Install the Wide Angle Lens

5. The Wide-angle lens comes with a Light Seal that is donut shaped one side of which is soft and the other is hard. See picture below



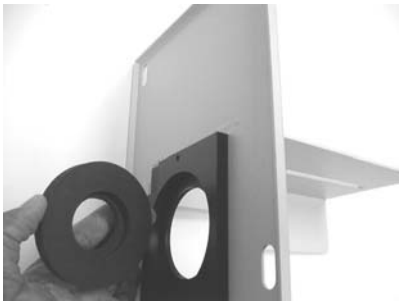
Light Seal Soft side



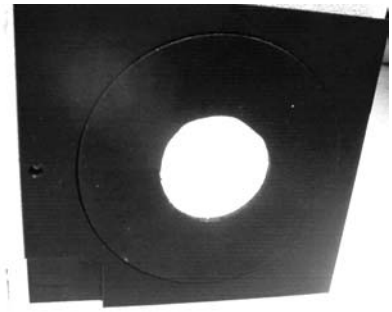
Light Seal Hard side

6. Insert the Light Seal (donut) in the round slot located at the bottom side of the black adapter plate on the bracket assembly. Make sure that the hard side light seal is facing outward. See picture for details

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Place the Light Seal in the round slot on the bottom side of the bracket



Make sure that the hard side of the donut is facing outward

7. Place the bracket assembly on a hard surface and attach the Camera with the wide-angle lens with the black washer and the thumbscrew. Before tightening the screw make sure that the wide-angle lens is sitting into the round slot it he Light Seal. Push camera down so that the lens goes into the slot all the way and comes to a stop. See pictures below:



Attach camera to the bracket using the black thumbscrew and washer



Make sure that the lens is seated properly in round slot in the soft side of the foam

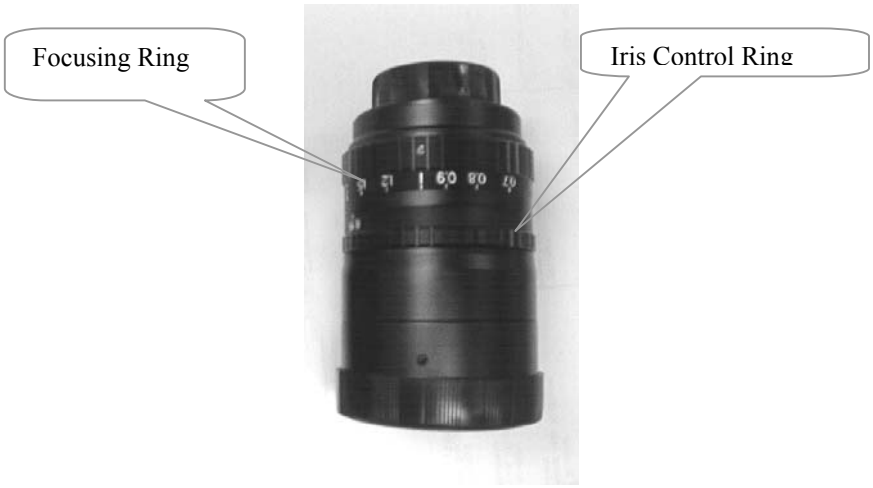
8. Tighten the screw so that the camera is secured properly to the bracket. Now place the Bracket + Camera assembly on the universal hood and secure it with washers and thumbscrews.



Secure the Camera to the hood using black thumbscrew and washer

9. Adjust the position of the bracket so that the light seal and lens are well centered in the round opening in the Universal Hood and tighten the thumbscrews to secure the bracket tightly to the hood.
10. Turn ON the power to the hood and the camera and click on Live Focus button in the software.
11. Lens has a Iris and Focus ring that allows users to adjust for optimum light collection and focus

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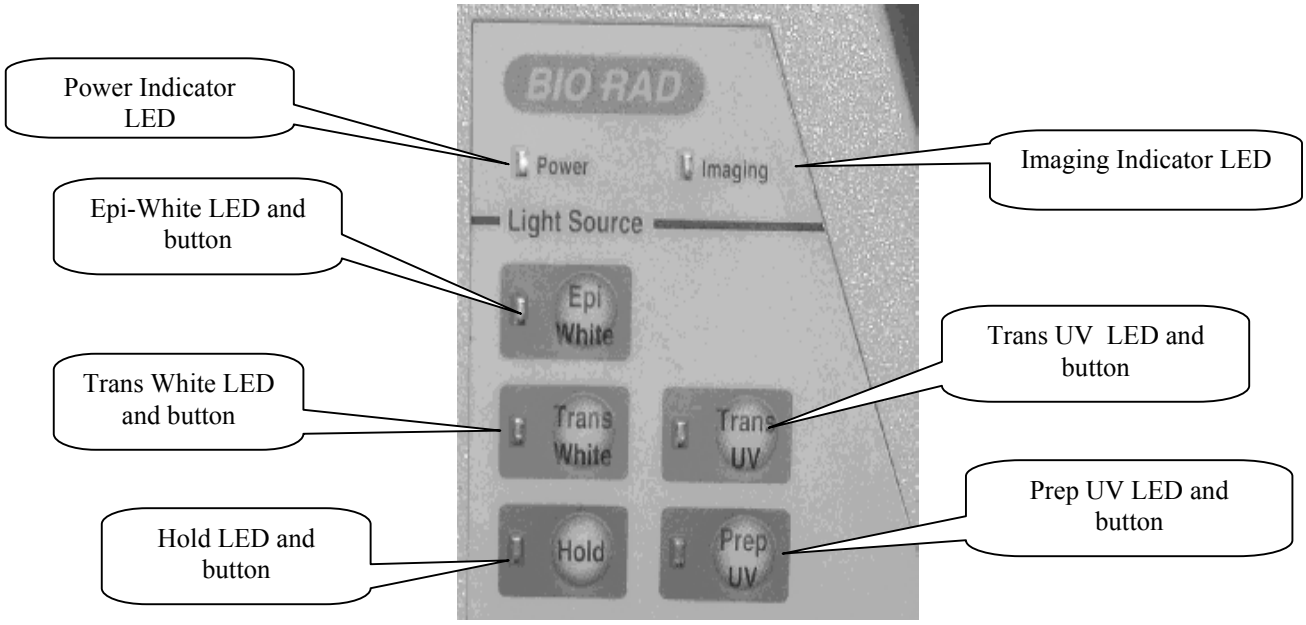


12. When using this Lens for most sensitivity in Chemi Imaging, make sure that the Iris is opened all the way.

4.3 Description of Functions and System Initialization

4.3.1 Control panel

The front membrane touch pad control panel of the Universal Hood allows full control of all the functions including the lens operations, the UV, Epi and White Light (optional) illumination in the darkroom cabinet. Please read the following section to become familiarized with each function.



Membrane touch pad – Light Source Section

The ***Power*** light tells you whether the system is turned on or not. The power on/off switch is located on the back left side of the instrument.

The ***Imaging*** led blinks when you are acquiring an image with the ChemiDoc camera (this function is not present using the Gel Doc 2000 or ChemiDoc XRS cameras) in the integration mode. It also blinks if the computer is turned off.

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Light source section

The ***Epi-White*** button controls the white Epi-illumination light. Press the button to turn on Epi illumination; press the button again to turn it off. Epi-illumination will automatically turn off after 15 minutes, unless the hold button is activated. When the UV transilluminator switch is activated, the white-white light is automatically turned off.

The ***White Light Trans*** button controls the white light transilluminator when installed (optional). It will automatically turn off after 15 minutes, unless the hold button is activated.

The ***UV Trans*** button controls the UV transilluminator with full intensity. The transilluminator will automatically turn off after 15 minutes unless the hold button is activated. For safety purposes, this switch is subject to the following automatic controls:

- It is turned off when the front door is open.
- It is turned off when the drawer is open.

If the door or drawer is opened while the transilluminator is on, the blinking LED will warn you that the transilluminator has been turned off. After the door or the drawer is closed, you have to press the UV Trans switch again to turn it on.



Important: For the purposes of band cut applications, it is possible to turn on UV light with the drawer fully open. You must wear all possible UV protections, especially for your eyes, when the transilluminator switch is turned on with the drawer fully open. The UV shield has to be used but glass or mask and gloves are recommended to block the UV radiations. This option is not applicable to the door.

Wichtig: Wer die Absicht hat, Banden aus dem Gel zu schneiden, kann bei eingeschaltetem UV-Licht die untere Schublade oeffnen. Sie muessen Schutzkleidung und die notwendigen UV-Schutzmassnahmen tragen, besonders Augenschutz, wenn der Transilluminator bei offener Schublade eingeschaltet ist. Das Plexiglasschutzschild muss benutzt werden, ebenso Schutzbrille oder Schutzmaske und Einmalhandschuhe, um sich vor der UV-Strahlung zu schuetzen. Diese Moeglichkeit ist von der Geraetetuer aus nicht anwendbar.

The ***UV Prep*** switch is used to decrease the light output of the UV transilluminator. The UV Preparative function is a lower intensity light designed to minimize the effects of UV exposure on DNA. The Preparative mode is recommended for applications that require longer UV exposure times. In order to activate the UV Prep switch, the UV Trans button must be on.

The ***Hold*** key disables the automatic shut-off of the UV and White light transilluminators and the Epi-illumination; the lights will remain active until the hold status is cancelled. When the Hold key is pressed, the orange LED lights, indicating that the Hold function is active. If opening door or drawer (activating the UV interlock, which turns off the UV), you will need to turn off the HOLD button before pressing any other switch.

The control panel has a second section that includes the buttons to run all the MZL functions (see Lens control section below).

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Camera Lens and Filters

The MZL functions are operated from the membrane touch pad or through the buttons present in the acquisition window in the software. To see buttons in the software acquisition window, it is necessary to connect the Universal Hood with a null modem cable. (170-7963 or 1707964 – MAC or PC) from the COM1 to the Serial port of the hood itself. If the only port present is the USB port then it is necessary to use a USB To Serial converter (Part # 1707960) for PC and Part # 170-7959 for MAC.

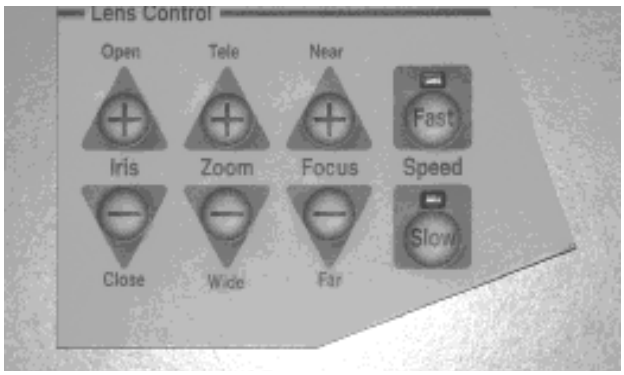
Lens Control section

The membrane pad has a **Fast** and a **Slow** button to obtain rapid or fine adjustments of the lens. An image can be optimized with the following lens adjustments:

Aperture is adjusted using the "**Iris**" buttons on the membrane touch pad. Aperture allows the CCD sensor to take in more or less light. Pushing the aperture button on Close (-) decreases the amount of light coming into the sensor, thereby making the image darker. Pushing the aperture button on Open (+) increases the amount of light coming into the sensor, resulting in a lighter image.

Focus is adjusted using the "**Focus**" buttons on the keypad. Pushing the button Near (+) or Far (-) changes the focal point of the lens and allows user to focus on the sample.

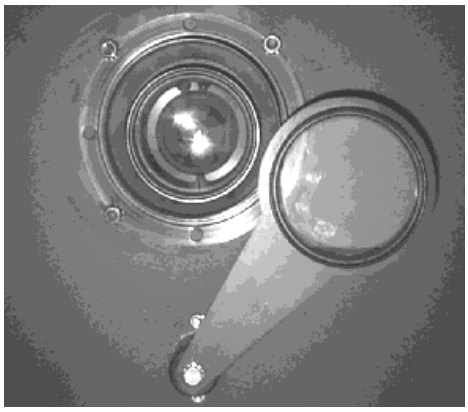
Zoom is adjusted using the "**Zoom**" buttons on the keypad. It allows you to change the size of the image on the screen. Pushing the Wide (-) button ZOOMS OUT the image (far field). Pushing the Tele (+) button ZOOMS IN the image (close up)



Membrane touch pad – Lens Control Section

Filters: The ***+1 Diopter*** is already installed on the lens. This Diopter should always remain on the lens assembly. An ***Amber Filter*** is included in the accessory kit box. This may be screwed on the sliding filter device. The Amber filter is designed to be used only with UV transilluminator for fluorescence and White light transilluminator applications.

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Picture of the Sliding Filter from the inside

4.3.2 Initial test

Before starting the initial test please make sure that:
1. The software and the digitizing board are installed properly.
2. The cabling harness is connected properly. (See **Appendix A, B or C**)

Please follow the procedure in the table to ensure that the Universal Hood is functioning properly.

Initial test for the Universal Hood

	Procedure	Control Panel
	Make sure the door and drawer are closed and the PC is switched on.	
	Turn on the system.	Power LED turns on after short blinking.
	Press the Epi-White key.	Epi-White LED turns on.
	Open the door.	Epi-lights are on, Tran UV LED blinks.
	Press the Epi-White key again. Close the door.	Epi-lights and LED are turned off. Trans UV LED turns off.
	Press the Trans UV key.	Trans UV LED turns on.
	Open the door.	Trans UV LED blinks.
	Close the door.	Trans UV LED turns off.
	Press the Trans UV key.	Trans UV LED turns on.
	Open the drawer.	Trans UV LED blinks.
	Close the drawer.	Trans UV LED turns off.
	Press the Trans UV key.	Trans UV LED turns on.
	Press the Prep UV key	Prep UV LED turns on.
	Press the Hold key.	Hold LED turns on.
	Open the drawer.	Trans UV LED blinks, Prep UV LED and Hold LED turn off.
	Close the drawer.	Trans UV LED turns off.

Note: When the Imaging LED blinks (PC switched Off or during the Integration) the buttons of the Light Source section on the control panel are disabled.

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Initial test for the camera and lens assembly

Procedure (For Gel Doc 2000/ChemiDoc/ChemiDoc XRS systems)

1. Press the Epi-Illumination Key.
2. Open the door and check if light is on.
3. Place the focusing target on the UV transilluminator.
4. Start the image acquisition software in your PC (TDS Quantity one).
5. Choose the right configuration (Gel Doc or ChemiDoc or ChemiDoc XRS)
6. You should get the image of the target. Using the lens control buttons on the membrane touch pad or the control panel that appears in the PC screen, find the best Iris, Focus, and Zoom conditions.

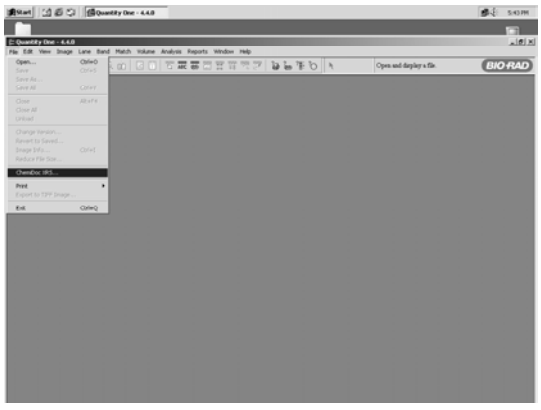
Note: Working with a widely open Iris and changing the Zoom may require you to adjust the Focus. To reduce this need to focus with a dim sample it is suggested to close the iris and increase the integration time.

Test Procedure (For ChemiDoc XRS systems Only)

NOTE: The Operation Test for the ChemiDoc XRS system is different from the Gel Doc 2000 or ChemiDoc systems. Please note that the steps described below must be performed in either of the following scenarios

a. When installing the system with a new computer or Camera
b. When software is first installed or reinstalled for any reason

1. Make sure that all the lights in the universal hood are off.
2. Make sure that the Lens Cap is ON the lens so that no light would enter the Camera.
3. Power ON the camera and the Universal Hood if not done already
4. Double click on Quantity One software icon on the desktop From "File Menu" select ChemiDoc XRS.



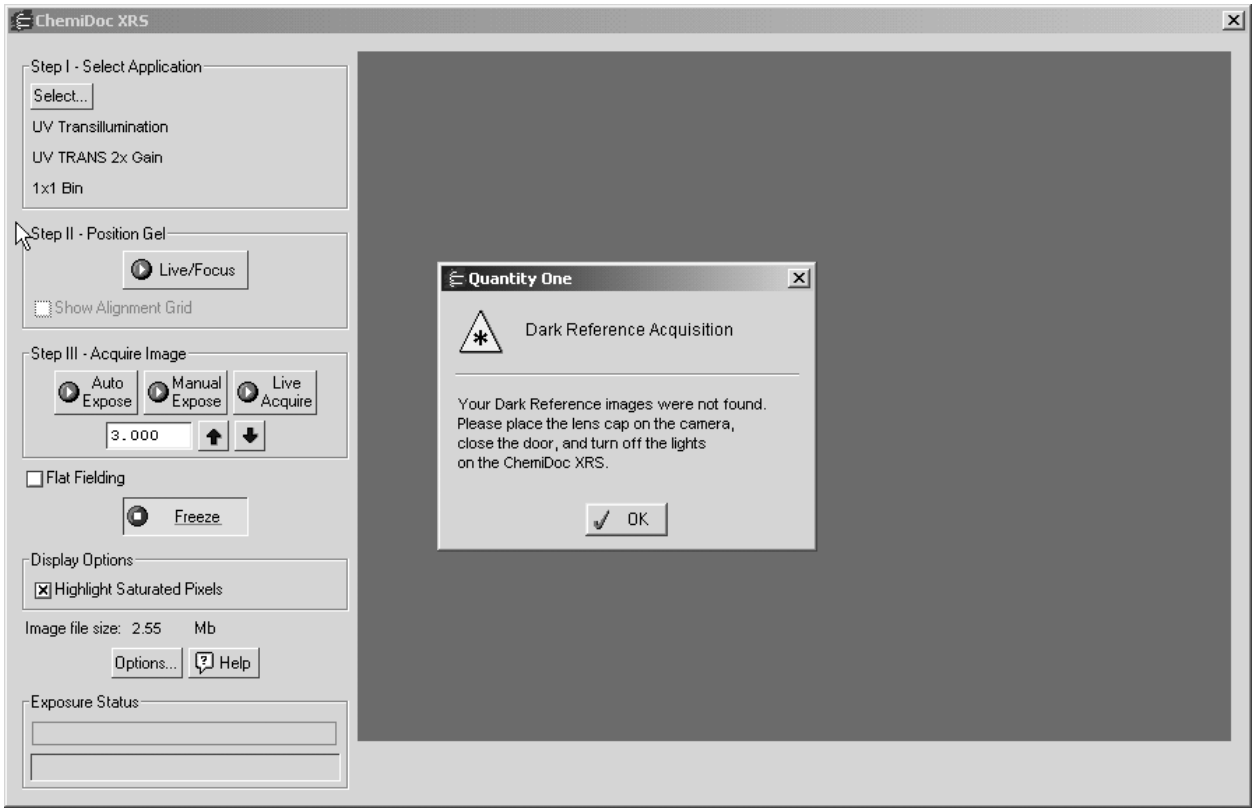
Quantity One Window



Select ChemiDoc XRS from File Menu

5. The following window will open with a notification that the system will be acquiring Dark Reference Data images.

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NOTE: No lights should be turned ON. Please allow approximately 1 hour for the Dark Reference acquisition.

1. After the "Dark Reference" acquisition is over the system will be ready to operate
2. Turn ON the Epi-White lights using the Epi-White touch pad button
3. Place the focusing target on the Transilluminator platen
4. Click on Live/Focus
5. An image of the target will be seen on the imaging screen.
6. Using the lens control buttons on the membrane touch pad or the control panel that appears in the PC screen, find the best Iris, Focus, and Zoom conditions to get a well-focused image of the target.
7. Follow the procedure below to align the Camera with respect to the center of the platen

NOTE: For details on "Dark Reference Subtraction" refer to the Software Manual.

4.3.3 Aligning the camera and bracket (This applies to all systems):

Centering the CCD camera on the lens hole of the Universal Hood should give a perfect alignment with the center of the UV transilluminator. To verify it please follow the below instructions:

1. Place the focusing target in the center of the transilluminator.
2. Switch on the Epi-White light if not done already
3. Open the acquisition software. Select Live/Focus mode so that a live image of the target is seen on the monitor.
4. Focus on the target.
5. Click on "Show Alignment Grid" button located near Live/Focus button. A red cross hair will appear in the middle of the Imaging Area.
6. Loosen the bracket screws and move it slightly until the center of the target is matches with the red X-mark in the image. Tighten the four screws to secure bracket in place.

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7. Use the zoom button on the control panel to zoom in and out on the image.
8. When the camera, bracket, and target are correctly aligned, the center of the target will stay in the center of the image throughout the zoom range.
9. Select “Fast” on the universal hood. Click on or press “Focus” button to check that the lens is responding. If not, adjust the position of the lens so that the opening on the hood offers no resistance/binding to the focus ring on the lens. This may not allow exact center of the Target to the image.

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Section 5 Operation of the Universal Hood

5.1 Operating the unit

The Gel Doc 2000, ChemiDoc and ChemiDoc XRS Systems are easy-to-use instruments. In the TDS Quantity One Acquisition screen on your computer, select Live/Focus mode and adjust your image position, size, focus, and intensity using the lens controls. After the image is optimized, capture the image. A typical procedure is described below.

5.1.1 Switch on the Universal Hood system

1. Turn on the Universal Hood main switch (on the rear left side of the cabinet).
2. Turn on the computer and start the software.
3. Select the acquisition mode from the File menu.

5.1.2 Position your gel

1. Either open the front door or open the drawer of the Hood.
2. Center your gel on the Transilluminator platen and close the door.
3. Press the Epi-Illumination button to turn on the Epi-White lights.
4. Adjust the lens Aperture, Zoom, and Focus while looking at the computer screen.
5. Open the door and reposition the gel if necessary.
6. If using white light conversion screen or white light transillumiator, focusing is easily achieved if the Iris is slightly closed.

5.1.3 Acquire an image

1. Press the appropriate light source for your sample
2. Select an integration time (see software manual for details).
3. When a satisfactory image is seen click Capture.

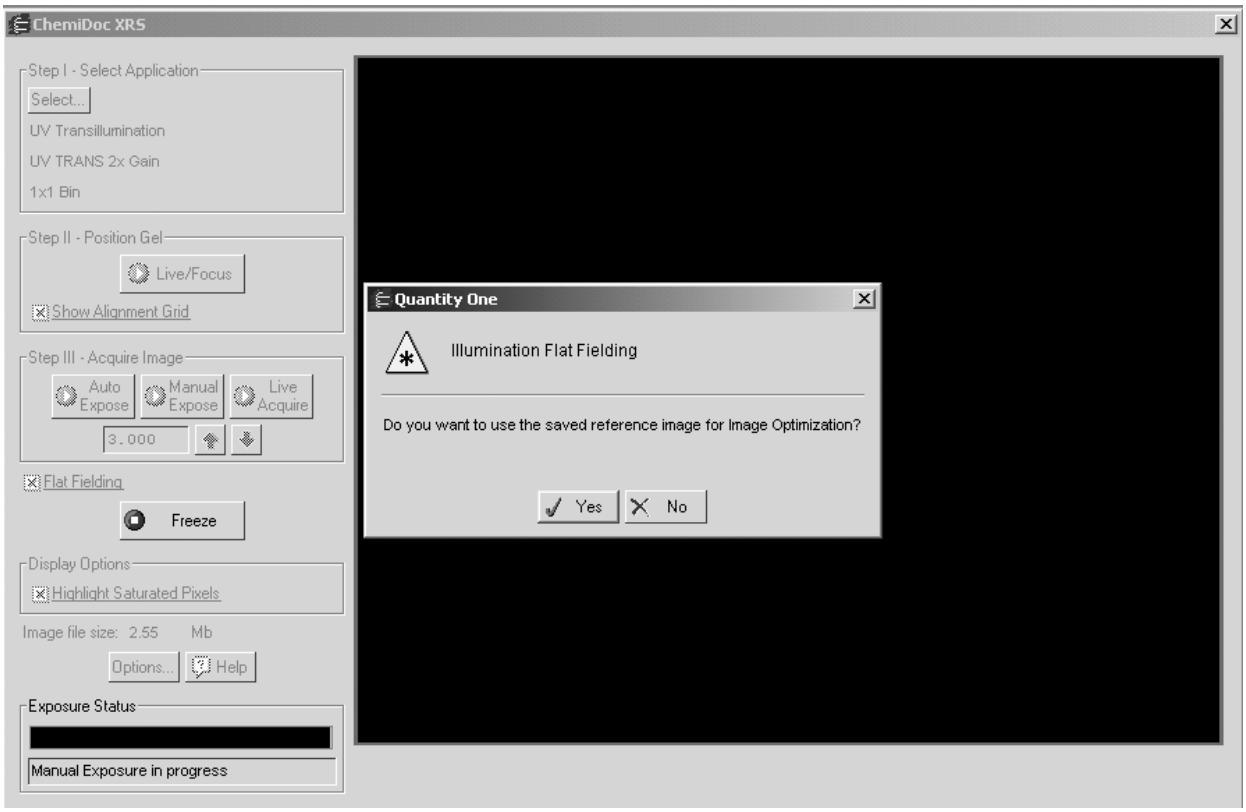
5.1.4 Acquiring an image with Flat Fielding:

NOTE: This applies to ChemiDoc XRS systems only where Flat Fielding is made available for acquiring images with UV or white light Transillumination.

1. Center your sample on the platen.
2. Turn ON the UV/White Light Transilluminator.
3. Adjust zoom, focus and iris to get the best possible image in Live/Focus mode.
4. Make sure that the box labeled “Flat Fielding” is checked to enable Flat Fielding.
5. Select Auto Expose or Manual Expose.
6. Following the exposure a window will open asking if you would like to use a saved reference image for Flat Fielding.
7. Select NO unless you have recently acquired a Flat Field reference image and are still using the same Illumination and Lens settings.
8. Select YES if you are using the same lens and illumination settings to use previously generated Flat Field reference image file for Flat Field correction.

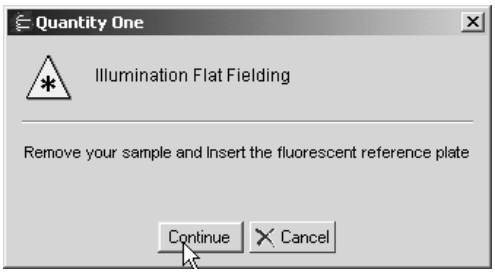
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9. See picture below:



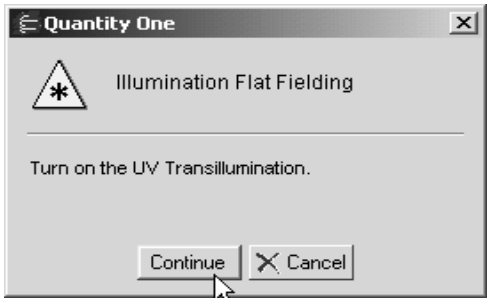
10. Next you will be prompted to remove your sample from the transilluminator and place the Fluorescent Reference Plate on the platen for UV illuminated images. For White Light Illumination the white light transilluminator or the UV conversion screen is used to collect the reference Flat Fielding image. In either case you must remove the sample from the platen.

NOTE: For White Light Conversion screen you must turn ON the UV Transilluminator after removing the Sample. To achieve good focus you may need to close the aperture till proper focus is achieved.



11. Remove the sample from the Transilluminator. Clean the platen properly for UV transillumination. Place the Fluorescent Reference Plate on the platen. Make sure that the plate covers the entire UV filter glass. Close the Universal Hood door and then Click on "Continue" in the window shown above.
12. Next prompt will require you to turn ON the UV Transilluminator. Press the UV Transilluminator/White Trans button on the universal hood as the case may be and click on "Continue"

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13. The system will automatically acquire a reference image and a flat-fielded Image of the sample will be generated for you to save and analyze.
14. For additional details on Flat Fielding please refer to the Software Manual. You may also click on the HELP button in the Software window for a detailed description of the Software functionality.

5.2 Cutting gels

1. Open the drawer until it is fully extended and the UV Trans LED stops blinking.
2. Place the clear acrylic UV protection screen upright in the metal brackets on the front edge of the transilluminator.



!! CAUTION!! !! VORSICHT !!

WARNING: EXPOSURE TO UV RADIATION IS HAZARDOUS TO HEALTH. PLEASE WEAR PROPER UV PROTECTIVE CLOTHING AND FACE AND EYE SHIELDS WHEN CUTTING GELS. THE UV SHIELD PROVIDED WITH THE SYSTEM IS NOT ADEQUATE PROTECTION AGAINST UV GENERATED BY THIS SYSTEM.

3. Press the UV Trans button to turn on UV.
4. Cut the gel.
5. Press the UV Trans button and the UV Transilluminator will turn off. Remove the acrylic UV
   protection shield before closing the drawer.

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Section 6 Trouble Shooting

Problem	Possible Cause	Solution
Image is not visible on the monitor	• Aperture is closed. • Incorrect monitor settings • Wrong cable connections.	• Open the aperture. • See your computer manual • See Appendix A or B for correct cabling.
Image is not bright enough.	• Wrong aperture setting.	• Open the aperture.
Impossible to image whole sample area.	• Lens is zoomed-in too close.	• Zoom-out the lens.
Printout does not look the same as the image on the monitor.	• Monitor settings are wrong.	• Read the manual for the printer to ensure proper settings
Video Thermal printout area is not the same as the image on the monitor.	• Improper dipswitch selection on the printer.	• The dipswitch must be:1 and 8 up, and rest down. • Adjust contrast, brightness and gamma on the thermal printer.
Light leakage into the darkroom.	• The rear hole on the MZL not closed with the screw. • The Lens body is not properly centered and against the light seal gasket on the hood	• Close the hole with the black plastic screw. • Loosen the bracket and move the camera around to properly seal the opening on the hood or adapter plate as the case may be.
Hot pixels are seen in the image.	• “Reference” is not selected for “Dark Subtraction” in the OPTIONS window	• Select “Reference” by clicking on the appropriate box in the OPTIONS window.
ChemiDoc XRS camera will not respond	• Power may be off • Controller cable may not be seated properly • Software Driver for the Camera is missing • Camera may be defective	• Turn ON the power to the camera • Make sure that camera controller cable is connected properly • Install Quantity One again if the driver is not present • Replace Camera

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Problem	Possible Cause	Solution
ChemiDoc XRS image will not Auto expose	• The sample is too bright and saturates the image at the minimum possible exposure	• Close the IRIS using the IRIS control until Auto expose is possible.
Unable to focus on the sample using White Light Transilluminator or conversion screen	• Aperture is open too wide causing a shallow depth of field	• Close the Iris slightly and then focus again. Keep repeating until good focus is achieved

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Section 7 Accessories and Replacement Parts

7.1 Accessories

Part number	Description
100-1359	Knob Knurled Head M6 (4)
100-1361	Lamp, UV B (302 nm – 1 each for Gel/ChemiDoc/XRS)
100-1370	UV TR Starter St151 (3 each)
100-1381	Lamp, Epi-illumination, 11 W PI1182
100-1397	UV Transilluminator Lid (Includes filter glass)
100-1399	Universal Hood Right Shield Epi-illumination
100-1948	Universal Hood Opal Filter Epi-illumination
100-1949	Universal Hood Left Shield Epi-illumination
100-1950	Universal Hood Screw Feet (4)
100-1951	Fuse T 2 A – 250 V (10 each)
100-1952	Fuse T 4 A – 250 V (10 each)
100-2648	Power Supply, Camera, ChemiDoc XRS
100-2649	Cable, Controller, ChemiDoc XRS
100-2651	Card, PCI Digitizing, ChemiDoc XRS
170-3759	Bio-Rad fluorescent Ruler
170-3760	Gel Cutter Ruler
170-6887	Kit, 6 lamp, 365 nm, Gel Doc 2000/ChemiDoc/ChemiDoc XRS
170-7251	Mitsubishi P-91W Printer 100 – 240 Volts
170-7540	Card, PCI Digitizing, Gel Doc 2000/ChemiDoc, CCIR
170-7541	Card, PCI Digitizing, Gel Doc 2000/ChemiDoc, RS170
170-7546	Cable, Integration controller Gel Doc 2000/ChemiDoc
170-7582	Mitsubishi K65H Paper, 4 rolls
170-7813	Sample Holders for gels
170-7940	UV/White Light conversion Screen,
170-7950	White Light Transilluminator upgrade for Universal Hood
170-7951	Camera, Gel Doc 2000, W/MZL, 115VAC
170-7952	Camera, Gel Doc 2000, W/MZL, 230VAC
170-7953	Camera, ChemiDoc , W/MZL, 115VAC
170-7954	Camera, ChemiDoc , W/MZL, 230VAC
170-7959	Converter, USB to MAC Serial (Includes USB Cable)
170-7960	Converter, USB-RS232 (PC)
170-7961	Kit, Filter, 58mm, Gel Doc 2000/ChemiDoc
170-7962	Shield, UV, Universal Hood
170-7963	Cable, Serial, MAC
170-7964	Cable, Serial, PC
170-8008	Fluorescent Reference Plate (ChemiDoc XRS only)
170-8072	Lens,f/0.95, 25mm, wide angle lens (ChemiDocXRS only)
170-8073	Lens,f/0.95, 17mm, wide angle lens (ChemiDocXRS only)
170-8074	Filter, 520DR30
170-8075	Filter, 560DF50
170-8076	Filter, 630BP30

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170-8077	Filter, 440BP70
170-8078	Camera w/MZL, ChemiDoc XRS
170-8079	Camera Bracket Assembly, ChemiDoc XRS
170-8080	Kit, Accessory, Chemi Doc XRS
170-8081	Kit, Filter, Amber, 62 mm
170-8082	Adapter, filter, 58-62 mm, Gel Doc 2000/ChemiDoc/ChemiDoc XRS
170-8092	Upgrade kit, RS170, MZL, PC (Gel Doc 2000 to ChemiDoc)
170-8093	Upgrade kit, CCIR,, MZL, PC(Gel Doc 2000 to ChemiDoc)
170-8094	Upgrade kit, RS170, MZL,MAC (Gel Doc 2000 to ChemiDoc)
170-8095	Upgrade kit, CCIR,, MZL, MAC(Gel Doc 2000 to ChemiDoc)
170-8096	Lens, Motorized, 8-85 mm, f1.2 (Gel Doc 2000/ChemiDoc)
170-8097	Kit, 6 lamp, 302 nm, Gel Doc 2000/ChemiDoc/ChemiDoc XRS
170-8098	Kit, 6 lamp, 254 nm, Gel Doc 2000/ChemiDoc/ChemiDoc XRS
170-8120	Kit, Accessory , Universal Hood (Gel Doc 2000/ChemiDoc)
170-8601	TDS Quantity One Software PC
170-8609	TDS Quantity One Software Mac

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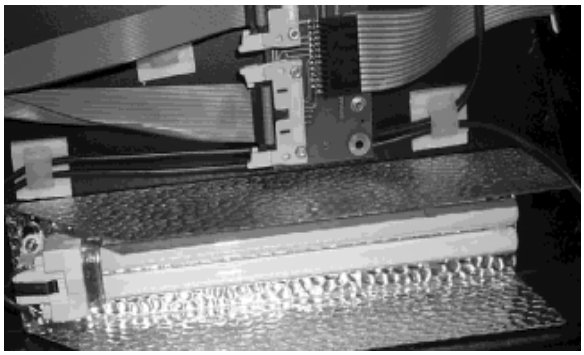
Section 8 Maintenance and Part Replacement:

This section covers the replacement of parts in the Universal Hood.

8.1 Epi-illumination lamps replacement

The lamps are located behind the two panels on each side (left and right) of the internal side of the hood.

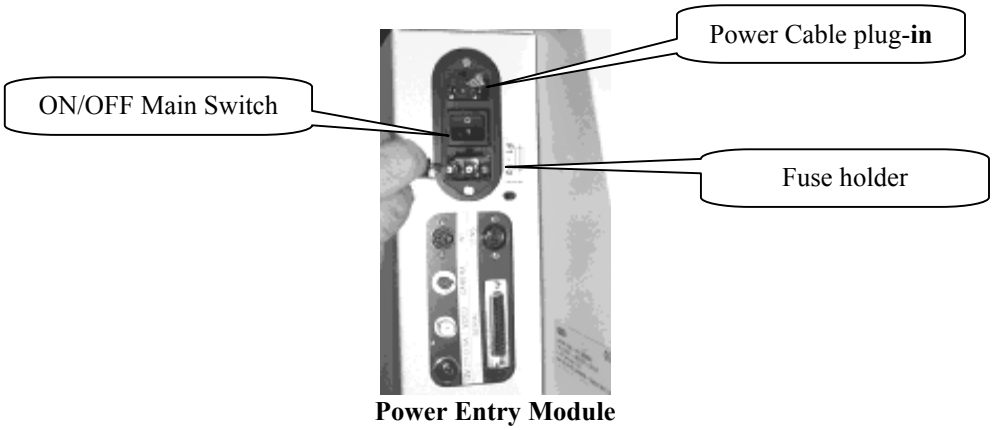
- Turn system power off.
- Remove the power cord.
- Open the cabinet door.
- Locate the Epi lamp housing.
- Locate the hex nuts that hold each lamp housing to the internal side of the hood.
- Remove these nuts.
- The cover screen with a plastic piece will come loose and the lamp will become visible.
- To remove the lamp, hold it from the receptacle and then pull it from the plastic Holder.
- Insert the new lamp (P/N 100-1381) into the lamp holder and then push it into the Receptacle.
- Reassemble the cover screen.



Epi-White Light assembly (right side)

8.2 Fuse replacement

Always unplug the instrument before changing or checking the fuses.



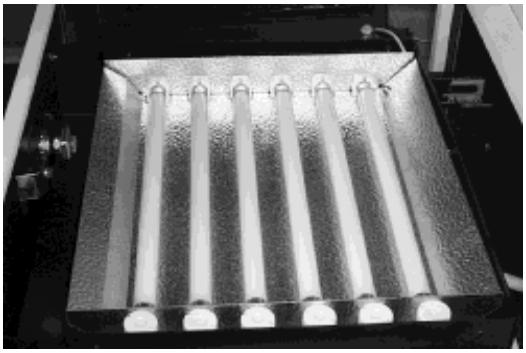
Power Entry Module

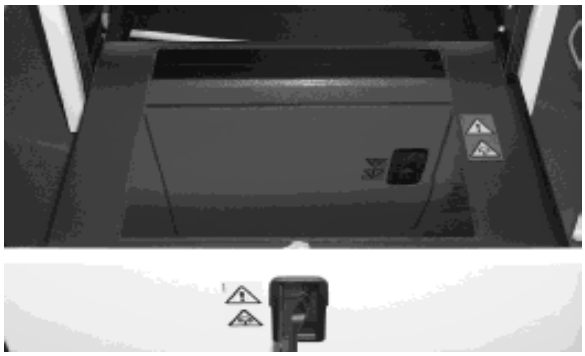
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This unit is protected by 2 fuses 5X20 mm 2A Slow Blow. The fuses are located in the rear left side in a fuse holder. See above picture.

1. Unplug the main power cable from the power entry module outlet.
2. Using a screwdriver lever on the fuse holder to extract it.
3. Remove the blown fuses and replace them with two new ones (P/N 100-1951).
4. Slide the fuse holder into the power entry module until it snaps in place

8.3 UV Transilluminator





UV Transilluminator

8.3.1 Lamps replacement (P/N 100-1361)

Attention: The UV filter surface should always be kept clean from the chemical agents used as gel dyes. Please use protective gloves when touching the UV transilluminator cover.

The lamps must be replaced after every 500 hours of use.

- Turn off the power.
- Remove the power cable.
- Remove the four screws located on the left/right sides of the drawer.
- Remove the cover with the UV filter.
- Place it down on its backside on a non-abrasive surface.

Caution: Do not put the UV filter directly on the bench.

- Use glove when touching the lamps. Remove the lamp by rotating it until it
- becomes loose and the pins come to a vertical position;
- Remove the lamp. Install the new lamp by rotating so that the pins are horizontal and the lamp is tight.
- Reassemble the lid and retighten the screws on both sides.

Lamp replacement



Starter replacement



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8.3.2 Starter replacement (P/N 100-1370)

- Turn off the power.
- Disconnect the power cord.
- Remove the four screws located on the side of the instrument.
- Remove the lid.
- Place it down on its backside on a non-abrasive surface.

Caution: Do not put the UV filter directly on the bench.

- To replace the starter, rotate it counter-clockwise and remove.
- To replace the starter insert it into the holder and rotate clockwise.
- Reassemble the lid and retighten the screws on both sides.

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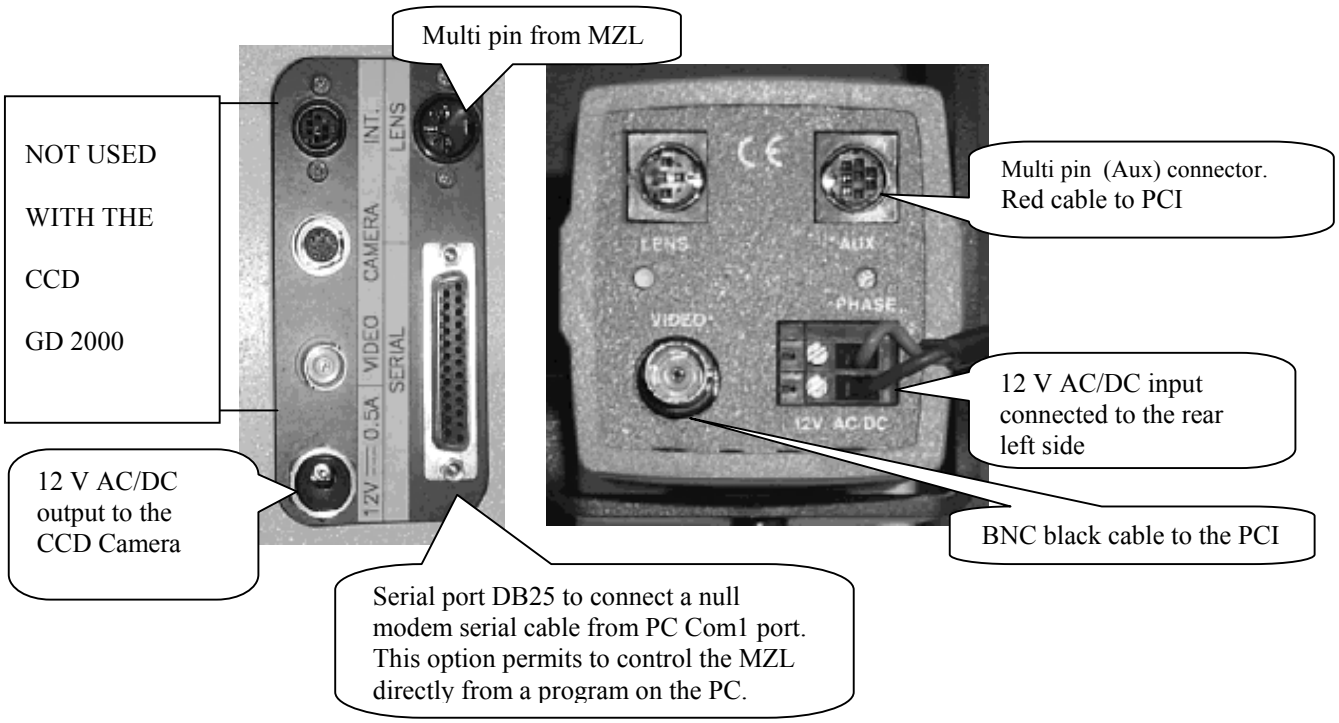
Appendix A: Gel Doc 2000 System installation

The following appendix gives additional information to use the Universal Hood in the Gel Doc 2000 configuration.

Connecting the cabling harnesses

a) Carefully take the CCD camera assembly out of the box and hold the camera so that the two locking holes are facing you.
b) Insert it into the camera holder from the open left side and attach it with the two black screws.
c) Place the bracket with the camera on the top of the Hood and attach it with the four washers and knobs.
d) Carefully unpack the 170-7546 integration cable. The power cable should be already plugged into the CCD camera 12 V AC/DC connector.
e) Connect each end of the CCD Camera cable following the instruction below:

Label / Color	Instrument / Connection
9-pin connector / Black	PCI board / Back of computer
Camera Video / BNC Black	CCD Camera / Video
Camera AUX / Multi Pin Red cable	CCD Camera / AUX
12 V AC-DC / Black cable two poles	Camera / 12 V AC-DC
12 V Power Cable / Metal end	Hood / Mini Din



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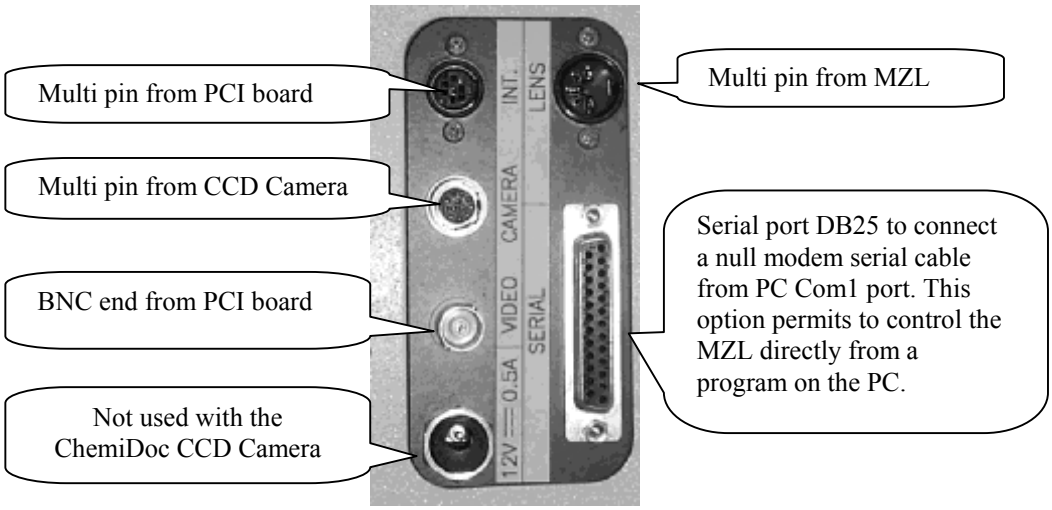
Appendix B: ChemiDoc System installation

The following appendix gives additional information to use the Universal Hood in the ChemiDoc configuration.

Connecting the cabling harnesses

a) Carefully take the CCD camera assembly out of the box and hold the camera so that the two locking holes are facing you.
b) Insert it into the camera holder from the open left side and attach it with the two black screws.
c) Place the bracket with the camera on the top of the Hood and attach it with the four washers and knobs.
d) Connect each end of the CCD Camera cable following the instruction below:

Label / Color	Instrument / Connection
9-pin connector / Black	PCI board / Back of computer
BNC Black	Hood rear left side / Video
Multi Pin Red	Hood rear left side / Int
Multi pin / Metal end	CCD Camera / 12 V AC-DC
Multi pin / Metal end	Hood rear left side/ Camera



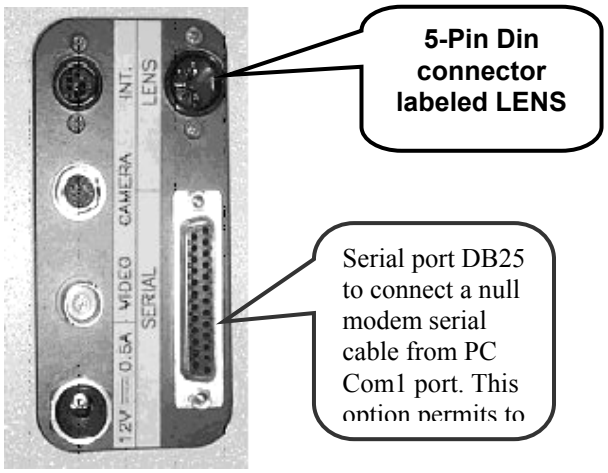
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Appendix C: ChemiDoc XRS System installation

a. Connect the Motorized zoom lens cable to the 5-pin din connector labeled LENS on the side panel of the hood. (See picture below)

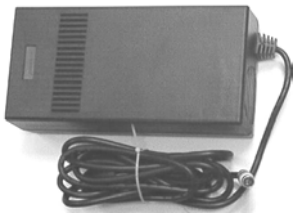


Motorized Zoom Lens control cable



Magnified view of the Side Panel

b. Connect the camera power cable to the connector on the camera labeled POWER (See picture below)



Camera Power Supply

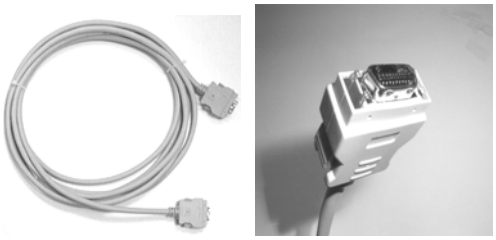


Connector on the cable



Power connector on the camera

c. Connect one end of the Camera Controller cable to the connector on the camera labeled DATA and the other end of this cable should be connected to the PCI Digitizing Card after the card is installed in the PC per procedure in **Step 4.2.3.**



Camera Controller Cable and Connector



Controller Cable Connector labeled Data

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d. Connect the provided Serial Cable to the 9- pin DIN/8 pin round serial connector on the PC/MAC and the other end of the 25 pin serial connector on the Universal Hood.
e. In case of a MAC with a USB, connect the optional (170-7959) USB to Serial adapter (not included) with a USB cable to the MAC and then connect the 8 pin round connector of the MAC serial cable (1707963) between the adapter and the Universal Hood.
f. Now proceed with installation of the PCI Digitizing Card and software

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Appendix D: ChemiDoc XRS PCI Digitizing Card Driver Installation:

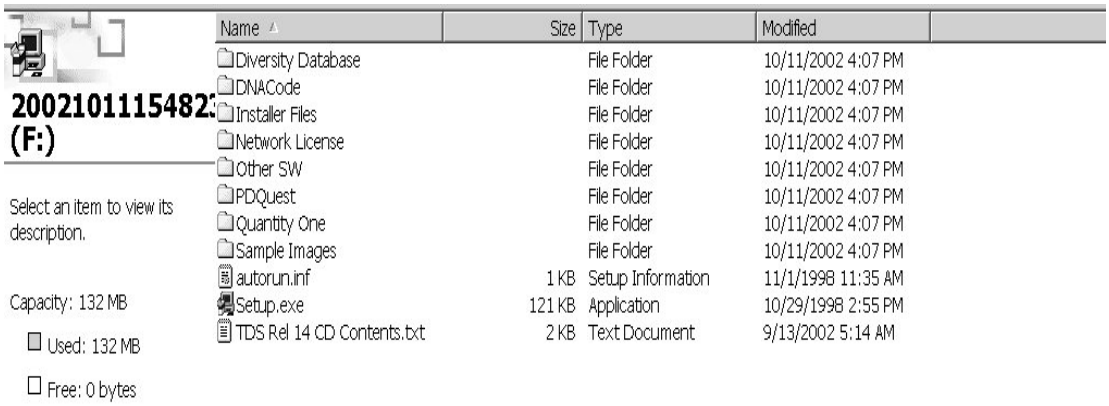
CAUTION: Make sure that Card is NOT installed in the PC

The following procedure describes how to install the drivers that are provided with your TDS Quantity CD ROM.

a. Insert TDS Quantity One CD into the CD ROM drive of the PC. It will go into AUTO RUN mode and the following window will open:

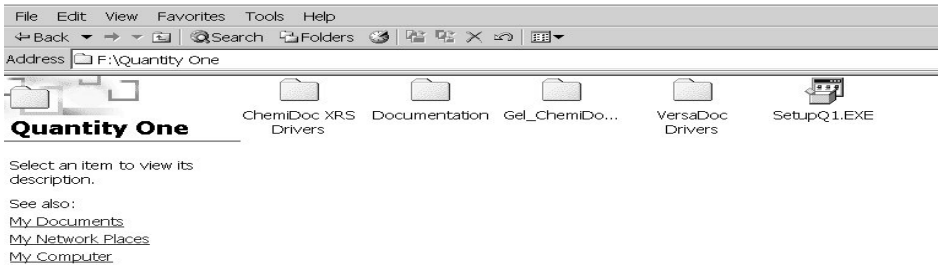


b. Click on "Explore CD" and the following window will open:

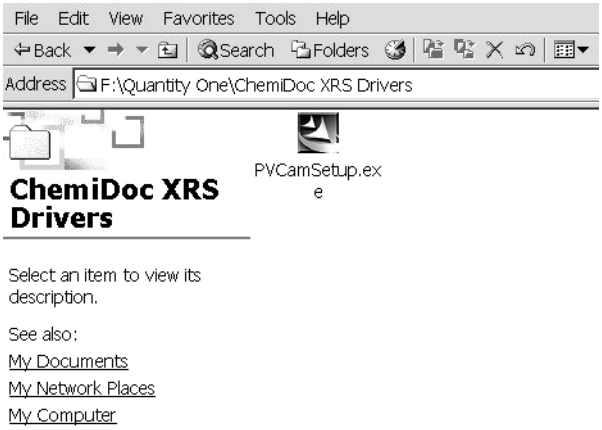


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c. Click on “Quantity One” folder and the following window will open:



d. Select “ChemiDoc XRS Drivers” folder and the following window will open:



e. Double click on “PVCamSetup.exe” icon and follow direction. This self installing utility will install the appropriate drivers on your PC.
f. Next install the PCI Card into the PC. The operating system will automatically find the card and appropriate driver and install the card.

NOTE: If a conflict is notified by the Windows Device Manager, it may be necessary to move the PCI card to a different slot to avoid conflict with an existing card in the PC.

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Appendix E: Technical Specifications

Model	Gel Doc 2000	ChemiDoc	ChemiDoc XRS
Application			
Chemiluminescence	No	Yes	Yes
Fluorescence	Yes	Yes	Yes
Chemifluorescence	No	No	No
Colorimetric/Densitometry	Yes	Yes	Yes
Gel Documentation	Yes	Yes	Yes
Isotopic Imaging	No	No	No
Hardware Specifications			
Maximum Sample Size	28 x 36 cm	28 x 36 cm	28 x 36 cm
Maximum Image Area	25 x 26 cm	25 x 26 cm	25 x 26 cm
Excitation Source	Trans UV 302, 254, 365 nm & White, Epi-White light	Trans UV 302, 254, 365 nm & White, Epi-White light	Trans UV 302, 254, 365 nm & White, Epi-White light
Illumination Modes	3 Trans UV & White, Epi-White	3 Trans UV & White, Epi-White	3 Trans UV & White, Epi-White
Detector	CCD	Super Cooled CCD	Super Cooled CCD
CCD Resolution (H x V)	768 x 494 RS-170 752 x 582 CCIR	768 (H) x 494 (V) (RS170) 752 x 585 (CCIR)	1300 x 1030
Pixel Size (in Microns)	8.4 (H) X 9.8 (V)	8.4 (H) X 9.8 (V)	6.7 (H) X 6.7 (V)
Cooling System	No	2 stage Peltier	Peltier cooled
Camera Cooling Temp.	NA	-40°C	-45°C
Filter Holder	2 positions 1-Emission Filter 1-Chemi	2 positions 1- Emission Filter 1-Chemi	2 positions 1- Emission Filter 1-Chemi
Emission Filters	1 Included (amber), 4 optional	1 Included (amber), 4 optional	1 Included (amber), 4 optional
Dynamic Range	1.8 Orders	1.8 Orders	3.0 Orders
Pixel Density (gray levels)	8 bit (256 gray levels)	8 bit (256 gray levels)	12 bit (4096 gray levels)
Dynamic Flat Fielding	No	No	Yes
Instrument Size (cm)	45(L) x 61(W) x 96(H)	45(L) x 61(W) x 96(H)	45(L) x 61(W) x 96(H)
Instrument Weight (kg)	32 kg	32 kg	32 kg
Software Specifications			
Application Driven	Yes	Yes	Yes
Windows 98/XP	Yes	Yes	Yes
Windows NT/2000	Yes	Yes	Yes
Mac OS 9.X	Yes	Yes	Yes
Image File Size (MB)	Approx. 360 Kb	Approx. 360 Kb	Approx. 2.5 MB

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