



**Molecular Imager[®]
Gel Doc[™] XR System
170-8170**

**Molecular Imager[®]
ChemiDoc[™] XRS System
170-8070
170-8071**

Hardware Instruction Manual

Important

Please read these instructions before attempting to install or operate the Molecular Imager[®] Gel Doc[™] XR or ChemiDoc[™] XRS.

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 does not 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 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 Gel Doc XR and ChemiDoc XRS systems are warranted against defects in materials and workmanship for 1 year. If any defect occurs in the instrument during this warranty period, Bio-Rad Laboratories, Inc. 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, Inc. or an authorized agent
- Use of spare parts supplied by anyone other than Bio-Rad Laboratories, Inc.
- Damage caused by accident or misuse
- Damage caused by disaster
- Corrosion caused by improper solvents or samples

Garantie

Die Garantie fuer den Hood betraegt 1 Jahr auf Herstellungs- und Materialfehler.

Bei Auftreten von Fehlern waehrend der Garantiezeit repariert oder ersetzt Bio-Rad Laboratories, Inc. 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, Inc.
- Benutzung von Ersatzteilen, die nicht von Bio-Rad Laboratories, Inc. geliefert wurden
- Schaeden durch Naturkatastrophen verursacht
- Schaeden durch unsachgemaessen und fehlerhaften Gebrauch verursacht
- Korrosionsschaeden durch ungeeignete Loesungen oder Proben

Regulatory Notice

IMPORTANT: The Gel Doc XR and ChemiDoc XRS systems are designed and certified to meet EN61010, the internationally accepted electrical safety standards, EMC regulations, and TUV. 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:

- Void the manufacturer's warranty
- Void the regulatory certifications
- Create a potential safety hazard

NOTE: Bio-Rad Laboratories, Inc. 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, Inc., or an authorized agent.

Richtlinien

WICHTIG: Dieses Geraet, von Bio-Rad Laboratories, Inc. konstruiert, besitzt das Zertifikat ENC1010 anerkannt von dem internationalen elektrischen Sicherheitsstandard EMC und unterliegt dessen Richtlinien und TUV. 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:

- Ungueltigkeit der Herstellergarantie
- Ungueltigkeit des Zertifikats
- Eventuelles Sicherheitsrisiko

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

General Precautions

- Please read the instruction manual carefully
- The instrument must be used only for the intended purpose of gel documentation in research laboratories
- The instrument must be connected to a power source line which **MUST BE** grounded and protected by a circuit breaker
- 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 Hood muss eine geerdete 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

TABLE OF CONTENTS

SECTION 1 INTRODUCTION	6
1.1 <i>COMPUTER REQUIREMENTS</i>	6
SECTION 2 IMPORTANT SAFETY INFORMATION	7
2.1 <i>IMPORTANT NOTICE</i>	7
2.2 <i>POWER SAFETY INFORMATION</i>	7
SECTION 3 PRODUCT DESCRIPTION	8
3.1 <i>CCD CAMERA AND LENSES</i>	8
3.2 <i>DARKROOM ENCLOSURE, EMISSION FILTERS, AND ILLUMINATION SOURCES</i>	8
3.3 <i>USB AND FIREWIRE CONNECTIONS</i>	9
3.4 <i>QUANTITY ONE SOFTWARE</i>	9
3.5 <i>PRINTER (OPTIONAL)</i>	9
3.6 <i>UNPACKING THE SYSTEM</i>	10
SECTION 4 GETTING STARTED	14
4.1 <i>SELECTING A LOCATION</i>	14
4.2 <i>ASSEMBLING THE SYSTEM</i>	14
4.2.1 <i>ASSEMBLING THE UNIVERSAL HOOD II</i>	14
4.3 <i>GEL DOC XR SYSTEM</i>	15
4.3.1 <i>INSTALLING THE GEL DOC XR CAMERA</i>	15
4.3.2 <i>INSTALLATION OF QUANTITY ONE SOFTWARE FOR GEL DOC XR</i>	16
4.3.3 <i>GEL DOC XR SYSTEM CABLE CONFIGURATION</i>	20
4.4 <i>CHEMI DOC XRS SYSTEM</i>	22
4.4.1 <i>INSTALLATION OF QUANTITY ONE SOFTWARE FOR CHEMI DOC XRS</i>	23
4.4.2 <i>CHEMI DOC XRS SYSTEM CABLE CONFIGURATION</i>	28
4.4.3 <i>FIREWIRE CARD INSTALLATION</i>	29
4.5 <i>INSTALLING THE WHITE LIGHT TRANSILLUMINATOR (OPTIONAL)</i>	29
4.6 <i>INSTALLING THE OPTIONAL 17 MM OR 25 MM WIDE-ANGLE LENSES (CHEMI DOC XRS SYSTEM ONLY)</i>	30
4.7 <i>DESCRIPTION OF SYSTEM FUNCTION AND SYSTEM INITIALIZATION</i>	32
4.7.1 <i>CONTROL PANEL</i>	32
SECTION 5 OPERATION OF THE UNIVERSAL HOOD II	39
5.1 <i>OPERATING THE UNIT</i>	39
5.1.1 <i>SWITCH ON THE UNIVERSAL HOOD II</i>	39
5.1.2 <i>POSITION YOUR GEL</i>	39
5.1.3 <i>ACQUIRING AN IMAGE</i>	39
5.1.4 <i>ACQUIRING AN IMAGE WITH FLAT FIELDING</i>	39
5.2 <i>CUTTING GELS</i>	41
SECTION 6 TROUBLESHOOTING	42
SECTION 7 ACCESSORIES AND REPLACEMENT PARTS	43
SECTION 8 MAINTENANCE AND PARTS REPLACEMENT	45
8.1 <i>EPI ILLUMINATION LAMP REPLACEMENT</i>	45
8.2 <i>FUSE REPLACEMENT</i>	45
8.3 <i>UV TRANSILLUMINATOR</i>	46
8.4 <i>LAMP REPLACEMENT</i>	46
APPENDIX A: TECHNICAL SPECIFICATIONS	48

Section 1 Introduction

The Bio-Rad Gel Doc™ XR and ChemiDoc™ XRS gel documentation systems are easy-to-use, high-performance systems. They use a charge coupled device (CCD) camera to capture images in real time, which allows you to more accurately position and focus the image. With Bio-Rad Quantity One® software, acquired images can be optimized, annotated, analyzed and printed.

The Bio-Rad Gel Doc XR and ChemiDoc XRS systems utilize an enclosure (Universal Hood II) that is light-tight and contains UV illumination and white light illumination. Please note that both the Gel Doc XR and ChemiDoc XRS cameras have external power supplies.

1.1 Computer Requirements

This software will run under Windows XP, Vista Ultimate, or Mac OS X. 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.

Specifications	PC	MAC
Operating system	Windows XP or Vista Ultimate	Mac OSX 10.5.x
Base unit	Intel Core 2 Duo, minimum 2.0 GHz	Power PC G4 or better
RAM	>2 GB	>2GB
Cache memory	>2 MB	> 2 MB
Hard disk space	>120 GB	>120 GB
Video card	128 MB video memory minimum, capable of generating minimum 1024 x 768 pixels	128 MB video memory minimum, capable of generating minimum 1024 x 768 pixels
Camera connection ports	One full height empty PCI slot required (ChemiDoc XRS only)	Available FireWire port (ChemiDoc XRS only)
Communication ports	4 USB 2.0 ports	4 USB 2.0 ports

Section 2 Important Safety Information

2.1 Important Notice

Both the Gel Doc™ XR and ChemiDoc™ XRS imaging systems are intended for laboratory use only. Use of the Gel Doc XR, and ChemiDoc XRS systems involve 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 trained personnel that know the health risks associated with UV radiation and with 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: <i>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.</i>
---	---

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

- Voltage Setting Information:** The Universal Hood II has a power supply that automatically chooses the correct voltage for your country or region.
- Fusing:** The Universal Hood II has two user-serviceable fuses, F1 and F2, which are located on the bottom rear panel and are a part of the power entry module (see below).



Fuse F1 and F2 are located in this drawer. Use a screwdriver and pull the drawer out to see the fuses.

Main power entry module

Section 3 Product Description

3.1 CCD Camera and Lenses

A CCD camera is placed on top of the Universal Hood II for capturing images. The camera comes with a motorized zoom lens (MZL) that allows a remote adjustment of the lens control functions (zoom, focus, and iris).

For ChemiDoc™ XRS systems optional lenses with low f-numbers are available that offer extreme light collection efficiency for low-light applications like chemiluminescence.

Lens f/0.95, 25 mm, wide-angle	catalog #170-8072
Lens f/0.95, 17 mm, wide-angle	catalog #170-8073

3.2 Darkroom Enclosure, Emission Filters, and Illumination Sources

The Universal Hood II is designed to capture fluorescent and chemiluminescent images without using a photographic darkroom. The enclosure has built-in white light epi-illumination and UV transillumination. An optional white light transilluminator (catalog #170-7950) or a white light conversion screen (catalog #170-8001) may also be used with the system.

For easy sample loading, the UV transilluminator is located in the drawer of the Universal Hood II and can be accessed from the front of the enclosure. For your convenience, the lights in the darkroom enclosure turn off automatically after about 15 minutes. This time period can be extended indefinitely by pressing the *Hold* button.

The Universal Hood II has a three-position filter slider that offers the flexibility of using two different emission filters for fluorescent applications as well as the ability to image chemiluminescent samples (no filter).

Bio-Rad Laboratories, Inc. offers a selection of filters and illumination sources.

Standard Filter	Comes with each system.	Catalog #
580AF120 62 mm	Ethidium Bromide filter	170-8081
Optional Filters		
520DF30 62 mm	Optional filter for SYBR Green/SYBR Gold/GFP/fluorescein	170-8074
560DF50 62 mm	Optional filter for Cy3/rhodamine	170-8075
630BP30 62 mm	Optional filter for SYPRO Ruby	170-8076
480BP70 62 mm	Optional filter for Hoechst/coumarin	170-8077
Optional Illumination Sources		
White light transilluminator		170-7950
White light conversion screen		170-8001
302 nm UV lamps, 6 (shipped standard with each system)		170-8097
254 nm UV lamps, 6		170-8098
365 nm UV lamps, 6		170-6887

3.3 USB and FireWire Connections

The Universal Hood, common to both Gel Doc XR and ChemiDoc XRS systems, requires a USB connection in order to communicate with the PC. The Gel Doc XR camera has a USB connection that connects to the Hood. However, the ChemiDoc XRS camera is directly connected to the PC and will need a FireWire port to communicate with the PC, which is where the user interface software is installed. In case of PCs that do not offer a FireWire (IEEE1394) interface, in order to connect the ChemiDoc XRS system, a FireWire card (included as an accessory) needs to be installed in the host computer to communicate with the camera.

Note: Read and follow the instructions for installing the USB cable (Gel Doc XR) or FireWire cable (ChemiDoc XRS), card, drivers, and software in the following sections.

3.4 Quantity One[®] Software

Each system ships with a full version of Quantity One 1-D Analysis Software and unlimited copies of Quantity One Basic software for data sharing. The software can be used to annotate and document images, analyze molecular weights, print, and perform a host of other applications. See the software manual for detailed instructions on how to install and operate the software.

Note: Read and follow the instructions in the following pages prior to installing Quantity One software.

3.5 Printer (Optional)

For your convenience, Bio-Rad offers an optional USB printer for use with the Gel Doc XR and ChemiDoc XRS systems:

Mitsubishi P93DW Thermal Printer

catalog #170-8089

3.6 Unpacking the System

Gel Doc XR Components

The Gel Doc XR and ChemiDoc XRS systems consist of multiple components. Each of them may be in a separate box or in one box with a label describing the catalog numbers and its contents. Please make sure that all the system components are in your shipment. Please unpack each component carefully and verify that you have the correct one. Each system includes the following:

Catalog #	Descriptions
170-8170	Gel Doc XR System PC/Mac
170-8162	Universal Hood II with TLUM 100/240 V
170-8169	Gel Doc XR Camera w/MZL(motorized zoom lens)
170-8080	Kit Accessory, Universal Hood II
170-9600	Quantity One Software PC/Mac



Universal Hood II with TLUM 100/240V



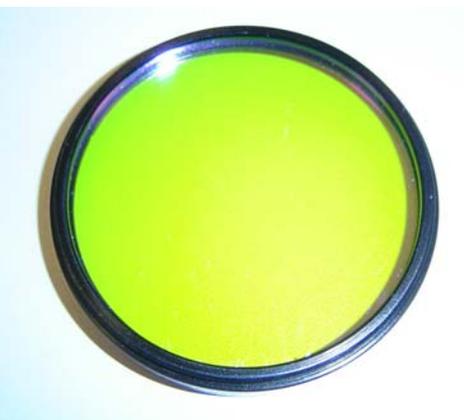
Gel Doc XR camera with MZL & power supply



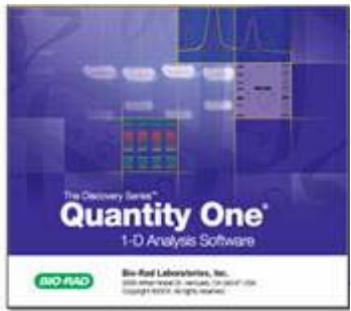
6 ft USB cable



10 ft USB cable



580 AF 120 Band Pass Filter (EtBr)



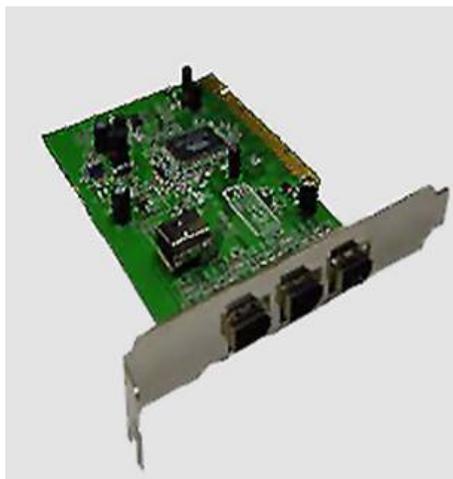
Quantity One software

ChemiDoc XRS Components

<u>Catalog #</u>	<u>Descriptions</u>
170-8070 / 1708071	ChemiDoc XRS System PC/Mac
170-8162	Universal Hood II with TLUM 100/240 V
170-8099	ChemiDoc XRS camera with MZL (including camera controller cable and power supply)
170-8173	FireWire card (PC system only)
170-8080	Kit accessory, Universal Hood II
170-8008	Fluorescent reference plate
170-9600	Quantity One software PC/Mac
170-8177	FireWire cable



ChemiDoc XRS Camera with MZL and Power Supply



Firewire card

Section 4 Getting Started

4.1 Selecting a Location

The Gel Doc™ XR and ChemiDoc™ XRS systems can be placed on any benchtop. The best position is near the computer where Quantity One® is operating. Remember to leave space to easily access the power switch on the Universal Hood II, which is located at the rear bottom-left side of the enclosure.

4.2 Assembling the System

4.2.1 Assembling the Universal Hood II



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

Wichtig: Es wird empfohlen, dass mindestens zwei Personen den Hood transportieren und dabei das Gerät am Geräteboden halten.

1. Lift the top lid off the main box.
2. Open the accessory box and review the unpacking instructions.
3. Lift off the top foam.
4. Lift the cardboard enclosure off the pallet.
5. Remove the plastic wrapping and carefully lift the enclosure from the bottom foam, and place it in a suitable location.

Note: Please do not connect the power cable to a power source until all connections are made. The power source has to be grounded and protected by a circuit breaker.

6. Locate the band pass filter in the accessory kit and thread it onto one of the two 62 mm rings of the Filter Slider (inside of the hood). The filter slider facilitates the selection between two filters and an open position for chemiluminescence.
7. The three selectable positions are indicated by **NO FILTER**, **FILTER 1**, or **FILTER 2** on the right side of the camera support. Note the position of the 580 AF 120 Ethidium Bromide filter for future use. See picture below.



Three positions sliding filter

4.3 Gel Doc XR System

If you have purchased the ChemiDoc XRS System, proceed to page 22 for installation instructions.

4.3.1 Installing the Gel Doc XR Camera

1. Place the camera on the bench sideways as shown. Take out the lens cap and put it in a safe place. Take out the thumb screw from the box and assemble it to the camera bracket exactly as shown.
2. Place the thumb screw as shown.



Gel Doc XR camera with bracket, MZL, and thumb screw

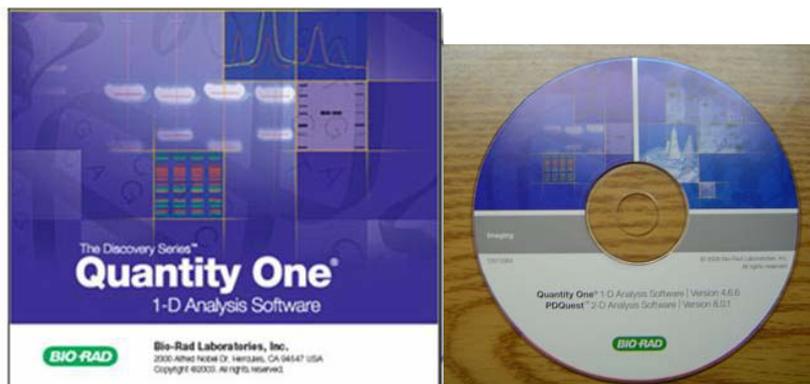
3. Place the Camera over the Universal Hood II by inserting the lens into the hole in gasket and seating the lens on the gasket while the thumb screw is positioned on the camera bracket as shown. The thumb screw slides through the slot in the vertical camera bracket on the Hood.
4. Secure the thumb screw (see pictures below). Make sure that the camera/lens is fully seated on the gasket and is upright.
5. The camera position can be fine adjusted in all directions; loosen the two Phillips head screws and move the entire assembly, along with the bracket.



Closeup of Gel Doc XR camera mounted with thumb screw

4.3.2 Installation of *Quantity One* Software for *Gel Doc XR*

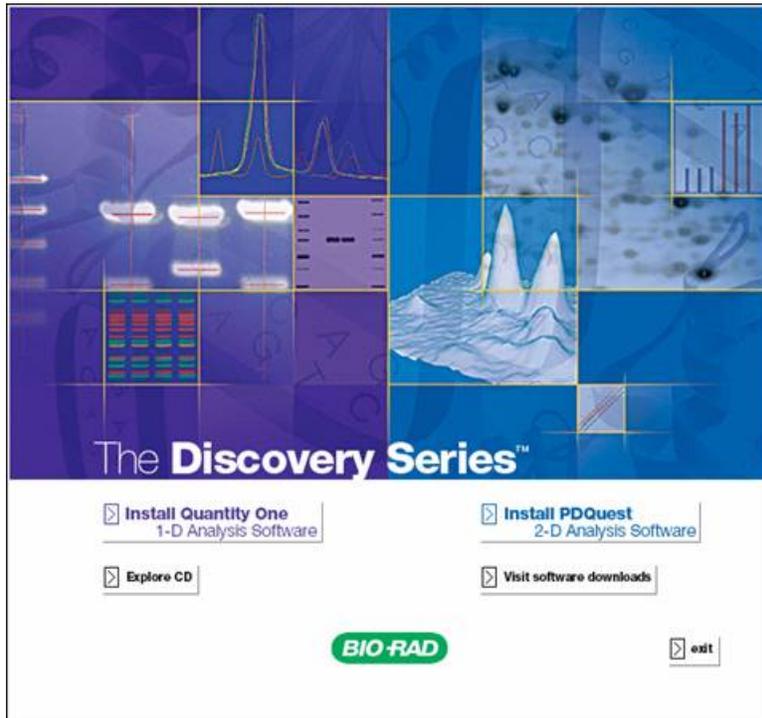
Quantity One ships with the CD and the HASP key.



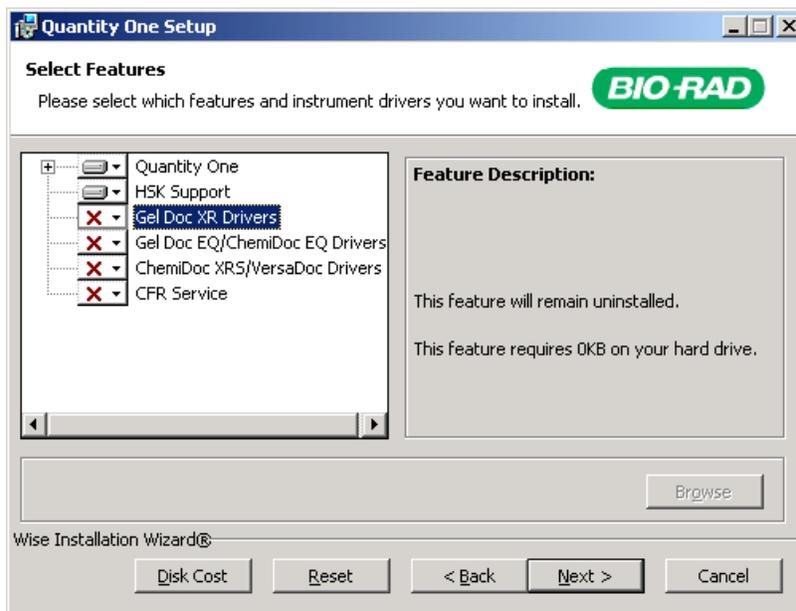
HASP key

For a PC computer – *Quantity One* installation

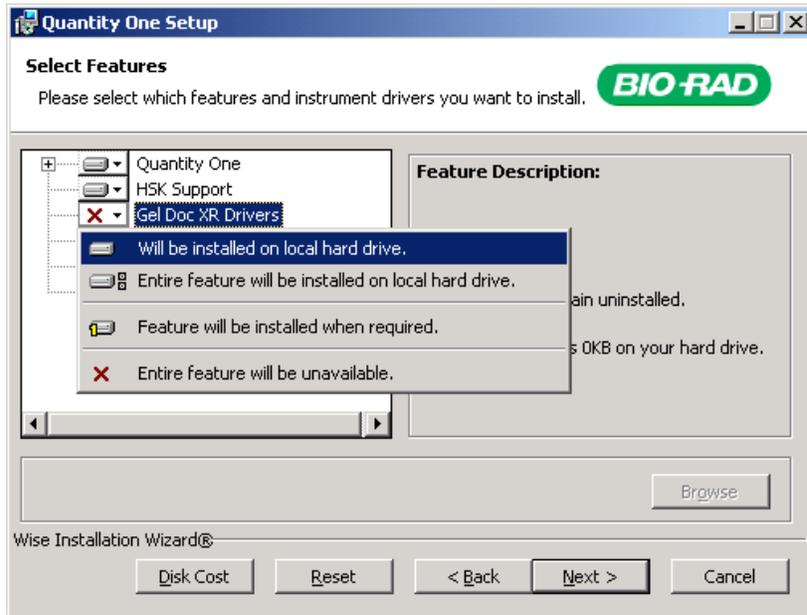
1. Insert CD for *Quantity One*.
2. When the Installer launches, select Install *Quantity One*.



3. The Select Features screen has Quantity One and HSK Support selected as default.
4. In addition, select Gel Doc XR drivers.



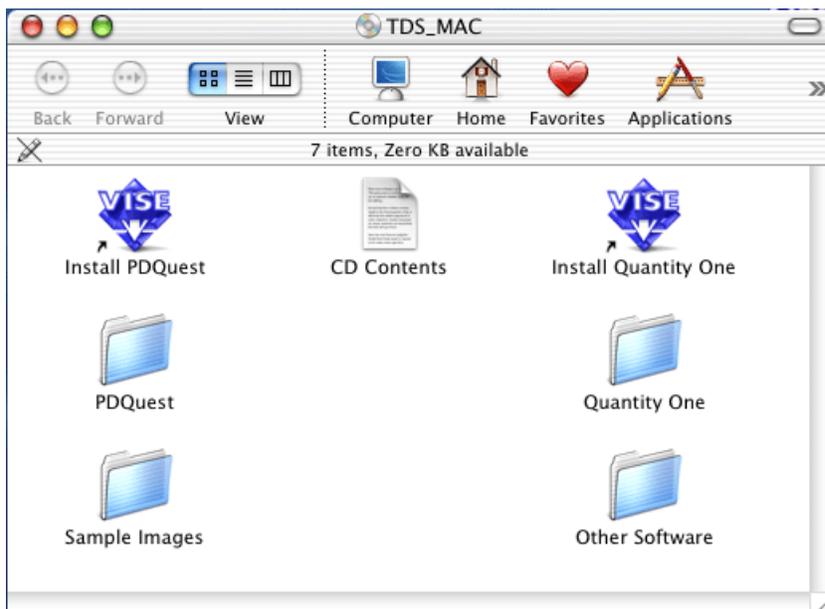
5. Click on the pull down arrow, next to X on Gel Doc XR Drivers.
6. Select "Will be installed on local hard drive."



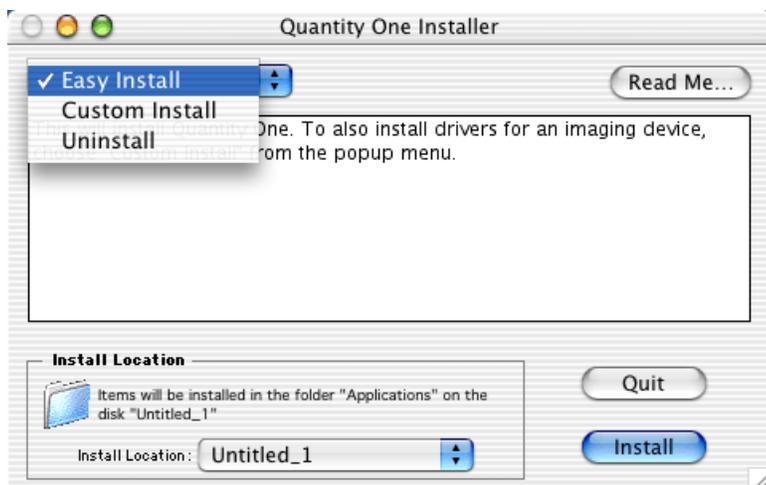
7. Finish Installation.
8. Insert the HASP key in the USB port.
9. Restart the computer.

For MAC computer – Quantity One installation

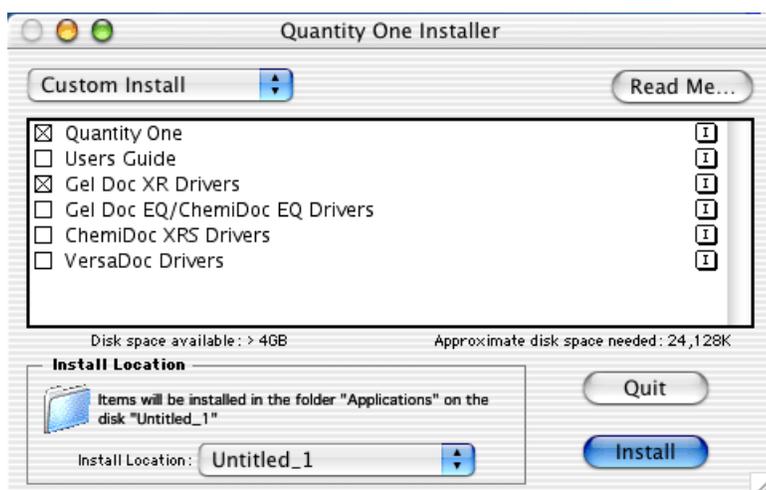
1. Insert CD. It appears as an icon on the desktop.
2. Open the CD by clicking on the icon.
3. Select Install Quantity One.



4. Select Custom Install.



5. Select Quantity One and Gel Doc XR drivers, users guide is optional.



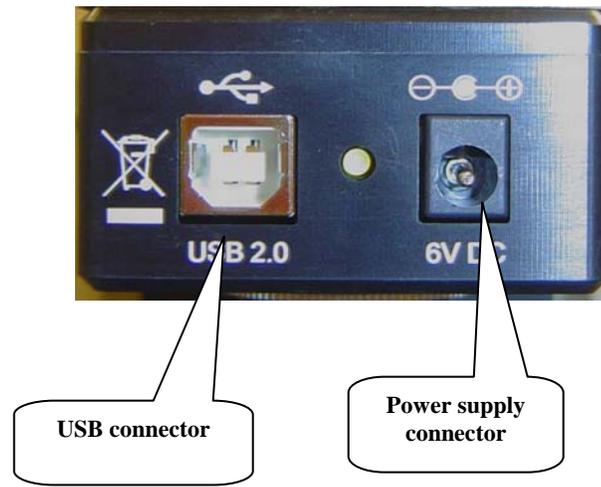
6. Click on Install.

7. Insert the HASP key in the USB port.

8. Shut down and restart the computer.

4.3.3 Gel Doc XR System Cable Configuration

Camera connections



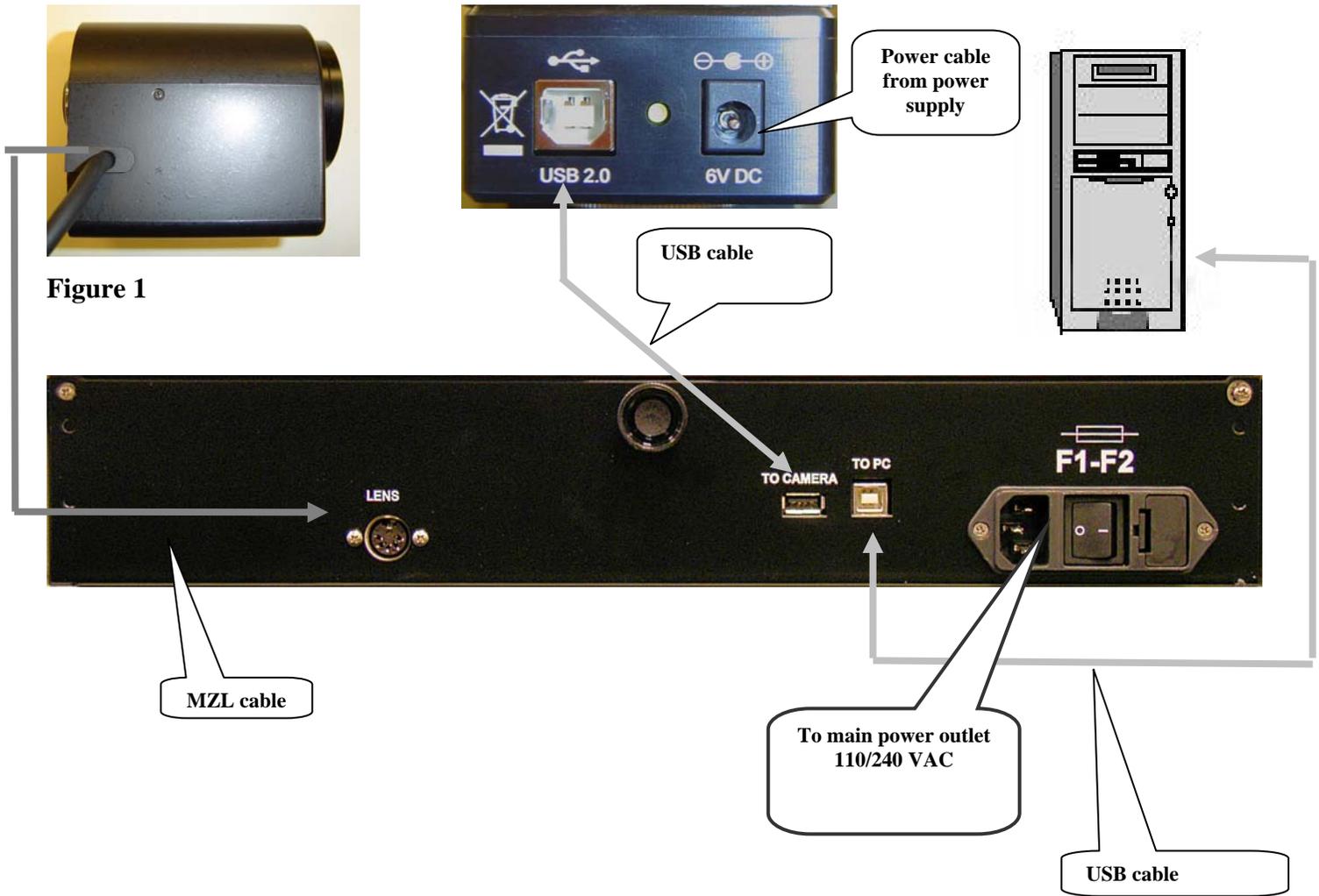
Connecting the cabling harnesses

1. Locate the 6 ft USB cable. Connect one end of the USB cable connector to the USB port on the camera. Connect the other end to the corresponding port on the rear panel on the Universal Hood that says 'TO CAMERA'.
2. The camera power supply cable should be plugged into the CCD camera power connector.
3. Connect the MZL (Motorized Zoom Lens, page 13) cable connector to the connector labeled **LENS** on the rear panel of the Universal Hood.
4. Connect the 10 ft USB cable from the Universal Hood to the PC.
5. The main power cable that connects the Universal Hood to the power outlet.

The following table describes the cable/connectors and their designations.

<u>Label</u>	<u>Instrument/Connection</u>
10 ft USB connector/cable	From hood to PC
6 ft USB connector/cable	From camera to hood
Camera power supply cord/power supply	Camera/PWR connector
MZL (motorized zoom lens) cable	Hood/LENS Din connector
Power cable	Connects the Hood to the power outlet on the wall

See the cabling diagram on the following page.



This completes the installation of the Gel Doc Camera and Quantity One software. Proceed to Section 4.7 on page 32 for a description and initial test for the Universal Hood II.

4.4 ChemiDoc XRS System

Unpacking the system was covered in Section 3.6.

1. Place the camera on the bench so that the locking hole of the tripod mount is facing you.
2. Thread the thumb screw on the locking tripod hole. Turn twice.
3. Remove the lens cap and put it in a safe place.
4. Place the filter assembly in the 'NO FILTER' position.
5. Place the ChemiDoc XRS camera/lens (MZL: motorized zoom lens) on the mounting plate, on top of the enclosure, by inserting the lens through the hole in the gasket while the screw slides through the camera bracket slot. Make sure that the lens is fully seated on the gasket.
6. Tighten the screw against the camera bracket. See the following pictures.



ChemiDoc XRS camera with thumb screw

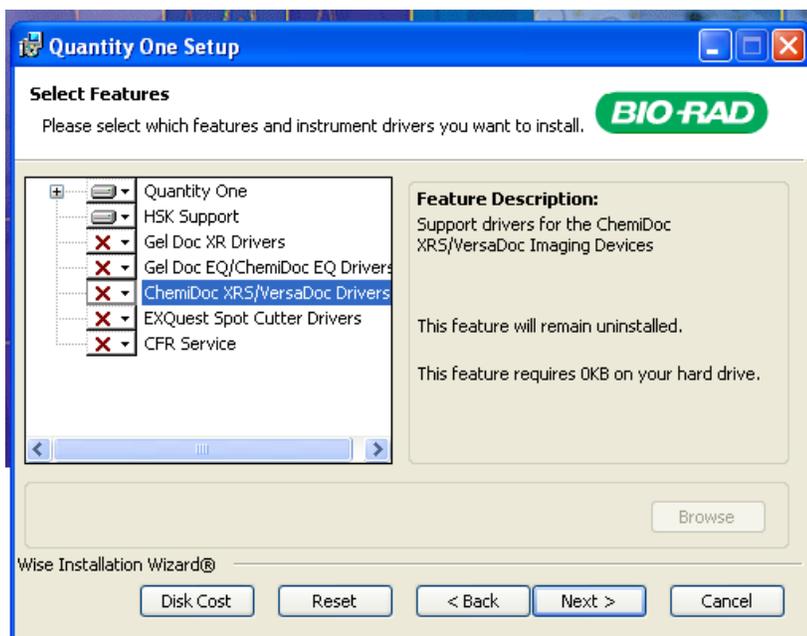
7. Fix the camera bracket. Tighten the screw to lock the camera against the camera bracket.



4.4.1 Installation of Quantity One Software for ChemiDoc XRS

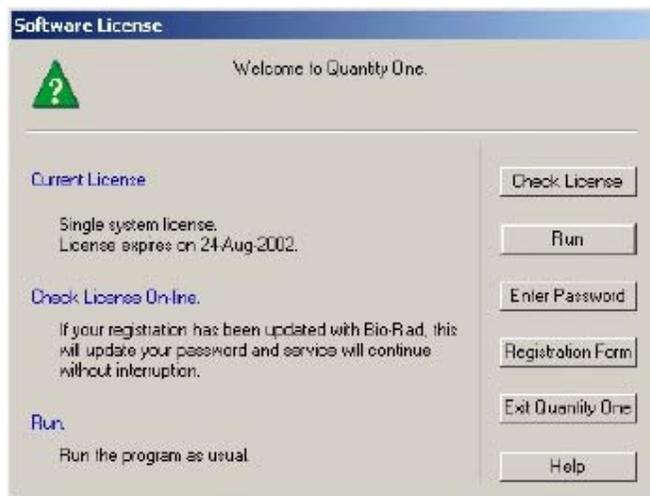
Installation of Quantity One on a PC

1. Insert the Installation CD.
2. The Select features screen has Quantity One and HSK Support selected as a default.
3. In addition to these defaults, select the ChemiDoc XRS driver.



4. Finish the installation wizard.
5. Insert the HASP key in the USB port.
6. Shut down the computer.

When you restart and click on Quantity One, you will see a Welcome screen.



You can either click on the registration form button to send your registration online, or call Bio-Rad Tech Support with your system ID to register.

To register the software, you need the software serial number and the system ID.
The Quantity One serial number is on the outside of the box and on the CD jacket.
Format of serial number: **BRQ1AXXXXXX**

To get the system ID :
Click on Enter Password in the Welcome page.
The system ID is seen in the Enter Password window.

Enter Password

To register, please contact Bio-Rad during 8:00 a.m. to 4:00 p.m., Pacific Standard Time in the US:
Phone: 1-800-4-BIO-RAD (in the U.S.)
+1 510-741-2601 (Intl.)
Ask for Software Registration.
Fax: +1 510-741-5885
e-mail: LSG_Software_Registration@Bio-Rad.com

Please provide the information in the completed registration form.

For network license registrations or software upgrade registrations, please submit your request for a new password by email only. Include your system ID, purchase order number, and the software catalogue number purchased along with the standard registration info in your message text.

Enable Network License (red HSK)

Current license
Single system license.
License expires on 24-Aug-2006.

System ID
4280DA3D

Password
Quantity One [] OK Not OK
CFR Password [] OK Not OK

Copy System ID To Clipboard Done Cancel

Once you register online or by phone, you get a password. Enter the password in the Quantity One field. The Password is not case sensitive and can be entered without spaces. If the password is correct, a Green OK is seen. Click Done to finish.

Enter Password

To register, please contact Bio-Rad during 8:00 a.m. to 4:00 p.m., Pacific Standard Time in the US:
Phone: 1-800-4-BIO-RAD (in the U.S.)
+1 510-741-2601 (Intl.)
Ask for Software Registration.
Fax: +1 510-741-5885
e-mail: LSG_Software_Registration@Bio-Rad.com

Please provide the information in the completed registration form.

For network license registrations or software upgrade registrations, please submit your request for a new password by email only. Include your system ID, purchase order number, and the software catalogue number purchased along with the standard registration info in your message text.

Enable Network License (red HSK)

Current license
Single system license.
License expires on 24-Aug-2006.

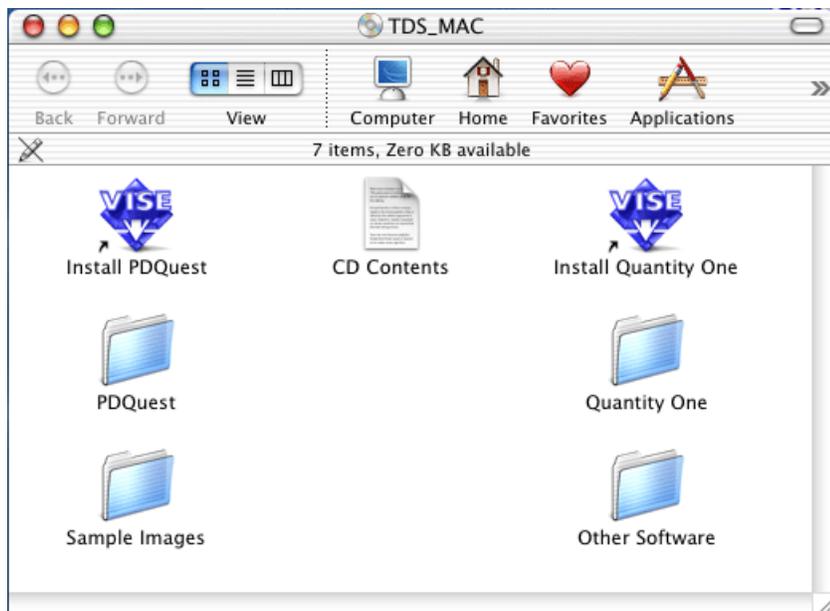
System ID
4280DA3D

Password
Quantity One 9ULQ5 EZ Z8U3E JT JHAKR OK Not OK
CFR Password [] OK Not OK

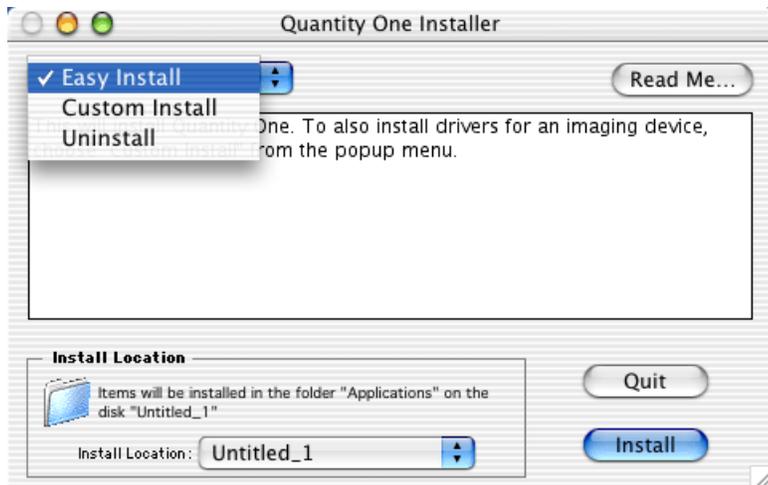
Copy System ID To Clipboard Done Cancel

Installation of Quantity One On MAC

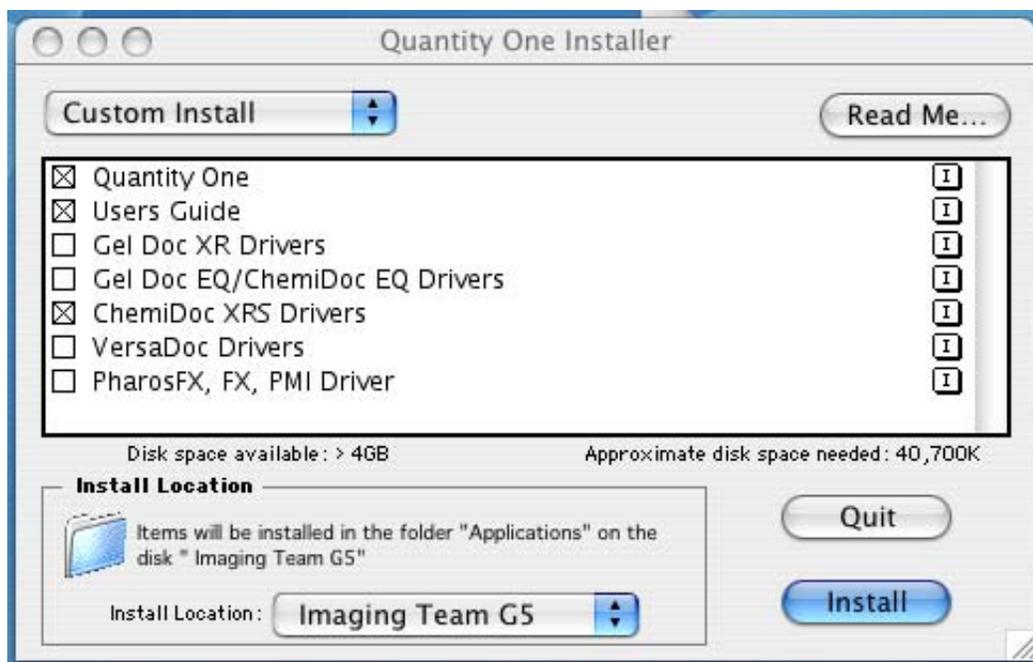
1. Insert the CD. It appears as an icon on the desktop.
2. Click on the CD icon.
3. Select Install Quantity One.



4. Select Custom Install.



5. Select Quantity One and ChemiDoc XRS drivers.



6. Click on Install.
7. Insert the HASP key in the USB port.
8. Shut down and restart the computer.

When you click on newly-installed Quantity One software, you will see a Welcome screen.



You can click on the Registration Form button to register online, or call with the system ID to register.

To register the software, you need the software serial number and the system ID. The serial number of Quantity One is on the outside of the box and on the CD jacket.

Format of serial number: BRQ1AXXXXXX

To get the system ID :

Click on Enter password in the Welcome page.

The system ID is seen in the Enter Password window that opens.

Enter Password

To register, please contact Bio-Rad during 8:00 a.m. to 4:00 p.m., Pacific Standard Time in the US:
Phone: 1-800-4-BIO-RAD (in the U.S.)
+1 510-741-2601 (Intl.)
Ask for Software Registration.
Fax: +1 510-741-5885
e-mail: LSG_Software_Registration@Bio-Rad.com

Please provide the information in the completed registration form.

For network license registrations or software upgrade registrations, please submit your request for a new password by email only. Include your system ID, purchase order number, and the software catalogue number purchased along with the standard registration info in your message text.

Enable Network License (red HSK)

Current license
Single system license.
License expires on 29-Jun-2008.

System ID
413E2762

Password
Quantity One [] OK Not OK

Copy System ID To Clipboard Done Cancel

Once you register online or by phone, you get a password. Enter the password in the Quantity One field. Password is not case sensitive and can be entered without spaces. If the password is correct, a Green OK is seen. Click Done to finish.

Enter Password

To register, please contact Bio-Rad during 8:00 a.m. to 4:00 p.m., Pacific Standard Time in the US:
Phone: 1-800-4-BIO-RAD (in the U.S.)
+1 510-741-2601 (Intl.)
Ask for Software Registration.
Fax: +1 510-741-5885
e-mail: LSG_Software_Registration@Bio-Rad.com

Please provide the information in the completed registration form.

For network license registrations or software upgrade registrations, please submit your request for a new password by email only. Include your system ID, purchase order number, and the software catalogue number purchased along with the standard registration info in your message text.

Enable Network License (red HSK)

Current license
Single system license.
License expires on 29-Jun-2008.

System ID
413E2762

Password
Quantity One 4KC3R 56 EK353 P3 CJB9H OK Not OK

Copy System ID To Clipboard Done Cancel

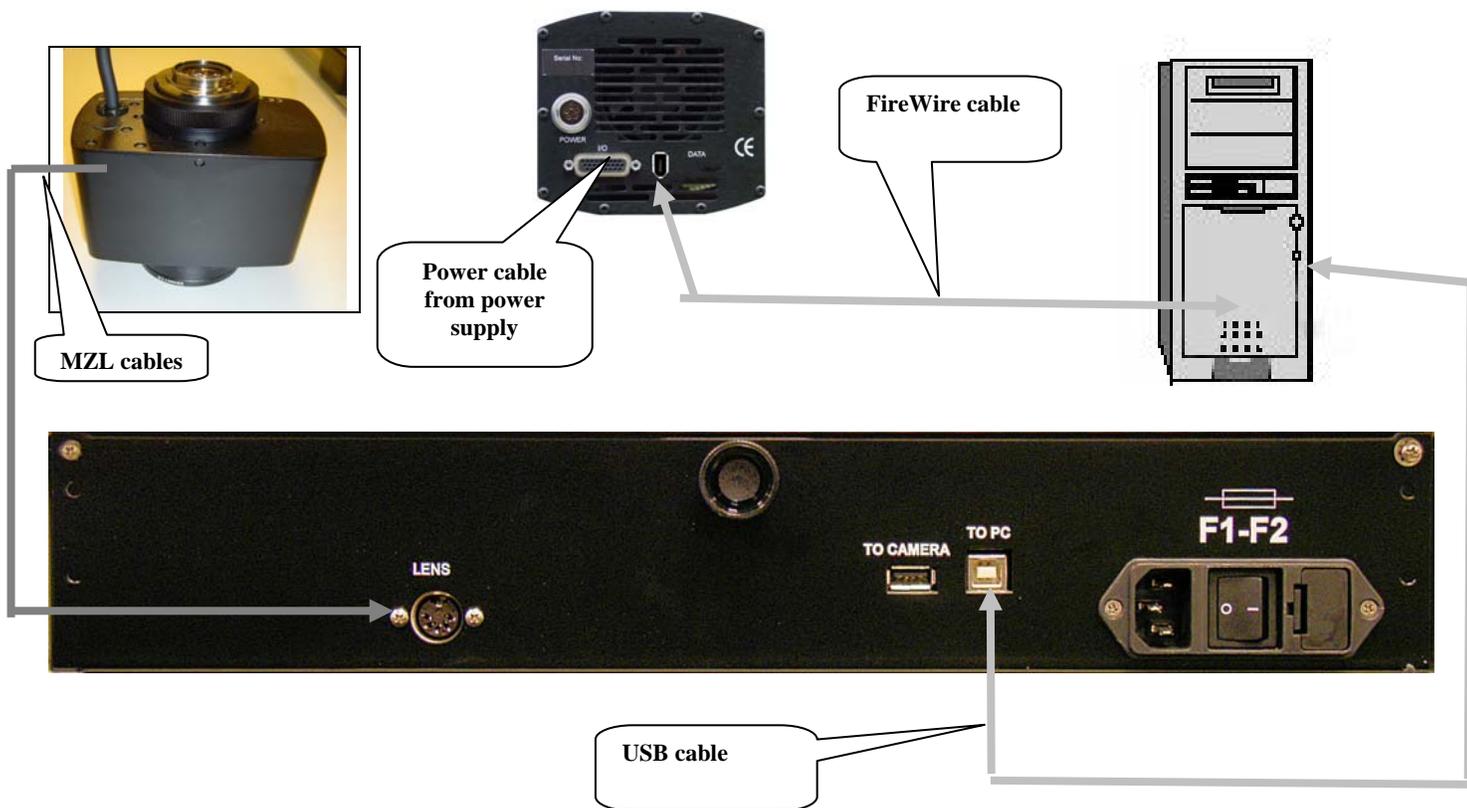
4.4.2 ChemiDoc™ XRS System Cable Configuration

Connecting the cabling harnesses.

1. Locate the FireWire cable. Connect one end of the FireWire cable connector to the FireWire connector on the camera.
2. Connect the other end to the FireWire connector on the PC/Mac.
3. The camera power supply cable should be plugged into the CCD camera power connector.
4. Connect one end of the USB cable to the connector labeled 'TO PC' on the hood, and the other end to the USB port on the PC.
5. Connect the MZL cable connector the extension cable. Connect the other end of the extension cable to the connector labeled LENS on the rear panel of the universal hood.

The following table describes the cable connectors and their designations.

Label	Instrument/Connection
6-pin FireWire cable/connector	FireWire connector from camera to PC
Camera power supply cord/power supply	Camera/PWR connector
10 ft USB cable	From Hood to PC
MZL (motorized zoom lens) cable	LENS Din connector to extension cable din connector
MZL extension cable	Extension cable din connector to Hood connector
Power cable	Connects the Hood to the power outlet on the wall



4.4.3 Firewire Card Installation

Please follow the instructions below to install the FireWire card into your PC or Mac.

ChemiDoc XRS – PC:

1. Install the FireWire (IEEE 1394) adaptor card into the PC if necessary. Make sure that the computer is powered off and the power cord is disconnected from the PC while installing.
2. Turn on the computer.
3. The Windows XP or 2000 operating systems will recognize the card and automatically install the appropriate driver for it.

ChemiDoc XRS – Mac:

Current Mac systems generally have onboard FireWire ports (connectors). The ChemiDoc XRS FireWire cameras can be plugged directly into any one of these connectors, and the Bio-Rad software interface will be able to communicate with the camera via this port.

4.5 Installing the White Light Transilluminator (Optional)

1. To install the white light transilluminator, open the enclosure door and pull the drawer toward you.
2. Locate the power cable positioned on the inside left side of the enclosure, behind the drawer slide.
3. Remove the black rubber that covers the banana plug and insert it into the white light transilluminator outlet. Make sure that the main power switch on the transilluminator is in the ON position. The transilluminator will not illuminate, because power to the white light transilluminator is controlled from the membrane touch pad.
4. To use the white light transilluminator, place it horizontally on the UV transilluminator and press the **TransWhite** button on the membrane touch pad.

When the white light transilluminator is not in use, store it in the two plastic holders located at the rear of the enclosure, as it stands against the back wall.



Storage of the white light transilluminator

4.6 Installing the Optional 17 mm or 25 mm Wide-Angle Lenses (ChemiDoc XRS System only)

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

- a. Lens f 0.95, 25 mm, wide-angle
- b. Lens f 0.95, 17 mm, wide-angle

The lens kit includes a lens and the light seal adaptor ring. See pictures below:



**17 mm wide-angle lens with
light seal adaptor**



**25 mm wide-angle lens with
light seal adaptor**

Setting Up the Lens:

1. Turn off the power to the enclosure 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.
Attach the 25 mm or 17 mm lens to the camera as shown below:



Remove existing motorized zoom lens



Install the wide angle lens

5. The wide-angle lenses come with an adapter. See picture below.



6. Place the adapter ring on the mounting plate.

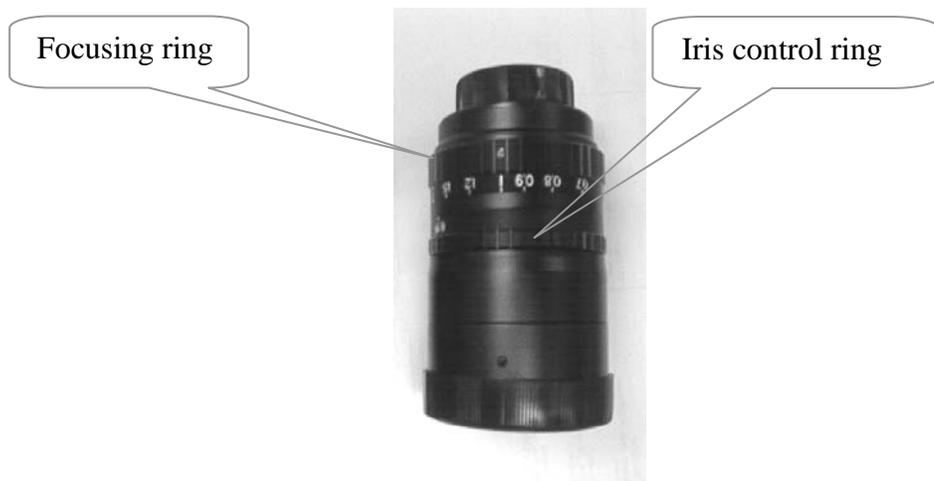
7. Position the camera lens assembly on the adapter ring while sliding the thumb screw through the slot on the camera bracket. Before tightening the screw, make sure that the wide-angle lens is seated on the gasket of the adapter ring, and that the back of the camera closely faces the camera bracket.

8. Tighten thumb screw. See pictures below:



Make sure that the lens is seated properly on the gasket in the adapter.

The wide angle lenses have an iris and focus ring that allows users to adjust for optimum light collection and focal plane. See image below:

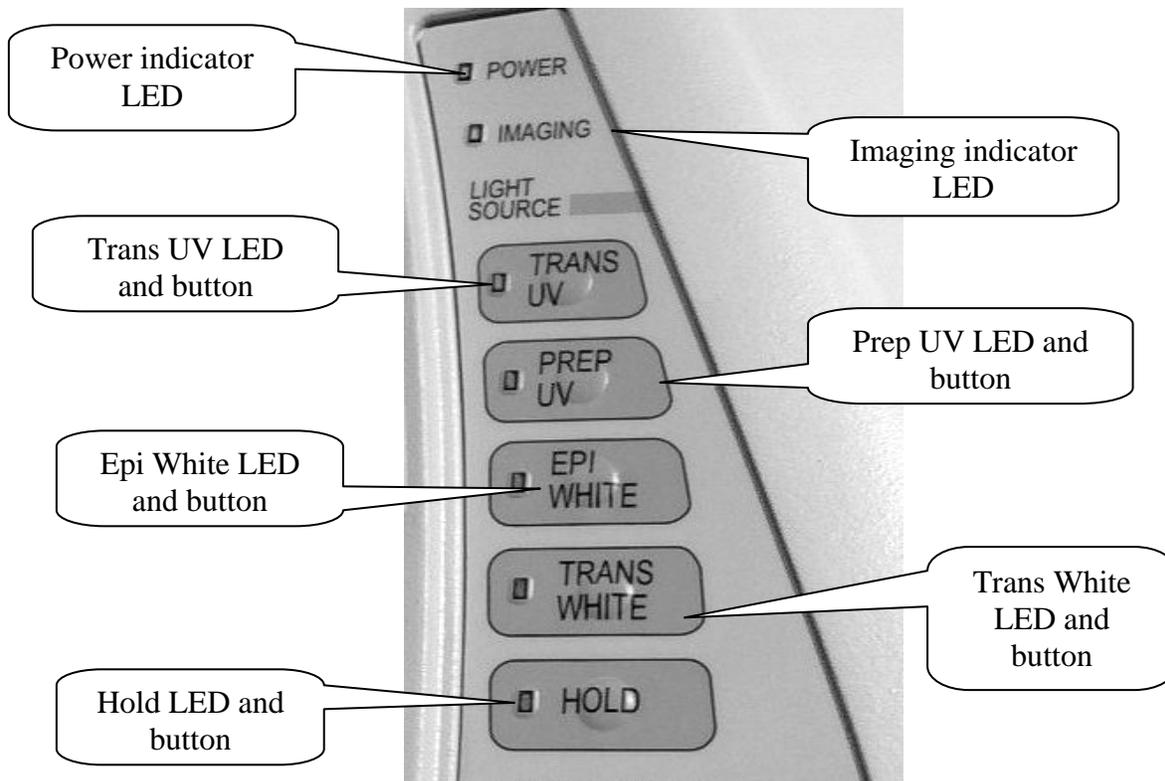


For imaging of chemiluminescent samples, make sure that the iris is opened all the way.

4.7 Description of System Function and System Initialization

4.7.1 Control Panel

The front membrane touch pad control panel of the Universal Hood II allows full control of the motorized zoom lens, UV transillumination, white epi illumination and white light transillumination. Please read the following section to become familiar with each function.



Membrane touch pad

The **Power** light tells you whether the system is turned on. The power on/off switch is located at the rear bottom-left side of the enclosure.

The **Imaging** LED blinks when you are acquiring an image with the camera indicating integration by the Camera. It also blinks if the computer is turned off.

Light Sources

The **TransUV** 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 automatically turned off when the front door is open
- It is automatically 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 the 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 radiation. 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 **Prep UV** 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 **Epi White** button controls the epi white illumination. Press the button to turn ON epi-white; 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, **Epi White** is automatically turned off.

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

If the **Conversion Screen** option is selected, place the 'Conversion Screen' on the sample area, select **Trans White Light**. It turns on the Trans UV.

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 will light up, indicating that the **Hold** function is active.

If opening the 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 the Lens Control Section below).

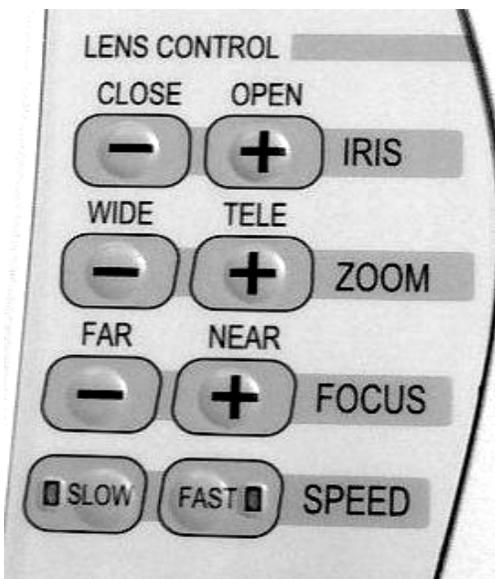
Lens Control

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. The size of the aperture opening allows the CCD sensor to take in more or less light. The **Iris** has two buttons. One button, **Close (-)**, reduces the size of the aperture and decreases the amount of light coming into the sensor, thereby making the image darker. The other button, **Open (+)**, opens the aperture and increases the amount of light coming into the sensor, resulting in a brighter image.

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

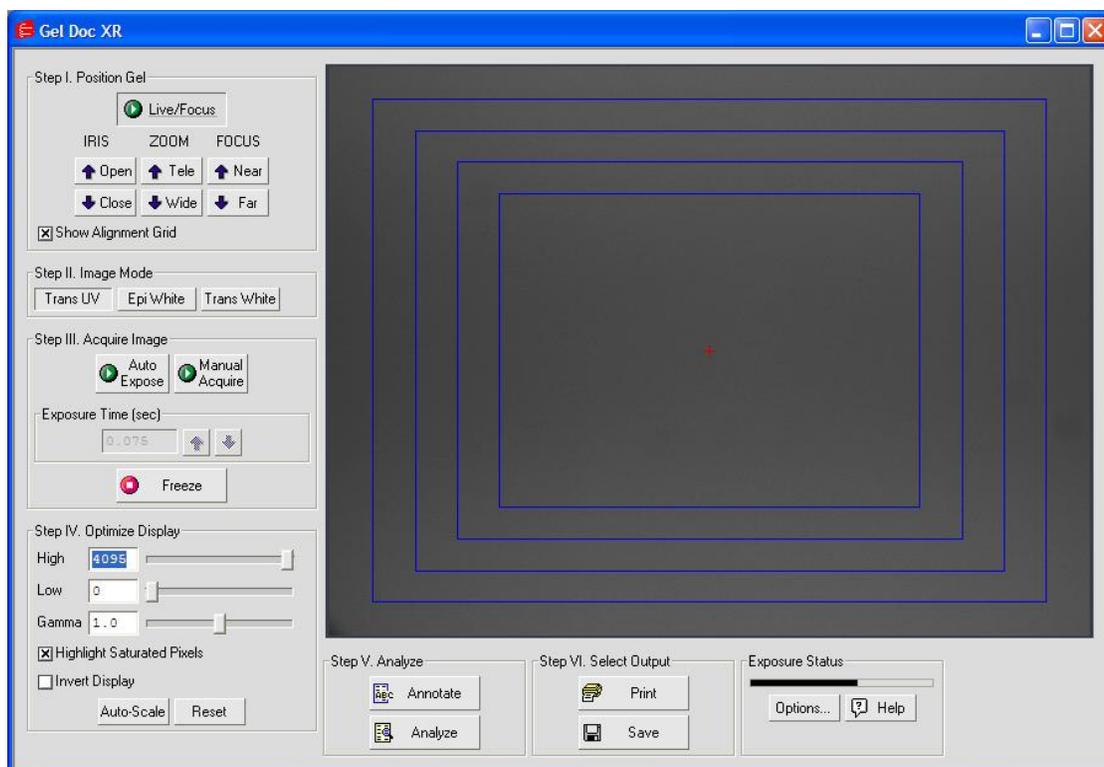
Zoom is adjusted using the **Zoom** buttons on the keypad. These buttons allow you to change the size of the image on the screen. Pushing the **Wide (-)** button zooms out (far field). Pushing the **Tele (+)** button zooms in (close up).



Membrane touch pad – Lens control section

Lens and Light Source Control Through the Computer

The functions described in the previous paragraphs can also be performed through the PC. The attached screen shot as applied to Gel Doc XRS is self-explanatory.



Filters: A **+1 diopter** is factory installed on the lens. This diopter should always remain on the lens assembly. A 580AF120 Ethidium Bromide **filter** is included in the accessory kit. Place this filter in position 1 or 2 of the filter slider (see 4.2.1). The Ethidium Bromide filter should be used for fluorescence (UV) and colorimetric (white light) applications.

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

STEP 1. Initial test for the Universal Hood II:

Procedure	Control Panel
<i>Make sure the door and drawer are closed and the computer is switched on.</i>	
Turn on the system	Power LED turns on after short blinking.
Wait 30 minutes for camera to warm up	Nothing will change except the camera will warm up.
Press the Epi White key	Epi-white LED turns on.
Open the door	Epi-lights are on, Trans UV LED blinks.
Press the Epi White key again	Epi-lights and LED are turned off.
Close the door	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 half way	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 turns off.
Close the drawer	Trans UV LED turns off.

Note: The light source buttons on the control panel are disabled when the Imaging LED blinks (indicating that the computer is switched off).

STEP 2. Procedure for initialization of the camera and lens assembly both (for GelDoc XR/ChemiDoc XRS systems)

1. Press the epi illumination button.
2. Open the door and determine if lights are on.
3. Place the focusing target on the UV transilluminator.
4. Double click on Quantity One software icon on the desktop. From File Menu, select Gel Doc XR or ChemiDoc XRS.

Note: “Dark Reference” comes up on first use for both GelDoc XR system. Please refer to the step 3 for details about reference file image acquisition.

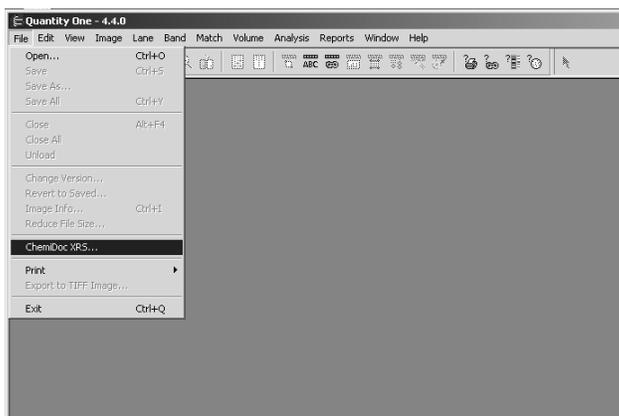
5. Select Live/Focus. This applies to Chemi-Doc XRS System only, Gel Doc XR does this automatically.
6. An image of the target will appear on the computer screen. Using the lens control buttons on the membrane touch pad or the control panel that appears in the software, find the best Iris, Focus, and Zoom conditions.

Note: Working with a widely open Iris and changing the Zoom may require you to adjust the Focus.

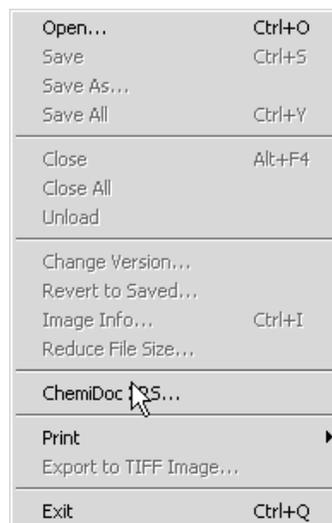
STEP 3. Reference file acquisition:

Please note that the steps described below must be performed in either of the following scenarios:

- When installing the system with a new computer or camera
 - When software is first installed or reinstalled for any reason
1. Make sure that all lights in the Universal Hood II are off.
 2. Make sure that the lens cap is on the lens. **This is critical!**
 3. Power ON the camera and the Universal Hood II.
 4. Wait 30 minutes for the system to warm up and stabilize.
 5. Double click on Quantity One software icon on the desktop.
 6. From File Menu, select Gel Doc XR, OR ChemiDoc XRS.



TDS Quantity One Window



**Select GelDoc XR
OR ChemiDoc XRS from file
menu**

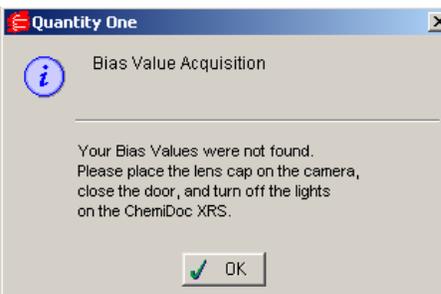
The following window will open with a notification that the system will be acquiring reference files, depending on the imager:

a. Gel Doc XR



Note: No lights should be turned ON. Please allow approximately 30 seconds for the acquisition of the reference file.

b. ChemiDoc XRS



This process takes a fraction of a second.

After the reference file acquisition is over the system will be ready to operate.

1. Turn ON the lights using the Epi-white touch pad button.
2. Place the focusing target on the transilluminator platen.
3. Click on Live/Focus.
4. An image of the target will be seen on the imaging screen.
5. Using the lens control buttons on the membrane touch pad or the control panel that appears in the Quantity One acquisition window, adjust the iris, focus, and zoom.

Note: For additional details on Reference File Acquisition, refer to the Quantity One software manual.

Section 5 Operation of the Universal Hood II

5.1 Operating the Unit

The Gel Doc™ XR and ChemiDoc™ XRS systems are easy-to-use instruments. In the Quantity One® acquisition window 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 II

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

NOTE: Turn the camera power on, if you have not already done so.

5.1.2 Position Your Gel

1. Open the drawer of the Universal Hood II.
2. Press the Epi White button to turn on the epi white lights.
3. Center your gel on the transilluminator platen and close the drawer.
4. Adjust the lens iris, zoom, and focus while looking at the computer screen.
5. Open the door and reposition the gel, if necessary.
6. When using the white light conversion screen or the white light transilluminator, focusing is easily achieved if the iris is slightly closed.

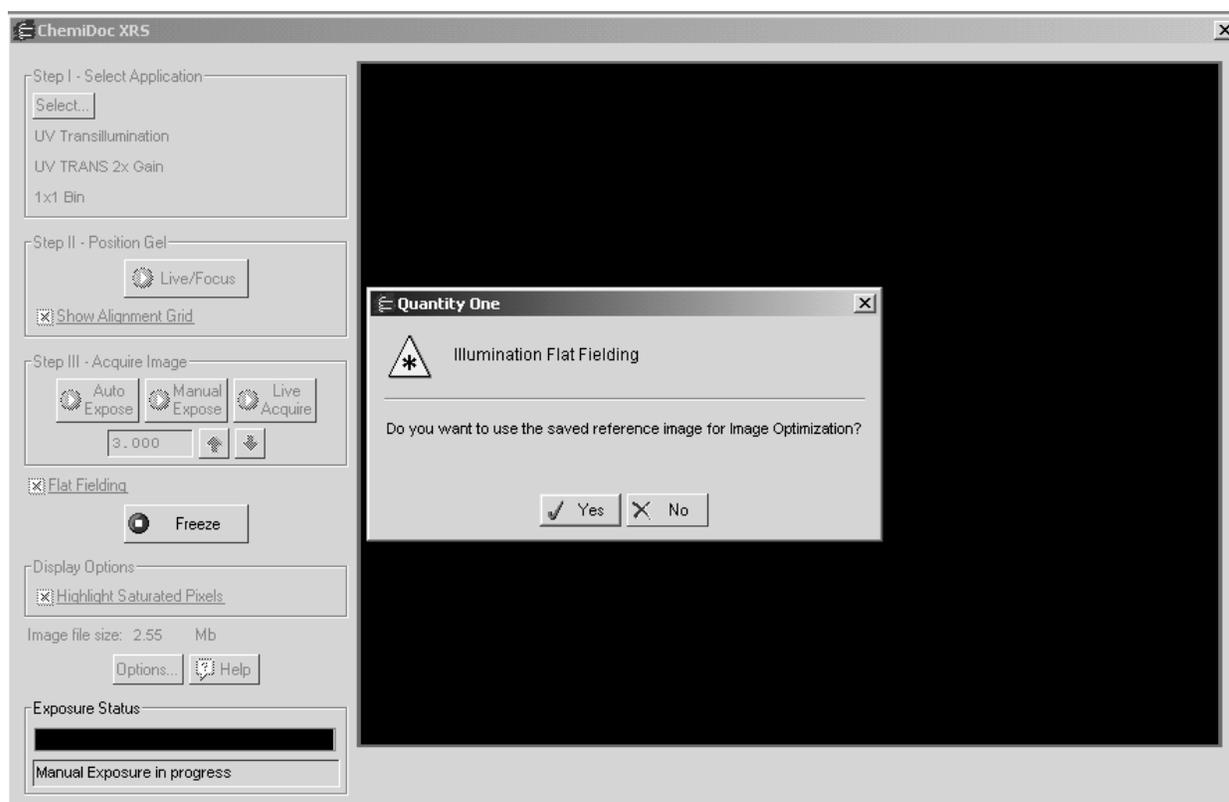
5.1.3 Acquiring an Image

1. Press the appropriate light source for your sample.
2. Select exposure time (see software manual for details) or select auto exposure..
3. When a satisfactory image is seen, click **Freeze**.

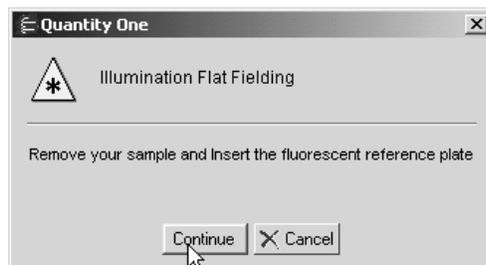
5.1.4 Acquiring an Image With Flat Fielding

Note: This applies to ChemiDoc XRS systems only where flat fielding is made available for acquiring images with UV or white light transillumination.

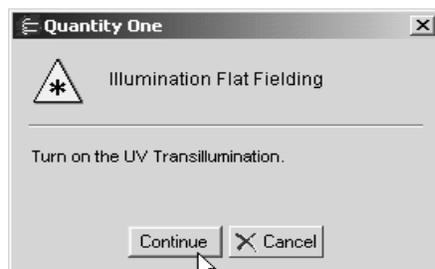
1. Center your sample on the platen.
2. Turn ON the UV or white light transilluminator.
3. Adjust zoom, focus, and iris to get the best possible image in Live/Focus mode.
4. Make sure that the box labeled Flat Fielding is checked to enable flat fielding.
5. Select Auto Expose or Manual Expose.
6. Following 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 that were used to previously generate a flat field reference image file. See image on the following page.



- 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 White Light conversion screen is used to collect the reference flat fielding image. In either case, you must remove the sample from the platen.



- Remove the sample from the transilluminator. Remove any liquid or residue remaining from the sample platen. Place the fluorescent reference plate on the platen. Make sure that the plate covers the entire glass surface. Close the door and then click on Continue in the window shown above.
- The next prompt will direct you to turn ON the UV transilluminator. Press the UV transilluminator or white light transilluminator button on the hood, as the case may be, and click on Continue.

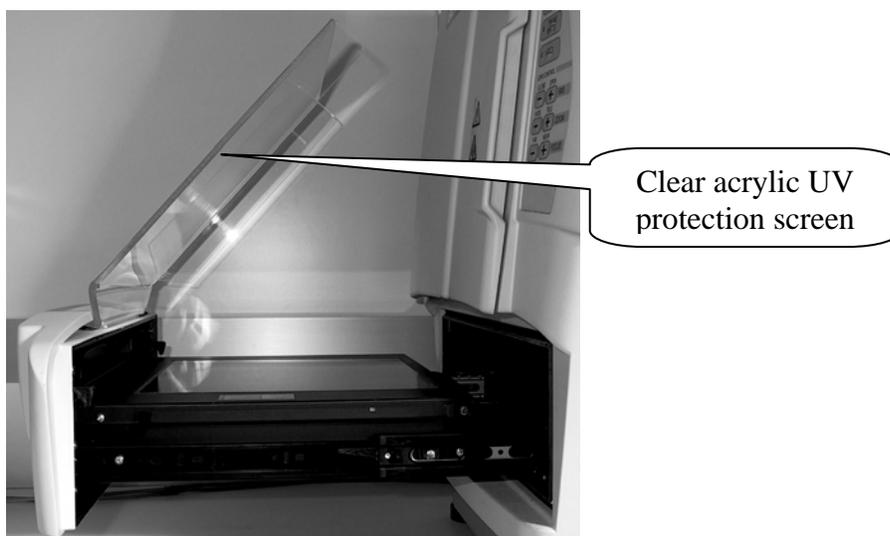


Note: When using the white light, you must turn ON the UV transilluminator after removing the sample.

12. The system will automatically acquire a reference image, and a flat-fielded corrected image of the sample will be generated for you to save and analyze.
13. For additional details on flat fielding please refer to the Quantity One Software Manual. You may also click on the Quantity One **Help** button for a detailed description.

5.2 Cutting Gels

1. Open the drawer until it is fully extended and the Trans UV LED stops blinking.
2. Place the clear acrylic UV protection screen in the horizontal slot in the inside of the drawer facing 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 **Trans UV** button to turn on the UV illumination.
4. Cut the gel.
5. Press the **Trans UV** button and the UV transilluminator will turn off. Remove the acrylic UV protection shield before closing the drawer.

Section 6 Troubleshooting

Problem	Possible Cause	Solution
Image is not visible on the monitor	<ul style="list-style-type: none"> • Aperture is closed • Incorrect monitor settings • Wrong cable connections 	<ul style="list-style-type: none"> • Open the aperture • See your computer manual • See Appendix A for correct cabling
Image is not bright enough	<ul style="list-style-type: none"> • Wrong aperture setting • Insufficient exposure time 	<ul style="list-style-type: none"> • Open the aperture • Select longer exposure time
Impossible to image whole sample area	<ul style="list-style-type: none"> • Lens is zoomed-in too close 	<ul style="list-style-type: none"> • Zoom-out the lens
Printout does not look the same as the image on the monitor	<ul style="list-style-type: none"> • Monitor settings are wrong • Thermal printer settings are wrong 	<ul style="list-style-type: none"> • Read the manual for the printer to ensure proper settings
Light leakage into the darkroom	<ul style="list-style-type: none"> • The lens body is not properly centered and against the light seal gasket on the hood • The rear hole on the MZL not closed with the screw 	<ul style="list-style-type: none"> • Loosen the bracket and move the camera around, to properly seal the hood opening or adaptor plate, as the case may be • Close the hole with the black plastic screw
Hot (very bright) pixels are seen in the image (ChemiDoc™ XRS only)	<ul style="list-style-type: none"> • Hot pixels are more susceptible to dark current than surrounding pixels. 	<ul style="list-style-type: none"> • Select reference by clicking on the appropriate box in the Options window
Hot (very bright) pixels are seen in the image (Gel Doc XR only)	<ul style="list-style-type: none"> • Corrupted reference dark image 	<ul style="list-style-type: none"> • Click on Options button and then click on Reset Reference Dark
ChemiDoc XRS camera will not respond/camera not found	<ul style="list-style-type: none"> • Camera power may be turned off • Controller cables may not be seated properly • Software driver for the camera is missing • Computer power-saving modes may be interfering with the camera driver • Multiple FireWire devices are installed on the same computer • Camera may be defective 	<ul style="list-style-type: none"> • Turn ON the power to the camera • Make sure that all cables are connected properly • Install Quantity One software again if the camera driver is not present • Disable power-saving modes on the computer • Exit out of the Quantity One software and turn off power to the ChemiDoc XRS camera • Power the camera back on and restart the software • Replace camera
ChemiDoc XRS image will not autoexpose	<ul style="list-style-type: none"> • The sample is too bright and saturates the image at the minimum possible exposure 	<ul style="list-style-type: none"> • Close the Iris control until autoexpose is possible
Unable to focus on the sample using white light transilluminator or conversion screen	<ul style="list-style-type: none"> • Aperture is open too wide causing a shallow depth of field 	<ul style="list-style-type: none"> • Close the iris slightly and then focus again. Repeat until good focus is achieved

Section 7 Accessories and Replacement Parts

Accessories and Replacement Parts

Catalog number	Description
170-8001	UV/White light conversion screen
170-7950	White light transilluminator upgrade for Universal Hood II
170-8089	Printer, digital, Mitsubishi P93DW, 100/240 V, USB
170-7581	Mitsubishi thermal printer paper, 4 rolls
170-8074	Filter, 520DR30
170-8075	Filter, 560DF50
170-8076	Filter, 630BP30
170-8077	Filter, 440BP70
170-8081	Kit, filter, 580AF120, 62 mm
170-8072	Lens, f/0.95, 25 mm, wide-angle lens (ChemiDoc™ XRS system only)
170-8073	Lens, f/0.95, 17 mm, wide-angle lens (ChemiDoc XRS system only)
931-0198	Lens, motorized, 12–75 mm, f/1.2 (ChemiDoc XRS system)
921-0265	Lens, motorized, 8.5–51 mm, f/1.2 (Gel Doc™ XR system)
170-8068	Shield, UV, Universal Hood II
170-3759	Bio-Rad fluorescent ruler
170-3760	Gel cutter ruler
170-7813	Sample holders for gels
170-8008	Fluorescent reference plate (ChemiDoc XRS system only)
931-0071	Cable, USB, Type A to B, 10' long
901-0064	Cable, USB, Type A to B, 6' long
10007733	Cable, Din, 5 pin, 3 ft, blk.
100-2827	Lamp, epi illumination, 5 W
100-1361	Lamp, UV B, 302 nm, 1
170-8097	Kit, 6 lamp, 302 nm
170-8098	Kit, 6 lamp, 254 nm
170-6887	Kit, 6 lamp, 365 nm
170-8080	Kit, accessory, ChemiDoc XRS system

170-8173	Card, FireWire, ChemiDoc XRS systems
170-8177	Cable, FireWire, 10' for ChemiDoc XRS system
170-8099	ChemiDoc XRS camera with MZL
100-2784	UV transilluminator lid (includes filter glass)
100-2785	Universal Hood II right shield epi-illumination (lid complete)
100-1948	Universal Hood II opal filter epi-illumination (without metal frame)
100-2786	Universal Hood II left shield epi-illumination (lid complete)
100-2787	Universal Hood II screw feet, 4
100-3951	¼-20 screw with black knob
100-1951	Fuse T 2 A, 250 V, 10
100-1952	Fuse T 4 A, 250 V, 10
100-1370	UV TR starter, 3
170-9600	Quantity One [®] software, PC/Mac

Section 8 Maintenance and Parts Replacement

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

8.1 Epi Illumination Lamp Replacement

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

1. Turn system power off.
2. Remove the power cord.
3. Open the enclosure door.
4. Locate the epi-lamp housing.
5. Locate the socket head screw that holds each lamp housing to the internal side of the hood.
6. Remove this screw. The cover screen with a plastic piece will come loose.
7. Pull on the cover to remove it from the box and the lamp will become visible.
8. To remove the lamp, hold it from the receptacle and then pull it from the plastic holder.
9. Insert the new lamp into the lamp holder and then push it into the receptacle.
10. Reassemble the cover.

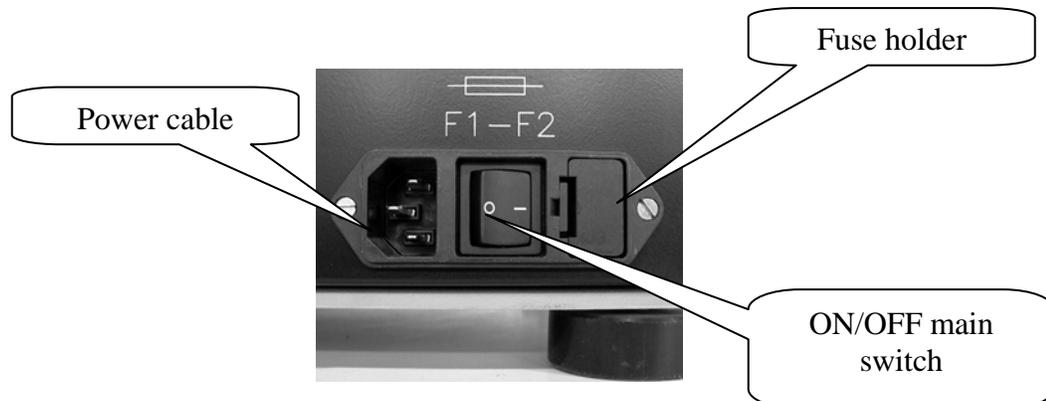


Epi-white light 5 W assembly (left side)

8.2 Fuse Replacement



Always unplug the instrument before changing or checking the fuses.



Power entry module

This unit is protected by 2 fuses (5 x 20 mm, 2A Slo-Blo). The fuses are located in the rear left side in a fuse holder. See picture above.

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

8.3 UV Transilluminator



UV transilluminator without cover

8.4 Lamp Replacement

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.

1. Turn off the power.
2. Disconnect the power cord from the Universal Hood II.
3. Remove the four screws located on the left/right sides of the trans cover.
4. Remove the cover with the UV filter by sliding it forward, then lifting it up.
5. Place it down on its backside on a nonabrasive surface so that the glass does not get scratched.
6. **Caution: Do not put the UV filter directly on the bench.** Wear gloves when touching the lamps. Remove the lamp by rotating until it becomes loose and the pins come to a vertical position.
7. Remove the lamp. Install the new lamp by rotating so that the pins are horizontal and the lamp is tight.
8. Reassemble the cover and retighten the screws on both sides.



Lamp replacement



Starter replacement

Starter Replacement (Catalog #100-1370)

1. Turn off the power.
2. Disconnect the power cord from the Universal Hood II.
3. Remove the four screws located on the left/right sides of the trans cover.
4. Remove the cover with the UV filter by sliding it forward, then lifting it up.
5. Place it down on its backside on a non-abrasive surface so the glass does not get scratched.
6. **Caution: Do not put the UV filter directly on the bench.**
7. To remove the starter, rotate it counterclockwise and pull out.
8. To replace the starter, insert it into the holder and rotate clockwise.
9. Reassemble the cover and retighten the screws on both sides.

Appendix A: Technical Specifications

Model	Gel Doc™ XR	ChemiDoc™ XRS
<i>Application</i>		
Chemiluminescence	No	Yes
Fluorescence	Yes	Yes
Chemifluorescence	No	No
Colorimetry/densitometry	Yes	Yes
Gel documentation	Yes	Yes
Isotopic imaging	No	No
<i>Hardware specifications</i>		
Maximum sample size (cm)	28 x 36	28 x 36
Maximum image area (cm)	25 x 26	25 x 26
Excitation source	Trans-UV 302, (254, 365 nm and white, optional), epi white light	Trans-UV 302, (254, 365 nm and white, optional) epi white light
Illumination modes	3 Trans UV and white, epi white	3 Trans UV and white, epi white
Detector	CCD	Supercooled CCD
CCD resolution (H x V)	1,392 x 1,040	1,392 x 1,040
Pixel size (H x V in microns)	4.65 x 4.65	6.7 x 6.7
Cooling system	No	Peltier cooled
Camera cooling temp.	NA	-50°C
Filter holder	3 positions 2-emission filter 1-chemi	3 positions 2-emission filter 1-chemi
Emission filters	1 included (amber), 4 optional	1 included (amber), 4 optional
Dynamic range	>3.0 orders of magnitude	4.0 orders of magnitude
Pixel density (gray levels)	4096	65,536
Dynamic flat fielding	-	Yes, <5% CV
Instrument size (cm)	36(L) x 60(W) x 96(H)	36(L) x 61(W) x 96(H)
Instrument weight (kg)	32	32
<i>Software specifications</i>		
Application driven	Yes	Yes
Windows XP	Yes	Yes
Windows Vista	Yes	Yes
Mac OS X	Yes	Yes
Image file size (MB)	~2.5	~2.5
<i>Operating ranges</i>		
Operating voltage	100/115/230 V AC nominal	100/115/230 V AC nominal
Operating temperature	10–28°C (21°C recommended)	10–28°C (21°C recommended)
Operating humidity	<70% non-condensing	<70% non-condensing

Legal Notices

Coomassie is a trademark of BASF Aktiengesellschaft. Cy is a trademark of GE Healthcare Group Companies. FireWire, Mac, and Mac OS are trademarks of Apple, Inc. Hoechst is a trademark of Hoechst GmbH. Mitsubishi is a trademark of Mitsubishi Companies. Slo-Blo is a trademark of Lifford, Inc. Sony is a trademark of Sony Corporation. SYBR, SYPRO, and Texas Red are trademarks of Invitrogen Corporation. Bio-Rad Laboratories, Inc. is licensed by Molecular Probes, Inc. to sell SYPRO products for research use only, under US patent 5,616,502. Windows, Windows XP, and Windows Vista are trademarks of Microsoft Corporation. Practice of the polymerase chain reaction (PCR) may require a license.



**Bio-Rad
Laboratories, Inc.**

Life Science
Group

Web site www.bio-rad.com **USA** 800 4BIORAD **Australia** 61 02 9914 2800 **Austria** 01 877 89 01 **Belgium** 09 385 55 11 **Brazil** 55 21 3237 9400
Canada 905 364 3435 **China** 86 21 6426 0808 **Czech Republic** 420 241 430 532 **Denmark** 44 52 10 00 **Finland** 09 804 22 00 **France** 01 47 95 69 65
Germany 089 318 84 0 **Greece** 30 210 777 4396 **Hong Kong** 852 2789 3300 **Hungary** 36 1 455 8800 **India** 91 124 4029300 **Israel** 03 963 6050
Italy 39 02 216091 **Japan** 03 6361 7000 **Korea** 82 2 3473 4460 **Mexico** 52 555 488 7670 **The Netherlands** 0318 540666 **New Zealand** 0508 805 500
Norway 23 38 41 30 **Poland** 48 22 331 99 99 **Portugal** 351 21 472 7700 **Russia** 7 495 721 14 04 **Singapore** 65 6415 3188 **South Africa** 27 861 246 723
Spain 34 91 590 5200 **Sweden** 08 555 12700 **Switzerland** 061 717 95 55 **Taiwan** 886 2 2578 7189 **United Kingdom** 020 8328 2000
