# *1.1 ImageQuant Imaging System Setup*

## 1.1.1 System Components

The ImageQuant 300 System includes:

- High-performance CCD camera
- Zoom lens, close-up 2+ diopter lens, and interference filter
- (optional) Computer with keyboard, mouse, and monitor
- (optional) Windows operating system (preinstalled)
- ImageQuant image processing and analysis software
- (optional) ImageQuant light cabinet with UV transilluminator and white light fold-down transilluminator
- (optional) wide-angle fast lens
- (optional) epi-illuminating UV lights
- (optional) printer

Check the packing list included with the system to verify that all components have been received.

## 1.1.2 System Placement

As with all electrical instruments, the ImageQuant System should be located away from water, solvents, or corrosive materials, on a table or bench top that is dry and stable. Further, the system should be placed away from interfering electrical signals and magnetic fields. If possible, a dedicated electrical outlet should be used to eliminate electrical interference from other instrumentation in your laboratory.

## 1.1.3 Cable Connections

The cable ends and the ports into which they are inserted are keyed or unique for each connection to eliminate confusion. The connections are pictured and described in the next few sections.

**WARNING**
**Make sure the power is OFF and all power cords are disconnected while connecting the cables and setting up the instrument.**

## 1.1.4 Cabinet Assembly

When you remove the light cabinet from its shipping carton, it is already partially assembled. The camera mounting assembly is packed separately in the same container. The UV transilluminator and cabinet top are both packed in separate boxes. Make sure you have received all the hardware before discarding the shipping carton. Start by placing the cabinet on a level flat surface, in a position where you can easily reach the top, front and back.

### Attaching the Camera to the Cabinet

Take the following steps to attach the camera to the cabinet:

1. Remove the camera and lens from the packaging and attach the lens to the camera.

2. Place the stand in a vertical position. Place the metallic washer seal over the hole on the base of the stand.

3. Attach the camera to the post using the fastening knob. Lower the camera until it is firmly seated in the washer seal at the base of the stand. The lens should poke slightly through the hole at the base of the camera stand.

4. Place the foam rubber camera stand gasket in the cabinet over the location where the camera stand will be placed.

5. Carefully lower the camera stand through the top of the cabinet, placing it over the gasket and positioning the lens directly above the hole that leads to the filter wheel.

6. Fasten the camera post to the top shelf of the cabinet using the screws that are provided.

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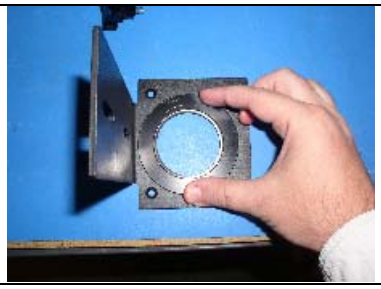
|  |  |  |
| Camera stand, camera, fastening knob and washer seal. | Place washer seal on camera stand | Use fastener knob to attach camera to stand, base of camera should rest within washer seal. |

## Installing the UV Transilluminator

Take the following steps to install the UV transilluminator (this is a box-shaped UV lighting apparatus that rests at the bottom of the cabinet):

1. At the bottom of the cabinet, there is an extendable metal tray that is held in place by a single screw (this is to prevent the tray from being damaged during shipping). Start by removing this screw and then pulling the tray out so that it is fully extended.

2. With the tray fully extended, re-insert the screw (This ensures that you will have the screw if you ever have to ship the unit and also prevent light coming through the threaded hole that seats the screw.)

3. Note that the extended tray has four holes, which match the rubber legs on the transilluminator. Place the transilluminator on the tray so that its legs are firmly seated in these holes.

4. Plug the power cord at the bottom of the cabinet into the socket at the back of the UV transilluminator.

5. Push the tray back into the cabinet.

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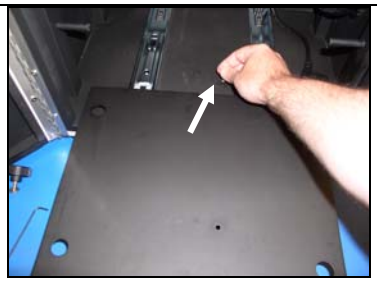
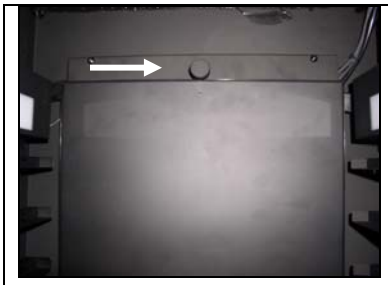
|---|---|---|
|  |  |  |
| Close-up of the slide-out tray at the bottom of the cabinet. Note that there is a screw that holds the tray in place for shipping. Remove this screw to allow the tray to slide freely. | Once the tray is extended, replace the locking screw in its original position. This will prevent light from entering into the cabinet through the threaded hole. | Place the UV transilluminator on the tray (making sure that its rubber “feet” are firmly seated in the holes on the tray) and then plug the cabinet’s power cord into the back of the transilluminator. |

## Unfastening the Fold-Down White Light Tray

The cabinet contains a fold-down light tray that is locked for shipping (see illustration below). Take the following steps to unfasten the light tray:

1. The light tray is held in place by a detachable knob that screws into place just above the light tray. Unscrew the knob until it is separated from the cabinet and the tray can move freely.

2. Note the bottom of the tray has a threaded hole. Insert the knob into this hole and turn it clockwise until it is firmly seated.

| | | |
|---|---|---|
|  |  |  |
| Close-up of the fold-down white light tray located at the back of the cabinet. This tray is secured by a detachable knob. | Release the white light tray by unscrewing the knob, which will allow the tray to swing down freely. | Once the tray is released, screw the knob back into the threaded hole underneath the light tray, where it will serve as a handle. |

## Attaching the Hood

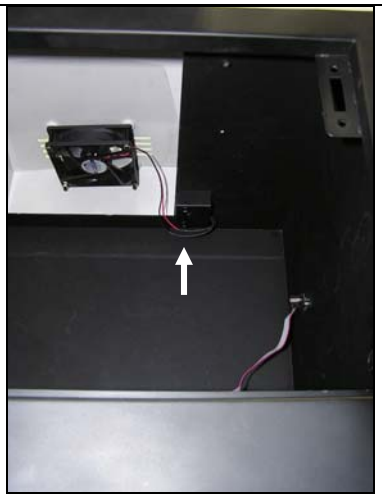
Take the following steps to attach the cabinet hood and connect the hood fan:

1. Place the hood on top of the cabinet so the holes for screws are centered over the corresponding holes in the top of the cabinet.

2. From within the cabinet, attach the hood fan's power cord to the temperature board socket on the top- right side of the cabinet.

3. Fasten the hood to the cabinet using M4x16 socket head screws.

The cabinet hood is positioned over the top of the cabinet

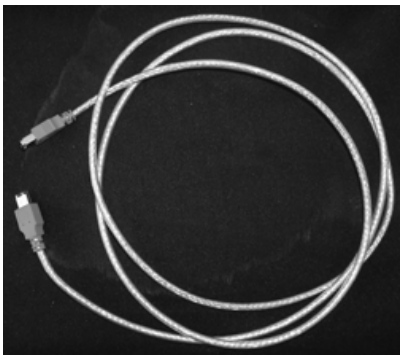


Once the hood is positioned over the top of the cabinet, plug the fan cable into the socket on the top-right side of cabinet.

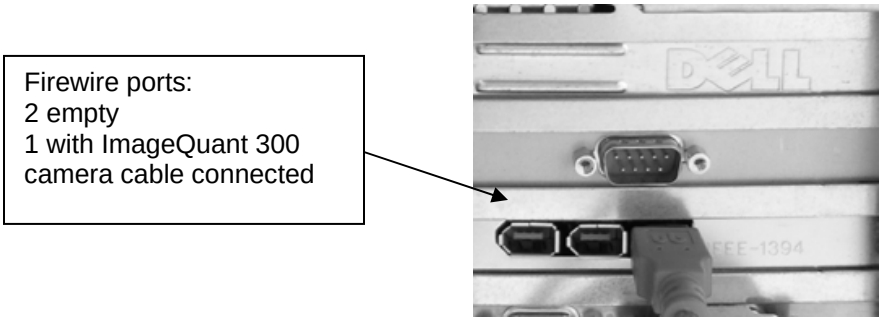
## 1.1.5 Camera Installation

The ImageQuant camera connects via a standard IEEE 1394 firewire connection. If the system was shipped with a computer, the firewire card will be pre-installed. If the system was not shipped with a computer it will be necessary to install the firewire card first before installing the camera and software. Please refer to the special addendum included with systems shipped without a computer for detailed instructions on the hardware and software installation.

1. Locate the ImageQuant firewire camera cable:

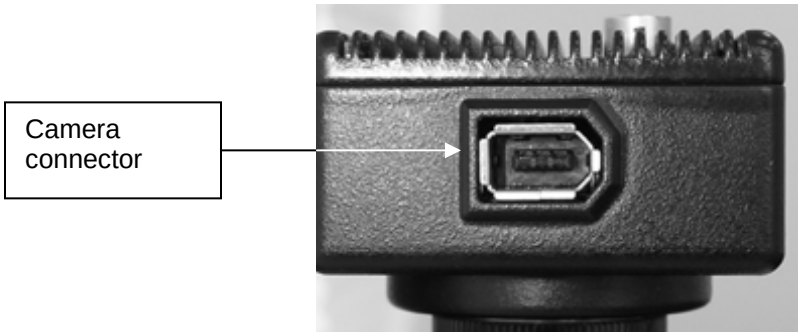


2. Connect the firewire cable to back of the computer in any of the open firewire ports.



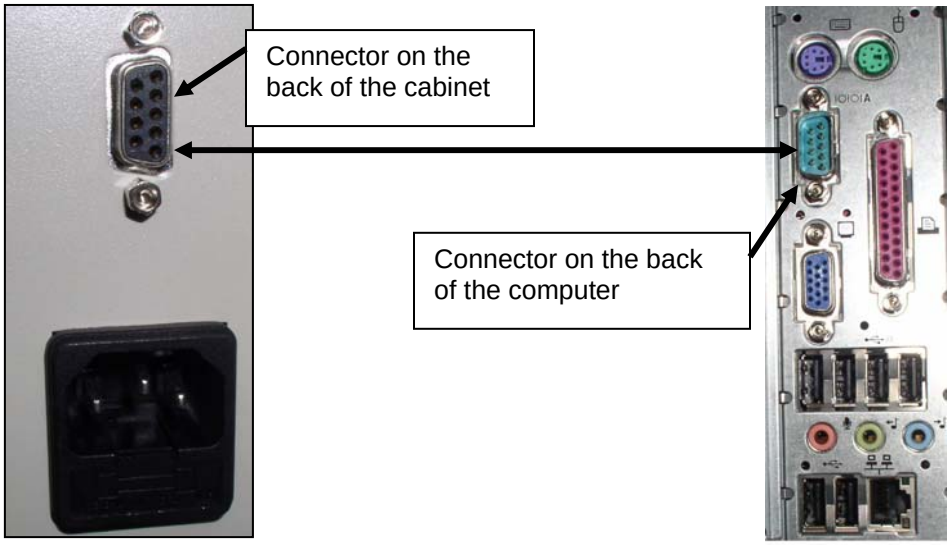

Firewire ports located on the back of the computer

3. Connect the firewire cable to the side of the camera.



## 1.1.6 Connecting the Cabinet

The cabinet connects to the back of the computer via an RS232 cable.



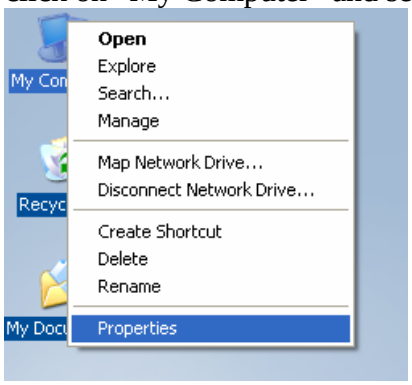

Ports on the back of the cabinet and computer respectively.

Power on the cabinet after the Windows operating system has fully loaded. The ImageQuant Imaging System is now ready for use.

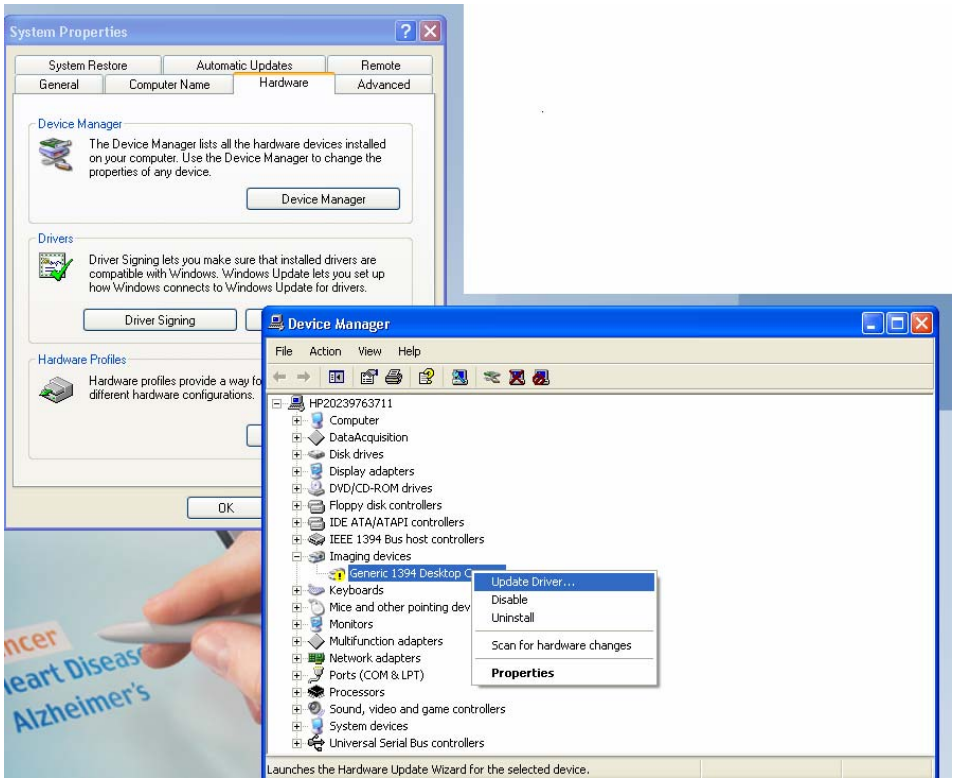
# IQ300 Software Installation

(If the computer contains a pre-installed firewire card or an on-board firewire port, please skip to step #4)

1) Install the firewire card into an available PCI slot on the motherboard of the PC.
2) Boot up the computer.
3) The firewire card should automatically be detected by the Windows operating system. If not refer to the firewire card instruction manual and/or the computer operating manual instructions.
4) Install **ImageQuant 300 Capture** software by placing the autorun CD into the CD ROM on the computer. The CD will automatically begin the installation routine. If the computer does not detect the CD, explore the contents of the CD and manually run the file **ImageQuant300.exe**.
5) Follow the default software installation instructions.
6) After the computer has re-booted back to the Windows operating system, right click on "My Computer" and select "Properties":

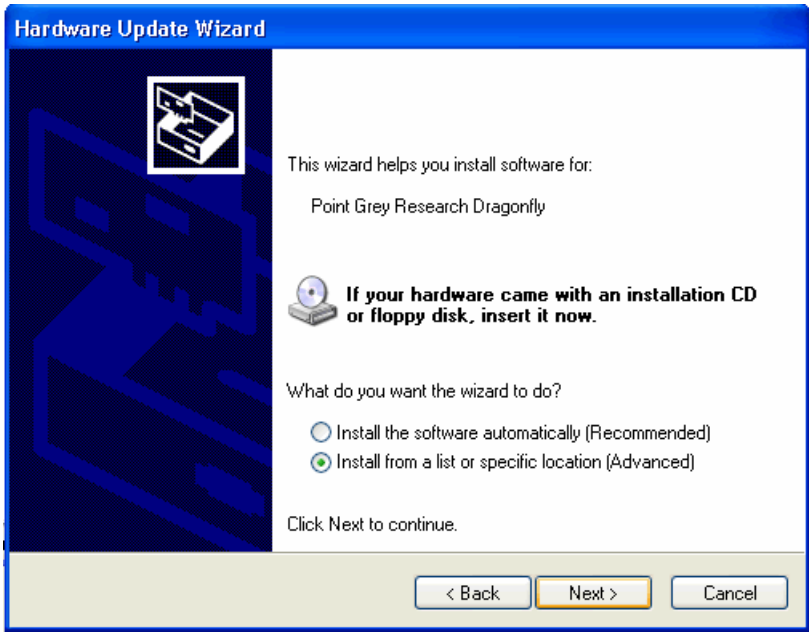



7) Go to the Device Manager and find the exclamation mark under "Imaging Devices." Right click on generic 1394 desktop and select Update Driver.

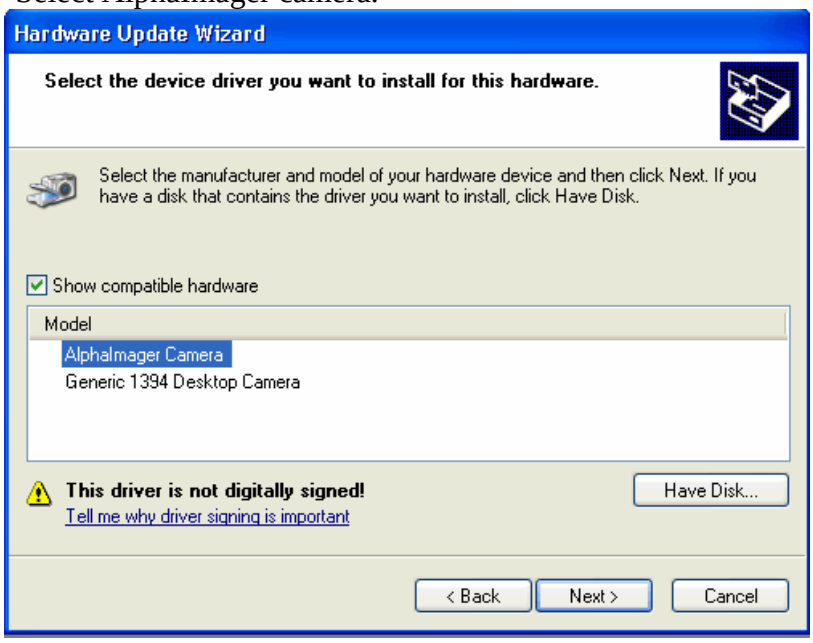



8) Select “No, not this time” when asked to connect to Windows Update

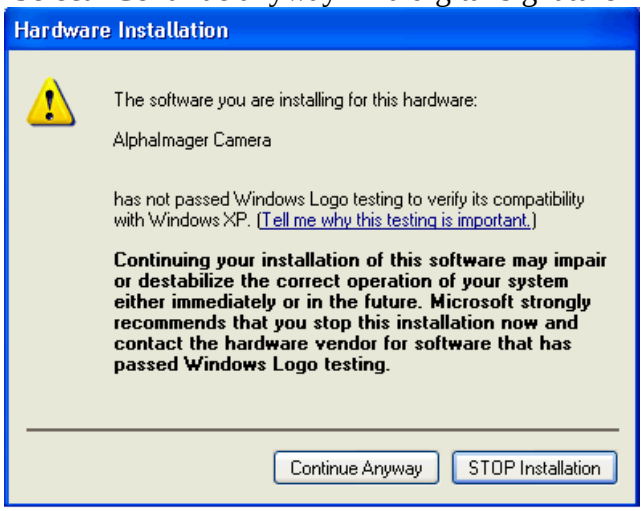

9) Select “Install from a list or specific location (Advanced)”


Hardware Update Wizard
This wizard helps you install software for:
Point Grey Research Dragonfly
If your hardware came with an installation CD or floppy disk, insert it now.
What do you want the wizard to do?
Install the software automatically (Recommended)
Install from a list or specific location (Advanced)
Click Next to continue.
< Back
Next >
Cancel

10) Select AlphaImager camera.




11) Select “Continue anyway” if a digital signature message appears.



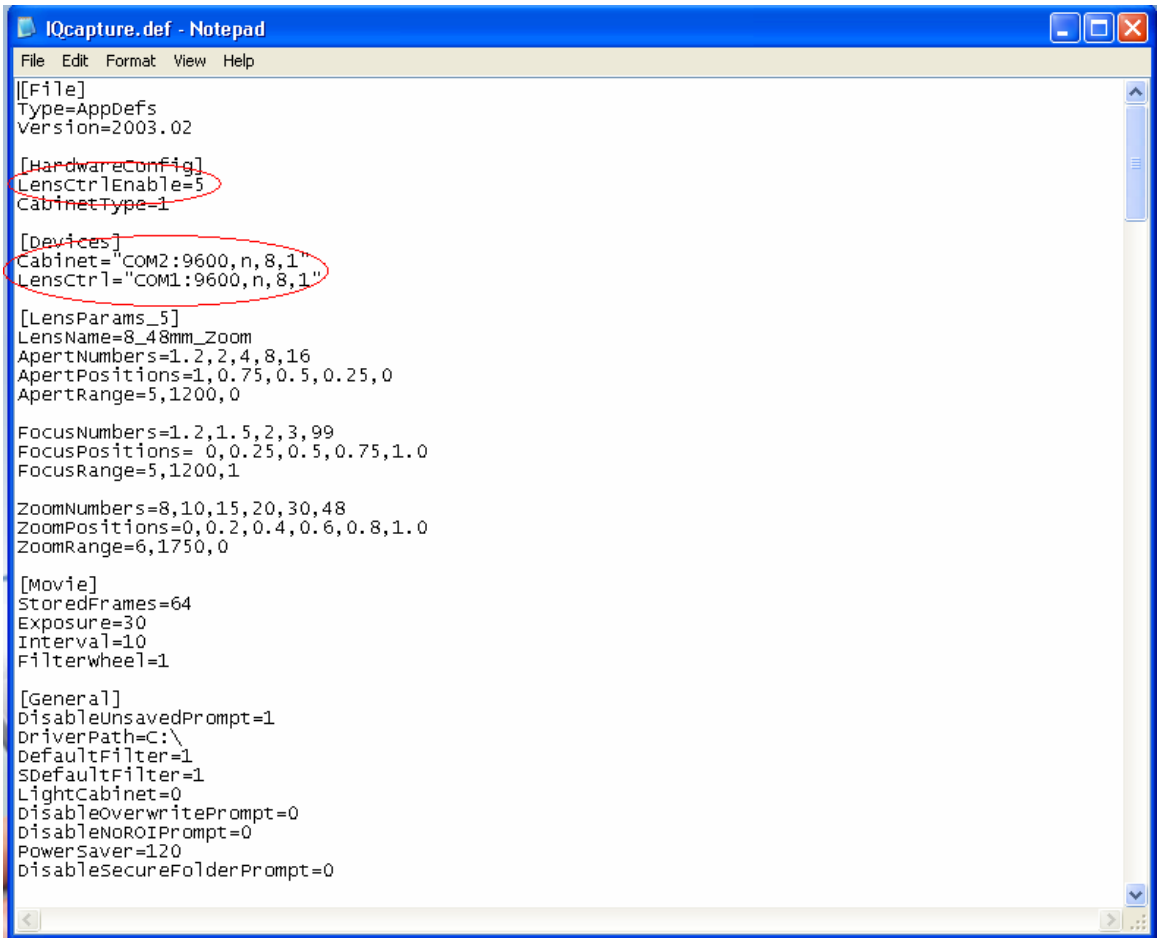

12) After the driver installation is complete, the error message should be resolved in the device manager.

13) Exit out of the device manager.

# Updating the IQcapture.def file

*If you are able to open the IQ 300 software but find you cannot control the motorized zoom, or if you cannot control the cabinet, you may need to make modifications to the IQcapture.def file.*

1) Open the IQcapture.def file using notepad. It is in the IQ300 folder, which is typically under C:\ProgramFiles\IQ300.
2) Open the file using Notepad.




3) The settings that might need to be modified are circled
    a. If you have a motorized zoom, LenCtrlEnable must be set to 5, not 0. If there is a semicolon in from of LensCtrl, delete the semicolon.
    b. The COM port that your cabinet is plugged into to must be set in IQCapture.def. If your cabinet is plugged into COM port 1, then you would change the IQcapture.def to read Cabinet = “COM1: 9600, n, 8, 1”.

If it is plugged into COM port 3, it must read Cabinet = “COM3: 9600, n, 8, 1”.

c. If you have a motorized zoom, you must also determine what COM port your motorized zoom control is plugged into, and modify IQcapture.def file to reflect that COM port.

4) Save the IQcapture.def, and launch the software.

# *1.2 ImageQuant System Quick Guide*

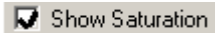
**Note: This is intended as a quick reference guide for acquisition. For more detailed information on the individual features reference section 1.6 of this manual.**

1. Power on the system:
   a. Turn on the computer, monitor, and optional printer.
   b. After the computer has booted up completely to the Windows desktop, turn on the power to the cabinet (if applicable).
   c. Start ImageQuant Capture by double clicking on the desktop shortcut.


2. Positioning and Focusing on the Sample:
   a. In the 'Tool Bar', select the 'Acquire' icon to activate the image acquisition software features.


   b. In the Image Acquisition window, select the 

button.
   c. Open the door to the cabinet and position your sample on the preferred illumination source. Fluorescence samples that require epi or transillumination of UV energy should be placed on the purple UV filter glass. For colorimetric samples such as protein gels, film, or blots, use the fold-down the white light table for your sample.
   d. Open the aperture on the camera lens all the way open to the smallest number - F1.2 - manually or via the software controls for motorized optics.
   e. With the door still open to allow light to enter into the cabinet, use the monitor real time readout display to position and focus your sample in the middle of the image acquisition window.
   f. Adjust the zoom setting manually or via the software controls so that the area of interest on the sample takes up all of the image size on the screen.
3. Capturing a bright sample like fluorescently labeled gels, colorimetric samples and film:
   a. Close the cabinet door.
   b. Choose the appropriate optical filter for your sample type:
      a. Position #1 for colorimetric gels and film (no filter)
      b. Position #2 for ethidium bromide gels
      c. Positions #3-5 for other fluorescently labeled gels (optional filters).
   c. Turn on the illumination source (UV or white light) using the touch panel or 'virtual' software controls.
   d. Select the 

button.
   e. Select 

   f. Select 

(for details on how to adjust the auto expose settings refer to section 1.6.3 of the manual)
   g. Once the image in preview mode does not contain any saturation (red false color palette for white bands, green for dark bands) select 

. The exposure bar will turn green when this is complete. If the exposure bar is pink in color, saturation is still present in the image. For really bright images, particularly in white light applications, it may be necessary to reduce the aperture setting until the saturation is removed from the image.
4. Save the original image

    a. Click on the Save Image function in the FILE menu or click on the SAVE or SAVE AS icon in the Tool Bar window.
    b. Enter a file name and select the directory to which it should be saved (the directory path should be less than 100 characters).
    c. Specify the file format (TIF, BMP, PCX, MAC, color TGA)
    d. Click OK to save the file
5. Enhance the display [optional]
    a. Adjust the black, white and gamma levels by moving the slider bars at the right of the image in the “Contrast Adjust” window, or select auto contrast.
    b. Apply digital filters, found in the Tool Box under the FILTERS tab (to stop a filter, hit any key on the keyboard; to reverse the effects of a filter, click UNDO).
    c. Add text, boxes, arrows, etc. to the image using the annotation tools in the Tool Box under the ENHANCEMENT and ANNOTATE tabs.
6. Print the image using the large PRINT button in the Tool Bar or the pull-down FILE menu option
7. Analyze the sample by using the analysis options in the toolbar (1D, Array, Colony and Toolbox). When one of these buttons is pressed, the image is transferred to the appropriate ImageQuant TL module for analysis.

## 1.2.1 Cabinet Controls (for optional cabinet)

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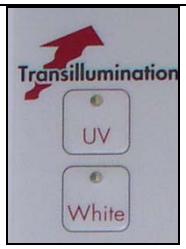
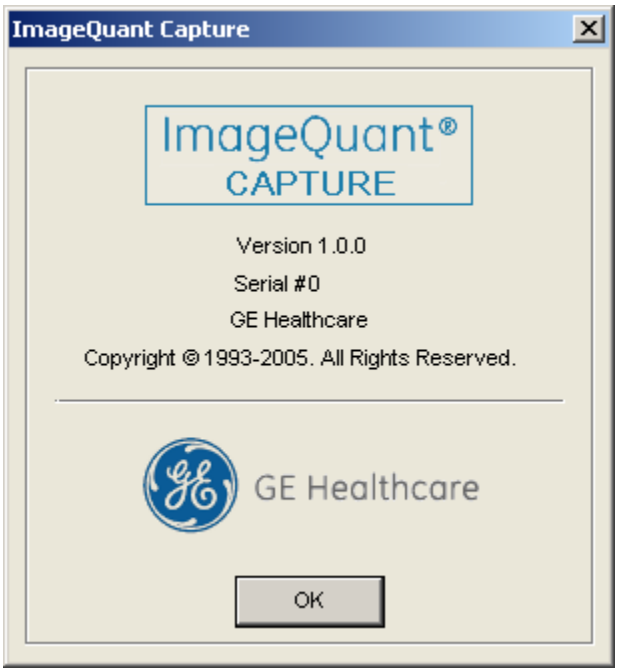
|---|---|
|  | **Transillumination Controls**<br>These two buttons are used to toggle the UV transilluminator and the reflective white light table on and off. |
|  | **Reflective Light Controls**<br>These two buttons are used to toggle the reflective UV and white light sources on and off. |
|  | **UV Override Button**<br>Normally, if UV light is being used the cabinet automatically shuts off the UV light source when the cabinet is opened. This button can be used to override this behavior (the button should be held down 5-7 seconds before opening the cabinet). |
|  | **Filter Wheel Position**<br>These controls are used to set the filter that will be utilized for acquisition. Use the arrow buttons to cycle through the available filter settings. The LED indicates the number of the filter that is currently being used:<br><br>**1** No filter – use for colorimetric gels and film.<br>**2** Ethidium Bromide<br>**3-5** Optional filters |

## *1.3 System Information*

To display system information, select the About option in the Help menu. This button accesses a pop-up box.




ABOUT Pop-Up Dialog

This box shows the instrument serial number (where appropriate) and the Software version number. Use the information specific to your instrument and software when calling for technical support, software upgrades, etc.

To close the dialog box, click on the OK button.