



ODYSSEY[®] **Fc**

Operator's Manual

Version 1.0



LI-COR[®]
Biosciences



Biosciences

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Declaration of Conformity

Manufacturer's Name: LI-COR, Inc.

Manufacturer's Address: 4647 Superior Street
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declares that the product

Product Name: Odyssey Fc Imaging System

Model Number(s): 2800

Product Options: All

conforms to the following Product Specifications:

Safety: UL 61010-1:2004, Ed:2, Rev. 2008
CAN/CSA C22.2 #61010-1:2004, Ed:2
IEC 61010-1:2001, Ed:2
EN 61010-1:2001, Ed:2
21 CFR Chapter 1 Subchapter J : Class 1 Laser Product
IEC 60825-1:2007; Ed:2, Laser Safety, Class 1 Laser Product

EMC: FCC 47 CFR Part 15.109 Radiated Emissions, Class A
FCC 47 CFR Part 15.107 Conducted Emissions, Class A
EN 61326-1:2006
EN 55011; Radiated Emissions, Class A
EN 55011; Conductive Emissions, Class A
EN 61000-3-2; Harmonic Current Emissions
EN 61000-3-3; Voltage Fluctuations and Flicker
IEC 61000-4-2; ESD, 4KV Contact/Air
IEC 61000-4-3; Radiative RF Immunity
IEC 61000-4-4; EFT- AC Mains Supply, 1kV
IEC 61000-4-5; Surge- AC Mains Supply, 0.5kV L-L, 1kV L-PE
IEC 61000-4-6; Conducted Immunity - AC Mains supply, 3V
IEC 61000-4-11; Voltage Dips, Short Interruptions/Variations

Supplementary Information:

The product herewith complies with the requirements of the Low Voltage Directive 2006/95/EC and the EMC Directive 2004/108/EC.

June 21, 2010
Document #53-11627

John Rada
Director of Engineering

Notes on Safety

LI-COR products have been designed to be safe when operated in the manner described in this manual. The safety of this product can not be guaranteed if the product is used in any other way than is specified in this manual. The Odyssey Fc Imager is intended to be used by qualified personnel. Read this entire manual before using the Odyssey Fc Imager.

Equipment Markings:



The product is marked with this symbol when it is necessary for you to refer to the manual or accompanying documents in order to protect against damage to the product.



The product is marked with this symbol when a hazardous voltage may be present.

Manual Markings:

WARNING **Warnings** must be followed carefully to avoid bodily injury.

CAUTION **Cautions** must be observed to avoid damaging your equipment.

NOTE **Notes** contain additional information and useful tips.

IMPORTANT Information of importance to prevent procedural mistakes in the operation of the equipment or related software. Failure to comply may result in a poor experimental outcome but will not cause bodily injury or equipment damage.

Federal Communications Commission Radio Frequency Interference Statement

WARNING: This equipment generates, uses, and can radiate radio frequency energy and if not installed in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC rules, which are designed to provide a reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

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7.2. Upon written request of either party, the dispute will be referred for negotiation to representatives of the parties who have no direct operational responsibility for the matters involved in the dispute and who have authority to resolve the dispute.

7.3. If these representatives have not agreed on a resolution of such dispute within ten (10) Business Days of its referral to them, the dispute shall be promptly submitted to a neutral adviser (the "Adviser") who shall be chosen from the list of arbitrators registered with the American Arbitration Association. For purposes of this Section, "Business Day" shall mean each weekday and the hours of such weekday in which Licensee is open for business. The Adviser shall, within fourteen (14) days of the submission, recommend, in writing, a procedure for resolving the dispute and shall specify in such writing whether such procedure shall be binding, non-binding or involve a combination of binding and non-binding procedures.

7.4. If the parties do not mutually agree upon the process recommended by the Adviser within ten (10) Business Days of their receipt of the Adviser's written recommendation, they shall promptly convene a non-binding hearing (the "Mediation"). The rules for Mediation will be established by the Adviser, after consultation with the parties.

7.5. If the dispute cannot be resolved, either through the procedure recommended by the Adviser or through the Mediation, within such period as the Adviser shall deem reasonable, the Adviser shall, at the request of either party, certify to the parties that the matter is incapable of resolution.

7.6. No litigation may be commenced concerning the dispute until the Adviser has certified in writing that the dispute is incapable of resolution, provided that any party may commence litigation: (a) on any date after which such litigation could be barred by an applicable statute of limitations; or (b) if litigation is otherwise necessary to prevent irreparable harm to the moving party.

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Table of Contents

ODYSSEY 

Chapter 1: Installation and Safety Information

Safety Considerations	1
Laser Safety	1
Safety Interlocks	2
Placement in the Laboratory	3
Ambient Laboratory Conditions	3
Instrument Ventilation	3
Space Requirements	3
Moving the Instrument	3
Chemical Safety	4
Electrical Considerations	4
Power Cords	4
Fuse Replacement	4
Chassis Ground Access Hole	4

Chapter 2: System Overview

External Panels and Controls	5
Front Panel	5
Right-side and Rear Panels	7
Imaging Drawer	8
Imaging Drawer Safety	8
Sample Placement	9
Using Membranes	9
Using Gels	10
Optical System Description	10
Computer Connections and Networking	11
Image Studio Software Overview	11
Learning the Software	11

Chapter 3: Maintenance

Routine Maintenance13

Cleaning the Fan Filter13

Front Panel Warning Light Indicates an Error14

Resetting the Instrument14

Desiccant Replacement14

Obtaining Technical Support16

Chapter 4: Focusing and Image Acquisition

Image Acquisition With No Analysis.17

Chapter 5: Appendices

Specifications19

Embedded Software Licenses21

Safety Considerations

Laser Safety

The Center for Devices and Radiological Health (CDRH) was established in October, 1982, by the U.S. Food and Drug Administration (FDA) to protect the public health in the fields of medical devices and radiological health.

Manufacturers of products subject to performance standards under the Radiation Control for Health and Safety Act of 1968 are required to furnish various reports to the CDRH.

The Odyssey Fc Imager is certified as a Class I laser product. This means that hazardous laser radiation is not emitted outside the instrument. Radiation emitted inside the Odyssey Fc is confined within protective housings and external covers. A series of safety interlocks ensures that the laser beam cannot escape during any phase of user operation.

One laser emits at 785nm and the other one at 685nm. The 785nm laser has a peak power rating of 1 watt. The 685nm laser has a peak power rating of 0.5 watt. The 685nm laser emits visible laser radiation - **direct exposure to either beam may cause eye damage**. Laser radiation from each laser uniformly illuminates the target area only, which is marked in the imaging tray (Figure 2-6) that fits in the imaging drawer. There is no emission of laser radiation outside the instrument under normal conditions.

The CDRH implemented regulations for laser products on August 1, 1976 (CDRH radiation performance standard 21, Code of Federal Regulations Chapter 1, Subchapter J). Compliance for products marketed in the United States is mandatory. The label that must be attached to laser products marketed in the United States is Figure 1-1 and is located on the rear panel of the Odyssey Fc (Figure 1-2), indicating compliance with CDRH regulations.

WARNING: Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.



Figure 1-1. CDRH regulation compliance label.



Figure 1-2. (a) Location of CDRH compliance label on the right side of the Odyssey Fc instrument. (b) Access hole for chassis ground.

Safety Interlocks

Where there is a potential for class 4 laser radiation behind a given panel, the label in Figure 1-3 is affixed to the panel. The label shown in Figure 1-3 is affixed to the Odyssey Fc Imager Instrument in two locations; one on top of the camera hood and one on the inner front access panel (Figure 1-4).

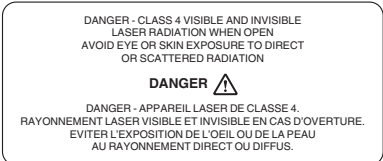


Figure 1-3. Class 4 laser warning label.

(a)



(b)



Figure 1-4. Location of class 4 laser warning label located on (a) the camera hood under the top panels of the Odyssey Fc instrument enclosure and (b) on the inner front access panel (do not open, no user-serviceable parts inside).

The Odyssey Fc Imager has two safety interlocks that prevent exposure to laser radiation when the imaging drawer is opened during operation. Do not attempt to defeat these interlocks. The drawer interlocks are located in the back of the instrument.

Placement in the Laboratory

The Odyssey Fc Imager weighs approximately 27 kg (60 lbs). The instrument should be placed on a laboratory bench that is sufficiently sturdy to bear its weight. The bench should also be able to bear the weight of the computer if the computer is to be installed beside the Odyssey Fc instrument.

Ambient Laboratory Conditions

Place the Odyssey Fc Imager away from external heat sources (furnaces, windows, etc.). Additional heating can cause high temperatures within the enclosure. Place the instrument away from sinks or other sources of water that pose a shock hazard. Recommended operating conditions are 15-35°C and a dew point not greater than 22°C to prevent condensation on the laser assemblies, which are cooled during operation.

Instrument Ventilation

The air intake fan on the back of the Odyssey Fc instrument (Figure 2-4) is used to cool the internal electronics and maintain fresh air circulation throughout the internal volume of the instrument. The air intake is filtered and the filter should be periodically cleaned (Chapter 3). Make sure there is plenty of room behind the instrument so that the air intake is not blocked and the filter is easily accessible for cleaning.

Space Requirements

The Odyssey Fc instrument requires an area 41.4cm W (16.3") x 47cm D (18.5") x 67.3cm H (26.5"). Depth with the imaging drawer open is 59.7cm (23.5").

Moving the Instrument

Be cautious and use a minimum of two people, one on each side of the instrument, when moving the LICOR Odyssey Fc Imager, as it weighs about 27 kg (60 lbs). Each person should place one hand in the lower hand hold and the other at the top of the instrument to help stabilize it. Keep the instrument as near vertical as possible. Gently set the instrument at its new location.

After the instrument has been moved, use the adjustment feet on the bottom of the instrument to approximately level the instrument. The instrument does not need to be level for operation, but if the instrument is not sufficiently level, liquid in the imaging tray may be uneven and pool in one of the corners or sides. Each of the four feet on the bottom of the instrument case is threaded and can be turned in either direction to adjust its height. The instrument should not rock back and forth after you are finished.

Chemical Safety

LI-COR Biosciences recommends that all biochemicals be handled carefully, and that safe laboratory procedures be followed at all times. Be aware of the hazards associated with any chemical before you begin work.

The LI-COR Odyssey Fc Imager should not be used with any radioactive materials.

Electrical Considerations

Power Cords

The Odyssey Fc Imager is equipped with a 3-wire grounding-type plug. This plug will only fit into a grounding-type outlet. This is a necessary safety feature. If you are unable to insert the plug into the outlet, you will need to replace the outlet. *Do not defeat the purpose of the grounding-type plug.*

Do not locate the Odyssey Fc Imager where the power cord will be walked on or exposed to water or chemical spills.

The Odyssey Fc Imager draws a maximum of 2 amperes at 120V (see Chapter 5 for complete specifications). If an extension cord is used, make sure the total of the ampere ratings on the instruments plugged into the extension cord does not exceed the extension cord ampere rating. Also make sure the total amperage of instruments plugged into the wall outlet does not exceed the amperage capacity for the outlet (usually 15 or 20 amperes in the United States).

Disconnect power before servicing.

Fuse Replacement

There are no user replaceable fuses in this instrument.

Chassis Ground Access Hole

To eliminate the potential for ESD damage during service, a hole on the side of the control module provides a chassis ground (Figure 1-2).

External Panels and Controls

Front Panel



Figure 2-1. Front panel features and controls of the Odyssey Fc Imager.

Power On/Off Switch: Pressing this switch momentarily turns the instrument on and off. Pressing the switch for 5 seconds or more cuts power to the instrument (Chapter 3). While the instrument is performing its startup or shutdown procedure, the blue indicator light in the power switch blinks. When the blue indicator light is continuously on, the instrument is ready for operation. Pressing the Power On/

Off button when the green image acquisition indicator is lit will cause the red error condition indicator to illuminate. This is just a warning that the instrument is in use.

Green Image Acquisition Indicator: This indicator light blinks during image acquisition and is continuously on at other times, as long as communication with the Image Studio software is maintained. The indicator light is off only if communication is lost or the Image Studio software is closed or the instrument is powered off.



Figure 2-2. Location of the green image acquisition light and red error light.

Red Error Indicator: The error indicator light illuminates when a particular process could not be completed. If the imaging drawer button is pressed before an acquisition is complete, for example, the error indicator illuminates. See instrument diagnostic log in the Image Studio software for details of what error occurred. See Chapter 3, *Maintenance*.

Imaging Drawer Button: This button opens and closes the imaging drawer in normal operation. The drawer front can be used to open or close the drawer in cases of power loss. Pressing the Imaging Drawer button when the green image acquisition indicator is lit will cause the red error condition indicator to illuminate. This is just a warning that the instrument is in use.

Imaging Drawer: The imaging drawer moves the imaging tray into position under the camera for imaging. The bottom of the imaging tray has a marker in each corner that indicates the edge of the camera's field of view.

Right-side and Rear Panels



Figure 2-3. Close up of the Odyssey Fc control module showing the power receptacle and ethernet connectors (use only the supplied ethernet cable). *All other connectors on this panel should not be used.*

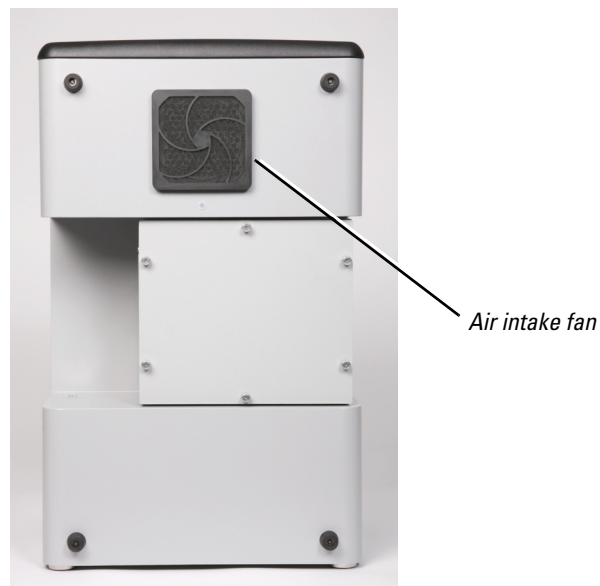


Figure 2-4. Rear panel showing air intake fan. Keep the intake unblocked during operation and accessible for routine filter cleaning (Chapter 3).

Imaging Drawer

The imaging drawer is opened and closed by pressing the large button above the drawer (Figure 2-1).



Figure 2-5. The imaging drawer holds one imaging tray that is capable of containing one membrane or gel up to 10 x 12 cm.

Imaging Drawer Safety

Be careful not to get your fingers caught between the Odyssey Fc instrument and the imaging drawer when the drawer closes. The drawer is specially designed to stop when a certain level of resistance is detected, so no harm should result, but the experience may be startling.

During an unexpected power loss, the drawer button will not function. This may leave a sample inside the Odyssey Fc Imager, or it may result in the imaging drawer being left partially open or closed. If the power remains off, the drawer can be opened or closed by pulling or pushing on the drawer front. The imaging drawer should resume normal operation once power is restored.

Sample Placement

The Odyssey Fc Imaging Tray has four corner markers that delineate the edges of the Odyssey Fc imaging area. Membranes or gels up to 10 x 12 cm placed within these markers will be fully imaged. Membranes or gels can be placed anywhere within the imaging area to be scanned.

Membranes should be placed sample side up with the head toward the rear of the instrument. Similarly, gels are also placed with the head toward the rear of the instrument.

Tips for handling and imaging membranes and gels are given later in this chapter. Trays are disposable and may be reordered using P/N 926-40020 (5pk).

The imaging tray is designed to contain the small volume of liquid needed to keep blots or gels moist. Do not fill the imaging tray and be careful not to add so much liquid that the sloshing action created by closing the drawer may result in a spill inside the instrument.

The imaging tray is inserted in the imaging drawer by aligning the notches in the tray with the guide pins in the imaging drawer (Figure 2-7), and lowering the tray into the drawer. Make sure the tray rests flat on the imaging drawer before pressing the open/close button to close the drawer.

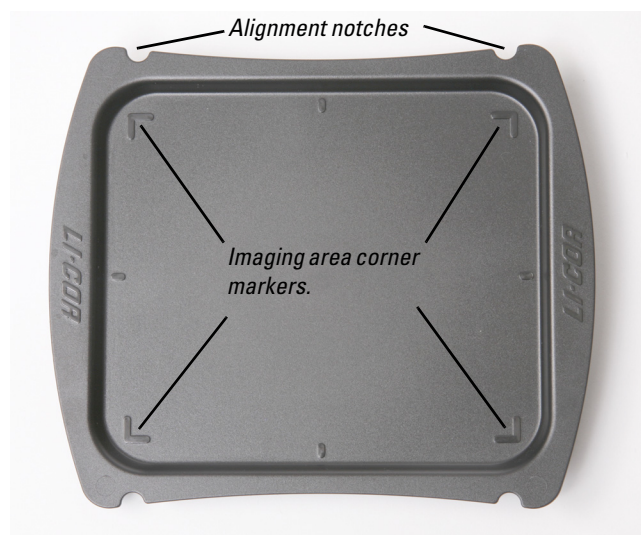


Figure 2-6. Imaging tray.

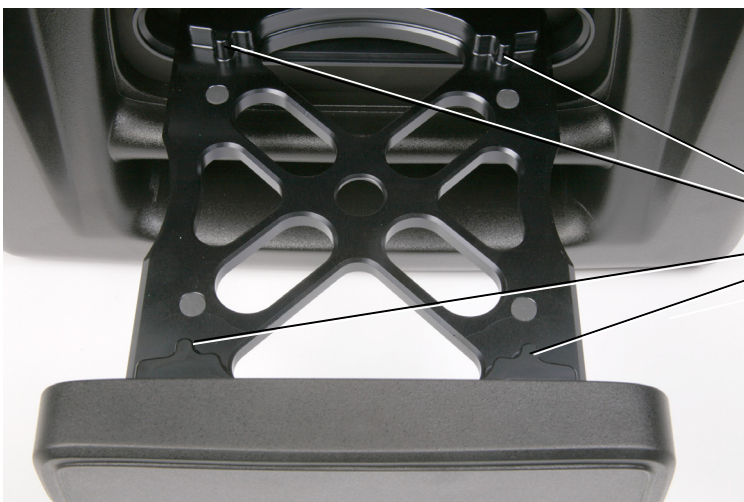


Figure 2-7. Imaging drawer has four guide pins that match the alignment notches in the imaging tray.

Using Membranes

For Western blotting methods, nitrocellulose or PVDF membranes may be used (see licor.com/bio for the latest membranes and kits that are optimal for infrared detection). For best performance, pure cast nitrocellulose membranes are recommended. Detailed blotting protocols can be found in the Odyssey Fc Application Protocols Manual. There are some general tips, however, for using membranes.

- **IMPORTANT:** Do not touch the membrane – handle only with a clean forceps. Lift the membrane only by the corners. Fingerprints, even from a glove, will show clearly when imaged.
- Protect the membrane from light until it has been imaged.
- Keep the membrane wet if it is to be stripped and re-used. This can easily be accomplished by wrapping the membrane in plastic wrap.
- For Western blots, store dry or in PBS buffer at 4°C.
- Use clean containers to avoid cross-contamination and reduce background.
- Multiple membranes can be washed together, provided there is ample volume so each membrane moves freely.
- The fluorescent signal on the membrane will remain stable for several months or longer if protected from light.

Using Gels

A protocol for in-gel Westerns is provided in the Odyssey Fc Application Protocols Manual. Coomassie-stained gels can also be scanned since Coomassie Blue dye can be seen clearly in the 700 nm channel, and faintly in the 800 nm channel. To image a gel, observe the following guidelines:

- Thoroughly rinse the gel with destaining solution or water to remove dye particulates.
- When placing the gel in the imaging tray, place the head toward the back of the instrument.

Optical System Description

The Odyssey Fc Imager is designed to image membranes or gels for Western blot analysis using near-infrared or chemiluminescent methods. Before image acquisition is started, the imaging tray containing a membrane or gel is placed in the Odyssey Fc imaging drawer and the drawer is closed. A safety interlock prevents operation of the laser illumination module while the imaging drawer is open. Image acquisition is started via Image Studio Application Software (Chapter 4).

The Odyssey Fc has three detection channels: two are infrared channels with 685 and 785 nm lasers, and the third is for detecting visible wavelength emissions from chemiluminescent substrates. The channels used during acquisition are chosen in Image Studio software.

The Odyssey Fc laser module contains a 685 nm and 785 nm laser. During image acquisition, each laser source is turned on, followed by image acquisition by the LI-COR[®] CCD camera. For infrared imaging, a typical image acquisition consists of images for two fluorescent probes in the 700 and 800 nm channels (assuming both channels are enabled). Image acquisitions from chemiluminescent substrates use just the chemiluminescence channel and imaging is done at visible wavelengths. Note, however, that Coomassie stains can be imaged in the 700 nm channel, allowing marker lanes to be imaged separately in the 700 nm channel and combined with the image from the chemiluminescence channel.

The quality of Odyssey Fc images is enhanced by a patented filtering system that dramatically reduces noise before detection by the CCD detector. Infrared signal detection has also been optimized for LI-COR IRDye[®] near-infrared dyes, which eliminates the need for filter selection by the user before imaging. The unique imaging technology, FieldBrite[™] XT, used in the Odyssey Fc Imager acquires images without saturated pixels on the first attempt with no user adjustments. More than six logs (22 bits) of dynamic range are available for each image.

Computer Connections and Networking

Note: Use only the supplied Cat. 5 RJ45 ethernet cable to connect the Odyssey Fc Imager and computer. The ethernet ports on the Odyssey Fc Imager are both Auto-MDIX, so a cross-over cable is not needed.

The Odyssey Fc Imager uses IPv6 Link-Local Addressing to automatically create an IP network without any user-configuration or additional servers. If you experience connection problems, be sure that IPv6 is enabled on the computer.

When Image Studio Application Software starts, it searches for and discovers any Odyssey Fc Imagers automatically. If only one instrument is found, Image Studio Application Software establishes communication. If more than one instrument is found, the user is presented with a list of instruments and asked which to use.

Image Studio Software Overview

Learning the Software

The Odyssey Fc Tutorial Manual demonstrates basic functions of the software. Each part of the user interface (button, etc.) has an extensive tool tip associated with it that can be invoked by hovering the mouse over the feature on the user interface. Chapter 4 of this manual gives a brief overview of acquiring images. A more comprehensive review of acquiring images as well as analysis functions can be found in the Image Studio Software Help system.

Routine Maintenance

CAUTION: Remove the tray and its contents from the instrument prior to any maintenance that requires moving or tilting the instrument.

The Odyssey Fc Imager requires only minimal maintenance. However, as with any equipment utilizing electrical voltages, there is a danger of fire or electrical shock if the equipment is not properly maintained. **Disconnect power before servicing.** LI-COR Biosciences recommends that you routinely inspect the system. The following are some general maintenance guidelines:

- Clean the exterior case parts with warm water and a damp cloth.
- Clean the imaging drawer with 100% methanol, then water.
- Clean the imaging tray by first removing the sample and then rinsing the tray with methanol followed by distilled water. Wipe or air dry.
- **CAUTION:** DO NOT use acetone to clean the imaging tray.
- Wipe all chemical spills from the case and imaging drawer to prevent damage to the surface coating.
- Keep the imaging bed free of organic solvents and other combustibles. Dry thoroughly before use.
- Inspect all cables and power cords for evidence of fraying, exposed wire, or loose connections.

Cleaning the Fan Filter

CAUTION: Remove the tray and its contents from the instrument prior to any maintenance that requires moving or tilting the instrument.

The air intake fan on the back of the Odyssey Fc instrument is used to cool the internal electronics. Periodically inspect the air intake filter (Figure 3-1). Clean or replace the filter when it looks like dust is starting to block air flow. To test air flow, place a piece of standard printer paper over the filter while the instrument is running. Release the paper. If the paper falls away, rather than being held to the air intake by suction, the filter is significantly blocked.

The back cover snaps off for access to the foam filter. The filter can generally be rinsed out, dried, and replaced if it is only clogged with dust.

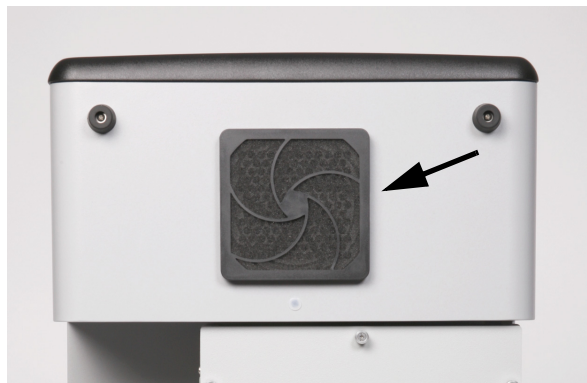


Figure 3-1. The foam fan filter on the back of the Odyssey Fc instrument is accessible for cleaning by removing the snap-on back cover.



Front Panel Warning Light Indicates an Error

When the Odyssey Fc Imager is unable to complete a task requested by Image Studio Application Software, or some hardware failure is encountered, the red error indicator on the Odyssey Fc front panel (Figures 2-1 and 2-2) flashes and an audible alarm sounds. This error condition is automatically cleared after a few seconds and a message dialog is displayed in the Image Studio Application Software to explain the error. The error message will instruct the user on any further required actions.

Resetting the Instrument

In the event that the instrument becomes unresponsive, reset the instrument by holding down the front panel power button (Figure 2-1) for at least 5 seconds until the instrument turns off. This procedure cuts power to the instrument and should only be used when communication cannot be re-established by any other means. The Odyssey Fc Imager should resume normal operation after the power button is pressed again to turn the instrument back on, though start up may take several minutes.

Desiccant Replacement

The Odyssey Fc Imager has a cooled CCD camera that uses a desiccant to prevent water condensation on the internal cooled surfaces. Depending on the humidity of the environment, the desiccant in the camera may need to be replaced periodically. Image Studio Application Software will issue a warning if the desiccant needs replacement. A warning notice will first be given that will provide at least a few weeks of normal operation. If not replaced in a timely fashion, an error will be generated and the cooler will be disabled to prevent damage to the instrument. This will prevent any new image acquisitions. The desiccant is user-replaceable. Please contact LI-COR Biosciences for a desiccant replacement kit to perform this task.

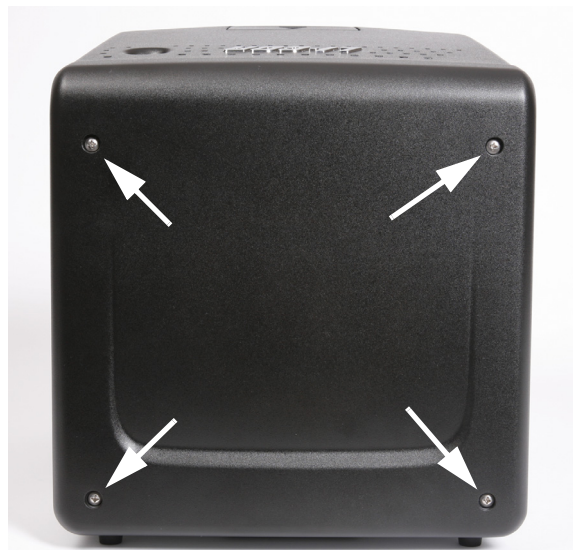
Important: Do not remove the new desiccant cartridge from the shipping bottle until ready for installation.

Replacement Procedure

CAUTION: Remove the tray and its contents from the instrument prior to any maintenance that requires moving or tilting the instrument.

- 1) If necessary, briefly press the power switch on the Odyssey Fc front panel and wait for the instrument to turn off.
- 2) Disconnect the power cord from rear of the instrument.
- 3) Disconnect the ethernet cable from rear of the instrument.
- 4) To access the desiccant, use a Phillips screwdriver to loosen the 4 screws on the top panel of the instrument. (These screws are captive and cannot be removed from the panel.)

Figure 3-2. Top view of the Odyssey Fc Imager showing the four top panel retaining screws.



- 5) The top panel should now be removable. If not, check to make sure all of the screws are fully loosened. Once they are, the top should easily lift off.
- 6) The brass desiccant cap is now visible (Figure 3-3). Remove the desiccant cap by turning it counter-clockwise. You can use a screwdriver placed in the slot of the top of the cap to aid in loosening the cap.



Figure 3-3. Odyssey Fc Imager with top panel removed. Location of the brass desiccant cap is indicated.

- 7) Remove the desiccant cartridge and discard.
- 8) Remove the new desiccant cartridge from the shipping bottle and place it into the cap. Ensure the hook and loop fasteners engage.

- 9) Replace the brass cap and desiccant by turning clockwise back into the camera. Some resistance will be felt while turning as the o-ring is being engaged. When the cap abruptly stops turning, it is correctly installed. No need to tighten any further.
- 10) Replace the instrument top panel and tighten the 4 screws until they are snug – do not over-tighten them.
- 11) Reconnect the power cord and ethernet cable.

Depending on the state of the old desiccant, it may take up to a few hours before the instrument is ready to be used. The status can be viewed by powering on the Odyssey Fc Imager and then starting the Image Studio Application Software. Observe the **Status** on the acquisition tab in the main window. When the instrument is ready for use, the **Status** will be “Ready”.

Note: If an error message to replace the desiccant is displayed after replacing the desiccant, power off the Odyssey Fc Imager and wait an hour or two. After waiting for the air inside the camera to dry, power on the Odyssey Fc Imager, start the application software, and see if the **Status** changes to “Ready” with no further error messages. If only a warning message is displayed, rather than an error message, the instrument can be operated normally as long as the **Status** is “Ready”.

Obtaining Technical Support

To resolve a problem with your Odyssey Fc Imager, start by contacting LI-COR Technical Support at 800-645-4260 (U.S. only), or e-mailing biohelp@licor.com. Outside of the U.S., contact your local sales office or distributor. Be prepared to give the serial number of your instrument, which can be found on a label near the computer module on the right side of the instrument.

LI-COR Technical Support may ask you to provide copies of the instrument log files to aid in diagnosing problems. The log files can be archived in a standard zip file by choosing **File > Zip Select Event Logs**. Archive all the log files or just a portion if you have restrictions on the file size that can be transmitted via e-mail. Save the log file and e-mail it to the address recommended by Technical Support.

Chapter 4

Image Acquisition

ODYSSEY Fc

Image Acquisition With No Analysis

For this procedure, it is assumed that the instrument is turned on and that the Image Studio Application Software is running and connected to the instrument.

Sample Insertion

- 1) Place a blot or gel up to 10 x 12 cm in an imaging tray (Chapter 2), observing the alignment marks in the corners of the tray.
- 2) Press the Imaging Drawer open/close button to open the imaging drawer.
- 3) Insert the imaging tray into the imaging drawer, by sliding it down between the guide pins (Chapter 2).
- 4) Press the Imaging Drawer open/close button to close the imaging drawer.

Image Acquisition

- 5) If necessary, click the Acquire tab to display all the image acquisition functions.

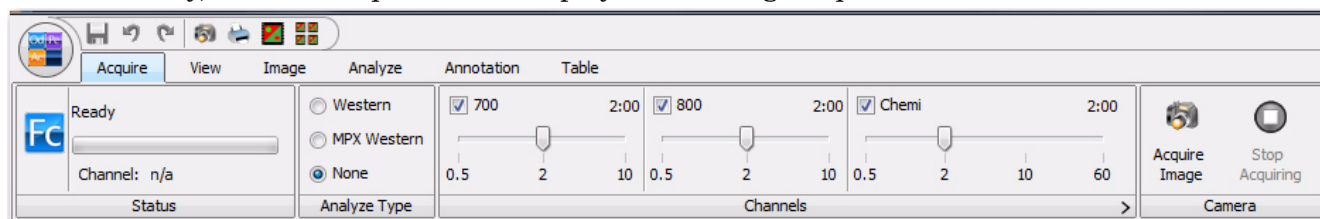





Figure 4-1. Acquire tab.

In general, the Acquire tab is used by starting on the left, checking each of the settings and finally, clicking the Acquire Image button () to start image acquisition.

- 6) Make sure the Status area indicates “Ready”. A status of “Ready” indicates the Odyssey Fc instrument is connected and communicating properly.
- 7) Set the analysis type to “None”. See the Odyssey Fc Tutorial Manual to learn how to start one of the other analysis types (Western or MPX Western) available when the Western key is installed.
- 8) Select 700 and 800 for a standard two-color infrared acquisition using both the 700 and 800 channels, or select only one of the two channels if only one IRDye was used on the blot/gel. For chemiluminescent substrates, select Chemi and deselect 700 and 800. (For Coomassie gels, select the 700 channel to image the stain.)
- 9) For typical acquisitions, leave the exposure time set to the default value of 2 minutes.
- 10) Click .

If the Odyssey Fc Imager has just been turned on or has been idle for a long time, the message “Warming Up” may be displayed in the **Status** area of the ribbon. Warm up takes about two minutes, during which time the camera controls are disabled. The **Status** changes to “Ready” when warm-up is complete. During image acquisition, the **Status** area shows which image is being acquired and the progress. To stop an acquisition before it is completed automatically, click .

Note: A more comprehensive review of acquiring images as well as analysis functions can be found in the Image Studio Application Software Help system. The Odyssey Fc Tutorial Manual demonstrates basic functions of the software.

Specifications

Operating Conditions: For Indoor use only; operating temperature 15-35°C and dew point not greater than 22°C, non-condensing; maximum operating temperature may be reduced at elevations above 2000 m.

Environmental Conditions: Pollution Degree 2.

Dynamic Range: 22 bit (>6 logs)

Depth of Field for Best Sample Focus: 6 mm

Patented FieldBrite™ Technology: CV <3%

Laser Lifetime: 20,000 hours

700 Channel Laser Source: Solid-state Laser Diode at 685 nm

800 Channel Laser Source: Solid-state Laser Diode at 785 nm

Detector Type: Low-noise CCD. Thermoelectrically cooled.

Acquisition Times:

Fluorescence (700 and 800 nm) channels: 30 s, 2 min, 10 min plus advanced variable time feature.

Chemiluminescence channel: 30 s, 2 min, 10 min, 60 min plus advanced variable time feature.

Focusing: None needed.

Sensitivity: Similar to Odyssey® Infrared Imaging System

Wavelength Maxima for Excitation/Emission Bands:

Channel	Excitation	Emission
700 nm	685 nm	730 nm
800 nm	785 nm	830 nm
Chemiluminescence	none	Visible

Dyes: Optimized for LI-COR® IRDye® 680LT and IRDye 800CW, and chemiluminescent substrates.

Resolution: 125 µm

Image Display Options: Pseudocolor, positive and negative grayscale, single color (red, green or blue), or two colors with overlapping fluorescence displayed in a third color.

Capacity: One imaging tray containing one blot or gel.

Field of View: 10 cm D x 12 cm W (3.9" D x 4.7" W) at the surface of the imaging bed.

Power Requirements: Universal input between 100-127 VAC and 200-240 VAC (voltage fluctuations not to exceed 10% of the nominal voltage); 50/60 Hz; 1 Amp at 120V typical; 2 Amp at 120V maximum (240W). Insulation Category II.

Computer Connection Cable: Cat. 5 RJ-45, 10 Base-T/100 Base-TX. Use only the supplied cable.

Size: 41.4 cm W x 47 cm D x 67.3 cm H (16.3" W x 18.5" D x 26.5" H). Depth with imaging drawer open is 59.7 cm (23.5").

Weight: 27 kg (60 lb).

The Odyssey Fc Imager is certified as a Class 1 laser product. Hazardous laser radiation is not emitted outside the instrument. Radiation emitted inside the Odyssey Fc Imager is confined within protective housings and external covers. A series of safety interlocks ensures that laser beams cannot escape during any phase of user operation.

JAVA ADVANCED IMAGING SAMPLE INPUT/OUTPUT SOURCE CODE LICENSE

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Version 2.1, February 1999

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Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also combine or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications.

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b) Use a suitable shared library mechanism for linking with the Library. A suitable mechanism is one that (1) uses at run time a copy of the library already present on the user's computer system, rather than copying library functions into the executable, and (2) will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.

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In a mail sent to Bruno Lowagie on January 23, 2008, Brian Burkhalter (@sun.com) writes: "This code is under a BSD license and supersedes the older codec packages on which your code is based. It also includes numerous fixes among them being the ability to handle a lot of 'broken' TIFFs."

Note that numerous fixes were applied to the code used in iText by Paulo Soares, but apart from the fixes there were no essential changes between the code that was originally adapted and the code that is now available under the following license:

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FYI: Brian also added: "A bit of history might be in order. The codec classes that you used originally were based on some classes included with JAI but not strictly part of JAI. As of Java SE 1.4 an official Image I/O framework was added in javax.imageio.... This framework supports these formats: Java 1.4: GIF (read only), JPEG, PNG Java 1.5: Added support for BMP and WBMP Java 1.6: Added support for writing GIF The JAI Image I/O Tools packages (jai-imageio-core) were created to support formats handled by JAI but not included in Java SE as well as some new things like JPEG2000."

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JExcelAPI-2.6.12

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