OMEGA LUM™
Imaging Systems

User Manual

Omega Lum C

Omega Lum G

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Rev 070213

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SYSTEM OVERVIEW

Congratulations on purchasing your Aplegen Omega Lum Imaging System! The Omega Lum is a powerful tool for gel documentation and chemiluminescent imaging. It generates publication quality 16 bit tiff images and comes completely assembled for quick installation. The Omega Lum Image Capture Software has a clean user interface for image capture and viewing. With the superior optical design, the Omega Lum captures high quality images without the need for focus or aperture adjustment. Images generated by the Omega Lum are ideal for downstream quantitative analysis.

The Omega Lum Systems include the following key components:

- Cabinet – The cabinet is a light tight imaging station.
- Camera – Integrated with the cabinet, it is a high resolution, cooled, scientific grade CCD camera.
- UV Transilluminator – The UV transilluminator offers both 302nm and 365nm transillumination. The UV lights are controlled via the software, and switch off automatically with image capture.
- Epi-LED lighting – The cabinet contains epi-white and blue LED panels for multiple imaging options.
- Tablet PC – A touch screen PC for system control and image capture.

Tablet Power Switch

Tablet PC

UV Indicator Light

3 USB Ports
(1 Front, 2 Rear)

UV Safety/Override Switch

Epi-LED panel

UV Transilluminator

UV Wavelength Selector
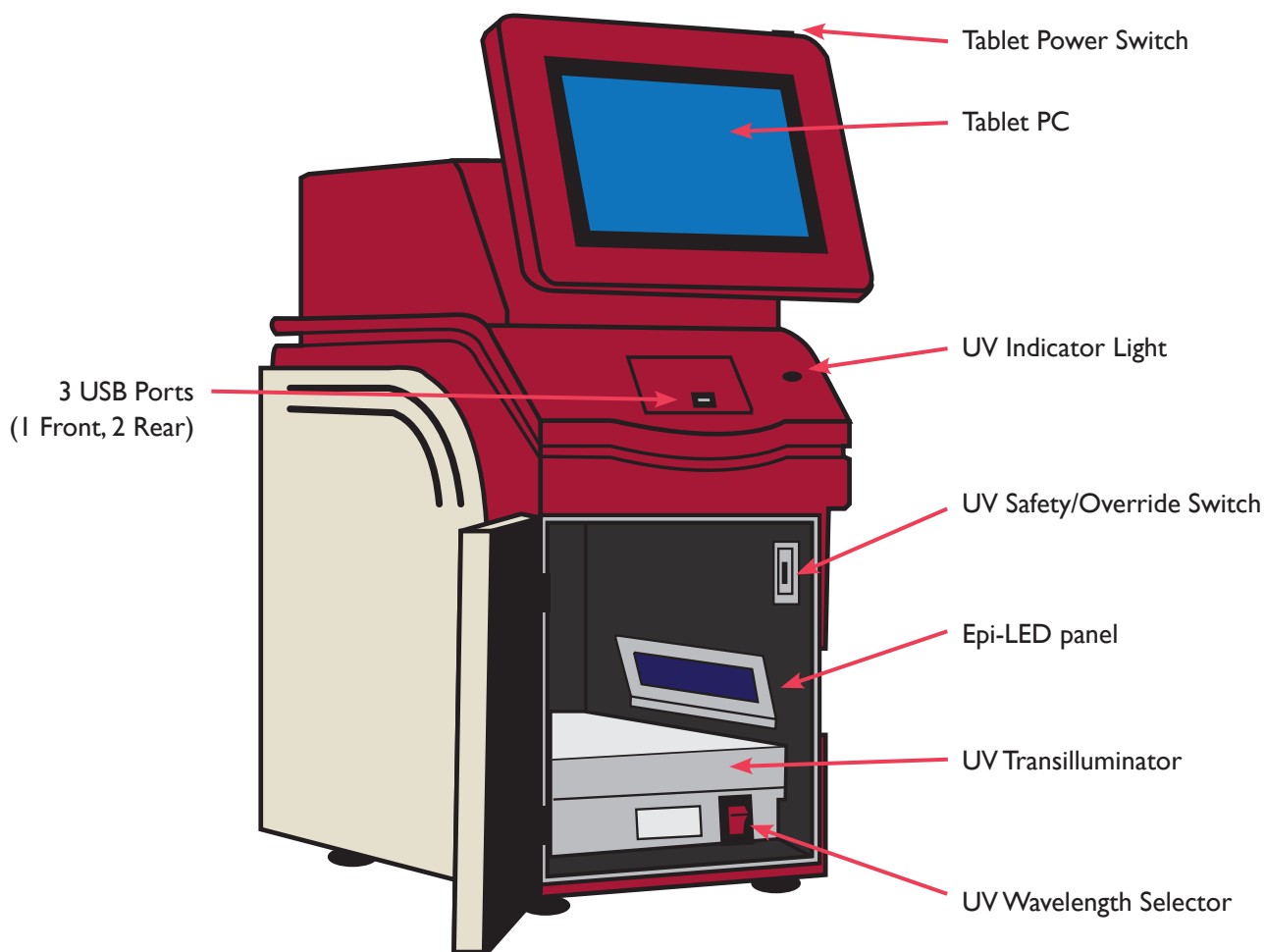
OMEGA LUM SYSTEM SPECIFICATIONS

Omega Lum G System Specifications

Camera resolution	6M pixels
Epi-illumination	White & Blue LED
Trans-Illumination	302 nm / 365 nm
Lens	18mm Fixed
Maximum Field of View	21.0 cm x 27.0 cm
Image output	16-bit Tiff, Jpeg
Power requirement	110V-240V
Dimensions (W x D x H)	33.0 cm x 48.0 cm x 74.0 cm
Weight	31.2 kg

Omega Lum C System Specifications

Camera resolution	8M pixels
Epi-illumination	White & Blue LED
Trans-Illumination	302 nm / 365 nm
Lens	25mm Motorized
Maximum Field of View	21.0 cm x 27.0 cm
Image output	16-bit Tiff, Jpeg
Power requirement	110V-240V
Dimensions (W x D x H)	33.0 cm x 48.0 cm x 74.0 cm
Weight	31.2 kg

SYSTEM SETUP

Warning! **Excessive Weight Hazard** – Please use two or more people to lift the system. Failure to do so may result in personal injury and/or system damage.

As with all electrical instruments, the Omega Lum imaging system should be located away from water, solvents, or corrosive materials. Place the unit on a flat, stable surface with adequate clearance, and at least 4 inches, on all sides. 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 instruments in your laboratory. **Aplegen recommends using a surge protecting power strip to prevent electrical damage to the system.**

Remove the system from the packaging and place on the work surface. The accessories are packaged separately in a smaller box. Remove the accessories, packaging, and protective films.

- The Omega Lum has two power cables, one which powers the system components and one to power the onboard tablet. Locate the power cables and plug them into the back of the system.

- Once you have plugged in the power cords turn on the system power. The power switch is located on the lower right side of the cabinet. It will take the system approximately 20-30 seconds to initialize once the power has been turned on.


- Turn on power to the tablet.

- At the home screen, select the Omega Lum tile. The software will launch and you are now ready to use the Omega Lum system.
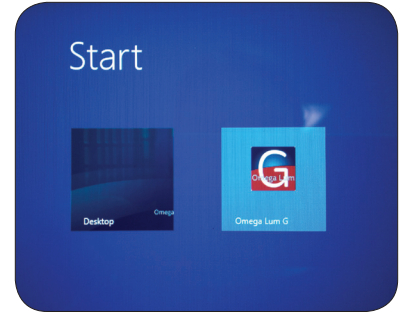
Software License

The first time you run the software you will be asked to accept the terms and conditions of the Omega Lum Image Capture Software License Agreement. The complete software license is included in Appendix A. To accept the terms and conditions select the Accept button.
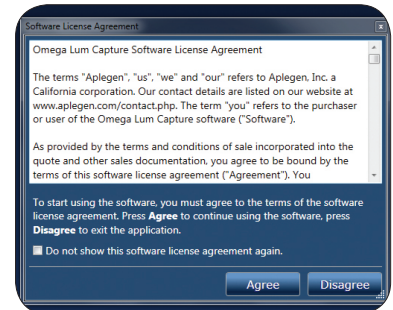
To disable the software license popup, check the box at the bottom of the window and then select Agree.
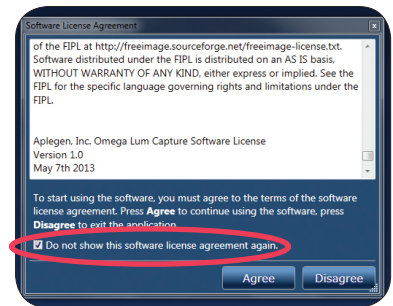
Adjust Tilt of the Tablet PC

To change the angle of the tablet PC, hold the tablet frame with one hand, and loosen the locking knob with you other hand. Adjust the tilt to the desired angle and retighten the locking knob.

UV Safety Switch

The UV safety interlock switch is located on the inner door frame. Opening the door when the UV transilluminator is in use will trip the safety switch. Always exercise caution when working with UV. For more information see Appendix A.

Remember to observe all standard UV safety precautions when overriding the UV Safety Switch. These include, but are not limited to UV protective face shield, gloves, lab coat, etc.

UV Override

To visualize or excise bands you must override the UV safety switch with the following steps:

- Open the door, pull out the UV tray, and position your sample.

- Select your desired UV wavelength.

- Pull out the UV switch.

- Select the **EtBr (UV-302nm)** application.

- Select the **Manual** option and set the time to between 5 and 10 minutes.

- Select **Capture**, the UV light will come on.

846 x 1120
Capture

- When done you may either hit **Stop**, depress the safety switch, or return the UV tray and close the cabinet to shut off the UV light.

Auto Contrast
Light Source
UV-302nm
Emission Filter
Orange - 590/50)
Zoom In
Stop
Zoom Out

SOFTWARE

Introduction

The Omega Lum Image Capture Software comes pre-installed on the system tablet. The capture software controls the light sources and image capture. The separate UltraQuant analysis software is included for easy image annotation and analysis on your laptop or PC. The Aplegen USB drive in the accessory package contains a copy of the analysis software, three analysis software registration keys, copies of the user manuals for both the image capture and analysis software, the quick installation guide. Aplegen recommends that the USB software drive be kept in a safe place for reference.

Starting the Software

The capture software will launch after the Omega Lum tile is selected from the home window. If it does not launch, or, if the software has been closed on the desktop, it can be launched by double clicking on the desktop icon. It can also be run from the program files folder.

Logging In

The software starts at the User Login Screen.

- Select a user, enter the password, and click the **Login** button.

- The default Admin password is: *admin*

- There is no default password for the Guest user. Leave the password box blanks and click **Login**.

- The default users are Admin and Guest. The Administrator can create additional, individual logins. Please see Creating User Profiles on page 20.

The Imaging Studio

Taking an image begins in the Imaging Studio Tab. The Imaging Studio is your workspace for selecting and editing the image capture settings. The Omega Lum has eliminated the need for focusing or aperture settings; simply place your sample in appropriate gel tray, select the application, and click acquire.

Basic Imaging involves:

1. Positioning your sample
2. Selecting your application
3. Capturing your image

Positioning Your Sample

Place your gel either directly on the UV transilluminator or on one of the optional sample trays available from Aplegen. Use the positioning markers as a guide. The Omega Lum systems capture a large area so you can place your sample on any part of the imaging surface. For ease of use, Aplegen recommends that you place your sample centrally, towards the front of the transilluminator.
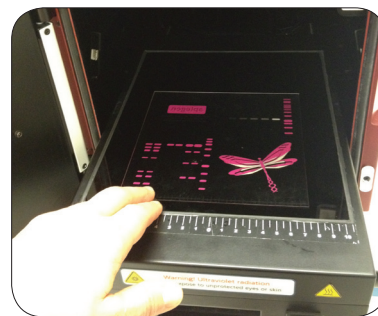
Selecting Your Application

The Omega Lum has a dual wavelength transilluminator, epi white lights, epi blue lights, as well as a white light conversion screen, and chemi tray. Use the table below to select the correct combination for your application. If you do not see your application listed, please check Creating Custom Applications, on page 15.

| Sample Dye	Excitation	Conversion/Tray	Omega Lum Application
Ethidium Bromide	UV Light		EtBr (UV-302nm)
SYBR® Green	Epi Blue		SYBR® Safe
SYBR® Safe	Epi Blue		SYBR® Safe
Coomassie Blue	UV Light	White Light Conversion Screen*	Coomassie (UV-365nm)
Visible Light Gels	UV Light	White Light Conversion Screen*	Coomassie (UV-365nm)
Chemiluminescent Blots	None	Chemi Tray	Chemi / Chemi (Faint Bands)

*The White Light Conversion Screen should be used with the 365nm UV wavelength.

Capturing Your Image

Imaging with Default Applications

Once you have determined the correct application for your desired excitation source, place your gel or blot on the appropriate tray and log into the software.

- Select your **Application** from the Application menu. Use the scroll bar on the right to move through the entire list.

- Select **Auto** or **Manual** exposure.
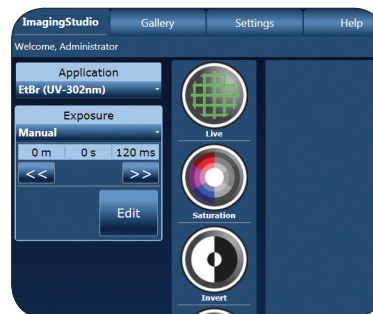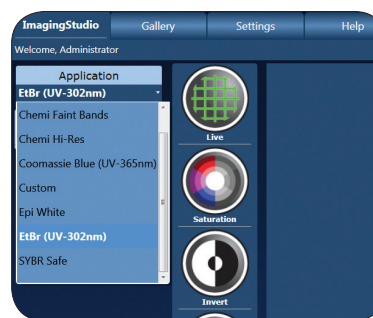
- Select **Capture**.

- To stop capture for any reason, simply select the **Capture** button again. It now reads **Stop**.
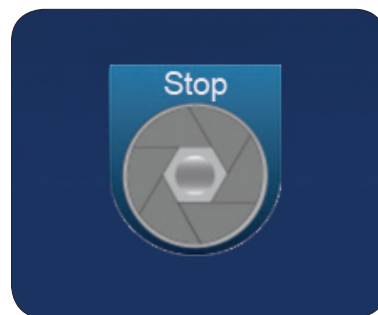
- Your image will appear in the Gallery Tab. Here you can make visual adjustments to the image and save or send the image to the desired location.

Manual Exposure Options

Resolution and Binning

Binning is the combining of digital pixels when taking an image. Binning pixels increases sensitivity, allowing fainter bands to be captured. However, the trade off is lowered resolution. The Omega Lum Image Capture software offers three sensitivity modes: Chemi Faint Bands, Chemi, and Chemi Hi-Res. Chemi Faint Bands uses a high binning mode for the greatest sensitivity. Chemi Hi-Res is un-binned for the highest resolution. The total resolution of the image is displayed above the capture button.
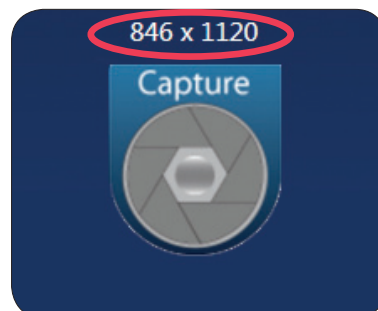

Exposure Settings

The Omega Lum offers two exposure options on most gel applications and four options on Chemi applications. For gel applications the most common exposure option will be auto, and is the default setting. If you select the manual option, the Manual Exposure options will appear.

- To make changes select **Edit** to open the Edit Exposure Settings Window.

Edit Exposure Settings

|	
0 minutes	1 2
	4 5
0 seconds	7 8
120 milliseconds	← 0
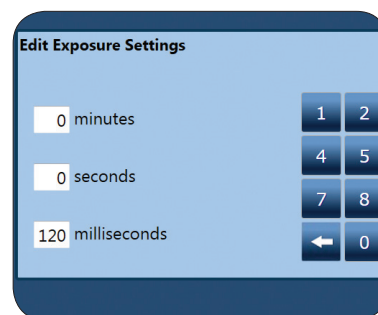
- Highlight the box you wish to edit and type in the desired exposure time.

- When done, select the enter arrow (far right), then select **Capture**.

Edit Exposure Settings

1 minutes	1 2
	4 5
0 seconds	7 8
0 milliseconds	← 0
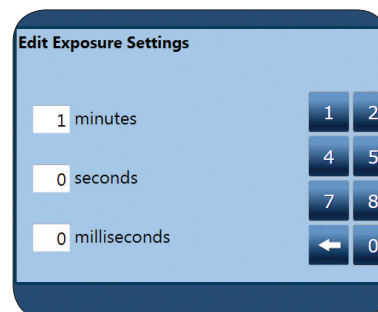
Exposure Options for Chemi Applications

With Chemi applications there are two additional exposure options in addition to the Auto and Manual Exposure. Each exposure options has its benefits.

- **Auto** – Ideal for bright light images such as gel images using visible or fluorescent dyes. Auto expose can be used for chemi applications. However, they are best used for very bright westerns whose substrate is very stable and long acting (>12hrs).

- **Manual** – Ideal for know exposure times. For example, the exposure is always going to be 2 minutes. Manual Exposure takes a single image at the time input.
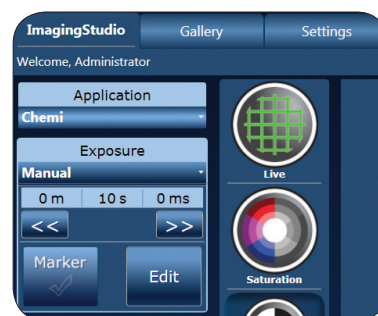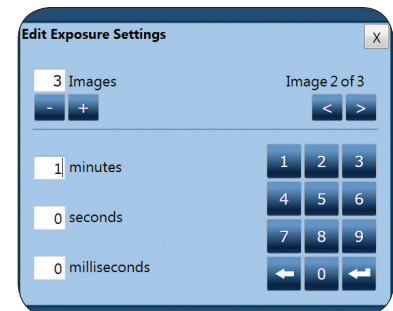
- **Multiple** – Multiple allows you to capture multiple images with difference exposure time.

  - Example: you could take three frames, the first 10 seconds.
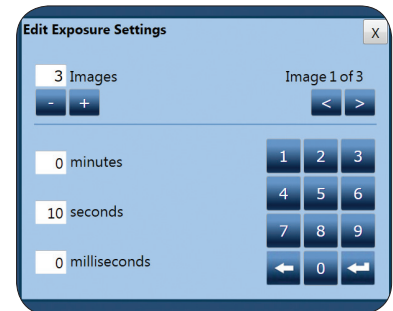
  - The second 1 minute, and the third 3 minutes. Each frame is an individual image.

- **Cumulative** – Cumulative allows stacking of multiple frames of the same exposure time. This option is deals for samples with an unknown exposure time and a substrate with a short half-life. Cumulative can capture multiple images before the signal decays.

  - Example: you capture three frames at 10 seconds. This first image will have an exposure time of 10 seconds, the second image will have an exposure time of 20 seconds, and the third image will have an exposure time of 30 seconds.

  - Please note that stacked images have a higher background level because the background of these image is also stacked.

Custom Applications

The Omega Lum Image Capture has the option to create custom applications, allowing the user to tailor the imaging parameters. While the parameters can always be modified prior to capturing your image, creating a custom application saves these changes. To create a custom application:

- Select the default application you wish to modify.

- Select **Custom** from the Application menu.

<u>Omega Lum G</u>: You can customize your Light Source and Emission Filter.

<u>Omega Lum C</u>: You can customize your Light Source, Emission Filter, Tray Type, and Aperture Type.

General users can create and mange their own custom applications. Custom applications created by the administrator will be available to all users, but can only be modified by the administrator.
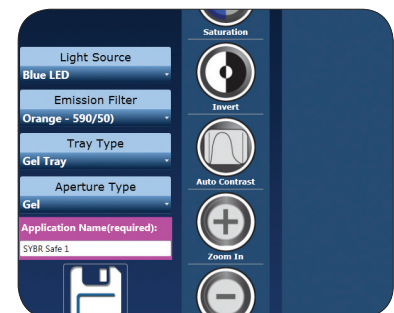
Creating Custom Applications

Binning and Image Correction in Custom Applications

Example: on the Omega Lum C to create a custom UV gel application using the Blue LED and Orange Filter.

- Select **EtBr (UV-302)**.

- Select **Custom**.

- Select **Blue LED** under Light Source, **Orange Filter** under Emission Filter, **Gel Tray** under Tray Type, and **Gel** under Aperture Type. Name the application and select **Save**.
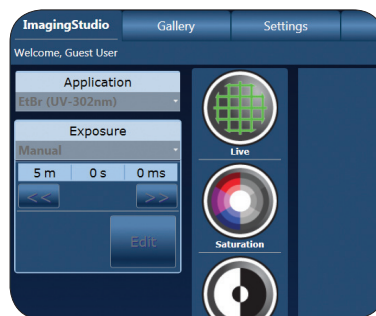
The Custom Application option builds the application based on the original applications parameters, which have defined sensitivity levels, darkmaster correction, and auto-exposure methods.

- Gel Applications use standard sensitivity, simplified bias and darkmaster corrections, and normal auto-exposure methods.

- Chemi Applications use enhanced sensitivity, full bias and darkmaster corrections, and normal auto-expose methods.

- Chemi Faint Band Applications use high sensitivity, full bias and darkmaster corrections, and enhanced auto-expose methods.

- The sensitivity mode is based on the original application, while bias file and darkmaster correction as well as the auto-expose method are determined by the final application name. To use full bias file and darkmaster correction ensure that "Chemi" is included in the application name. To ensure that enhanced auto-expose is used, include "Faint Bands" in the application name. Please see the examples below for illustration. They are demonstrated on the Omega Lum G.

  - Example 1: to create a custom application with standard sensitivity and full bias file and darkmaster correction:
    - Select a gel application such as: **Coomassie**.
    - Select **Custom**.
    - Adjust the lighting, exposure, and display options as desired.
    - Name the application "Chemi Example 1" and **Save**.
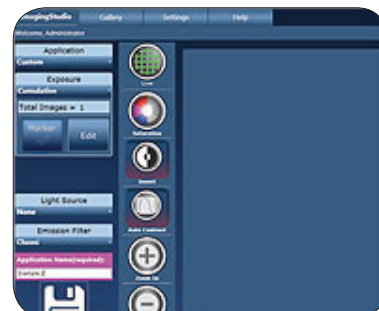
  - Example 2: to create a customer application with enhanced sensitivity, and simplified bias file and darkmaster correction:
    - Select **Chemi**.
    - Select **Custom**.
    - Adjust the lighting, exposure, and display options as desired.
    - Name the application "Example 2" and **Save**.
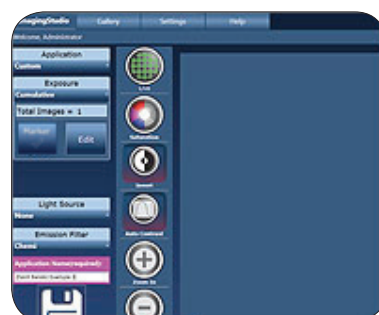
  - Example 3: to create a custom application with enhanced sensitivity, simplified bias file and darkmaster correction, and enhanced auto expose options:
    - Select **Chemi**.
    - Select **Custom**.
    - Adjust the lighting, exposure, and display options as desired.
    - Name the application "Faint Bands Example 3" and **Save**.
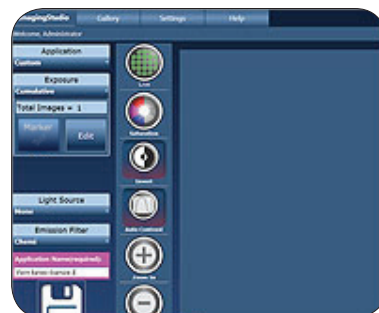
  - For the Omega Lum C you will need to also select the Tray Type and Aperture Type.

Software Features

Imaging Studio

- Live Mode – A quick display of what is inside the cabinet, using the epi white lights for illumination. This is not a preview of the image.

- Saturation – Oversaturated pixels appear in red.

- Invert – Inverts the black and white values of the image in the display.

- Auto Contrast – Calculates a balanced contrast ratio.

- Zoom in – Zooms in on the image.

- Zoom out – Zooms out on the image.

- Capture – Use this button to start the image capture process.

Gallery

The Gallery Tab in the Omega Lum Image Capture software allows modification of basic visual aspects such as contrast and saturation. Previously captured images can also be opened and modified.

- Save – Opens the Save or Save As dialogue boxes. The keyboard does not automatically pop up when entering text into a text box. To open the keyboard look for the keyboard icon and touch it to select. When saving you will need to open the keyboard prior to selecting **Save**.

- Save All – Allows the user to save multiple images at the same time.

- Print – Print the currently selected image.

- Open – Open an image from a saved file location.

- Crop – Opens the Crop Image tool. A box will appear with blue handles on the image. To crop, adjust the handles to the desired size and select Crop Confirm. The cropped image will display in a new tab.

- Contrast – Use the slide bars to adjust the image contrast.

- E-mail – Use to send image files.

- Marker – Only available for use with chemi applications, creates a new image that overlays the marker file and the chemi image.

- Image Info – Displayed Information: Image Width, Image Height, Bit Depth, Exposure Time (ms), Date Taken, Taken By, Comment.

- Invert – Inverts the black and while values of the image in the display.

- Auto Contrast – Calculates a balanced contrast ratio.

- Zoom in – Zooms in on the image.

- Zoom out – Zooms out on the image.

Settings Tab

All users are granted access to the settings tab to use the following utilities: the RBI utility, filter wheel homing, and e-mail settings. General users can also delete custom applications that they have created. Additional Settings are restricted to the Administrator.

Residual Bulk Image Utility

To ensure an optimal imaging environment during chemi imaging the Omega Lum Image Capture Software offers the Residual Bulk Image (RBI) Utility. The feature ensures the highest sensitivity imaging for chemi by removing trace residual photons from the camera sensor. The RBI utility is ideal for situations where a bright UV gel, blue light gel, or white light gel image has been taken 0-10 minutes before a chemi image needs to be taken.

- Select the **Settings Tab**.

- Select the **Residual Bulk Image Utility**. It will take two (2) minutes to run.

- Once the utility has completed select the **Imaging Studio Tab** and continue with image capture.
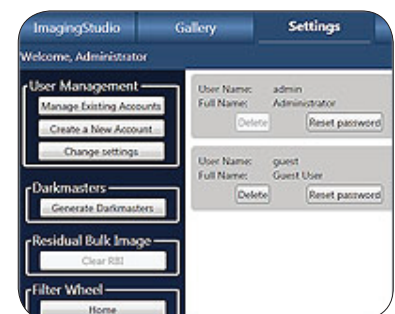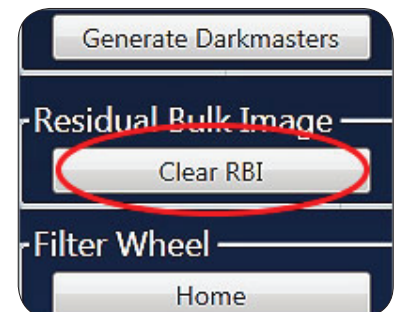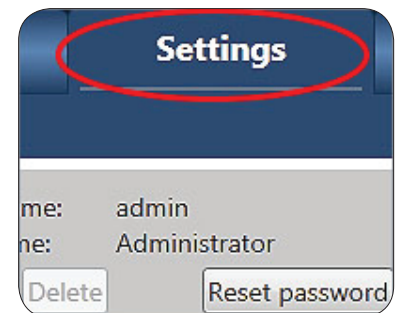
Filter Wheel Home

The filter wheel of the Omega Lum homes automatically on startup. If you are uncertain of the filter wheel's position use the Filter Wheel Home Utility to return to the home position.
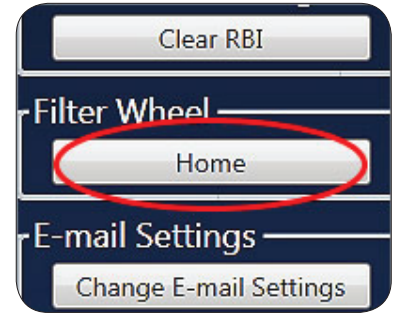
E-mail Settings

The Omega Lum Image Capture Software can export your image via e-mail. To enable this feature you must first enter the e-mail settings. You will need your STMP service information. Please consult with your system administrator of IT department as needed.

- To edit e-mail settings select **Change E-mail Settings**.
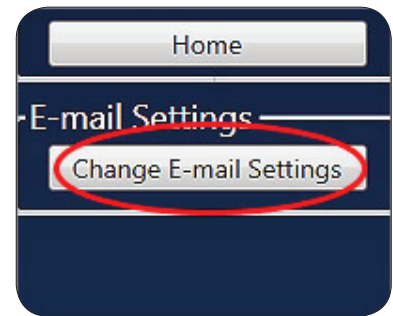
- Fill in the requested information.

Remove Custom Applications

General users can use this feature to delete custom applications they created. The view will only show those applications they created.

Administrator Settings

The Administrator can create and manage user accounts, generate new bias and darkmaster files, create flat field correction files, edit emission filters and run diagnostics, as well as change e-mail settings and calibrate the focus. The default password for this user is *admin*. It is recommended that the administrator change the password once the system is set up and keep the new password in a safe location.

User Profiles

The Omega Lum Image Capture Software allows you to create individual user profiles.

- To create a new user profile, login as the Administrator, you will be redirected to Administrator Settings tab.

- Select **Create New Account** and enter the requested information.

- If no password is entered, then no password will be required to login.

- To change the admin password and settings, select **Change Settings**.
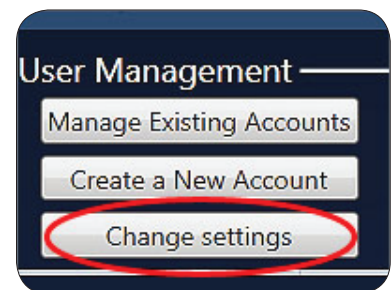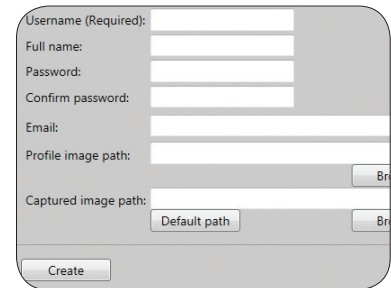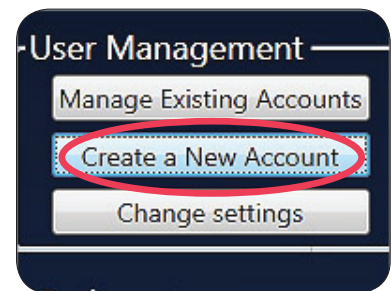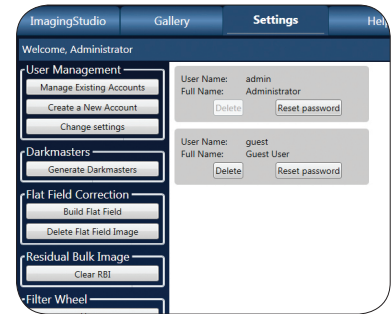
Bias and Darkmaster Files

Bias and darkmaster files provide for automatic background correction during long exposures. They are unique for each camera. Bias and darkmaster files have already been created for your system for 1, 3, and 9 minute exposure times. If you anticipate taking longer exposures, we recommend you create a new set of darkmaster files.

- To create darkmaster files, login as Administrator, and navigate to the Settings tab.

- Select **Generate Darkmasters**.

Change settings

Darkmasters
Generate Darkmasters

Residual Bulk Image
Clear RBI

- Enter the desired exposure times in the popup window. The exposure times would be comma separated with no spaces. You must enter all the times you want such as 1,3,9,20.

- Click **Generate**. The total time remaining for the completion of the darkmasters will show on the screen.

- The new set of bias and darkmaster files will overwrite any previously generated files.
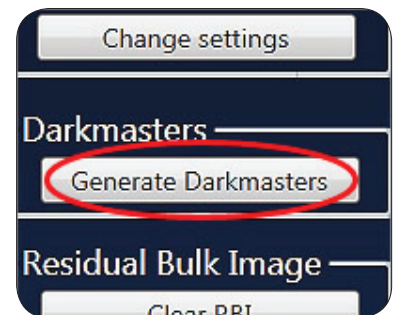
Enter exposure time for each set of r
comma separated list of exposure tir

Total Time [DD.HH:MM:SS]:

Completion Time:

Flat Field Correction

Flat Field Corrections are digital image adjustments that correct for artifacts in the optical path and pixel variations to improve image uniformity. Flat field files are created at the time of manufacture and applied automatically. If these files need to be recreated the Flat Field Correction Utility will quickly create the necessary files. Events that would require a new flat field correction include replacement of the UV bulbs, corruption of the original files, or replacement of the camera and lens.

Flat Field Corrections are created for each imaging environment. Alterations in the emission filter, light source, aperture setting, and working distance (ie height of tray used), all affect the final outcome. A flat field file must be created for each imaging environment. To create a Flat Field Correction file:

- Select **Build Flat Field** from the Settings Tab.

- Select the desired emission filter position.

- Select the **Light Source**. Note, if using Transilluminating White Light, the light source will be UV, as the white light conversion screen converts the UV illumination source. The White Light Conversion screen should only be used with 365nm UV. When building UV flats, make sure to note the UV wavelength.

- Select the **Aperture Type**. For gel applications select **Gel (F2.8)**, for chemi applications select **Chemi (F0.95)**.

- Select the tray type to be used:
  - Select UVT for all flourescent gel applications
  - Select Chemi Tray for all chemi applications
  - Select White Light Conversion for all visible gel applications

- Place the Flat Field Target in the system. The target and tray used may need to be different than those selected in the software. PLEASE CHECK CAREFULLY.
  - If the UVT is selected, place a full 8 ½" x 11" sheet on the tray so that it completely covers the UV glass.
  - If the Chemi Tray is selected place a 3" x 3" section of paper in the filter wheel shield such that it covers the hole. Please see Adding and removing filters in Appendix D for a visual aid.
  - If the White Light Conversion Tray is selected, no sheet of paper is necessary.

- Close the door and select **Build**. The system will automatically save the file to the correct location.

- Repeat these steps for each imaging environment desired. The files will be applied automatically when the imaging parameters meet those selected in the Flat Field Correction generation.
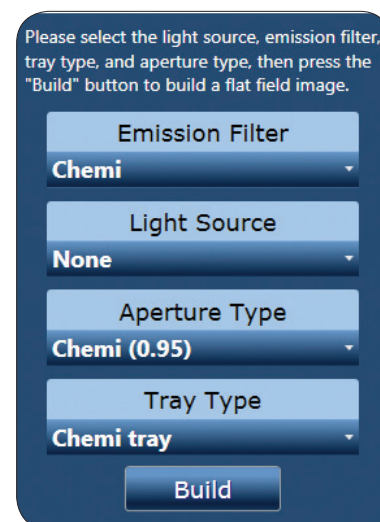
Omega Lum Flat Field Trays and Targets

The target used to construct the Flat Field Calibration reference image varies slightly depending on the application. Generally a large (11"x14") target, cut to cover the entire UVT is used. Alternatively the white light conversion tray may be used in some cases.

When using the UVT as a light source the wavelength must be selected correctly or the resultant Flat Field image will not be correct. If additional filters and custom applications are used the appropriate setting will need to match those used to define the custom application.

Application	Emission Filter	Light Source	Aperture Setting	Tray Type	Target and Tray Used
Chemi	Chemi (none)	None	Chemi (0.95)	Chemi Tray	White paper inside filter wheel cover with 11"x14" on UVT
EthBr UV302	Orange	UV 302nm	Gel (F2.8)	UVT	11"x17" white paper on UVT
SYBR Safe	Orange	Blue EPI LED	Gel (F2.8)	Chemi Tray	Chemi Tray
Coomassie UV 365	Orange	UV 365nm	Gel (F2.8)	White Light conversion tray	White Light Conversion Tray
Epi White	Orange	EPI White LED	Gel (F2.8)	UVT	11"x17" white paper on UVT

Edit Emission Filters

- Use this feature to name emission filters that are added later.

- Enter the name of the filter on the desired line.

- For information on adding and removing filters please see Appendix D.
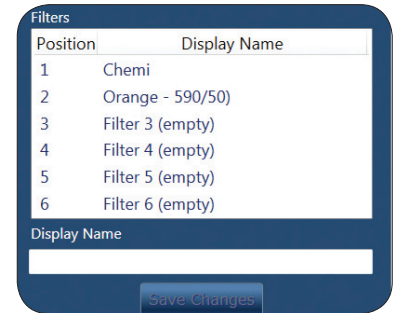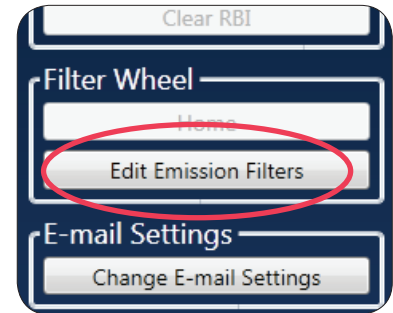
Emission Filter Diagnostics

The Emission Filter Diagnostics are performed if there is a suspected filter wheel malfunction. It tests the filter sensor and timing.

- To run the diagnostic utility select **Emission Filter Diagnostics**.

- Select **Start**.

- When it is complete you will get a pass or fail notification. If you receive a fail notification, contact Aplegen at support@aplegen.com.

23
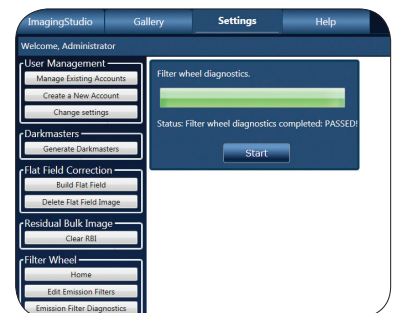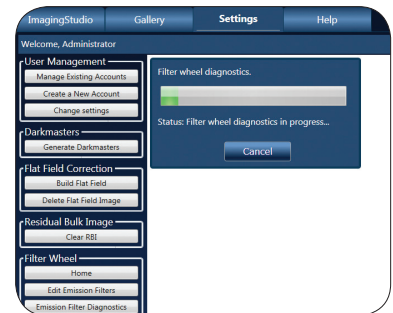
Omega Lum C Focus Calibration

Not applicable to the Omega Lum G.

The Omega Lum C motoried lens focuses automatically and the calibration is set at the time of manufacture. Over time and through use it is possible for the calibration of this focus to change. In the event that the images no longer appear to be in focus the Focus Calibration Utility can be run. The process is automatic and can take up to twenty minutes to complete. Failure of the utility to complete the calibration, or if images continue to appear out of focus after the calibration may be an indication of a problem with the lens or camera, please contact Aplegen at support@aplegen.com.

- To run the utility, select the **Settings Tab**.

- Select **Calibrate**.

- Select the **Emission Filter**, **Tray Type**, and **Aperture Type** of the application you are trying to focus.

- Select **Calibrate**.

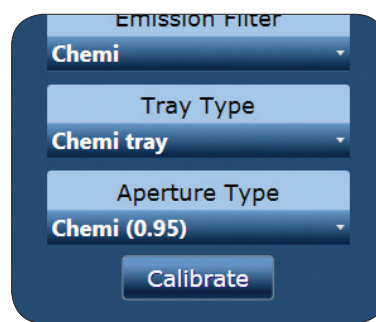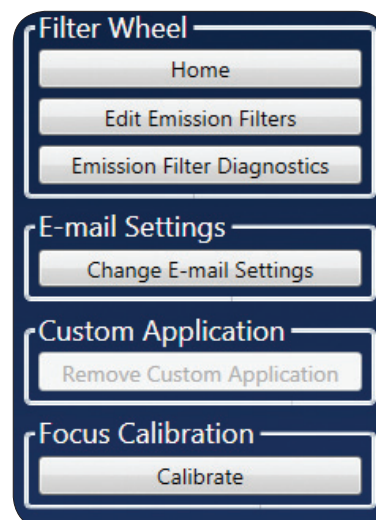Focus is affected by the choice of emission filter, aperture setting and tray position. There are many possible combinations of these three settings (~48) so a calibration method for all of these combinations is provided in the SETTINGS tab.

After a calibration is complete, capture an image to confirm accurate focus. If the image is not in focus, switch to a target with greater contrast. A business card is a good target for focusing. If the calibration fails again it may be necessary to manually focus the lens. In this case please contact Aplegen at support@aplegen.com.

Commonly used configurations are calibrated at the factory and include the following:

Filter	Tray Type	Aperture	Typical Application
1. Orange	UVT	Gel (2.8)	EtBr (UV-302nm)
2. Orange	Chemi	Gel (2.8)	SYBR Safe
3. Orange	White	Gel (2.8)	Coomassie (UV-365nm)
4. Chemi	Chemi	Chemi (0.95)	Wide Angle Chemi
5. Chemi	Elevated	Chemi (0.95)	Chemi Hi-Res

APPENDIX A

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Version 1.0
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APPENDIX B – SAFETY

CE/CSA Conformity

The following Omega Lum Imaging System,

Models: **Omega Lum G/Omega Lum C**

Are in conformity with the provisions of the following EC Directives, including all amendments, and national legislation implementing these directive:

Low Voltage Directive 2006/95/EC
EMC Directive 2004/108/EC

And that the following harmonized standards have been applied:
EN61010-1: 2001
EN61326-1: 2006: Class A

EN61000-4-2,EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-11

UV Safety Precautions

CAUTION — Because U.V. radiation can cause serious damage to unprotected eyes and skin, we recommend to wear U.V. protection glasses or face shield.

The Omega Lum systems come with a built-in Ultra-Violet (UV 200-400nm) Trans-illuminator inside the system. Exposure to UV radiation can cause permanent and/or serious damage to the eyes and skin. The system enclosure confines the radiation within the system and shields the user from exposure. The system is also equipped with a two-way safety interlock switch which automatically cuts off the power to the trans-illuminator when the door is open during normal use.

The Omega Lum imaging system belong to Class A equipment, and fulfills the limit values of table 3 but not table 4 of EN 61326:1997+A1+A2+A3.

It may become necessary to override the safety switch or operate the transilluminator outside the system for service.

In this case, be sure to use the following safety precautions:

- Always wear UV-protected eyewear that is specified by the manufacturer as providing protection at the wavelength(s) used, making sure that the eyewear protects any areas wear radiation may come through (UV sunglasses may not prevent UV radiation from coming in through the sides or around the lenses).
- Always cover all skin that may be exposed to UV light, especially the face, neck, hands, and arms.
- Always make sure that any UV protection devices (such as the safety switch on the light cabinet apparatus) are working properly. If not, discontinue use until the device(s) are properly repaired.
- Please use only UV lamps in the trans-illuminator.

Electrical Safety Precautions

Be sure to take proper precautions when handling any electrical equipment. NEVER work on any live circuit, fixture, receptacle, or switch. Safety rules you should follow whenever working with any electrical appliance include:

- Always shut off power at the main disconnect before changing a fuse.
- Always shut off power to the circuit before repairing or replacing a switch, receptacle, or fixture.
- Always tape over the main switch, empty fuse socket, or circuit breaker you are working on.
- Always check that the circuit is dead before beginning work on it. Using a circuit tester or voltmeter can help you determine this.
- Always unplug any appliance before repairing it.

The earth terminal, intended for connection to an external protective conductor for protection against electric shock in case of a fault, is located on the inside of the back panel.

Hot Surface Warning

Under normal conditions, the temperature of glass surface of UV transilluminator is below 50 °C and safe to touch. However, if the system malfunctions, it is possible for the glass surface temperature to exceed 80°C. Please exercise caution when working around the glass surface in this instance.

Waste Electrical and Electronic Equipment (WEEE)

ENG		This symbol indicates that the waste of electrical and electronic equipment must not be disposed as unsorted municipal waste and must be collected separately. Please contact an authorized representative of the manufacturer for information concerning the decommissioning of your equipment.
FRA		Ce symbole indique que les déchets relatifs à l'équipement électrique et électronique ne doivent pas être jetés comme les ordures ménagères non-triées et doivent être collectés séparément . Contactez un représentant agréé du fabricant pour obtenir des informations sur la mise au rebut de votre équipement.
GER		Dieses Symbol kennzeichnet elektrische und elektronische Geräte, die nicht mit dem gewöhnlichen, unsortierten Hausmüll entsorgt werden dürfen, sondern separat behandelt werden müssen. Bitte nehmen Sie Kontakt mit einem autorisierten Beauftragten des Herstellers auf, um Informationen hinsichtlich der Entsorgung Ihres Gerätes zu erhalten.
ITA		Questo simbolo indica che i rifiuti derivanti da apparecchiature elettriche ed elettroniche non devono essere smaltiti come rifiuti municipali indifferenziati e devono invece essere raccolti separatamente. Per informazioni relative alle modalità di smantellamento delle apparecchiature fuori uso, contattare un rappresentante autorizzato del fabbricante.
SPA		Este símbolo indica que el equipo eléctrico y electrónico no debe tirarse con los desechos domésticos y debe tratarse por separado. Contacte con el representante local del fabricante para obtener más información sobre la forma de desechar el equipo.
SWE		Denna symbol anger att elektriska och elektroniska utrustningar inte får avyttras som osorterat hushållsavfall och måste samlas in separat . Var god kontakta en auktoriserad tillverkarrepresentant för information angående avyttring av utrustningen.

APPENDIX C – TABLET AND PERIPHERALS

Basic Tablet Operations

The Omega Lum uses a touch screen tablet PC to run the imaging station. For in depth directions please refer to the Dell Tablet User Manual. However, here are some basic navigation tips to help you get started.

- Use your finger as you would a mouse.

- One touch or tap to select.

- To Scroll tap once, then drag the scroll bar as desired.

- Double tap an icon to launch an application.

- To "right click" touch and hold your finger to the screen. A square will appear. When it completes, lift your finger and the options menu will appear.

- To exit the menu, tap anywhere on the desktop.

- The keyboard does not automatically pop up when entering text into a text box. To open the keyboard look for the keyboard icon and touch it to select. When saving you will need to open the keyboard prior to selecting **Save**.

- The windows button on the center bottom of the tablet can be used to open the Windows Main Menu.

Mitsubishi Electric P-95D Printer Driver Installation

For a quick and easy installation, Aplegen has pre-installed the Mitsubishi Electric P-95D Thermal Printer Driver. To use, simply plug the USB printer cable into the USB port indicated by the red dot on the side rear of the system. To re-install the driver, or to install a different driver that is not Windows 8 compliant, please follow the directions below.

Windows 8 Driver Signature Enforcement is a new feature of Windows 8 that has certain signature requirements not yet implemented in the Mitsubishi Electric P-95D Printer. In order to install the printer driver you must disable the Driver Signature Enforcement on startup, install the driver, and then reboot the system. The Driver Signature Enforcement will reset upon rebooting, but once the driver has been installed it will remain. You will need a USB keyboard to complete the driver installation.

To install the Mitsubishi Electric P-95D Printer Driver please take the following steps:
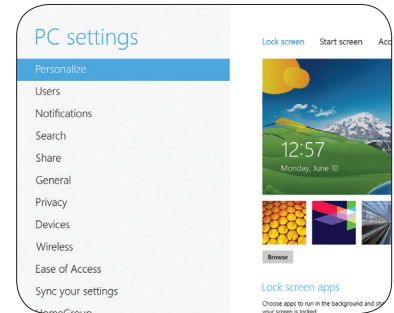
- Open the Charms Bar, swipe with your finger from the far right side of the screen, to the left.
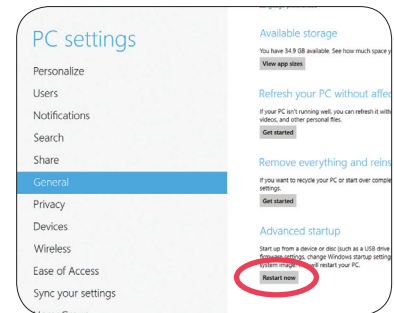
- Select **Settings**.
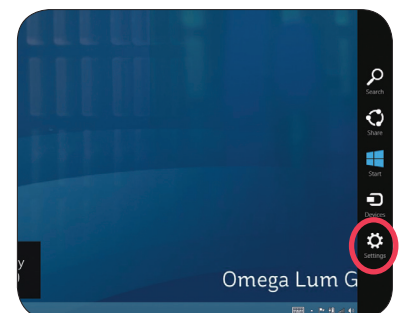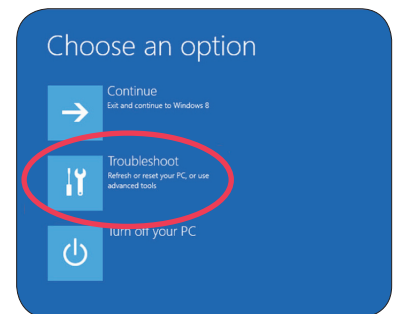
- Select **Change PC Settings**.
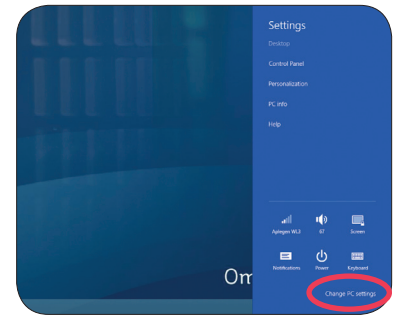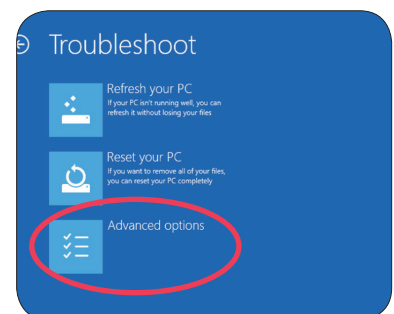

- Select **General**.

- Scroll down the list, Under Advanced Startup select **Restart Now**. The system will restart.
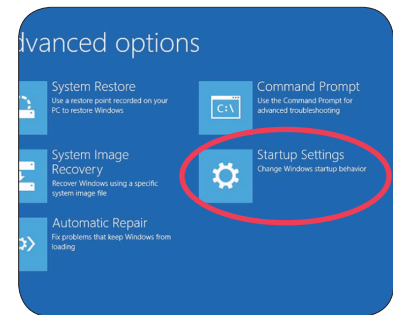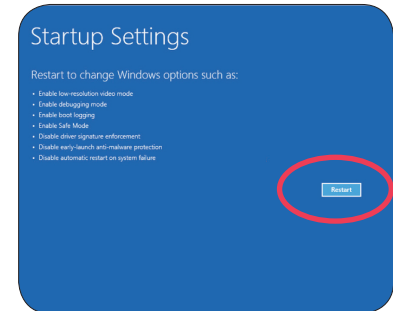

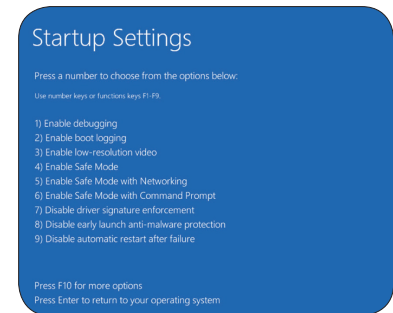- Select **Troubleshoot**.

- Select **Advanced Options**.

- Select **Startup Settings**.

- Select **Restart**.

- Use the USB keyboard to select number 7 (hit **F7** or the number 7 key). The system will restart. You are now ready to install the printer driver.

- To start, plug in the printer USB.

- Turn on the printer and follow the directions that appear on the screen.

- Or, you may install the printer from the control panel. To reach the control panel, open the Charms bar, select **Control Panel**.
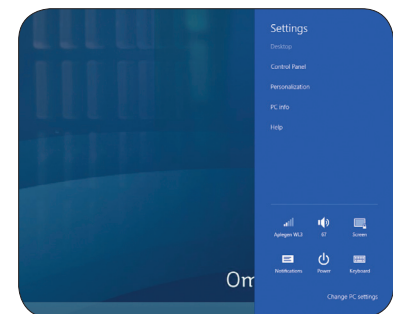
Detailed driver installation instructions are available in the Mitsubishi Electric P-95D Printer Installation Materials.

APPENDIX D – ROUTINE MAINTENANCE

The Omega Lum System is robust and requires minimal routine maintenance. The system should be kept clean and any spills cleaned up immediately. Simple green or ethanol can be used to remove dried spills. Use only a soft cloth to clean the UV transilluminator glass, as harsh clothes can leave scratches. Replace UV bulbs and the rubber camera gasket as needed. If condensation or frost appears in an image it may be necessary to replace the desiccant plug in the camera.

Adding or Replacing Filters

To add or replace a filter it must be physically added to the system as well as loaded into the software. Position 1 should be left empty for chemiluminescent applications. To start login as Administrator.
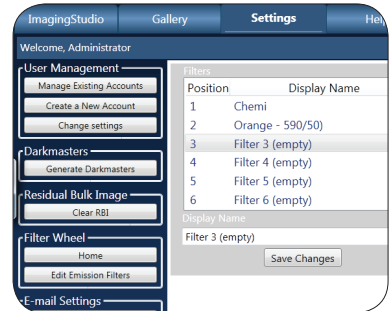
- To add a filter:

  - Create a custom application and select the filter position you wish to add.

  - Select **Capture**. This will rotate the filter wheel into the desired location.

  - Open the filter wheel shield.

  - Screw in the new filter.
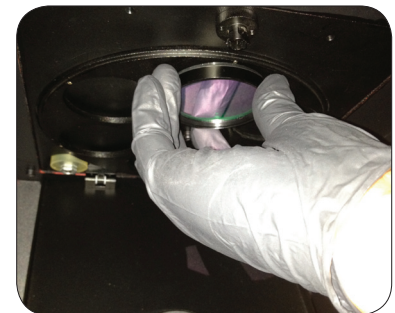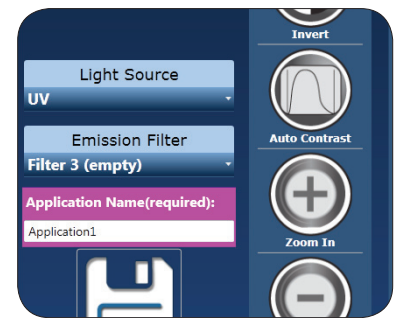
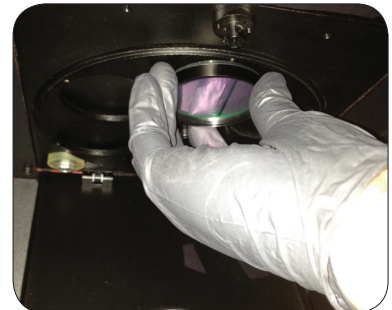- Close the filter shield.

- Select the **Settings Tab**. Enter the name of the filter in the correct location.

- To replace a filter:

  - Select an application with the filter in question.

  - Select **Capture** to move the filter into place.

  - Open the filter wheel shield.

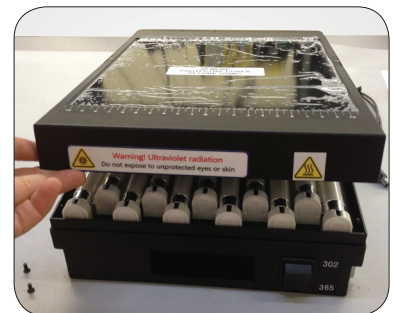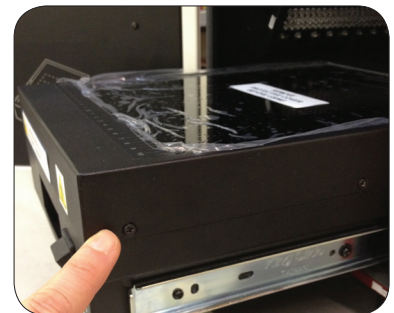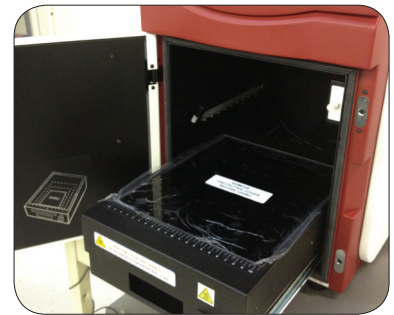 - Remove the old filter and screw in the new filter.
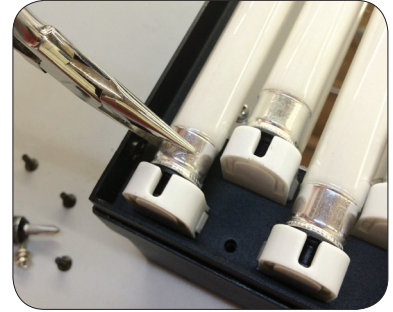
- Close the filter shield.

Replacing UV bulbs

The UV bulbs can be replaced without removing the UVT from the system.

- Open the door.

- Pull out the UVT.

- Remove the 4 screws (2 on each side) from the UV glass assembly.

- Lift the UV glass assembly off to reveal the bulbs.

- Using a pair of needle nose pliers with grip as an aid, rotate the bulb and lift it out of the ballast housing.

- Replace the bulb and rotate the bulb to the locked position.

- Replace the UV glass assembly and screws.