

INGENIUS ³



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Chapter One- Introduction

The InGenius³ system supports multiple applications including DNA/RNA gel imaging such as EtBr, SYBR Gold and UltraSafe Blue and visible stained gels i.e. coomassie blue and silver stain.

The InGenius³ gel imaging system is a dedicated UV transilluminator-based system with a small footprint. The InGenius³ image capture software GeneSys has been designed for ease of use and is application driven.

InGenius³ is the perfect choice for a low budget gel documentation system. It features a compact darkroom which has a sliding front door and an internal white light.

1.1 Applications supported

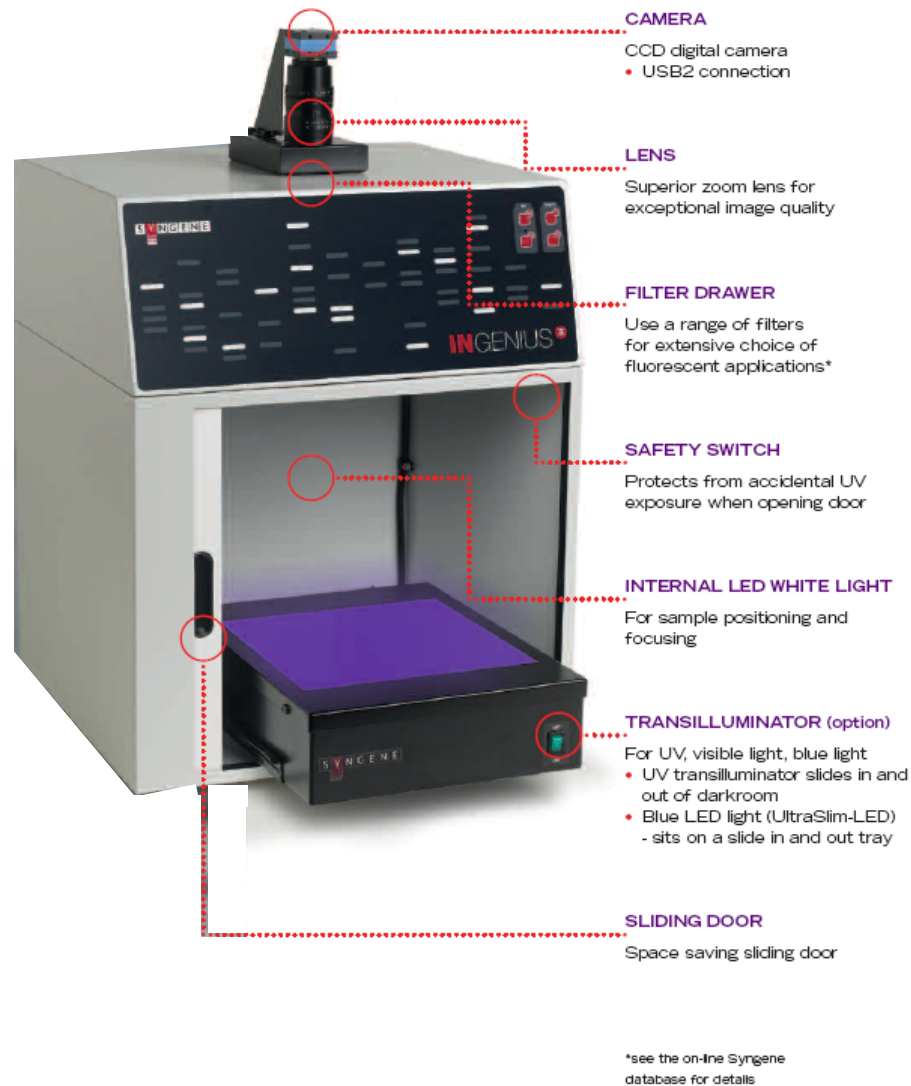
Transilluminator UV	White Light Pad	Blue LED Transilluminator
Ethidium Bromide SYBR Green SYBR Gold SYBR Safe Gel Green Gel Red SYPRO Ruby UltraSafe Blue	Coomassie blue stain Copper stain Zinc stain Silver stain	GelGreen SYBR Gold SYBR Green SYBR Safe UltraSafe Blue

1.2 Hardware

1.2.1 Specification

Camera	3.0MP, 12/16 bit
Filter holder	Yes (UV filter as standard)
Max gel size	20x20cm
Data types	SGD, BMP, TIFF and JPEG
CCD resolution	3.0M pixels
Image storage	USB, hard disk and network capabilities
Image enhancements	Annotation, rotation, inversion and many more
Illumination	Slide in and out UV transilluminator, Epi white LED light. Blue LED transilluminator

1.2.2 System components



1.2.2.1 Darkroom

The darkroom has a sliding door. The darkroom features:

- Slide out mid wave 302nm UV transilluminator
- Internal LED white light
- Safety switch to protect from accidental UV exposure

1.2.2.2 UV transilluminator

The UV transilluminator will excite many fluorescent stains such as Ethidium bromide, SYBR™ stains, Gel Red™. The standard wavelength is 302nm. The transilluminator can be slid easily in and out of the cabinet.

1.2.2.3 Filter Draw

Interchange a range of filters for extensive choice of fluorescent applications.

1.2.3 Accessories

1.2.3.1 Visible light converter



Syngene offer a visible light converter that can be placed on top of the UV transilluminator for imaging coomassie and silver stained gels.

1.2.3.2 Blue LED transilluminator



The UltraSlim blue LED transilluminator is ideal for safely imaging gels stained with SYBR Safe, Gold and Green, GelGreen and UltraSafe blue.

1.2.3.3 Thermal printer

You may attach a thermal printer either Mitsubishi P93D or Sony UPD897.

When you first attach the printer you will see the following window



Select 'No, not this time' and press Next button
The drivers will automatically install.

1.2.3.4 Analysis software

The InGenius³ system is supplied with a copy of GeneTools analysis software from Syngene. This may be loaded on a PC of your choice. Please see the loading instructions within the CD cover.

1.2.4 Set-up

Please refer to the Installation quick guide on how to set up the camera and darkroom.

1.2.4.1 Installing GeneSys image capture software

1.2.4.2 Minimum system requirements

GeneSys can operate on the following Operating Systems Windows XP Professional SP3 (32 bit version only) or Windows 7 Professional.

Please note that Home versions of Windows operating systems are not supported.

Please refer to the Syngene website FAQs Gel documentation and analysis section for the up-to-date minimum system requirements.

1.2.4.3 Software Installation

This section provides information regarding the installation of GeneSys image capture software.

You will need to install the software from an account that has Administrator rights.

Installation is performed in the following sequence

1. Hardware Information
2. Select destination location
3. Select Start Menu Folder
4. Device Driver Installation Wizard

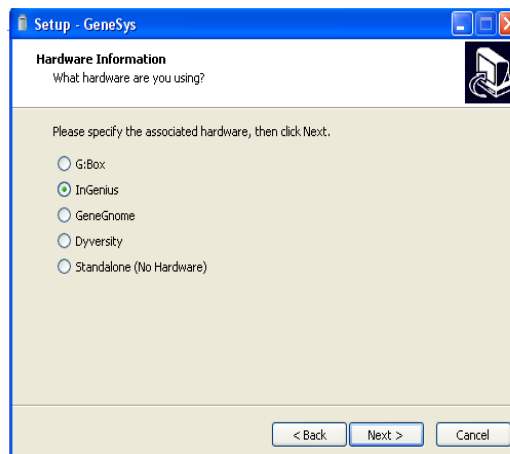
1.2.4.4 Installation of Hardware Information

Insert the GeneSys CD and run the set-up program.

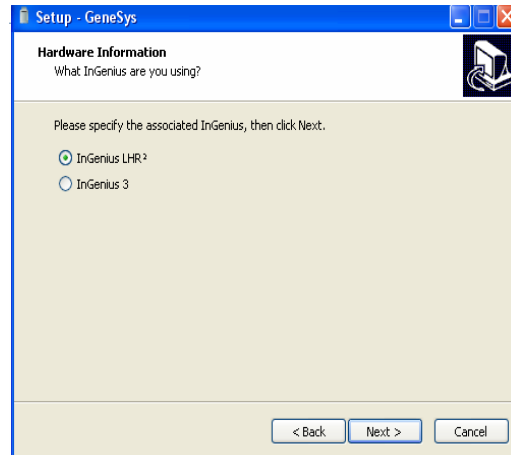


Click 'Next'

Select from the list the hardware that you have then click 'Next'

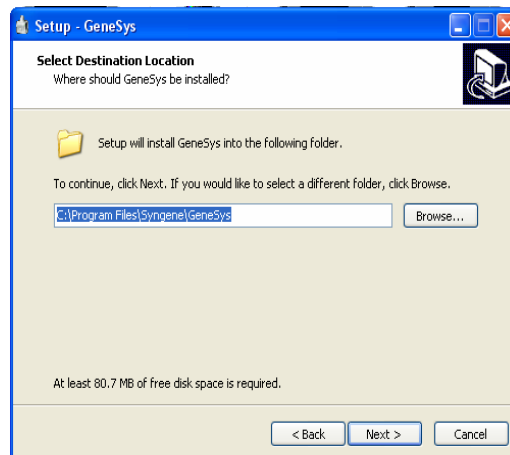


Now enter your specific model from the list then click 'Next'



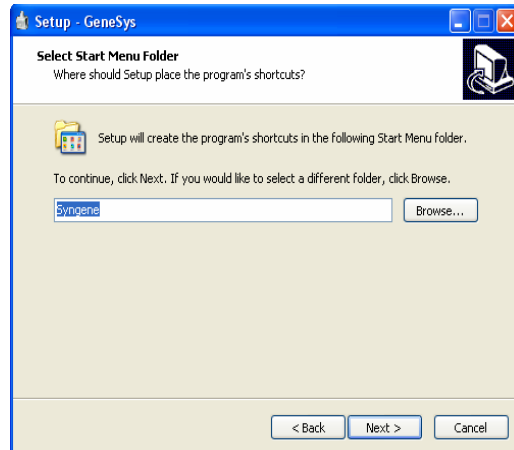
1.2.4.5 Select Destination Location

Please select the folder in which you would like GeneSys to be installed. Select Browse to explore more folder options. Click 'Next'

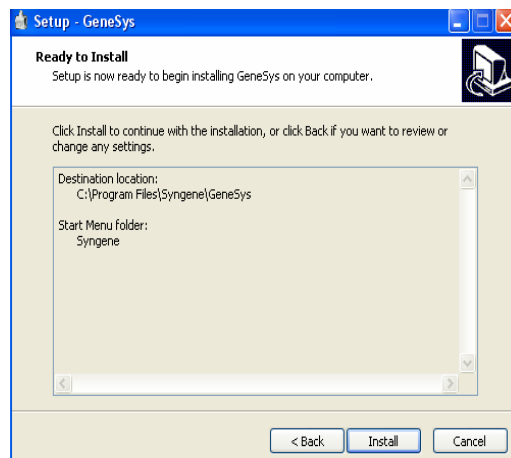


1.2.4.6 Select Start Menu Folder

Please select where you would like to create the shortcuts for the program. To select a different folder click the browse button. Click 'Next'.

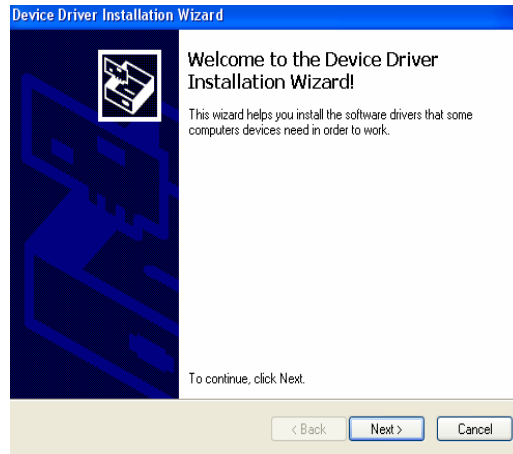


The software is now ready to install. Click 'Install' to continue the Installation process.



1.2.4.7 Device Driver Installation Wizard

This wizard will now install the software drivers that some computer devices need in order to complete the installation. Click 'Next'.



Click 'Finish' to complete the Device Driver Installation Wizard.

1.3 Enabling secure user accounts

To enable a secure user account you must use your Microsoft Windows account log in. Secure user accounts provide you with the full functionality of the software but will only show the configurations set up by you or the configurations which have been made public.

1.4 Setting up hardware

When using GeneSys software for the first time or when you have purchased additional accessories such as converter screens you need to tell GeneSys software this information.



To enter this information click on the 'View available hardware' icon from the home page. Once this information has been entered by selecting the appropriate buttons the selected items will turn red. Ensure that you click Save.

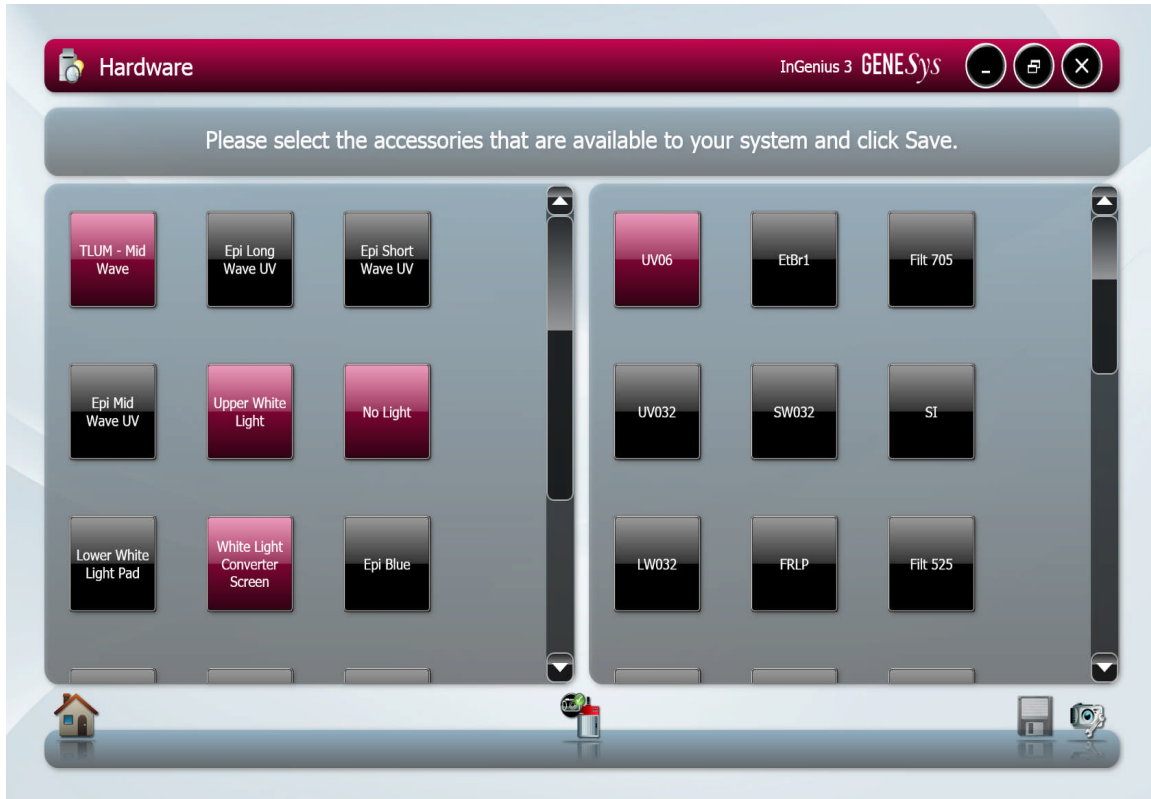


Figure 1- Hardware page

You can select your preferences on the type of report settings that you would like. You can select to view or print the full report (Image, File description and capture properties) or the basic report (image and capture settings).



To change the settings of the printer use this icon.

GeneSys software default setting for captured images is to save them as a .sgd file type. If you prefer you can select from the drop down list to change the saving default to any of the following file types Tif, Tif-compressed, bmp and jpg.

You can also select to remove screen prompts for converter screens, automatically hide light and filter messages, reset neutral field data and select your regional power frequency.

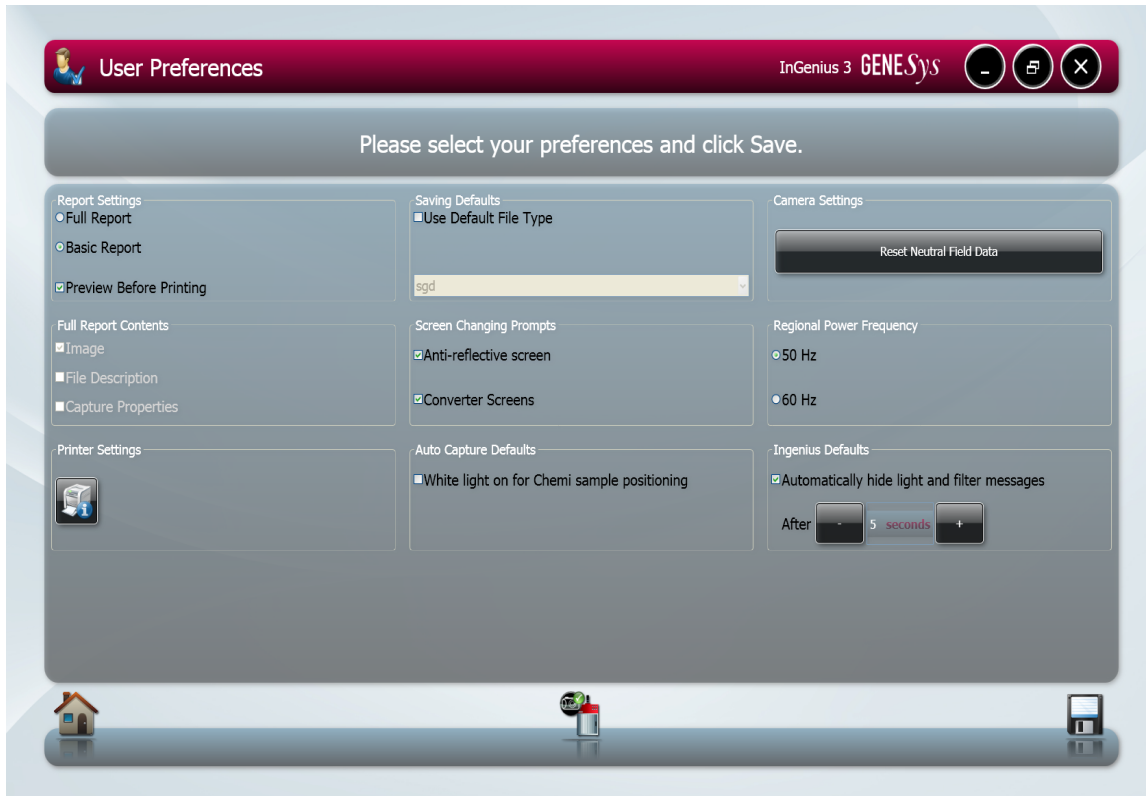


Figure 2- User Preferences page

Chapter Two- Auto Capture and Manual Image Acquisition

2.0 Auto Capture

The basis of auto capture mode is a series of steps that form a structured workflow. The workflow is very easy to navigate through by using the green bouncing arrow present in the bottom right hand corner of the screen to move forward to the next screen (**Figure 3**). The grey status bar shows the progress of the workflow, select any of the icons to move between any of the stages that make up the workflow (**Figure 4**).



Figure 3- Navigation arrow



Figure 4- Workflow status bar

The first step of the workflow is Sample Selection followed by Dye Selection, Protocol Selection and Sample Positioning. The final stage is the Capture screen.

2.0.1 Sample Selection

The sample selection screen provides you with a choice of Sample Format. This refers to the type of sample with the options being Gel, Blot or Other. **N.B. If you select 'Other' this will take you straight to the Manual capture screen.**

2.0.2 Dye Selection

GeneSys software has an extensive database containing a vast list of dyes covering a variety of applications from fluorescence, chemiluminescence, chemifluorescence and visible stains.

2.0.3 Protocol selection

GeneSys software has an extensive database which calculates the optimal imaging conditions for your sample based on the excitation and emission curves of the majority of dyes currently commercially available.

2.0.4 Sample Positioning

The sample positioning screen shows a live image of your sample.

2.0.5 Capture screen

The capture screen offers a wide range of functions including the ability to save, print, edit images and analyse the captured image (GeneTools is required).

The captured image appears in the main window with the summary of the protocol used present on the right hand side.

2.1 Capturing an image of an agarose EtBr or similar gel

(For rapid capture see Quick Guide-Capture)

Step One

Select Auto Capture from the home screen.



Step Two

From the Sample Selection screen select the following Gel as Sample Format, the sample type is either DNA or RNA and finally select whether your gel is Acrylamide or Agarose.



Step Three

From Dye Selection screen select the dye that you are using either from your recent selections only or by searching for a dye (N.B. untick recent selections only to search the full list).

Search for dye here...

Recent selections only

Step Four

As a default setting GeneSys shows you the best imaging condition for your hardware set-up.



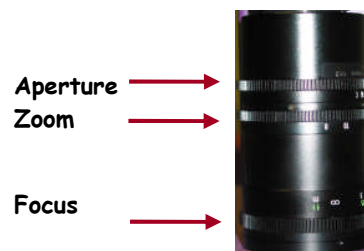
To see more options check the 'More Options' box. To view the non-UV protocols check the 'Non-UV protocols only' box.

More Options

Non-UV protocols only

Step Five

Place your sample on top of the transilluminator and close the door. The Sample Positioning screen will allow you to manually adjust the Lens controls (focus, zoom and iris settings).



N.B. Opening the aperture too far may result in areas of the sample being saturated, generating a very bright image.

If you wish to perform EDR, please check the EDR box.



Step Six

The captured image will appear in the main window. The image can now be saved in various file formats (.sgd, TIFF, JPG and BMP) or printed. You can also export the image to GeneTools analysis software.



Save



Print



GeneTools

2.2 Capturing an Image of a protein gel (coomassie, silver stained) or other white light image (colony plate, autorad, microtitre plate etc.)

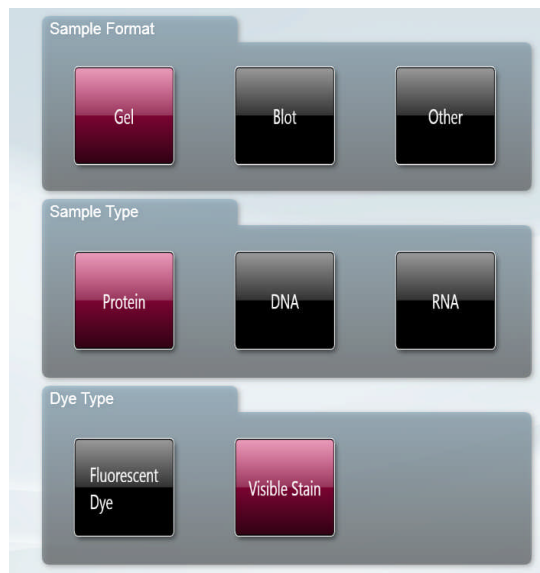
Step One

Select Auto Capture from the home screen.



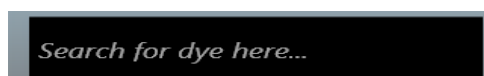
Step Two

From the Sample Selection screen select the following Gel as Sample Format, the sample type is Protein and then select that your gel is visibly stained.



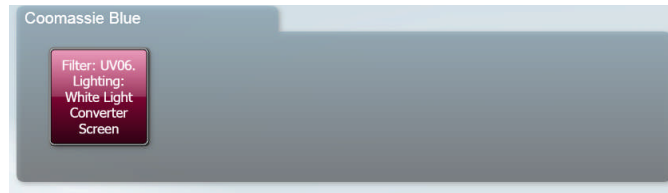
Step Three

From Dye Selection screen select the dye that you are using either from your recent selections only or by searching for a dye (N.B. untick recent selections only to search the full list).



Step Four

As a default setting GeneSys shows you the best imaging condition for your hardware set-up.



Step Five

If you have a white light converter then place your sample on top of the converter then place the converter on top of the transilluminator and close the door.

The Sample Positioning screen will allow you to manually adjust the Lens controls (focus, zoom and iris settings).



N.B. Opening the aperture too far may result in areas of the sample being saturated, generating a very bright image.

If you wish to perform EDR, please check the EDR box.



Step Six

The captured image will appear in the main window. The image can now be saved in various file formats (.sgd, TIFF, JPG and BMP) or printed. You can also export the image to GeneTools analysis software.



Save



Print



GeneTools

To ensure that the image you are capturing is not saturated select the 'Show Saturation button' (**Figure 5**). Saturation will only show when the slider bars have been moved to each end of the brightness/contrast slider. Over-exposed (saturated) white bands will show red and over-exposed black areas in blue (**Figure 6**).



Figure 5- Show Saturation button

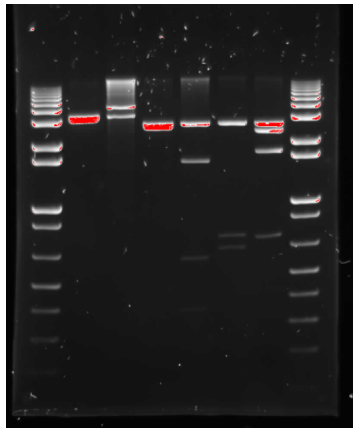


Figure 6- Image of a gel showing saturation

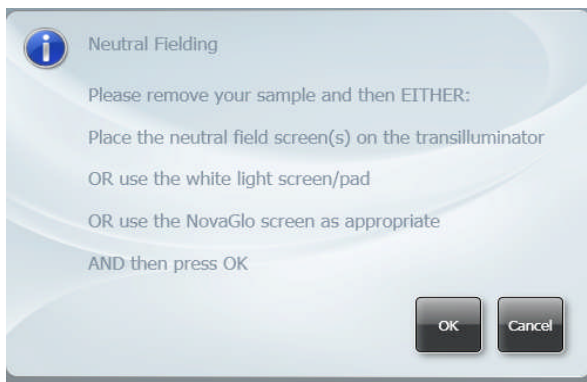
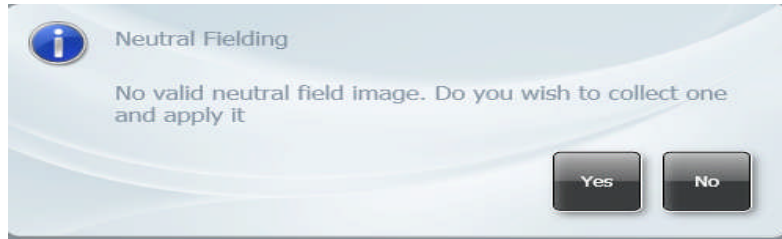
The bands coloured red show that these bands are saturated

GeneSys software also has the ability to Neutral field. The neutral field function is based on powerful algorithms which corrects for uneven illumination. This results in an image with a flat, even background whilst maintaining GLP compliance. To Neutral field check the box for neutral fielding (**Figure 7**) and then follow the on-screen instructions (**Figure 8**).



Figure 7- Neutral Fielding check box

Depending on which type of sample (UV, epi lights or transilluminator white light) you would like to neutral field you may get either of the bottom two messages shown below.



Or

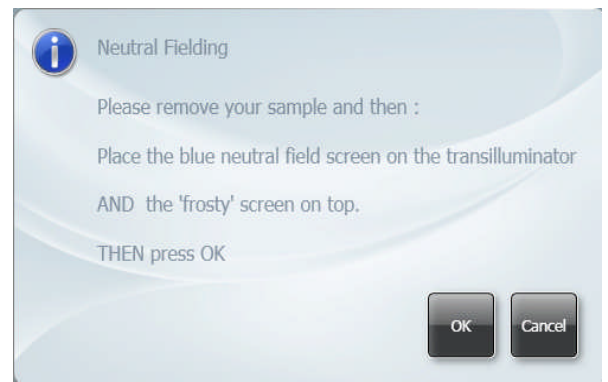


Figure 8- Neutral Fielding Dialog boxes

To freeze the image press (if you have a touch screen monitor) or click the Capture button (**Figure 9**). The image is no longer Live. If you wish to abort capture you can press the 'Stop' button at any time (**Figure 9**).

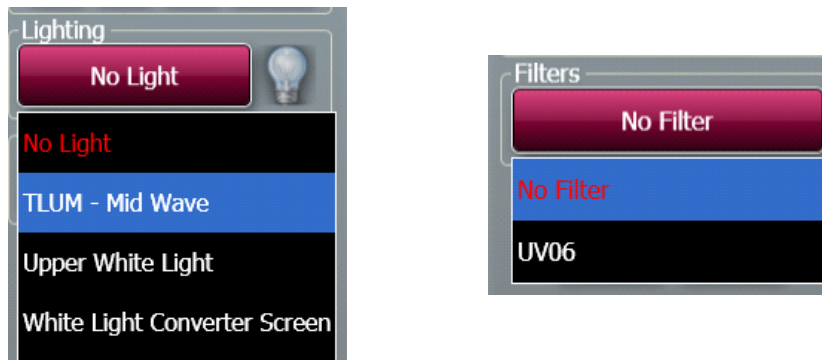


Figure 9- Capture and Stop buttons

2.3 Manual Capture

Manual capture offers you the ability to take complete control of every function of the system. The manual mode is particularly useful for the more unusual applications and if you have known imaging parameters that you wish to use.

Once Manual capture has been selected the camera is live. To be able to position your sample the appropriate lighting and filter combination need to be selected. Both the lighting and filter menus have a drop-down menu where you can select from all the available lighting and filters present in your system (**Figure 10**).



Once you have selected a light and filter you need to set the exposure time. Use the +/- buttons to increase or decrease the exposure time (**Figure 11**). The exposure time can be entered manually by typing a number directly into the box. Please enter the exposure time in the following format hours:minutes:seconds:milliseconds (h:m:s:ms). There is a default exposure time of 80ms for fluorescent gels.



Figure 11 - Setting Exposure times

Auto Capture is designed to capture the maximum available grey scales of the sample without actually allowing saturation. Therefore, this feature is ideal for quantifying data (**Figure 12**).

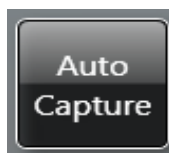


Figure 12- Auto Capture button

To ensure that the image you are capturing is not saturated select the 'Show Saturation button' (**Figure 13**). Saturation will only show when the slider bars have been moved to each end of the brightness/contrast slider. Over-exposed

(saturated) white bands will show red and over-exposed black areas in blue (**Figure 14**).



Figure 13- Show Saturation button

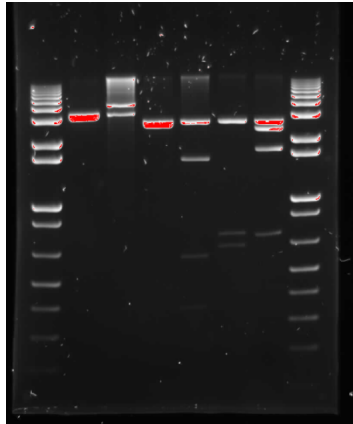


Figure 14- Image of a gel showing saturation

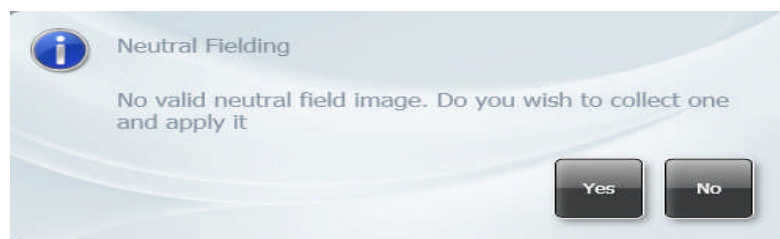
The bands coloured red show that these bands are saturated

GeneSys software also has the ability to Neutral field. The neutral field function is based on powerful algorithms which corrects for uneven illumination. This results in an image with a flat, even background whilst maintaining GLP compliance. To Neutral field check the box for neutral fielding (**Figure 15**) and then follow the on-screen instructions (**Figure 16**).



Figure 15- Neutral Fielding check box

Depending on which type of sample (UV, epi lights or transilluminator white light) you would like to neutral field you may get either of the bottom two messages shown below.



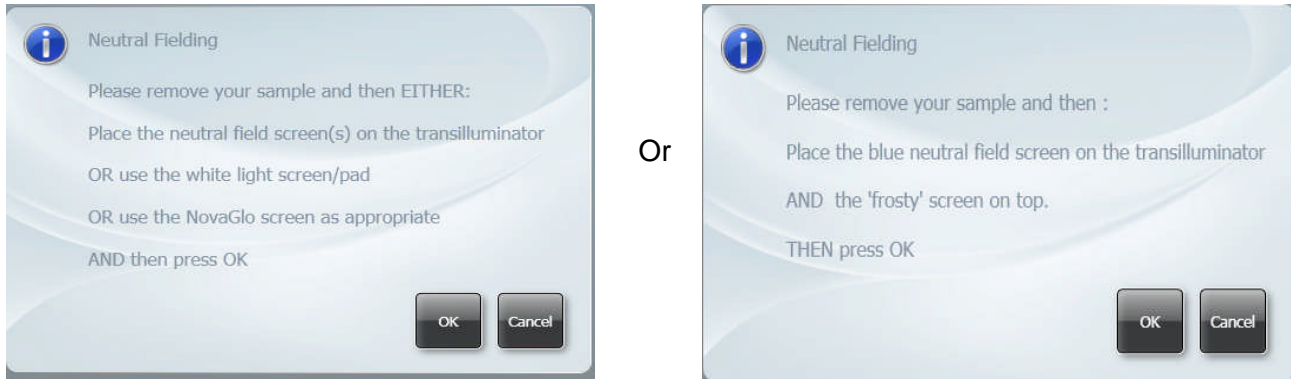


Figure 16- Neutral Fielding Dialog boxes

To freeze the image press (if you have a touch screen monitor) or click the Capture button (**Figure 17**). The image is no longer Live. If you wish to abort capture you can press the 'Stop' button at any time (**Figure 17**).



Figure 17- Capture and Stop buttons

Pixel binning is a process that further enhances the sensitivity of a CCD sensor in terms of the speed of the image acquisition. The process of binning involves taking square groups of pixels and combining them into one 'super' pixel. This has the effect of reducing required exposure times. However, this will lead to a reduction in image resolution.

GeneSys software offers a range of pixel binning options which involve combining pixel groups 2x2, 4x4. If you wish to perform binning select the 'No Binning' button and choose the level of binning from the drop-down list (**Figure 18**).

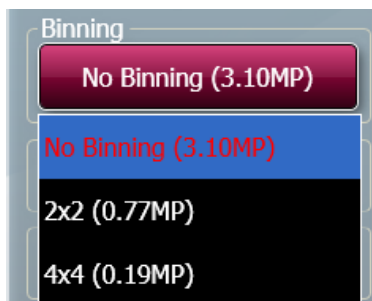


Figure 18- Binning factors

The histogram tool is very useful for illustrating the distribution of grey scales within the image (**Figure 19**). The level of grey scales produced is dependant on exposure time - up to 65536 grey scales will be displayed (**Figure 20**).



Figure 19- Manual Histogram tool button



Figure 20- Graphical representation of the number of greyscale levels captured

The red lines on the histogram are moveable allowing you to adjust the brightness and contrast by using the histogram.

The slider bars present on the left hand side of the screen can be used to adjust the brightness and contrast of an image and to digitally zoom in or out (**Figure 21**). Adjust the brightness and contrast by moving the slider tabs up and down. To return to original settings press the reset button (green arrows). To zoom in move the slider bar towards the (+) sign and to zoom out move the slider bar towards the (-) sign.

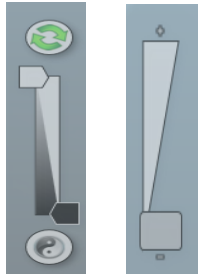


Figure 21- Manual capture slider bars for brightness and contrast and digital zoom

To view more information about the captured image select the image information icon. Once selected the pop up window will display information on dye, filter, light source, Iris F number, exposure time and the image size. The image information button also provides information on the range of black and white levels. You can also point the mouse arrow over a band and the black and white levels and XY coordinates appear in this box (**Figure 22**).

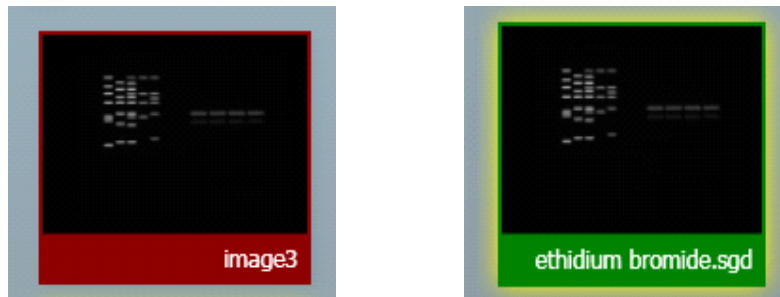


Figure 22- Image Information Icon

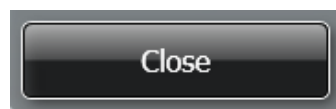
GeneSys software can be used to set up custom protocols containing system settings (lighting, filter and camera settings) which can be repeated and retrieved at any time. These repeatable custom protocols are configurations, to save a configuration select the following icon (refer to chapter 5 for more information on how to set up a configuration).

**Figure 23- Configuration Icon**

The image pool present on the right hand side of the screen contains saved and unsaved images that have been recently captured in this session. The images outlined in red are images that have not been saved; images outlined in green are images which have been saved and the file name will be present (**Figure 24**).

**Figure 24- Saved and unsaved images**

To remove an image from capture screen image pool, select the Close button. **N.B. This will remove the image from every image pool. If the image has not been saved the software will prompt you to save the image before removing it (Figure 25).**

**Figure 25- The Close button**

The image pool also permits the user to select multiple images by checking the Multi Select Mode box (**Figure 26**).

**Figure 26- Multi Select Mode check box**

Chapter Three- Exporting, Saving and Printing Images

The most convenient way to archive or document the complete information about your experiments is to generate reports.

However, you may just want to export only your gel or blot image(s) for presentation or publication purposes.

This chapter describes all the ways you can export an image, save and print images.

3.1 Saving Images

Images captured with GeneSys software can be saved in several formats. To save an image simply press (touch-screen) or click on the following icon (**Figure 27**).



Figure 27- Save icon

A dialog box will pop up where you can enter a file name for your image. You can also use the 'Save as type' drop down menu and select to save the image as a SynGene Data (*.sgd), TIFF image file (*.tif), Windows Bitmap image file (*.bmp) or a JPEG image file (*.jpg) (**Figure 28**).

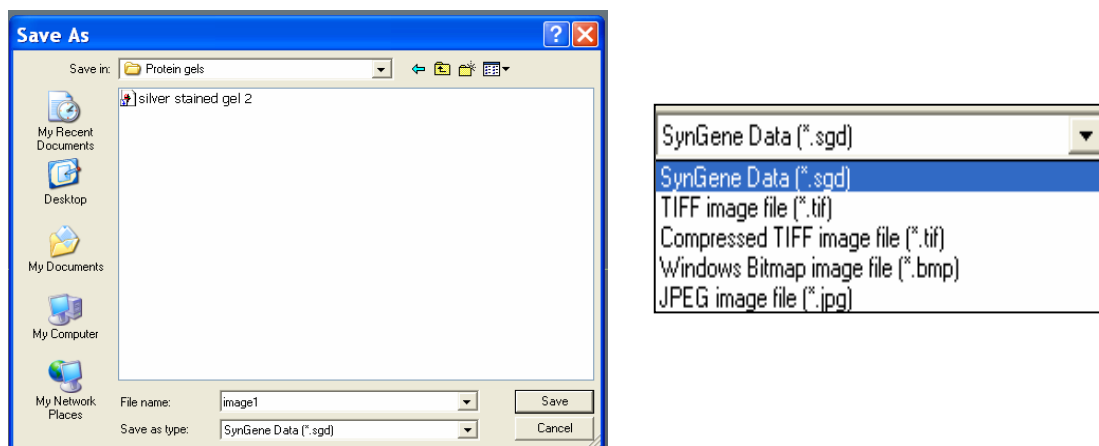


Figure 28- Saving dialog box

The default is set to SynGene Data (*.sgd) which is a secure file and GLP compliant. These files can only be opened or altered in Syngene software packages such as GeneTools. SGD files contain all the capture information such as lighting, filter, exposure times and many more complex details i.e. the camera serial number.

You can select to save the raw image as a TIFF (16 bit uncompressed or 8 bit compressed). This format is used when you require all the image data to be retained. This file option creates a larger file, but will allow you to analyse the image in other software packages.

To save the displayed image select between *.bmp and *.jpg formats N.B. *.BMP and *.jpg formats will save as 8-bit files and you will therefore lose quantitative data. This format should only be used for the export of visual information to presentation or word processing software, such as Microsoft Powerpoint or Microsoft Word.

3.1.1 Saving Annotations

Annotations can be saved as a .sgd file format. Select the Save/Load annotations icon to add annotations to an image from a saved .ANN file using the Load Annotation button (ANN. Annotation file) (**Figure 29**).

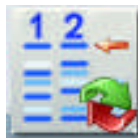


Figure 29- Saving Annotations icon

3.2 Printing Images

Images captured with GeneSys software can be printed using a thermal printer or any other printer. To print an image you need to press (touch-screen) or click the following icon (**Figure 30**).



Figure 30- Print icon

A dialog box will appear showing a print preview. Select Print to print the image (**Figure 31**).

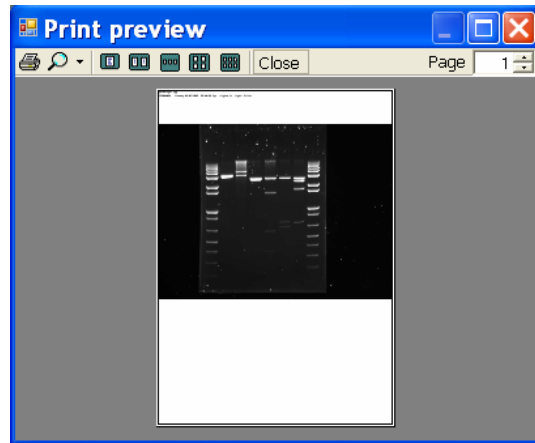


Figure 31- Print preview

3.3 Exporting Images to GeneTools analysis software

Various file formats can be exported from GeneSys to GeneTools. Syngene recommends uncompressed TIFF or .sgd to maintain quantification.

To export a captured or saved image simply select the 'open selected images in GeneTools' button (**Figure 32**).



Figure 32- Send to GeneTools icon

Chapter Four- Browse, Edit and View Screens

4.1 Edit screen

The Edit screen offers a variety of functions ranging from image enhancement and 3D view to changing the resolution of the image for publication purposes (**Figure 33**).

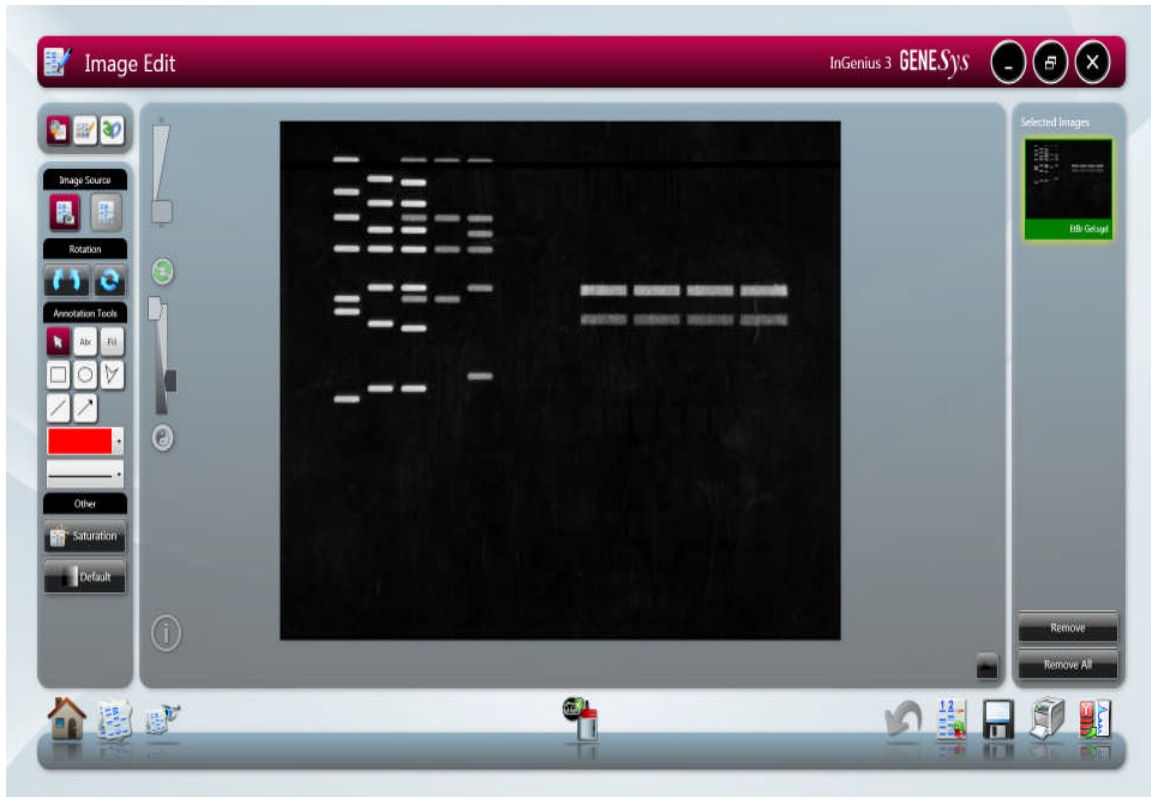


Figure 33- Image Edit screen

The Edit screen has a panel of 3 buttons present on the top left hand side of the screen allowing you to switch between annotation, enhancement tools and 3D view (**Figure 34**).

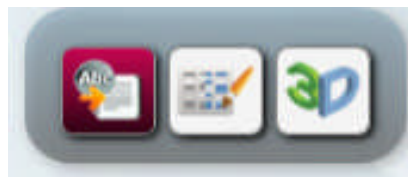


Figure 34- screen annotation, enhancement and 3D icons

The icons from left to right are annotation, enhancement and 3D.

4.2 Annotation tools

There are several annotation tools currently available with GeneSys software. The annotation tools will appear automatically when you enter the Edit screen to access the Enhancement and 3D tools you will need to select the appropriate icon (**Figure 35**).



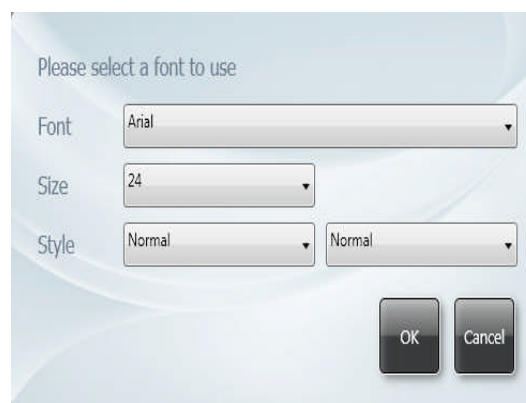
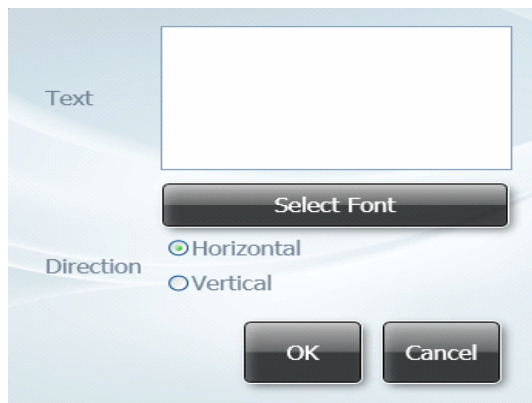
Figure 35- Annotation Tools

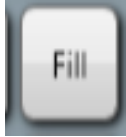


Use the mouse arrow as an selection tool



Use the Abc button to add text to your image. Simply click on the image where you wish to write. Now you can type your text directly onto the image. To edit the text, double click on it. A window will appear enabling selection of font, size and style. The text box can be dragged around the screen as can all the annotation.





This tool can be used when you wish to draw a filled shape. Press the Fill button then select the shape you wish to draw from the icons shown in figure 36.

To draw rectangles, circles, freehand shapes, lines and arrows click the appropriate icon shown below (**Figure 36**).



Figure 36- Draw icons

The colour of any annotation can be changed using the colour drop-down menu. **N.B.** When using the black and white thermal printer it is recommended to use white or black annotation for clarity (**Figure 37**).



Figure 37- Select line and shape colour drop-down menu

The style of annotated objects i.e. the line thickness and style can be altered using the drop-down menu.

Any annotations made will be automatically saved when images are in SGD format. When saving in other formats, you must check the engrave box to ensure annotations are saved. See section 3.1 for more information on saving images.

To save any annotation that you have made to your image in a separate file that can be re-opened over another image, press on (touchscreen) or click the following icon (**Figure 38**).

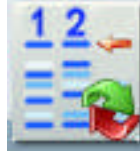


Figure 38- Save/Load Annotations icon

When you have selected the icon the following dialog box will appear. Select to save, load or cancel (**Figure 39**).

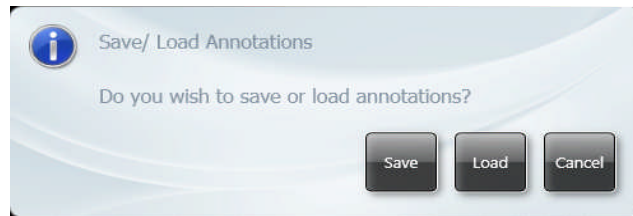


Figure 39- Save/Load Annotations dialog box

4.3 Image Rotation

The rotate function is available when the annotation and enhancement tools have been selected. To use the rotate function select the following icon (**Figure 40a**). Once this button has been selected the mouse cursor will change to show two arrows. This cursor can then be used to freely rotate the image (**b**). To finalise (fix) the rotation click button (**a**). To reset the orientation of the image press (**c**).

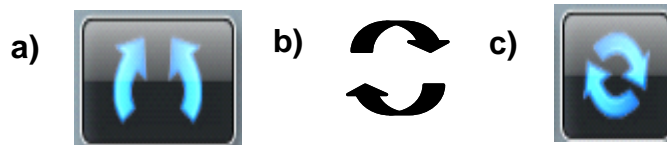


Figure 40- Rotation icons

a) rotation/fix button , b) arrow cursor permitting free rotation and c) reset button

4.4 Image source

If you have made enhancements to your image such as sharpening, smoothing and cropping an area this will alter the image source and the image will now be processed (**Figure 41**). To view the original image press original image button

.(**Figure 41a**). To go back to the processed image press the processed image button (**Figure 41b**)

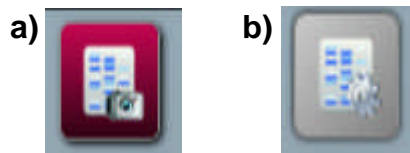


Figure 41- Image source icons

a) Original image and **b)** Processed image

4.5 Saturation button

To show saturation move the slider bars to each end of the brightness/contrast slider. Over-exposed (saturated) white bands will show red and over-exposed black areas in blue.



Figure 42- Saturation button

GeneSys offers a range of enhancement tools. Select this icon to access the enhancement tools.



4.6 Enhancement tools

The image enhancement tools allows the user to invert, smooth, sharpen, flip and crop the image (**Figure 43**).

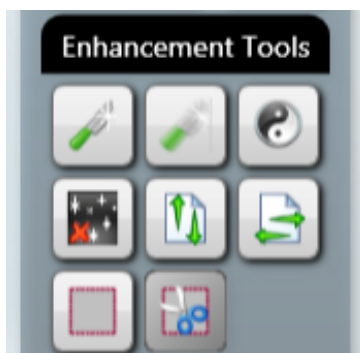


Figure 43- Image Enhancement tools



Click on this icon to apply a sharpening filter to your image. When this filter has been applied band edges should become more pronounced but you may also observe an increase in the graininess of the image.



Click on this icon to apply a smoothing filter. This is useful when the image has specks of dust or bubbles present. However, this will make bands appear less sharp.



The Reversal icon will reverse the image to give black bands on a white background or vice versa. This icon is particularly useful when trying to see faint bands.



Speckle correction icon will remove white speckles or 'hot pixels' from the image.



Flip vertical will mirror the image on the vertical plane. This is useful if the sample has been placed in the cabinet the wrong way round.



Flip horizontal will mirror the image on the horizontal plane. This is useful if the sample has been placed in the cabinet the wrong way round.



Select icon allows you to select an area of interest within the captured image.

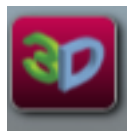


The crop icon will crop the selected area of interest and paste into a separate window; when used together the select and crop processes will reduce the image size.

4.7 3D View

3D view is a function which enables the user to see a 3D view of their image, revealing gel thickness and the contrast between peaks on a gel. The 3D view can be used with any sample type.

To turn on the 3D viewer select this icon.



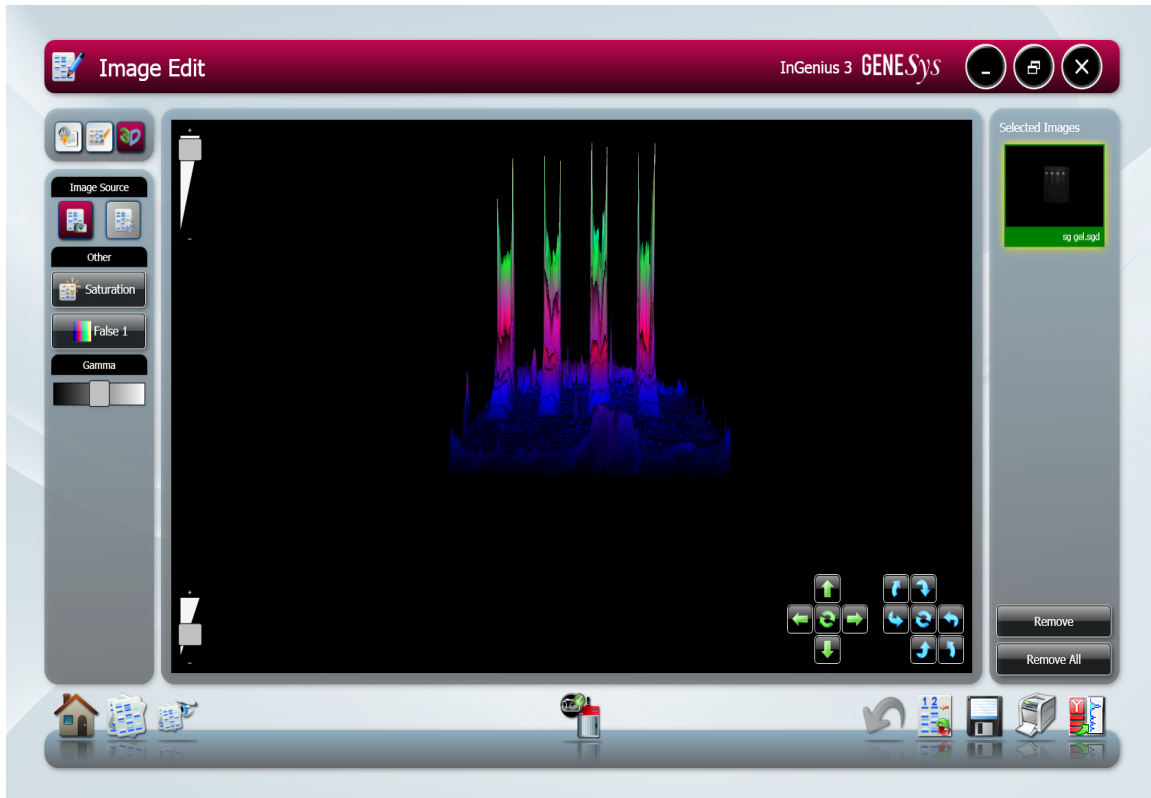


Figure 44- 3D View screen

To control the view use the following controls

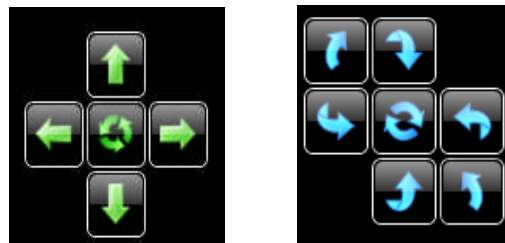


Figure 45- 3D View controls

Use the blue circles to rotate the image and the green arrows to move the image left to right and up and down the screen. The buttons in the middle reset to the original position.

The 3D image can also be controlled by clicking and dragging with a mouse to position as required.

Use the Gamma slider to adjust the gamma of the image to see fainter bands (Figure 46).



Figure 46- 3D View gamma slider

Adding a false colour wash can improve the contrast. Select the 'Default' button and from the menu select the colour wash you wish to apply to the 3D image (**Figure 47**).

The colour wash button can also be used to emulate different dyes, select the green colour wash to emulate a SYBR Green DNA gel, the yellow colour wash imitates a SYBR Gold DNA gel. The Orange, blue and red makes a protein gel appear silver, Coomassie blue and SYPRO red stained respectively. The false colour can be used to better illustrate faint bands.



Figure 47- Colour Wash

The Image pool present on the right hand side of the Edit screen shows the images that you have brought into the Edit screen from the Browse screen or from any of the capture screens. To remove any of the images from this pool simply select the 'Remove' button. If you wish to remove all the images from the image pool select the 'Remove All' button (**Figure 48**)

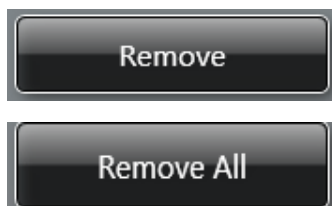


Figure 48- Remove image buttons

The selected image(s) can then be saved, printed, sent to the View screen for comparison or to the Edit screen for further enhancement (**Figure 49**).



Figure 49- Save, print, view and edit image icons

a) Save icon, **b)** print icon, **c)** View images icon and **d)** Edit screen icon

Single images can be sent to GeneTools for analysis (**Figure 50**).



Figure 50- Send to GeneTools icon

4.8 View Images Screen

The View Images screen allows you to view and compare the images that you have captured whether they are saved or unsaved and any images brought in from the Browse Images screen (**Figure 51**).



Figure 51- View Images Screen

The zoom slider can be used to increase or decrease the size of the image (Figure 52).



Figure 52- View Screen digital zoom slider bar

The View images screen also enables you to compare up to four images. To compare images simply highlight the images you wish to compare then select the icon with the magnifying glass (Figure 53).

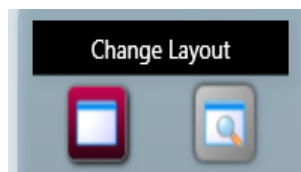


Figure 53- Change Layout icons

Once you have clicked the 'Change Layout' icon the following screen will appear (Figure 54).

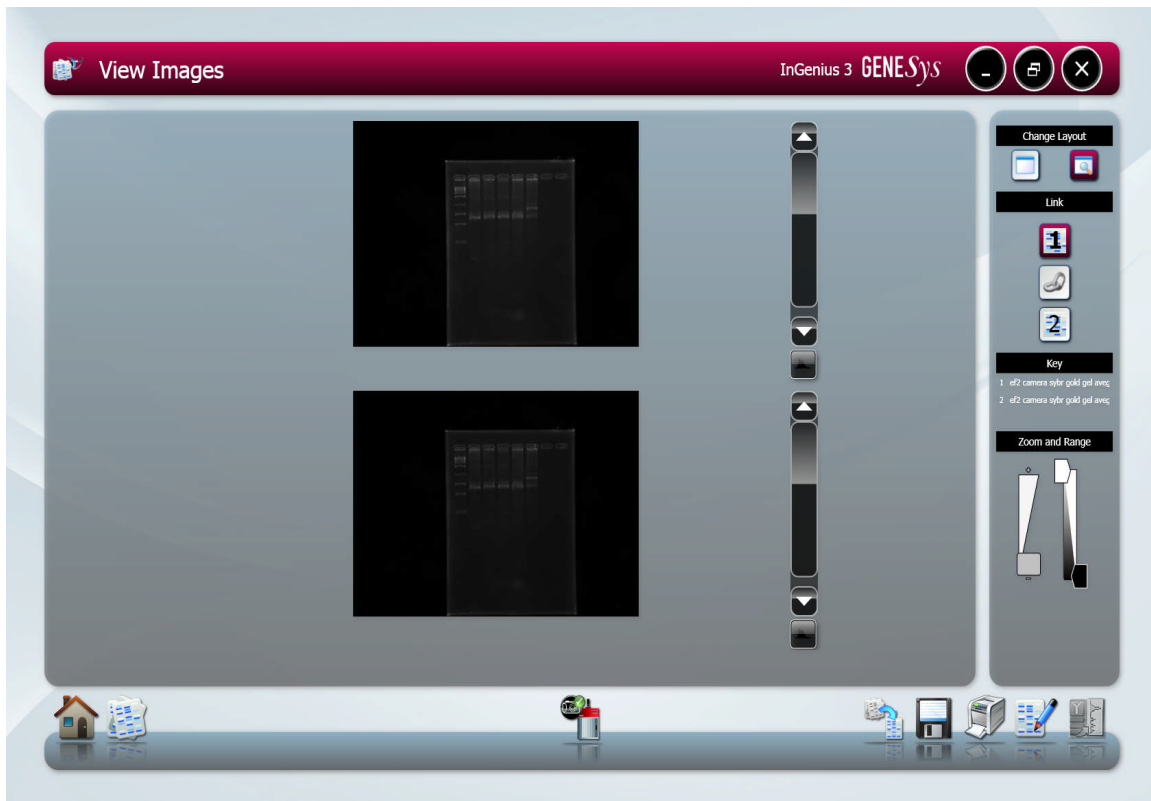


Figure 54- Change Layout Screen

The default setting is set to link all images that are being compared allowing the zoom and brightness and contrast all images to be altered to the same degree (**Figure 55**).

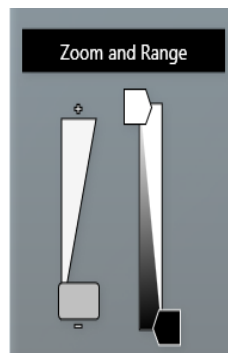


Figure 55- Change Layout screen Zoom and Range slider bars

To adjust the zoom setting of the image(s) use the slider on the left hand side. Move the slider bar towards the (+) to zoom in and towards the (-) to zoom out. To adjust the brightness and the contrast use the slider bar on the right hand side.

To alter the zoom, brightness and contrast of individual images the images will need to be unlinked. To do this select the numbered icon of the image you wish

to alter under the Link heading (**Figure 56**). To link images again select the linked chains icon (**Figure 56**).

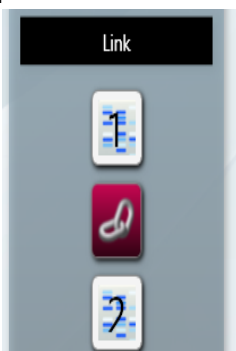


Figure 56- Linking and Unlinking images

The key identifies which image you have selected and the position of each of the images that you are comparing (**Figure 57**).



Figure 57- Change Layout screen image key

To exit from the comparison screen simply select the icon without the magnifying glass from the change layout heading (**Figure 58**).

4.9 Browse Images screen

The Browse images screen allows you to open files that are already saved on your computer and to open files from external devices such as USB keys.

Use the left hand side of the screen to explore folders on your computer. All images will be organised by date (**Figure 59**).

To select images simply click or press (touchscreen) on the image thumbnails which will turn green when selected. Then select the View images icon to compare or edit images.

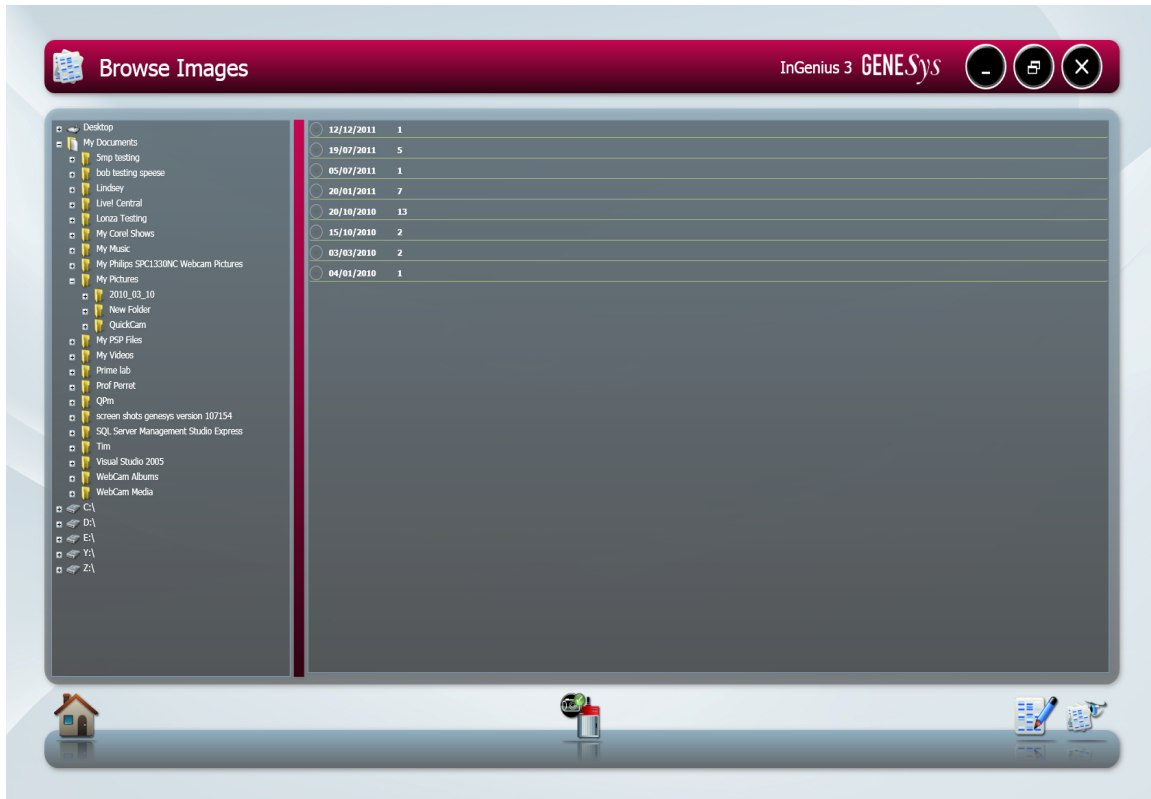


Figure 59- Browse screen

Chapter Five- Configurations

GeneSys software can be used to run specific applications with repeatable workflows and to design custom configurations with a wide variety of settings that are easily accessible, adaptable and re-usable at any time.

5.1 Saving Configurations

5.1.1 Saving configurations in Auto Capture mode

Set up your Protocol by working through the following screens Sample selection, Dye selection, Protocol selection and Sample positioning. Once you have captured an image you can save this as a configuration by selecting the following icon (**Figure 60**).



Figure 60- Configuration Icon

A pop-up window will appear where you enter a name for the configuration. You can at this point select to save the configuration as 'Lock' or 'Make public'. A 'locked' configuration means you cannot make any adjustments to the protocol. 'Make public' configurations allow you to share configurations with other users (**Figure 61**).

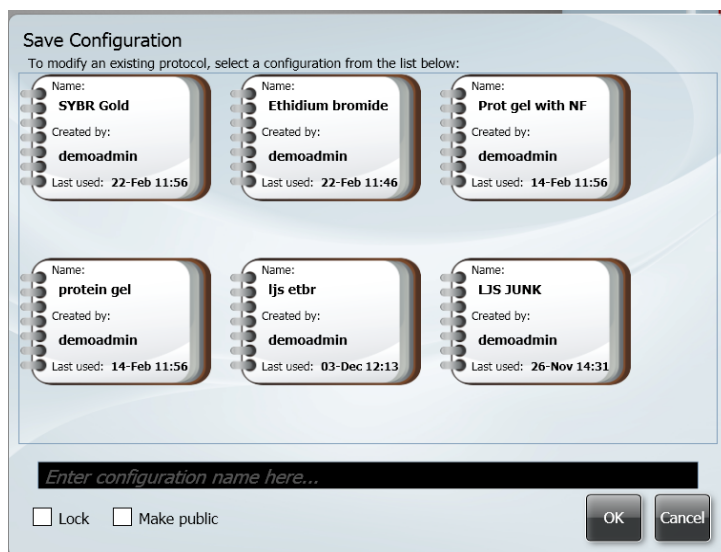


Figure 61- Save Configuration box

You can also modify an existing protocol by selecting the configuration you wish to edit from the 'Save Configuration' dialog box.

5.1.2 Saving Configurations in Manual mode

Once you have selected the lighting and filter options you wish to use, position your sample so it is zoomed in and in focus then capture the image. Once you have captured an image select the configurations icon (**Figure 60**).

Then enter a name for your configuration and select if you want to 'Lock' or 'Make public' the configuration (**Figure 61**).

5.1.3 Opening Configurations

From the home page you can open saved configurations by simply pressing or selecting the configuration you wish to open. Once selected the notebook will enlarge (**Figure 62a**) enabling you to select whether to open the file (**Figure 62b**) or delete the file (**Figure 62c**).

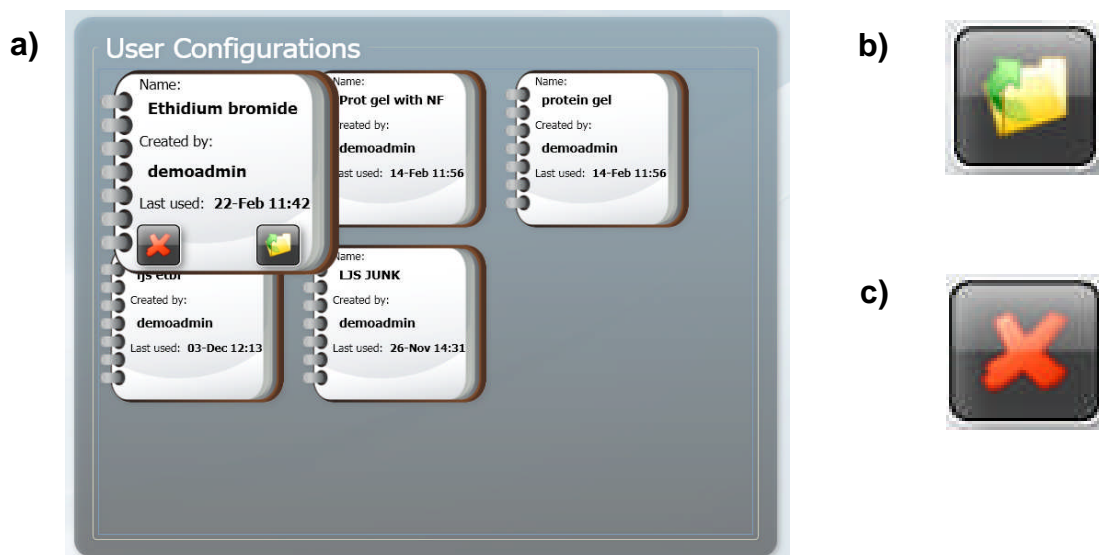


Figure 62- Opening User Configurations

a) Enlarged configuration **b)** Open configuration and **c)** Delete configuration

Once the configuration has been opened you will be taken to the Sample Positioning screen.

Chapter Six- Troubleshooting and General Information

If your dye/reagent is not listed then please contact support@syngene.com

6.1 Technical Information

GeneSys software hardware installation guide

Please visit the Syngene website www.syngene.com to download the following technical literature (This is also available on your GeneSys software CD).

Quick Guides

InGenius³ Installation

InGenius³ Image Capture

6.2 Technical Assistance

Europe Office

Beacon House

Nuffield Road

Cambridge

CB4 1TF

United Kingdom

Tel: +44 (0)1223 727123

Fax: +44 (0)1223 727101

Email: support@syngene.com

USA Office

5108 Pegasus court, Suite M

Frederick

MD 21704

USA

Tel: 800-686-4407 (Toll free)

301-662-2863

Fax: 301-631-3977

Email: support@syngene.com

6.3 Troubleshooting

PROBLEM	POSSIBLE CAUSE	SOLUTION
Camera not connected or not responding	<p>Camera power cable not plugged in</p> <p>Software driver for the camera is missing</p>	<p>Make sure all cables are connected as shown in the Installation quick guide</p> <p>Install Camera driver</p> <p>Press the refresh button on the InGenius icon</p>
'Hardware not available'	<p>You do not have the correct filter or lighting for the dye you have selected</p> <p>Check the 'hardware list' on the hardware screen</p>	<p>Contact support@syngene.com to upgrade your system</p> <p>Programme in any extra lights or filters that you may have on the hardware screen</p>
Dye not in list	Your dye is not in the database	Contact support@syngene.com
Dye name is greyed out	<p>You do not have the appropriate hardware to image that particular dye</p> <p>Check the 'hardware list' on the hardware screen</p>	<p>Contact 'support@syngene.com' to upgrade your system</p> <p>Programme in any extra lights or filters that you may have on the hardware screen</p>
Transilluminator will not turn on	<p>Make sure the transilluminator switch is in the 'on' position</p> <p>Make sure the darkroom cabinet is completely closed</p> <p>Check transilluminator tubes</p>	<p>If the transilluminator will not turn on then please contact support@syngene.com</p> <p>Transilluminator will not turn on when the cabinet door is open for safety reasons</p> <p>The tubes may need replacing</p>

Glossary

The following glossary defines words used in this manual.

Auto Capture- the software will configure the optimal exposure time for your sample using the maximum number of greyscales from your camera.

Binning- is a process that further enhances the sensitivity of the CCD sensor in terms of speed of the image acquisition. The process of binning involves combining square groups of pixels and making them into one 'super' pixel. This will lead to a reduction in image resolution.

Histogram- A graphed representation of brightness, or grey value, of an image.

Image source- there are two types of image sources, original and processed. If you have made enhancements to your image such as sharpening, smoothing and cropping an area this will alter the image source and the image will now be processed.

Iris- On a CCD camera the iris is an adjustable aperture used to control the amount of light coming through the lens.

Neutral Fielding- The neutral field function corrects for uneven illumination of light sources.

Speckle correction- will remove white speckles or 'hot pixels' (bright spots) from the image.

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