Neochemi FL mini 9

NB-12-9010

Neochemi FL mini 9

#Cat: NB-12-9010

Safety Instructions

Safety Practices

This document describes the general safety practices and precautions that must be observed when operating a Neochemi FL mini 9 system.

This advice is intended to supplement, not supersede, the normal safety codes in the user's country. The information provided does not cover every safety procedure that should be followed. Ultimately, maintenance of a safe laboratory environment is the responsibility of the user and the user's organization.

Please consult all documentation supplied with the Neochemi FL mini 9 before you start working with the instrument. Carefully read the safety information in this document and in the other documentation supplied. When setting up the instrument or performing analyses or maintenance procedures, strictly follow the instructions provided.

Warning notices

	We use 'Warnings' to highlight information or instructions that **MUST** be followed to avoid personal injury to yourself or other people in the vicinity. **For example: Switch off the mains voltage and remove the mains cord before cleaning.**

	**Ensure that all instrument operators read and understand the precautions listed below.** **You are advised to post a copy of the precautions near or on the instrument shelf.**

Precautions

The following precautions must be observed when using the Neochemi Mini.

- Be sure that the voltage of the Neochemi FL mini 9 corresponds to the voltage used in your laboratory.
- Never remove the rear panel of the Neochemi FL mini 9 without shutting down the instrument and disconnecting the instrument power cord from line power.
- The power cord must be an appropriately rated and approved cord-set in accordance with the regulations of the country it is used in.
- Do not replace the power cord with one of inadequate rating.

Symbols

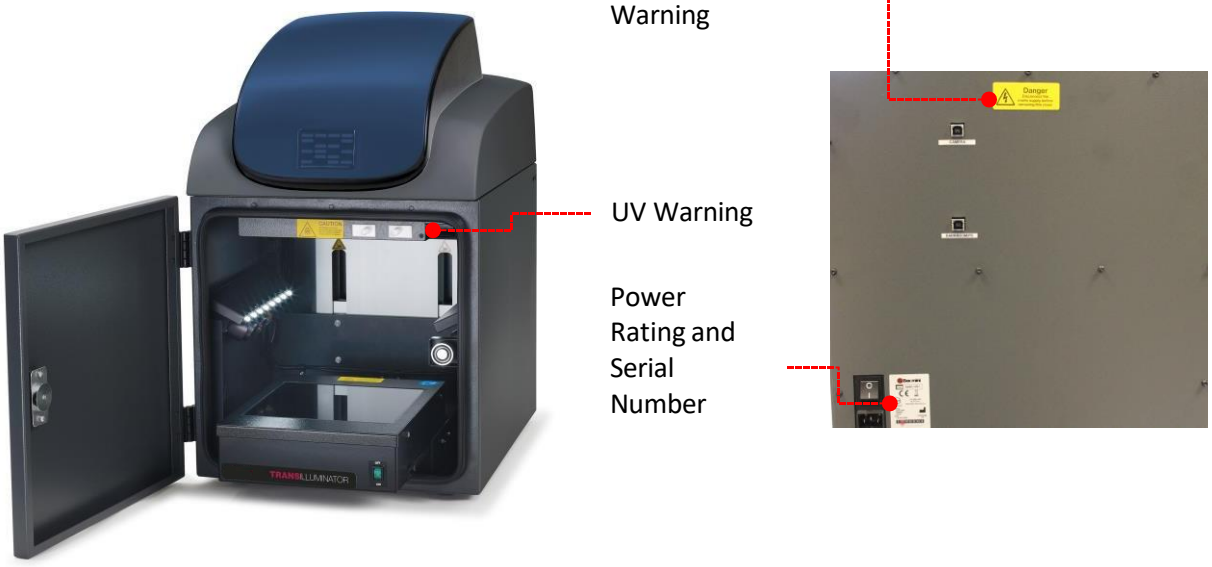
Symbol	Definition
	Attention: See instructions for use.
	Attention: Use of UV lights. Please Read UV Safety Warning.
	Attention: Danger of electric shock.
	Attention: Danger of trapped/crushed fingers. Keep fingers clear of moving parts.
	Serial Number.
	Symbol indicating "Not for general waste." For European Union (EU) States, this symbol should be used to mark devices that are reusable and not contaminated at the end of the device life.
	This symbol is a mandatory marking for devices entering the European market to indicate conformity with the essential health and safety requirements set out in European Directives.
	Symbol for "Manufacturer." This symbol shall be adjacent to the name and address of the manufacturer.
	Symbol for "temperature limitation." The upper and lower temperature limits will be indicated on either side of the symbol.
	Symbol used to indicate that the product should be kept dry.
	Symbol indicating that the device is "fragile" and should be handled with care.

	Symbol indicating the correct upright position of the transport package.

 WARNING	Warning labels attached to the instrument draw your attention to specific hazards. You must refer to this user guide and other documentation provided with your system for more details concerning the potential hazard and any precautions or other actions that must be taken.

Warning Labels

The following labels are displayed on the outer surfaces of the instrument:



UV Safety Warning

The Neochemi FL mini 9 system has a UV Transilluminator. If you open the door during the image capture process the system will automatically switch the UV off. If you wish to override the UV Safety, open the darkroom door, turn on the UV Transilluminator within GeneSys, and pull the right hand door switch out and then follow the on screen instructions.

To override the UV Safety interlock, pull the right hand door switch and then follow the on-screen instructions.

Before you override the UV safety interlock, read the following recommendations:

 **WARNING**	You should wear appropriate personal protection. As a minimum, we recommend the use of full-face shields that meet the necessary levels of UV protection. Those meeting the standard will be marked with the ANSI Z87.1. notation [ANSI Z87.1-89, Practice for Occupational and Educational Eye and Face Protection, IBR approved for 29CFR1910.133(b)(1)]. We recommend that all users of UV be made familiar with the guidelines published by the various national authorities. In the USA these guidelines are published by OSHA (www.osha.gov) in their standard 29CFR1910. This provides up to date safety information and guidance. In the UK the NRPB (www.nrpb.org) issues similar guidelines. Employers must familiarise themselves with these guidelines and their obligations described in the standards. In addition to face shields, we recommend that you should consider wearing appropriate clothing to protect potential exposure to areas of skin (face, arms, and hands for example).

N.B. The door safety interlock is reset when you close the door

General operating conditions

The Neochemi FL mini 9 has been designed and tested in accordance with the safety requirements of the International Electrotechnical Commission (IEC). The Neochemi FL mini 9 conforms to IEC61010-1 (Safety Requirements for electrical equipment for measurement, control and laboratory use) as it applies to IEC Class 1 (earthed) appliances, and therefore meets the requirements of EC directive 2014/35/EU.

If possible, avoid any adjustment, maintenance or repair to the instrument while it is open and operative. However, if any adjustment, maintenance or repair is necessary while the instrument is open, this **must** be done by a **skilled** person who is aware of the **hazards** involved.

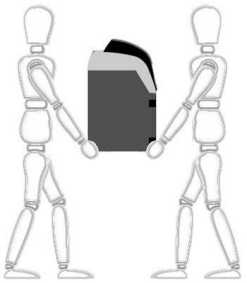
Whenever circumstances arise that mean your Neochemi FL mini 9 may be unsafe, make it inoperative. In particular, a Neochemi FL mini 9 may be unsafe if it:

- Shows visible damage.
- Fails to perform the intended measurement.
- Has been subjected to severe transport stresses.
- Has been subjected to prolonged storage in unfavourable conditions.

Transportation and Storage Conditions

The system should only be transported and stored in its original packaging to ensure maximum protection. It is recommended to keep the original packaging.
The unit should be transported and stored in an environment -10°C to +50°C, not condensing.

If you must move the imaging system any great distance please contact your local distributor to advise you about moving your system.

WARNING	The Neochemi FL mini 9 instrument requires two people to lift it safely. The Neochemi FL mini 9 weighs 42kg. 

Environmental conditions

The instrument should only be used under the following conditions:

- Indoors.
- Altitudes below 2000m.
- Ambient temperature between 5°C and 40°C.
- Relative humidity below 80% for temperatures up to 31°C, decreasing linearly to 50% relative humidity at 40°C.
- Electrical supply fluctuations not exceeding ±10% of the nominal voltage.

WARNING	The protection provided by the equipment may be impaired if the operating conditions do not lie within these parameters.

Electrical safety

The Neochemi FL mini 9 has been designed to protect the operator from potential electrical hazards. This section describes some recommended electrical safety practices.

WARNING	Lethal voltages are present at certain points within the instrument. When the instrument is connected to line power, removing the instrument covers is likely to expose live parts. Even when the power switch is set to off, high voltages can still be present – capacitors within the instrument may still be charged even if the instrument has been disconnected from all voltage sources.

The Neochemi FL mini 9 must be correctly connected to a suitable electrical supply. The supply must have a correctly installed protective conductor (earth ground) and must be installed or checked by a qualified electrician before connecting the instrument.

 **WARNING**	Any interruption of the protective conductor (earth ground) inside or outside the instrument, or disconnection of the protective conductor terminal is likely to make the instrument dangerous. Intentional interruption of the protective conductor is prohibited.

 **WARNING**	Ensure that the electricity supply inlets on the instrument are not obstructed, i.e. leave a gap to allow easy disconnection from the electricity supply.

When working with the Neochemi Mini:

- Connect the instrument to a correctly installed line power outlet that has a protective conductor connection (earth ground).
- Do not operate the instrument with any covers or internal parts removed.
- Do not attempt to make internal adjustments or replacements except as directed in the manuals.
- Disconnect the instrument from all voltage sources before opening it for any adjustment, replacement, maintenance or repair. If the opened instrument must be operated for further adjustment, maintenance or repair, this must **only** be done by your supplier's Service Engineer.
- Whenever it is possible that the instrument is no longer electrically safe for use, make the instrument inoperative and secure it against any unauthorised or unintentional operation. The electrical safety of the instrument is likely to be impaired if, for example, the instrument:
  - Shows visible damage.
  - Has been subjected to prolonged storage in unfavourable conditions.
  - Has been subjected to severe stress during transportation.

Electrical protection

- Insulation: Class I rating for external circuits. Only connect equipment that meets the requirements of IEC 61010-1, IEC 60950 or equivalent standards.
- Installation Category: The instruments are able to withstand transient over voltages typically present on the MAINS supply. The normal level of transient over voltages is impulse withstand (overvoltage) category II of IEC 60364-4-443.

- Pollution Degree 2: Normally only non-conductive pollution occurs. Occasionally, however, temporary conductivity caused by condensation must be expected.

Electrical Specifications

The Neochemi FL mini 9 power rating will be one of the following dependent upon your region:

Voltage	100-115Vac	220-240Vac
Frequency	50-60Hz	50-60Hz
Current	2A-3A	2A-3A
Fuse	2 of 20 mm x 5 mm IEC127 T 6.3 A H 250V	

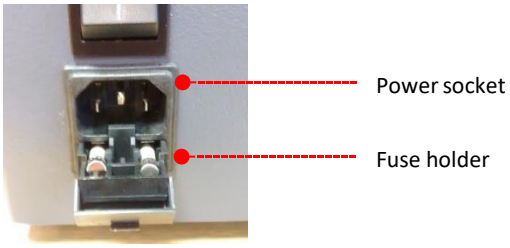
Please check the rating on the rear of the instrument.

Changing fuses

There are two sets of fuses that you may need to replace: the first set is located near the electrical power cord socket on the rear of the darkroom; the second set is located on the rear of the UV Transilluminator inside the darkroom (if supplied).

To change the fuses on the rear of the darkroom:

- Switch off the darkroom and remove the line power cord from the electrical supply.
- Gently pull out the fuse holder on the rear of the darkroom:



- Replace the fuse(s) with new ones of the same type and rating. The fuse type is 20 mm x 5 mm IEC127 T 6.3 A H 250V for instruments in all countries.
- Replace the fuse holder.

Note: It is recommended to always replace both fuses at the same time, even if only one of them has blown, as the other may have been weakened.

If the instrument still does not work correctly after replacing the fuses with the correct replacements, or if the fuses blow repeatedly, contact your supplier's office or representative.

EMC compliance

EC directive

The Neochemi FL mini 9 instrument has been designed and tested to meet the requirements of the EC directive 2014/30/EU. The Neochemi FL mini 9 instrument complies with the EMC standard EN61326 (EMC standard for electrical equipment for measurement, control and laboratory use) and EN55011 (ISM) class B (RF emissions).

FCC rules and regulations

This product is classified as a digital device used exclusively as industrial, commercial or medical test equipment. It is exempt from the technical standards specified in Part 15 of the FCC Rules and Regulations based on Section 15.103 (c).

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Unpacking A Neochemi FL mini 9 system

Removing from the Packaging

Visual Inspection

Upon taking delivery of a new Neochemi FL mini 9 instrument:

- Check the contents of the cartons as they are unpacked against the contents listed on the packing list.
- Check each item on the packing list for damage and document any damage carefully.
- If any items are missing or damaged, contact your local distributor immediately.

Unpacking the Main Box

The Neochemi FL mini 9 is packaged in a large carton which is securely strapped. The instrument will be shipped with the carton strapped onto a wooden pallet. Accessories are shipped in one or more separate cartons.

Unpacking your Neochemi FL mini 9	
	
Original packing of NEOCHEMI FL Mini 9	Remove the strapping and tape and open the carton

<table>
<tr>
<td> 
Carefully remove the carton</td>
<td> 
Remove the foam packing from around the Neochemi FL mini 9</td>
</tr>
<tr>
<td> 
Gently lift the Neochemi FL mini 9 out, slide the transilluminator into place and plug it in via the flying lead.</td>
<td> 
Neochemi FL mini 9 ready for use</td>
</tr>
</table>

Overview

Neochemi FL mini 9 Overview

The Neochemi FL mini 9 is a high resolution, multi-application image analysis system that has been designed to make your gel imaging simple, quick and easy.
The Neochemi FL mini 9 comprises of two main components:
Darkroom - this provides a completely dark environment into which the sample to be imaged is enclosed. Samples can be placed into the darkroom directly onto a screen, a UV transilluminator or a white light pad.
The Neochemi FL mini 9 utilises a compact darkroom, which has a fully variable, motor driven stage, which is controlled by the GeneSys software.

Imaging System - samples are illuminated with a specified light source or sources and imaged directly or through specified filters. A range of light sources are available:

- High Intensity (HI) LEDs of red, green, blue, Far Red and infrared (R,G,B, FR,IR) are located high up on the sides of the darkroom. These illuminate the sample from above.
- UV lights (254-nm, 302-nm or 365-nm) in the transilluminator, provide lower light through the sample.
- Visible light converter screen over the UV transilluminator.

In addition, white LED lights are provided on each side of the darkroom, to provide general illumination when positioning and setting up samples.
Between the darkroom and the lens/camera there is a rotating wheel with spaces for up to 7 filters to be inserted. The filter wheel is numbered, enabling the location of each filter to be specified in the GeneSys software.
The Neochemi FL mini 9– comes with either a 6 or 9 mega pixel camera, giving the system outstanding sensitivity and versatility.

Applications Supported

The Neochemi FL mini 9 system supports multiple applications including DNA/RNA gel imaging such as EtBr, SYBR Green and visible stained gels i.e. Coomassie Blue and silver stain. It can also be used for a wide range of imaging applications including; Chemiluminescence, fluorescent blots and gels, visible blots and gels (depending on accessories ordered).

	APPLICATIONS INDEX	
	NB-12-9009	NB-12-9010
DNA gels	●	●
Protein gels	●	●
Multiplex gels - 3 or more colours	●	●
Colony counting	●	●
Chemiluminescence blots	●	●
Colorimetric blots	●	●
Stain-free imaging	●	●
Films	●	●
IR imaging	●	●
Bioluminescence	●	●
GFP plant imaging	●	●

Neochemi FL mini 9 Range

	SPECIFICATIONS	
	NB-12-9009	**NB-12-9010**
Image resolution (megapixels)	6	9
Effective resolution (megapixels)	18	27
A/D	16 bit	16 bit
Greyscales	65 536	65 536
Quantum efficiency @ 425nm	73%	73%
Lens (motor driven)	f0.95 with automated focus	f0.95 with automated focus
Filter wheel (7 position)	●	●
UV filter	●	●
Use with external PC	●	●
Darkroom – compact with motor driven stage	●	●
EPI LED white lights	●	●
HI red LED module M series for multiplexing (Optional)	●	●
HI blue LED module M series for multiplexing(Optional)	●	●
HI green LED module M series for multiplexing(Optional)	●	●
Hi Far Red LED module M series for multiplexing (optional)	●	●
HI IR LED module(Optional)	●	●
Blue light converter (20 x 20 cm) (Optional)	●	●
Visible light converter (20 x 20 cm) (Optional)	●	●
UV transilluminator (254nm, 302nm, 365nm) (20 x 20 cm) (Optional)	●	●
Maximum image area (cm)	15 x 12	15 x 12
Minimum image area (cm)	10 x 8	10 x 8
W x H x D (cm)	40 x 64 x 52	40 x 64 x 52
Weight (kg)	45	45
Supply voltage (V ac)	100-115 / 220-240	100-115 / 220-240

System Components

Darkroom

The darkroom has a hinged door. The darkroom features:

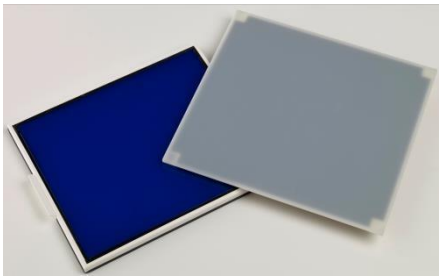
- Slide out UV Transilluminator
- Upper white light LEDs and HI LEDs (if pre-purchased)
- Safety switches to protect from accidental UV exposure

UV Transilluminator

The UV Transilluminator will excite many fluorescent stains such as Ethidium bromide, SYBR™ stains, Gel Red™. The standard wavelength is 302nm (254 and 365nm also available). To protect users from accidental exposure, the UV light is automatically shut off if the door is opened. The Transilluminator can be slid easily in and out of the cabinet.

Accessories

Visible or blue light converter screens

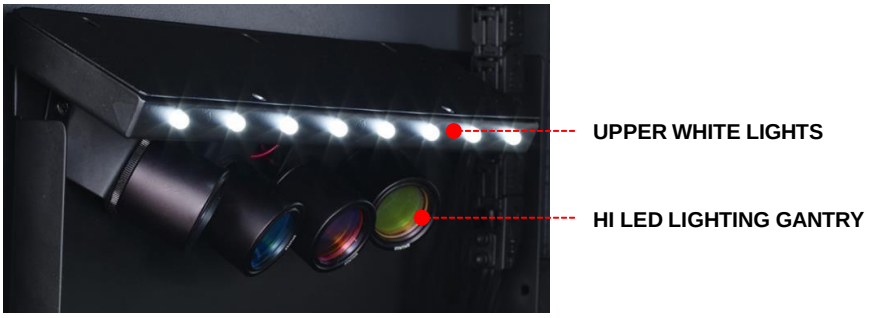


Neo Biotech offers a visible light converter that can be placed on top of the UV Transilluminator for imaging Coomassie and silver stained gels.
Neo Biotech also offers a blue light converter that can be placed on top of the UV Transilluminator for safely imaging gels stained with SYBR Safe, Gold and Green, GelGreen and UltraSafe blue.

Lights

The Neochemi FL mini 9 is provided with the following fixed overhead light sources:

- Two LED White Light units, each consisting of a strip of eight white LEDs, located on each side of the darkroom/stage.
- A HI LEDs lighting gantry on each side of the darkroom. Each capable of holding four specific colour HI LEDs.



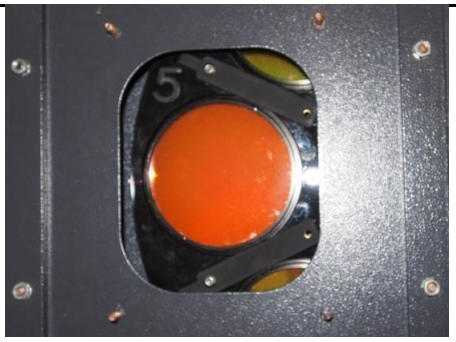
If HI LEDs have been pre-ordered then these will have been factory fitted.

Filters

The Neochemi FL mini 9 is provided with a motor driven rotating filter holder. This is located in the top of the Instrument, such that the filter lenses are positioned directly below the front element of the imaging lens. Positions are available for up to six circular filters (leaving an empty slot for chemiluminescance) to be installed. These are numbered 1 - 7 so that filter locations can be identified within the GeneSys software. Access to the filter holder is gained by removing the lens and camera unit.

If filters have been pre-ordered then these will normally be installed at the factory prior to shipping. If these have been purchased at a later date or have been loose-shipped, install them as follows:

1. Unscrew the top casing.
2. Remove the lens and camera unit.
3. The filters are visible through an opening in the top of the Darkroom.



Filter visible

4. Check that there is no Filter installed in the visible Filter Slot in the Filter Holder. If there is, rotate the Filter Holder gently with a finger until an empty slot appears.
5. Using a specialist allen key, slacken the screws on the Filter Retaining Strip on each side of the Filter Slot.
6. Insert a Filter into the Filter Holder, making sure that the screw thread is facing upwards and that it fits snugly in the Filter Slot in the Holder, and under the two Filter Retaining Strips.
7. Tighten, but **do not over-tighten**, the screws on the Filter Retaining Strips.
8. Make a note of the Filter name and the Filter Slot on the Filter Holder it is fitted into.
9. Using your fingers, gently rotate the Filter Holder until the next Filter Slot is accessible and repeat the process until all loose-shipped Filters have been installed.

   Note: You do not have to rotate the Filter Holder to any specific point; once the Machine is powered on it will be automatically indexed to its default position as part of the start-up sequence.
10. Replace the Lens and Camera Units and top casing.

Printer

The Mitsubishi P95DW printer is available for the NEOCHEMI Mini.

GeneSys Software

The GeneSys image capture software runs in a standard Windows environment and provides an application driven and time-saving workflow for running a variety of life-science applications.

The Neochemi FL mini 9 is controlled and operated by the GeneSys software running on an external PC operating in a standard Microsoft Windows environment. Two cable connections are required between the PC and the NEOCHEMI Mini; one for the darkroom, and one for the camera.

The GeneSys software provides both automatic and manual modes of control of the Neochemi FL mini 9 hardware and has a built in database of application specific information which it uses in automatic capture mode to optimise the hardware configuration, in order to obtain the optimal sample image. The database contains information relating to:
Sample format; Gel, Blot, Other.
Blot type; Chemiluminescence, Fluorescence, Visible.
Sample type; Protein, DNA, RNA.
Matrix type; Acrylamide, Agarose.
Dye types.
Lighting types.

Software Installatn

The GeneSys software can operate on the following Microsoft Windows Operating Systems:
Windows 7 Professional SP3 (32 bit and 64 bit versions)
or
Windows 8 Professional
or
Windows 10 Professional

Note: Home versions of the Windows Operating Systems are not supported.

Please refer to the Neo Biotech website FAQs Gel documentation and analysis section for the up-to-date minimum system requirements.
The Neochemi FL mini 9 needs to have the GeneSys software installed on the associated PC from which the instrument is to be controlled.
The GeneSys software can only be installed from a Windows account that has Administrator rights. Installation is performed in the following order:

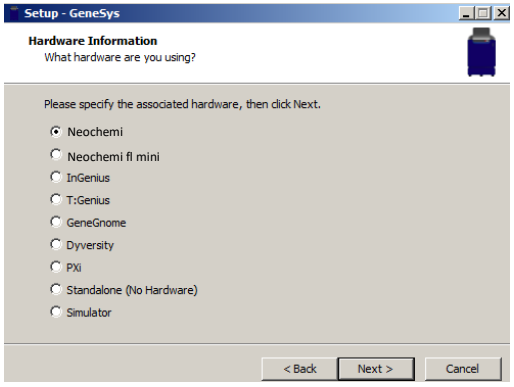
1. Run the Set-up program
2. Select the relevant hardware information
3. Select the installation folder destination Location
4. Select the Start menu folder
5. Install device drivers using the Device Driver Installation Wizard

Run the Set-up Program

Insert the GeneSys USB stick and run the Set-Up Program. The following screen will appear:

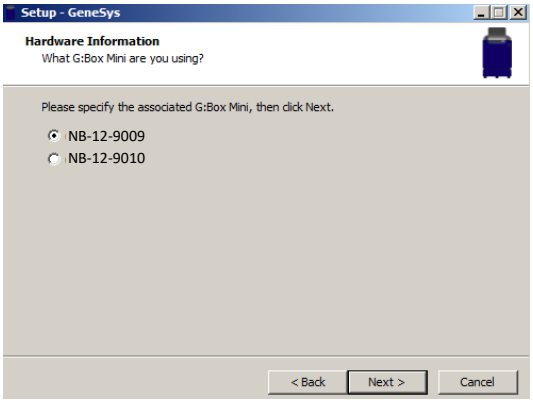
Select the relevant hardware information

Click on the **Next >** button. The first **Hardware Information** screen will appear.



Select the instrument type that you have by selecting the appropriate radio button, i.e. NEOCHEMI FL Mini 9.

Click on the **Next >** button. The second **Hardware Information** screen will appear (below). Select the particular model of instrument you have by selecting the appropriate radio button.

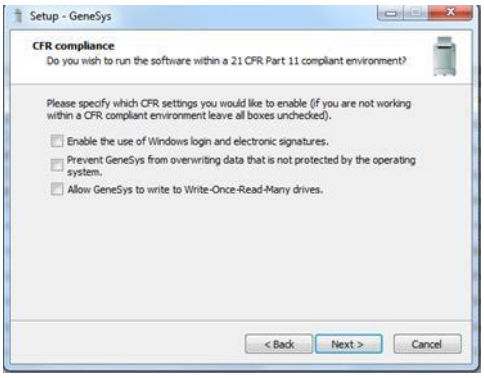


Click on the **Next >** button. The Setup - GeneSys CFR compliance screen will appear.

Select if running in a CFR 21 part 11 compliance environment

NOTE: Do Not Select CFR If Not Required

Select if running GeneSys software in a CFR21 part 11 Compliance environment. If you do not wish to work in CFR compliant environment, then select **Next** > The Setup - GeneSys Select Destination Location screen will appear.



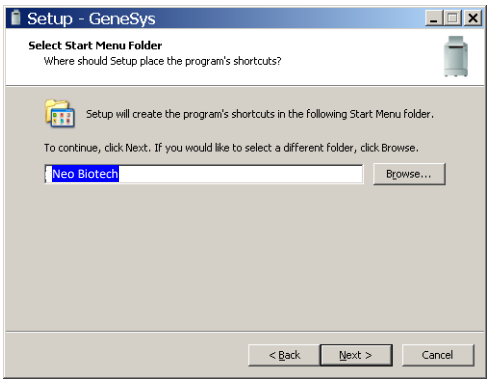
Select the installation folder destination Location

Select the folder in which you would like the GeneSys software to be installed:

- To accept the displayed default folder click on the **Next** > button.
- To choose a different folder click on the **Browse**... button and navigate to the desired folder or create a new folder. Then click on the **Next** > button.

Note:The GeneSys software installation requires at least 80.7 MB free space.

Select the Start menu folder

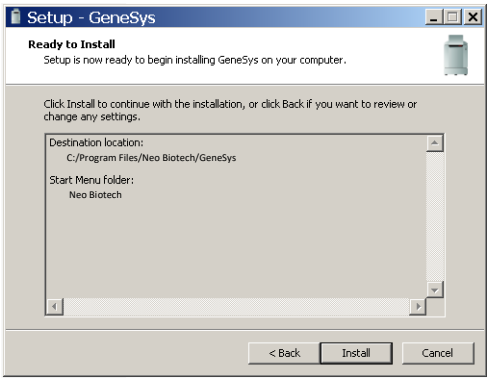


Select the folder in which you would like the GeneSys start menu shortcut to be added:

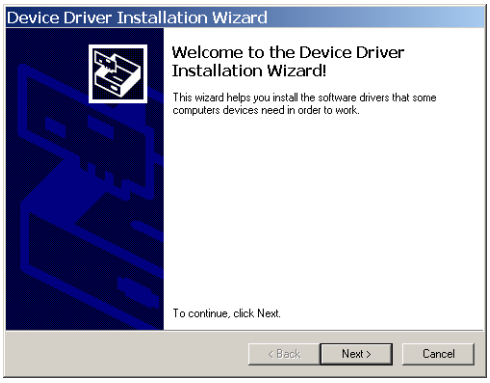
- To accept the displayed default folder click on the **Next** > button.
- To choose a different folder click on the **Browse**... button and navigate to the desired folder or create a new folder. Then click on the **Next** > button.

Install device drivers using the Device Driver Installation Wizard

The **Ready to Install** screen will appear. Click on the **Install** button to start the installation process.

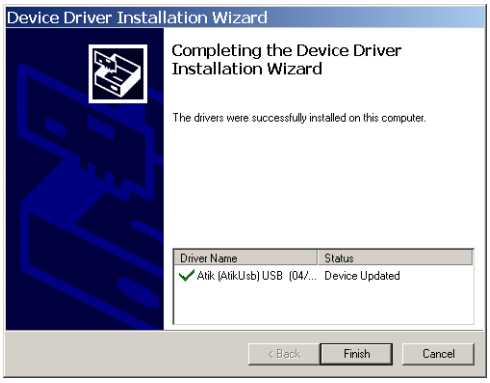


The **Device Driver Installation Wizard** screen will appear. This part of the installation process installs the software drivers that some computers need in order to complete the installation.



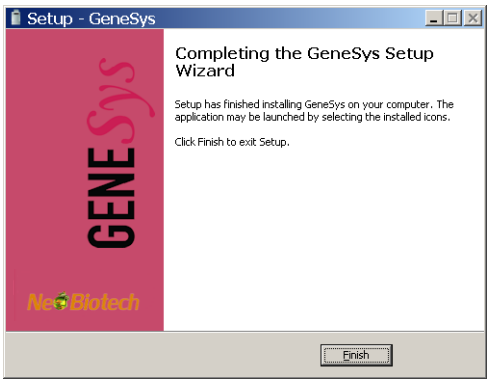
Click on the **Next** > button. The Wizard will automatically install the necessary device drivers on the PC that the selected hardware needs in order to operate.

Once the device drivers have been installed, the screen will change to the second **Device Driver Installation Wizard** screen. This displays details of the device drivers that have been installed.



Click on the **Finish** button.

The **Completing the GeneSys Setup Wizard screen** will appear. This indicates that the installation process has finished successfully.



Click on the **Finish** button to complete the **Set-Up** process, and remove the GeneSys USB stick.
Your GeneSys software is now ready for use.
Check your desktop, you should have a GeneSys icon visible, i.e. 

Operating

Operator controls

CAUTION: Do not connect power supply to any of the components until you are satisfied that everything is connected correctly.

For assistance please contact your supplier or Neo Biotech directly.

Transilluminator set-up

Place the UV Transilluminator inside and connect it to the free flying mains lead inside the Neochemi FL mini 9 system.

Power on/off

Connect the mains lead from the Neochemi FL mini 9 system to the mains power supply and switch on the unit.

Installing GeneTools on a separate PC

The Neochemi FL mini 9 system is supplied with unlimited copies of GeneTools analysis software from Neo Biotech. This may be loaded on a PC of your choice.

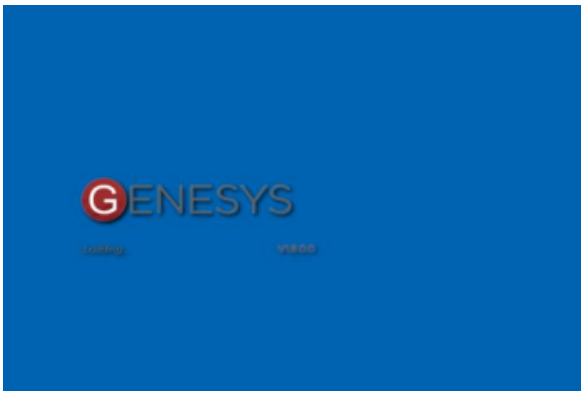
Plug the Neo Biotech branded flash drive into the PC you wish to install GeneTools on. Navigate into the “GeneTools” folder on the flash drive and run the “InstallGeneTools” program.

Follow the on-screen instructions to install and license the GeneTools software. You should have been provided with media keys to license the software. These media keys can be found in a file named “Media Keys.txt” on the Neo Biotech branded flash drive.

Switching Instrument On

To switch on a Neochemi FL mini 9 Instrument:

1. Switch on and log on to your PC as normal.
2. Connect the mains power cord between a power supply socket and the instrument.
3. Switch on the power supply socket (if provided with a switch).
4. Switch on the instrument using the ON/OFF rocker switch on the rear of the Darkroom.
5. Check that the green indicator light on the side of the Instrument lights.

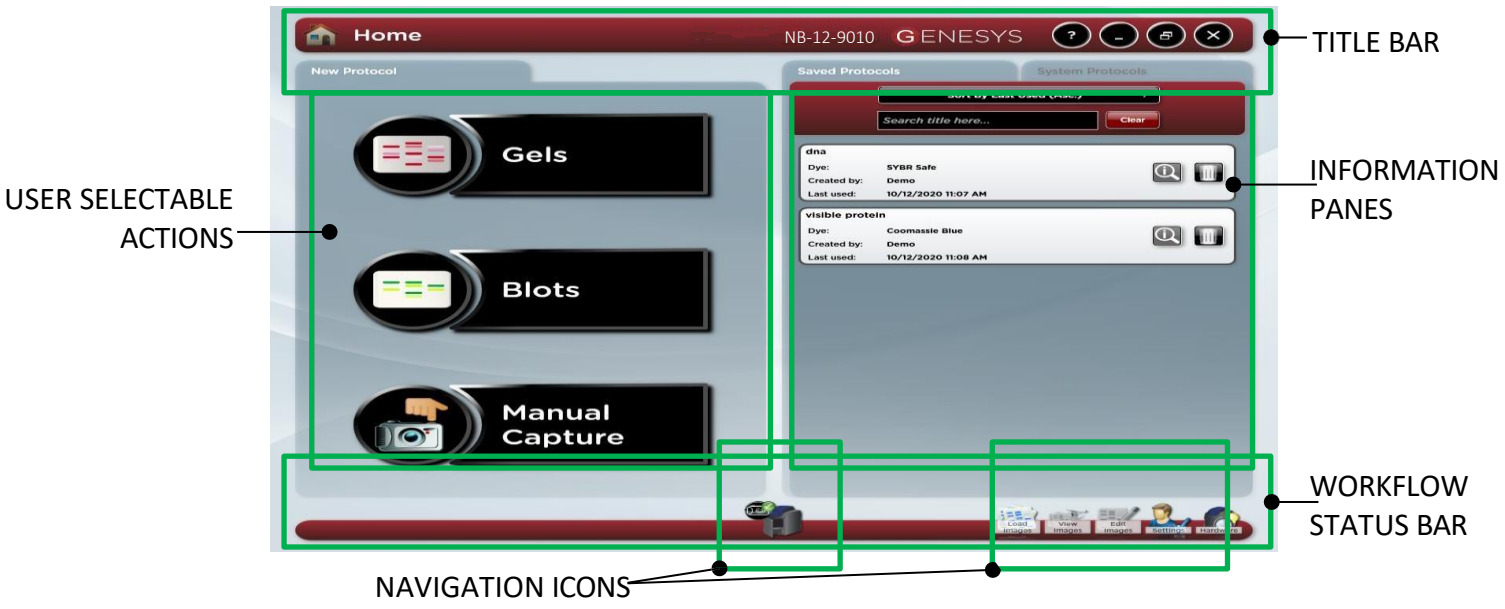


GeneSys SOFTWARE LAUNCHED SCREEN

Once the GeneSys software has started up the **Home** screen will appear.

GeneSys HOME SCREEN

GeneSys Home Screen Layout



Title Bar

Displays an icon to show where you are in the GeneSys program, e.g. here it shows the 

icon to show that you are on the Home Screen. On other screens within the GeneSys program this button is used to return you to the Home screen.

Displays the camera resolution, the connected hardware and the program title 

, for this particular installation it shows that a NEOCHEMI Chemi-XX6 with a 6MP camera is installed and the GeneSys program is running.

Displays the  icon, for accessing System data - camera hardware and program version information, as shown below:
Also displays the standard Windows program buttons  , for minimise, maximise, and close.

At various points through the image capture process the top left hand corner of the title bar is used to display icons which indicate the stage in the process that has been reached/is being actioned, e.g. when the NEOCHEMI is in the process of making an automatic exposure the 

icon is displayed, and when a manual exposure is being made the 

icon is displayed.

User Selectable Actions

Buttons for selecting the various main actions or functions that are available to the User from the current screen, in this case:

Quick access into the automatic image capture process for a Gel sample, from . 

Quick access into the automatic image capture process for a Blot sample, 

.

Accessing manual image capture 

.

Information Panes

Displays information or images. May be presented in a number of configurations depending on the User's location within the program.

The Standard View Home screen displays Saved Protocols (also referred to as User Configurations) and sort/select options for the Protocols.

Workflow Status Bar

Displays various items of information:

Home icon (when not on the Home screen).
Workflow icons - illustrate the User's position within a series of steps that form a sequence of actions necessary to complete an activity, e.g. Manual Capture. Clicking on an icon takes the User to screen associated with the icon.

When multiple steps are displayed a grey arrow appears in between each icon. This indicates each step back in sequence.

Instrument status, e.g. here it shows the  icon, indicating that the Camera is establishing connection with the program. This icon changes depending on status:

 indicates that the Camera and Darkroom are OK and ready for use

 indicates that the Camera is overheated or otherwise not ready

 indicates that the Darkroom is establishing connection with the program

 indicates that neither the Camera nor the Darkroom are connected

Navigation icons - enable a User to navigate to various Settings or System Tools screens. The icons displayed depend on the activity being undertaken within the program.

Navigation Icons Shown here, with icon labels displayed:

 Load Images icon, to navigate to Load Images screen

 View Images icon, to navigate to View Images screen

 Settings icon, to navigate to User Preferences screen

 Hardware icon, to navigate to Hardware screen

Entering Hardware Details

Now that you have installed your NEOCHEMI Instrument you need to enter the details of the light sources and filters that are installed into the GeneSys software. This must be done when the Instrument is first used and also each time additional hardware is installed.

1. Select the **Hardware** icon  on the Home screen. This displays the Hardware screen.

HARDWARE SCREEN

2. Scroll the window vertically to view all available options.
3. Select each hardware option installed in your Instrument.

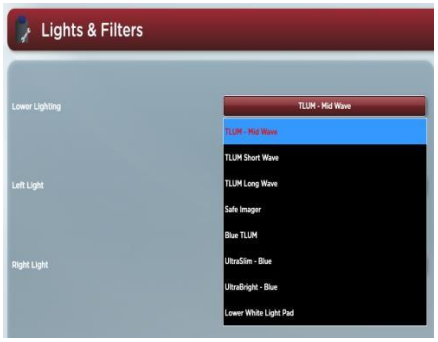
Note: If you have pre-specified your exact requirements at time of order then this operation may have been performed by Neo Biotech and all the hardware may have been pre-installed. However, it is good practice to check that the hardware selections made on this screen match the actual hardware installed.

4. Unselected options are grey/black, selected options turn red.
5. Once all hardware options have been selected on this first Hardware window, select the **Save** icon  .
6. Select the **Edit Hardware** icon  to open the Lights & Filters screen to programme more options into the software.

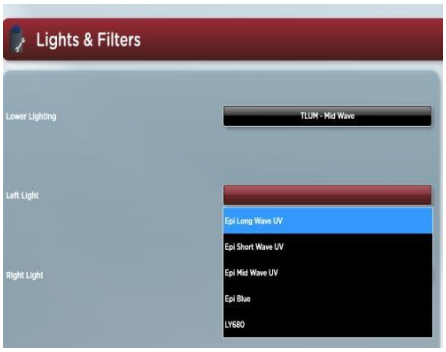
LIGHTS & FILTERS SCREEN

The Lights & Filters screen is used to specify the fixed lighting unit types installed to each side of the Darkroom, and also to specify the accessory lighting that is installed on the Darkroom Stage (Lower).

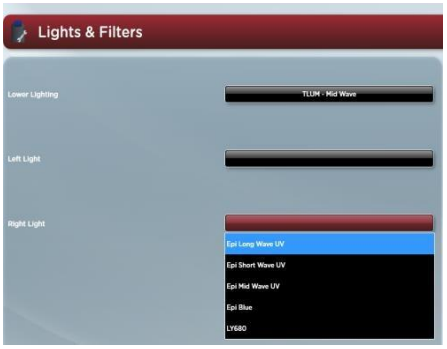
7. For the three lighting locations in the left hand pane; **Lower Lighting**, **Left Light**, and **Right Light**, select the data button and select the lighting type installed at that location from the drop down menu.



LOWER LIGHTING MENU



LEFT LIGHT MENU



RIGHT LIGHT MENU

8. For each of the Filter locations in the right hand pane, select the data button and select the filter type installed at that location from the drop down menu (illustrated is Filter Position 2).

LIGHTS & FILTERS SCREEN - FILTER SELECTION

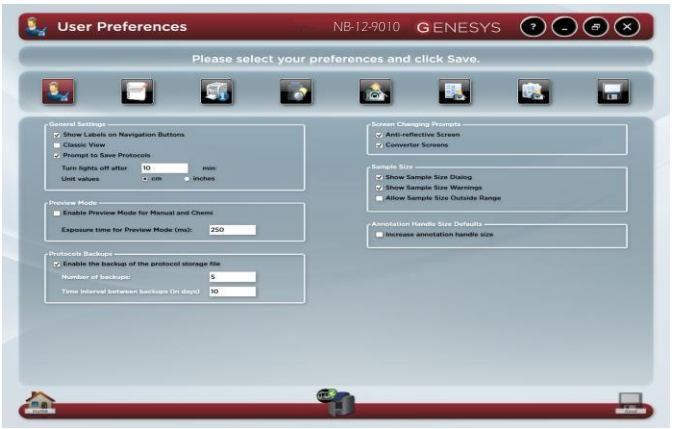
9. Once all Lights & Filters options have been selected on this second Hardware window, select the **Save** icon  .
   Note: Ensure that you save your selections before you leave the Hardware screen.

10. Select the  icon to return to the Home screen.

Entering Personal Preferences

Every individual who logs on to a NEOCHEMI Instrument can create a customised set of Instrument settings, i.e. a profile, which reflects the nature of the work the individual normally undertakes and what they do with the test results

1. Select the **Settings** icon  on the Home screen. This displays the User Preferences screen.



USER PREFERENCES GENERAL SETTINGS SCREEN

2.Set your preferences:

General Settings

- **Show labels on navigation buttons** - checking this checkbox turns on the labels on the **Navigation** buttons, i.e.:

  with labels 

  without labels 

- **Classic View** - checking this checkbox changes the display from **Standard View**, the default setting, to **Classic View**.
- **Prompt to save Protocols**- if no longer wish to have this prompt displayed after an image is captured please un-check this checkbox.
- **Turn lights off after X minutes**- If using UV light you can set a prompt to appear after a set time (default 10 mins) to remind you that the UV light has been left on and the software has automatically turned the lights off.
- **Preview Mode**- check the box to 'Enable Preview mode for manual and chemi'. This will turn on the upper white lights to help with sample positioning . Select an exposure time the default is 250ms.
- **Protocols backup**- check the box to 'Enablethe back up of the protocol storage file'. select the number of backups and the time interval between back ups (in days).
- **Screen Changing Prompts** - enables you to turn the screen changing prompts which appear when you are setting up captures on or off. Two options are available:

o Anti-reflective screen - if the checkbox is checked, turns the prompt on (the default setting). If unchecked, turns the prompt off.
o Converter Screens - if the checkbox is checked, turns the prompt on (the default setting). If unchecked, turns the prompt off.

- **Sample Size**- if you prefer not to see the sample size pop-up box when using the automated mode please un-check this checkbox.
- **Annotation Handle Size Defaults-** checkbox to increase annotation handle size if using a touch screen.

USER PREFERENCES REPORT SETTINGS SCREEN

Report Settings

Enables you to pre-set some report defaults, this is useful where you are doing repetitive tests and want the same type of report for each test. The settable options are:

- **Full Report** - checking this checkbox sets the Instrument to generate a Full Report for each test. The Full Report content can be controlled using the additional checkboxes, check to include the feature:
  - Image
  - File Description
  - Capture Properties
- **Basic Report** - checking this checkbox sets the Instrument to generate a Basic Report for each test. Additional features are:
  - Basic Report Image Only - if the checkbox is checked, the printed report contains only the captured image for the test. If not checked, the report contains the image plus some basic information, e.g. filename / username / date / time / sample / filter, etc.
  - Preview Before Printing - if the checkbox is checked, the screen displays a preview of the report before it is printed. If not checked, the report is printed without a preview being displayed.
- **Quick Quant Report settings**- select the analysis report setting for all your images
  - Select to include or exclude full report details
  - Displayed results only, incidence or quantity calibration results
  - Export includes headers

Logging Defaults

- **Increase Logging level**-this will permit Neo Biotech Support to access more information on how the software is running on your instrument.

Printer Settings

Enables you to select a printer and set printer preferences for your selected printer, generally these will only be settable for the current session. The options available to you in Printer Settings will vary based on your operating system and printer make/model.

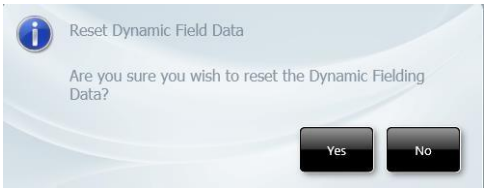
USER PREFERENCES PRINTER SETTINGS SCREEN

USER PREFERENCES SYSTEM SETTINGS SCREEN

System Settings

Enables you to reset Lens defaults and to perform a Dynamic Fielding operation. The GeneSys Software will then apply this default Dynamic Fielding data set to your captured images when you select the **Use Dynamic Fielding** checkbox in the **Dynamic Fielding** box on a Sample Positioning screen.

- If you select the **Reset Dynamic Field Data** button the following pop-up message is displayed:



RESET DYNAMIC FIELD DATA MESSAGE POP-UP

  - Select the **Yes** button to perform a Dynamic Fielding operation. Follow the onscreen prompts.
  - Select the **No** button to cancel.

- **Manual Multiplex images and settings-** Check the box 'multiple images group autoscale series images' When capturing multiple images in a series or a multiplex capture you can select for multiplexed images to use dynamic range for images and for multiple images you can select to group autoscale series images.

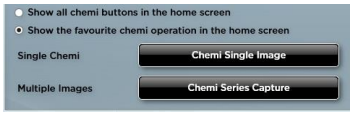
  Using the dynamic range will allow very faint bands to be seen as the system will automatically scale to show the best image possible. If it is turned off then it will be possible to see images get brighter as the capture time increases, but you may need to manipulate the histogram to visualise very week bands

USER PREFERENCES CHEMI GENERAL SETTINGS SCREEN

Chemi General Settings

Chemi home settings

- **Show all chemi buttons on home screen-** There are currently four different ways of capturing a chemiluminescent image; Chemi Rapid, Chemi (single image), Chemi (series) and Signal Accumulation Calculator.
- **Show Favourite chemi operation in home screen-** Select to show your favourite chemi operation in the home screen- use the drop down menu's to select your favourite for single chemi and multiple chemi images.



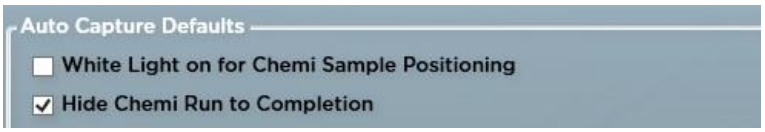
Chemi General settings

- **Select to show 'Change screen' in the main menu screen-** this allows you to easily switch between the different chemi modes. For example if you have selected chemi Rapid then at the top right hand side a button will be available to change screen to chemi single image using the drop down menu.

- **Check the box to automatically invert chemi images-** this will be a default setting.

- **Enable capture with timing for chemi series and SAC-** This allows you to pick an image from the series to capture as a single image using that images imaging conditions.

- **Auto Capture Defaults**- checking this checkbox sets the GeneSys Software so that whenever it gets to the Sample Positioning stage in a chemiluminescence image capture operation, it automatically switches on the interior white lights. Hide chemi to completion check box -some users may wish to keep capturing their chemi image until signal can no longer be detected uncheck this box if you would like to use this feature.



- **Flourescence blot and gel settings-** select to 'Enable binning'. When capturing a fluorescent gel or blot you can select the level of binning from the drop down menu and this will performed for each image captured. Binning combines adjacent pixels to form a super pixel but will result in a reduction in resolution. Using binning can reduce the exposure time required especially for dyes with an excitation at a longer wavelength.

Chemi Single Settings

Chemi single settings are split in to two sections chemi Rapid settings and chemi single settings.

Chemi Rapid settings

- Select the slider bar position for chemi Rapid exposure time. Choose from min, average, and max. For chemi Rapid settings you can use the slider bar to adjust the exposure time choose between min, average and max. Min is using more binning resulting in less resolution but a fast capture and max is using no binning, full resolution and result in a longer capture time.

Check box to image a visible or colour marker for chemi single.

If you would like the software to pick a generic chemiluminescent reagent as default please check the box. Alternatively, you can select the chemiluminescent reagent you wish to use as default by using the drop down menu.

Chemi single settings

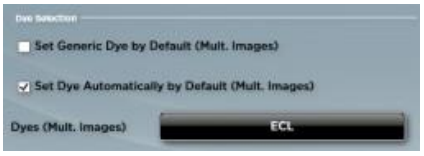
Check box to image a visible or colour marker for chemi single.

If you would like the software to pick a generic chemiluminescent reagent as default please check the box. Alternatively, you can select the chemiluminescent reagent you wish to use as default by using the drop down menu.

Chemi Multiple Settings
Chemi Series settings

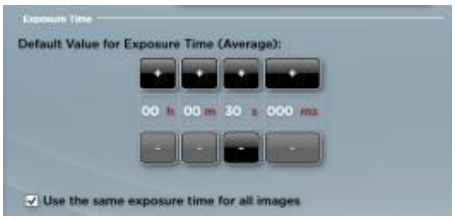
Check box to image a visble or colour marker for Chemi Series capture.

If you would like the software to pick a generic chemiluminescent reagent as default please check the box. Alternatively, you can select the chemiluminescent reagent you wish to use as default by using the drop down menu.



Select to 'Allow binning by Default' use the drop down menu to select binning level. Binning will increase sensitivity but reduce resolution.

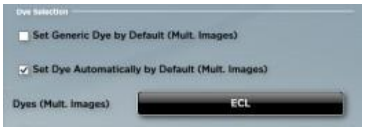
Enter default values for exposure time. Check the box to use the same exposure time for all images



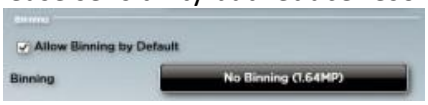
Select the number of images you wish to capture and whether you would like to add the contents of previous image. This will add the each captured image to the previous image. This will add each captured image to the previous image improving the signal to noise ratio.

Signal Accumulation Calculator settings
Check box to image a visble or colour marker for Signal Accummulation Calculator.

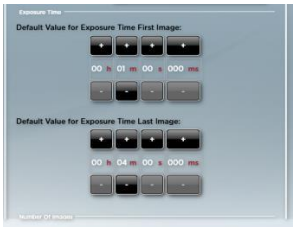
If you would like the software to pick a generic chemiluminescent reagent as default please check the box. Alternatively, you can select the chemiluminescent reagent you wish to use as default by using the drop down menu.



Select to 'Allow binning by Default' use the drop down menu to select binning level. Binning will increase sensitivity but reduce resolution



Enter default values for the exposure time settings for the signal accumulation feature for the first and last image.



Select the number of images to capture for S.A.C as default.

USER PREFERENCES SAVING DEFAULTS SETTINGS SCREEN

Saving defaults

- Select the default file type for saving images the current default is .sgd file format. Check the box to select al images in the save window by default.

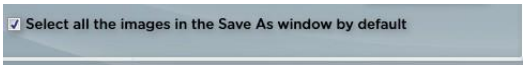
- **Autosave settings**- Check to autosave captured images once selected use the 'Browse' button to navigate to the location in which you would like the images to be saved to. Select the name format for the images to be saved using the drop down menu.

Save As Settings

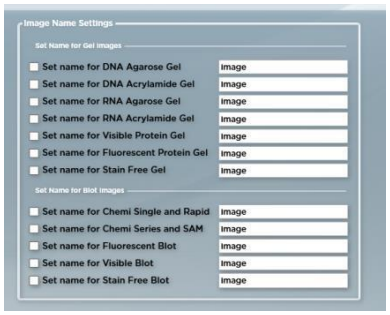
- Select between extended or classical window (older version of 'save as' screen)

- From the drop down menus select the default file format for export choose from TIFF, BMP and JPEG. Select the default DPI and the bit depth from the drop down menus.

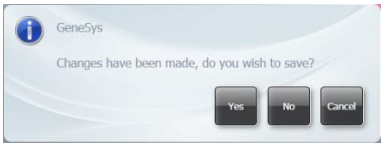
- Check the box to select all images in the 'saveas' window by default.



- **Image name settings-** You can enter a name for each type of gel capture and for each type of blot image captured in Genesys to automatically use the entered name when exporting or saving that type of image.



2. To save any changes you make, select the **Save** icon  . If you attempt to navigate away from the User Preferences screen without first saving the changes, the following pop-up message is displayed:



SAVE CHANGES MESSAGE POP-UP

3. Select the  icon to return to the Home screen.

Adjusting Basic Screen Viewing Size

By default GeneSys starts up with the display at full screen size. The size of the screen display can be adjusted by selecting the Maximise/Restore GeneSys button in the Title Bar and then resizing the display by dragging the dotted arrow  icon in the bottom right hand corner.

HOME SCREEN - DEFAULT

HOME SCREEN - ADJUSTED

Recommended Light / Dye / Accessory and Other Application Tables

LIGHTING AND FILTER OPTIONS			
APPLICATION	**SAMPLE TYPE**	**LIGHT SOURCE / ACCESSORY**	**FILTER**
Chemiluminescence	Membrane	Anti-reflective black screen	No filter
Chemiluminescence with visible marker	Membrane	Anti-reflective black screen	No filter
Fluorescence	Gel (e.g. EtBr™* / SYBR Gold™	Ultra-slim blue light LED Transilluminator	FiltUV/FiltSW
	Gel (e.g. Alexa Fluor, DyLight, Cy dyes, LI-COR)	RGB and IR Hi- LEDs. Anti-reflective black screen	Red HI- LED - Filt705M Far Red HI-LED- FiltLY700 Green Hi-LED - Filt605M Blue Hi- LED - Filt525 IR Hi- LED - FiltLY800 UV (365nm)HI-LED- FILTUV
	Membrane (e.g. Alexa Fluor, DyLight, Cy dyes, LI-COR)	RGB and IR Hi-LEDs. Anti-reflective black screen	Red Hi-LED - Filt705M Far Red HI-LED- FiltLY700 Green Hi-LED- Filt605M Blue Hi-LED - Filt525 IR Hi-LED - FiltLY800 UV (365nm)HI-LED- FILTUV
Visible light	Gel (e.g. Coomassie blue and Silver stain)	Visible Light converter	FiltUV
	Membrane (e.g. Ponceau Red)	Visible Light converter	FiltUV

* Please note that when imaging EtBr with the Ultra-slim blue light LED Transilluminator faint bands may be difficult to detect.

DYNAMIC FIELDING (DF) OPTIONS	
LIGHT SOURCE	**DF SCREEN**
White / visible light	Use a Visible Light converter screen as a DF screen.
UV light	If using an EtBr/UV or LP filter use a blue DF screen on the Ultra-slim blue light LED Transilluminator with a frosty DF screen on top. If using an SP filter use a frosty DF screen on the Ultra-slim blue light LED Transilluminator then a blue DF screen.
Epi-UV short and long wavelength light	Use a blue DF screen on the Ultra-slim blue light LED Transilluminator.

Loading Test Samples

Black Anti-reflective Screen Installed

The Black anti-reflective screen can be placed either directly on top of the Transilluminator or a blank box if a Transilluminator has not been purchased. Locate centrally.
Place the test sample centrally on the Black anti-reflective screen.

Converter Screens

Visible light converter screen for imaging Visibly stained proteins on gels such as Coomassie blue and Silver stain can be placed directly on top of the transilluminator with the white side facing upwards.
Blue light conveter screen for imaging 'Safe Dye' gels can be placed directly on top of the transilluminator with the blue side facing upwards.

Automatic Image Capture Mode

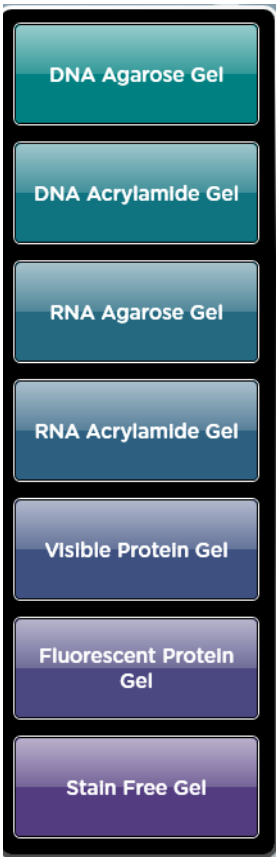
Automatic image capture can be carried out from the Home screen. Depending on your sample type select from Gels or Blots then select your sample from the drop down list.

Automatic Gel Image Capture

DNA\RNA Agarose Gel and DNA/RNA Acrylamide Gel

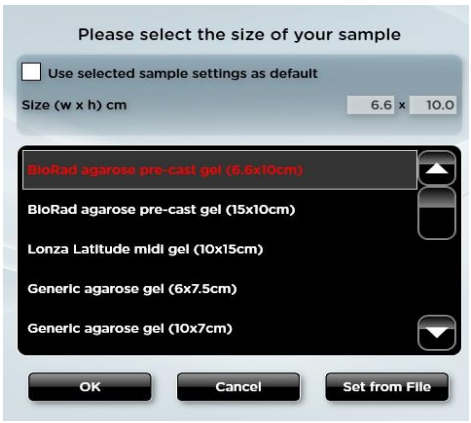
1. Select the Gels icon 

on the Home screen. This displays the Gels drop-down list.



GELS DROP-DOWN LIST

2. Select your Gel type from the drop-down list e.g. DNA Agarose Gel. This displays a Sample Size pop-up dialogue box.



SAMPLE SIZE POP-UP

3. Select your sample size from the standards in the pop-up menu, or enter the dimensions of your sample in the **Size** boxes, in cm.
4. From the dye selection screen select the dye e.g. Ethidium Bromide from the list. Use the green arrow to move forward to the sample positioning screen.
5. On the sample positioning screen adjust the lens controls. Press capture to capture an image.

Visible Protein Gel

For all visible protein gels the visible light converter screen is required. Place the converter screen on top of the UV transilluminator and then place the sample on top in a central position.

1. Select Visible Protein Gel from the Gel drop down menu.
2. Select the sample size from the standards in the pop-up menu, or enter the dimensions of your sample in the **Size** boxes, in cm.
3. From the dye selection screen select the dye e.g. Coomassie blue from the list. Use the green arrow to move forward to the sample positioning screen.
4. On the sample positioning screen adjust the lens controls.
5. Check the box to perform Dynamic Fielding. Press capture to capture an image.

Fluorescent Protein Gel

For all Fluorescent protein gels the black anti-reflective screen is required. Place the black screen on top of the UV transilluminator and then place the sample on top in a central position.

1. Select Fluorescence Protein Gel from the Gel drop down menu.
2. Select the sample size from the standards in the pop-up menu, or enter the dimensions of your sample in the **Size** boxes, in cm.
3. From the dye selection screen select the dye (s) e.g. Alexa Fluor 488 from the list. If multiplexing e.g. Alexa Fluor 488 and Alexa Fluor 647 you can image up to 5 different dyes at a time depending on your hardware set-up. Use the green arrow to move forward to the sample positioning screen. **Note** if you get the message 'You do not have the hardware for this multiplex. To find out more contact Neo Biotech' you may need to purchase additional lighting or filters to be able to image this dye.
4. On the sample positioning screen adjust the lens controls.
5. Select the level of binning from the drop down menu. This will bin each colour channel to the same level.

6. The software will automatically capture individual images for each dye and then combine the images as a composite image. GeneSys software will automatically colour the bands for each dye selected in the composite image according to the emission filter used. You can change the colour using the 'arrow' button at the side of the image.

Stain Free Gel

Stain free gel imaging technology utilises a proprietary polyacrylamide gel chemistry that makes proteins fluoresce directly in the gel after a period of photoactivation allowing the immediate visualisation of proteins under UV light.

1. Select Stain Free Gel from the Gel drop down menu.
2. Select the incubation time from the drop down menu. Choose between 1 minute incubation (used for activating the stain free gel before transferring the gel to membrane), 2.5 minutes (offers medium sensitivity) and 5 minutes (for maximum sensitivity).
3. Select the sample size from the standards in the pop-up menu, or enter the dimensions of your sample in the **Size** boxes, in cm.
4. On the sample positioning screen adjust the lens controls. Press capture.
5. The incubation period will start and after the incubation period the image will be captured.

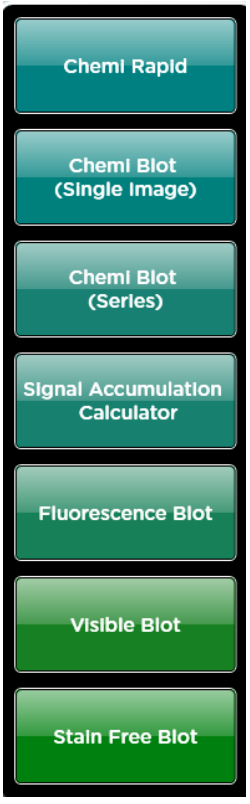
Automatic Blot Image Capture

Chemi Rapid

For users who would like a quick and easy capture of their chemiluminescent blot.

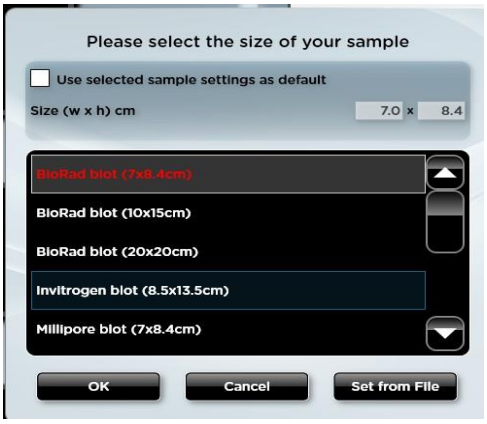
1. Select the Blots icon 

on the Home screen. This displays the Blots drop-down list.



BLOTS DROP-DOWN LIST

2. Select your Blot type from the drop-down list e.g. Chemi Rapid.
3. Select your sample size from the standards in the pop-up menu, or enter the dimensions of your sample in the **Size** boxes, in cm.

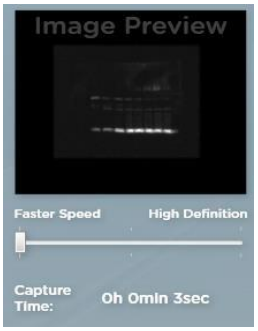


4. On the sample positioning screen adjust the lens controls.
5. Close the darkroom door and GeneSys software will automatically capture your image according to the chemi settings selected on the settings page.

Chemi blot (Single Image)

For users who would like to capture a single image of their chemiluminescent blot without ever saturating their blot.

1. Select your Blot type from the drop-down list e.g. Chemi blot (Single Image).
2. Select your sample size from the standards in the pop-up menu, or enter the dimensions of your sample in the **Size** boxes, in cm.
3. From the dye selection screen select the reagent you are using (this is for reference only).
4. Close the darkroom door and the software will automatically evaluate the optimal exposure times and show an image preview.
5. Adjust the lens controls.
6. Under the 'Image Preview' use the slider bar to adjust the exposure time. Slide the bar towards faster speed to decrease the exposure time (note: this will involve the use of binning. Binning involves combining pixels on the camera sensor together to form a 'super pixel' letting more light reach the sensor. When using binning, resolution of the image can be lost). Slide the bar towards 'high definition' for more publication quality images (this will require longer exposure times as less binning will be used).



7. Check the box if you would like to image a visible marker. Choose between 'visible marker' and 'marker is colour'.

8. Select 'Auto Expose Area' if required.
9. Press capture to capture an image. **Note:** If you have not pressed the capture button straight away after the evaluation time then when you press capture a message will pop up 'Preview time has expired' chemiluminescent signal may have decreased. Are you sure you would like to continue?' Select 'Yes' to continue and capture the image. Select 'No' if you wish to stop capture and re-evaluate the capture time using the 'Eval. time' button.
10. Press the 'stop' button to stop the capture at any time.

Chemi Blot (Series)

1. Select your Blot type from the drop-down list e.g. Chemi Blot (Series).
2. Select your sample size from the standards in the pop-up menu, or enter the dimensions of your sample in the **Size** boxes, in cm.
3. Select the reagent you are using (this is for reference only).
4. Check the box if you would like to image a visible marker. Choose between 'visible marker' and 'marker is colour'.
5. Select the number of images you would like to capture and the level of binning.
6. Check the box to 'add the contents of the previous image'. This can help to improve the signal to noise ratio providing smoother backgrounds.
7. Press the 'Green arrow' to input the exposure time for each image or you can check the box to 'use the same exposure for all images'.
8. On the sample positioning screen adjust the lens controls.
9. Press the capture button to capture the image.

Signal Accumulation Calculator (S.A.C)

Signal Accumulation Calculator (S.A.C) allows the user to take a series of cumulative images. The User estimates the shortest and the longest exposure times required to achieve the optimal image. Then decide on the number of images to be taken within this time range. For example select to capture 4 images and specify shortest exposure time as 1 minute and the maximum as 4 minutes. The first image will be taken at 1 minute and the last at 4 minutes and the remaining two images are taken at even intervals in between at 1 minute each capture.

S.A.C. capture is useful for determining the optimal imaging time for a chemiluminescent sample. Note: For very faint signals it is advisable to use Chemi Blot (Series) capture.

1. Select your Blot type from the drop-down list e.g. Signal Accumulation Calculator.
2. Select your sample size from the standards in the pop-up menu, or enter the dimensions of your sample in the **Size** boxes, in cm.
3. Adjust the lens controls.
4. Select the level of binning using the drop down menu.

5. Input the exposure time for the first image e.g. 1 minute then input the exposure time for the last image e.g. 4 minutes.

6. Select the total number of images to be captured.

7. Check the box if you would like to image a visible marker. Choose between 'visible marker' and 'marker is colour'.

8. Press the capture button to capture the image.

Fluorescence Blot

1. Select your Blot type from the drop-down list e.g. Fluorescence Blot.
2. Select your sample size from the standards in the pop-up menu, or enter the dimensions of your sample in the **Size** boxes, in cm.
3. From the dye selection screen select the dye(s) you wish to image. If multiplexing you can image up to 5 different dyes at a time. Example of multiplex is select Alexa Fluor 488 and Alexa Fluor 647 from the list.
4. Check the 'Light and filter' check box to allow the user to select 'more options' and you can then choose a different imaging condition from the list.
   Note: If you get the message 'you do not have the hardware for this multiplex. To find out more contact Neo Biotech'. You may need to purchase a new lighting and filter option to be able to image this dye.
5. From the sample positioning page adjust the lens controls. **Note:** it is advised when imaging fluorescent blots to keep the Iris fully open.
6. Select the level of binning from the drop down menu. This will bin each colour channel to the same level.
7. Press capture. The software will capture an image. If you have selected to multiplex then the software will capture individual images for each dye and then automatically combine the images of each dye as a composite image. GeneSys software will automatically colour the bands for each dye in the composite image according to the emission filter used. You can change the colour using the 'arrow' button at the side of the image.

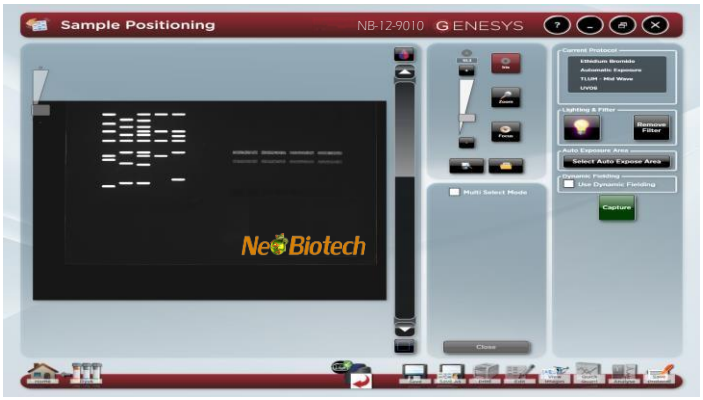
Visible blot

For the visible blot place the 'visible converter screen' on top of the UV transilluminator. Using this screen will give you a good background.

1. Select your Blot type from the drop-down list e.g. Visible Blot
2. Select your sample size from the standards in the pop-up menu, or enter the dimensions of your sample in the **Size** boxes, in cm.
3. From the sample positioning page adjust the lens controls.
4. Press the capture button to capture the image.

Stain Free Blot

Use Stain Free blot when you are performing a western blot and you would like to use total protein values to normalise your data. This feature will take an image of the membrane after a stain free activated gel has been transferred to a membrane.



Automatic Image Capture - Sample Positioning and Capture screen

Sample Positioning

At this point the Camera is live and the image it is seeing of your sample is presented in the left hand pane. Controls are provided for you to improve this live preview image of your sample, enabling you to improve the image quality before the Instrument makes an image capture.

Lighting & Filter Options to Improve Sample Imaging

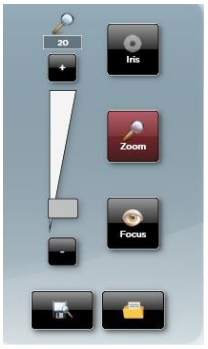
The **Lighting & Filter** function provides additional options for aligning the sample in the dackroom. Selecting the  icon turns the interior white lights on, giving greater visibility of the sample in the darkroom. Re-select the  icon to turn the white lights off again. Selecting the 

icon informs the GeneSys software to remove the emission filter so it is no longer in front of the Camera. The sample image should now appear much clearer. The software will automatically place the emission filter back in front of the Camera when the green bouncing arrow is pressed.

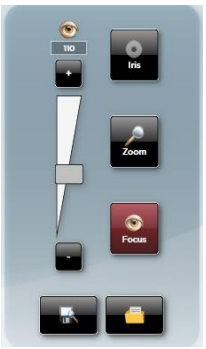
Lens Controls

Note: The lens controls that are available are Focus, Iris (aperture), and Zoom.
The available lens controls appear in the **Lens Control** pane.

LENS CONTROL – IRIS



LENS CONTROL – ZOOM



LENS CONTROL - FOCUS

With **Focus** control selected 

, the focal plane of the Camera can be moved up/down by moving the slider  up/down or by selecting the  /  buttons. As the **Focus** control is changed, the numbers in the box above the slider bar change. These numbers provide a reference for the **Focus** control.

With **Iris** control selected 

, the aperture or shutter opening of the Camera can be increased/decreased by moving the slider  up/down or by selecting the  /  buttons. As the **Iris** control is changed, the numbers (expressed in 'f' numbers) in the box above the slider bar change. The aperture numbers (f numbers) are counterintuitive, smaller numbers represent larger aperture openings, larger numbers represent smaller aperture openings. The aperture opening controls the amount of light that passes through the lens to the sensor. Larger aperture openings (smaller f numbers) will result in shorter exposure times and smaller aperture openings (larger f numbers) will result in longer exposure times.

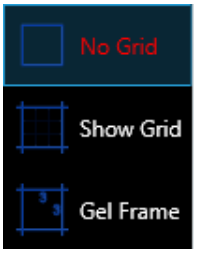
With **Zoom** control selected 

, the physical position of the sample relative to the camera is changed, allowing the User to concentrate on a smaller area of the sample, maximising resolution. This control works by raising / lowering the Stage by moving the slider  up/down or by selecting the  /  buttons.

Sample Alignment Using The Grid

The **Grid** button  lets you overlay a grid on the image, enabling you to better align the sample. Use the **Door Open** button on the right hand side of the Darkroom to open the Darkroom Door slightly to enable you to move the sample around to align it with the grid projection. Pressing the **Grid** button calls up the grid menu.

- **No Grid** option removes the grid projection.
- **Show Grid** option displays the default grid projection, 2 rows x 2 columns.
- **Gel Frame** to use with stain free imaging for protein normalisation.



GRID MENU

Controlling The Image Saturation

Select the **Show Saturation** button .  The **Saturation** function can be used to check if areas of the image are going to be over-exposed; over-exposed white bands will be highlighted in red on the image, over-exposed black bands will be highlighted in blue on the image. This function is useful if the **Select AutoExpose Area** function has been used. Please note that saturated bands are not quantifiable.

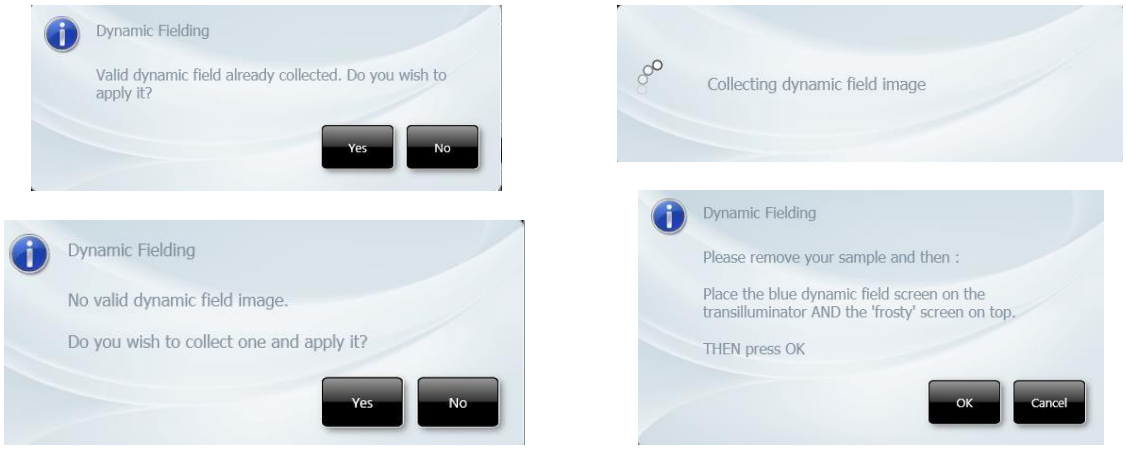
Sample Image Zooming

- The **Digital Zoom** slider allows you to zoom in or out of the displayed image. Dragging the slider towards the **+** sign zooms in, dragging the slider towards the **-** sign zooms out. Zooming in or magnifying an area of the image allows you to align the sample more accurately, using the grid overlay.

Using Dynamic Fielding To Improve Sample Image Quality

The Dynamic Fielding option allows you to correct the image for uneven lighting. This can cause problems when quantifying bands or spots across a large sample. The image of the dynamic field is normalised for light illumination. This normalisation is then applied to the gel image, such that uneven light illumination generated by the light source is addressed. For details of Dynamic Fielding screens and lighting combinations refer to **Recommended Light / Dye / Accessory and Other Application Tables**.

In the **Dynamic Fielding** box check the **Use Dynamic Fielding** checkbox. Follow the onscreen messages.



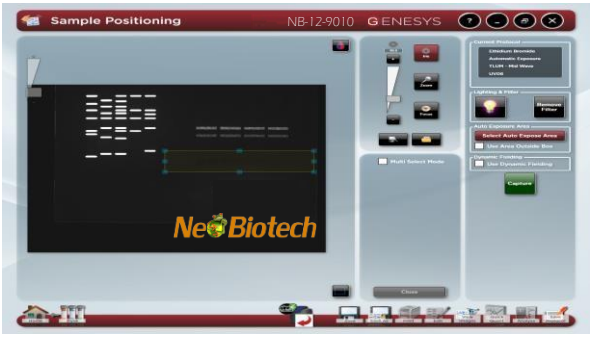
TYPICAL DYNAMIC FIELDING MESSAGES

Using A Selected Area to Improve Sample Image Quality

The **Select AutoExpose Area** function allows you to define an area of interest to set the Camera exposure. This can be used to improve an area of the image where the bands are very faint. The software determines the correct exposure settings for the defined area, resulting in a good image of the defined area. However, although this procedure may result in faint bands becoming more visible, more prominent bands may be overexposed (saturated).

Select the **Select AutoExpose Area** button 

. This introduces a yellow selector box onto the sample image. The yellow box can be dragged around and resized.



AUTOEXPOSE AREA SELECTOR BOX

You also have the option to use the area outside of the yellow box to set the exposure. This is useful if the bulk of the image is faint and only a small area contains prominent bands. The yellow box can be positioned to contain the prominent bands and then the **Use Area Outside ROI** checkbox can be checked. Exposure will then be based on the area outside the yellow box.

Current Protocol Box

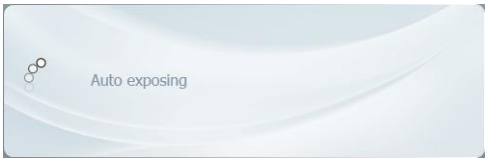
The **Current Protocol** box summarises the lighting and filter combination being used, and displays the exposure information; an exposure time if a manual exposure has been set, 'Automatic Exposure' if the exposure is to be set automatically.

CURRENT PROTOCOL BOX

Image Capture

To capture an image using the entered selections, select the **Capture** button . 

The following pop-up message is displayed as the Instrument makes an image capture:



AUTO EXPOSING MESSAGE POP-UP

The **Exposure Timing** icon  appears at the bottom of the screen. This changes to display the progress of the exposure as a coloured bar progressing around the icon. If capturing multiple exposures, the icon displays multiple coloured bars.

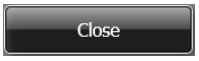
While the exposure is progressing, and this may take several minutes, it is possible to navigate away from the Automatic Capture screen and browse, view and edit previously captured images. The **Exposure Timing** icon  remains displayed at the bottom of the screen. Selecting this icon at any time returns you to the Automatic Capture screen.

Once the image is captured, it appears in the left hand pane and also as a thumbnail in the central **Image Pool** pane. As more images are captured, these also appear in the **Image Pool**. When initially captured, images in the **Image Pool** are unsaved and are outlined in red.

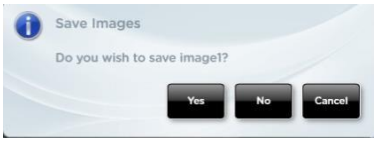
UNSAVED IMAGE POOL IMAGE

To save the captured image, select the image in the **Image Pool** and select the **Save** icon  . Once saved, images in the **Image Pool** are outlined in green and their filename appears below the image.

SAVED IMAGE POOL IMAGE

If further images are captured, additional images appear in the **Image Pool**, stacked vertically. Images can be dismissed from the **Image Pool** by selecting them and then selecting the **Close** button 

. If an image has not been saved you will see a Save prompt.



If multiple images are captured without any images being saved, multiple images can be selected and saved in a single operation. Check the **Multi Select Mode** checkbox in the Image Pool and select multiple images.

To save the selected images, select the **Save** icon  .

Histogram

Select the **Histogram** button  This displays a histogram or graphical representation of the distribution of grey scales recorded by the camera sensor; with black to the extreme left, white to the extreme right.

HISTOGRAM DISPLAY

The **Histogram** button  turns red to indicate that the function has been selected. Selecting the button again cancels the **Histogram** function.

The histogram is a graph showing the number of pixels in the image at each different intensity value found in that image. For a 16-bit image there are a possible 65535 different intensities so the histogram will graphically display 256 numbers showing the distribution of pixels amongst those grayscale values. If the graph is bunched up to the left it indicates that not many grayscale levels have been captured and the red lines on the histogram graph may need to be adjusted to see bands. If the graph reaches to the far right (65535 grayscales) this indicates that the image may be saturated.

Image Slider Controls
The following controls are available to adjust the way a captured image looks.

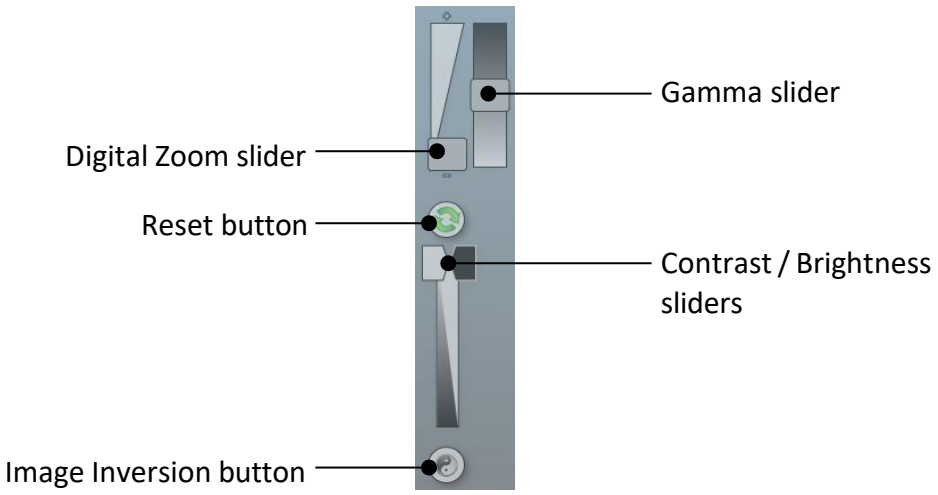


IMAGE SLIDER CONTROLS

The **Digital Zoom** slider allows you to zoom in or out of the displayed image. Dragging the slider towards the **+** sign zooms in, dragging the slider towards the **-** sign zooms out.
The **Gamma** slider changes the tone of the overall image. With reference to the histogram mentioned previously, the Gamma function changes the relative brightness of the recorded midrange tones by shifting them either towards the dark end or the white end of the graph, without changing the extreme dark or extreme white values. This gives the recorded image an overall darker or lighter appearance.
Contrast is a measure of how bright highlights are in an image. Brightness is a measure of how bright shadows are in an image. Use the **Contrast** slider to control how bright the lightest objects in an image are displayed. Use the **Brightness** slider to control how bright dark objects in an image are displayed.
If you make changes using the sliders you can undo the changes by selecting the **Reset** icon.
Use the **Image Inversion** button to invert the image, i.e. white appears black, black appears white. This can help when making changes with the slider controls. Selecting the **Image Inversion** button a second time changes the image back to normal.

Captured Image Information
Select the **Image Information** icon  This displays a pop-up window displaying captured image information. The information displayed is as follows:

- Dye
- Image capture date / time
- Filter
- Light
- Exposure time
- Iris f number
- Image size
- Range (range of grey scales captured)

IMAGE INFORMATION POP-UP WINDOW

The **Image Information** icon turns red. Selecting the **Image Information** icon a second time closes the pop-up window.

Selecting the **Save Protocol** icon  saves the displayed settings as a configuration (or protocol) or repeatable workflow. Refer to **PROTOCOLS - SAVING, OPENING AND EDITING**.

Automatic Image Capture - Image Actions Following Capture

Further actions can be performed on captured images by selecting **Image Action** icons. The function of these is explained in other parts of this User Guide.

IMAGE ACTION ICONS

Manual Image Capture Mode

Manual Capture mode allows the User to take complete control of every function of a NEOCHEMI Instrument. Manual image capture is particularly useful for the more unusual imaging applications or if a User has known imaging parameters that they want to use.
Within the Manual Capture mode, the following options are possible:

- **Single Image** - used to capture a single image of your sample.
- **Series Images** - used to capture a series (variable number) of separate images of your sample, using the same or different exposure/filter/lighting settings for each capture. For example, capture a series of images using different exposure settings, compare the resulting captured images, save the best captured image and delete the unwanted captured images.
- **Additive Series** - used to capture a series (variable number) of separate images of your sample, with the same or different exposure/filter/lighting settings for each capture, which are then combined into a single combined (additive) image.
- **Multiplex** - used to capture a series of images (up to 5) of your sample, with different exposure/filter/lighting settings for each capture, which are then displayed as separate images and as a combined image. Used when more than one fluorophore has been used on the sample.

Manual Image Capture – Start

1. Open the Darkroom Door and place either the Black anti-reflective screen or a Transilluminator Module into the Darkroom.
2. Position the sample in the Darkroom within the guidelines, as noted previously.
3. Select the **Manual Capture** icon 

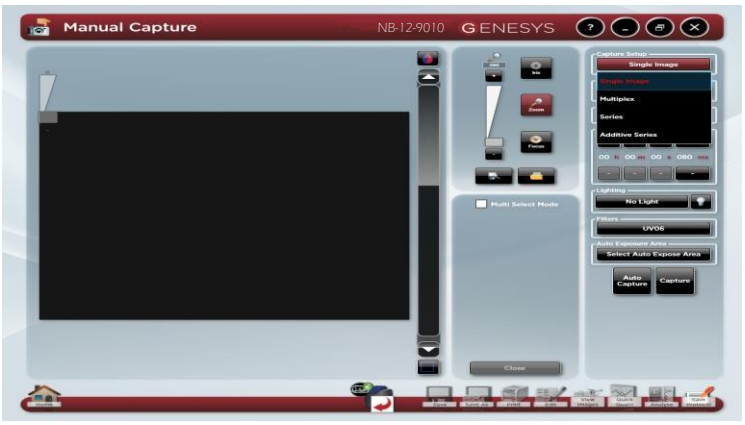
on the Home screen. This displays the basic Manual Capture screen.

MANUAL CAPTURE - BASIC SCREEN – DEFAULT

Note: By default the Manual Capture screen opens in **Single Image** mode.

4. To view the image capture options available select the **Capture Setup** menu . This displays the **Image Capture** options in a drop down menu.
5. Select the type of image capture you want to make by selecting from the options in the

drop down list.



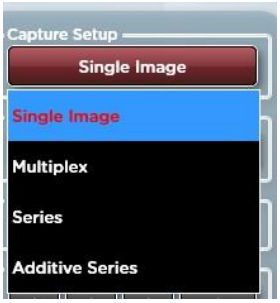
MANUAL CAPTURE SCREEN-IMAGE CAPTURE OPTIONS

- To capture a single image press the **Single Image** button. See **Manual Image Capture - Single Image**.
- To capture a series of images, with different settings for each, press the **Series** button. See **Manual Image Capture - Series**.
- To capture a series of images, with the same or different settings for each, which will then be combined into a single combined image press the **Additive Series** button. See **Manual Image Capture - Additive Series**.
- To capture a series of images, with different settings for each, which will then be displayed as separate images plus a combined image press the **Multiplex** button. See **Manual Image Capture - Multiplex**.

Manual Image Capture - Single Image

Note: A single image can be captured directly from the basic Manual Capture screen without accessing the **Image Capture** options.

6. Make Single Image settings directly on the basic Manual Capture screen or by selecting the **Single Image** button from the **Image Capture** options.



MANUAL CAPTURE - SINGLE IMAGE SELECTED

7. Use the **Lighting** and **Filters** functions in the right hand pane to make your lighting and filter selections.

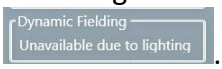
LIGHTING AND FILTERS FUNCTIONS

(i) Select the **Lighting** button and select your preferred light from the drop-down menu.

LIGHTING DROP-DOWN MENU

(ii) Select the **Filters** button and select your preferred filter from the drop- down menu.

FILTERS DROP-DOWN MENU

Note: On initially calling up the Manual Capture screen the Dynamic Fielding function in the right hand pane will have been displaying the following; 

. Once you have made

Lighting and **Filters** selections the Dynamic Fielding function will change to the following;

.

8. Position the sample and improve the the preview sample image as much as possible using the controls/functions described below, prior to making the sample image capture to be saved.

Lighting To Improve Sample Preview Imaging

The Preview mode 

will turn the upper white lights on use the default exposure time set on the settings page to help with positioning of your sample. Once you are happy that the sample is in focus and that you have zoomed in on your sample to fill the screen for maximum resolution press the 'Remove Preview 

Mode' button to return to the previously selected imaging conditions.

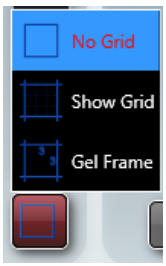
Sample Image Zooming


The **Digital Zoom** slider allows you to zoom in or out of the displayed image. Dragging the slider towards the **+** sign zooms in, dragging the slider towards the **-** sign zooms out. Zooming in or magnifying an area of the image allows you to align the sample more accurately, using the grid overlay.

Sample Alignment Using The Grid

The **Grid** button  lets you overlay a grid on the image, enabling you to better align the sample. Use the **Door Open** button on the right hand side of the Darkroom to open the Darkroom Door slightly to enable you to move the sample around to align it with the grid projection. Pressing the **Grid** button calls up the grid menu.

- **No Grid** option removes the grid projection.
- **Show Grid** option displays the default grid projection, 2 rows x 2 columns.

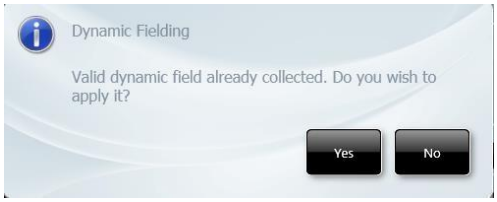


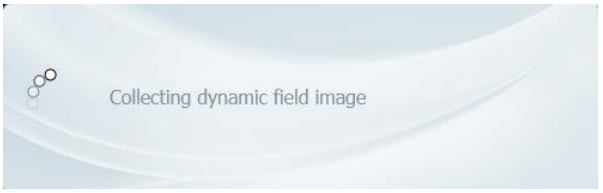
GRID MENU

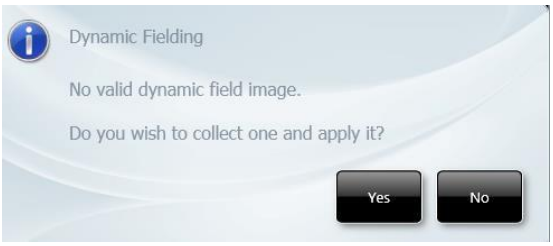
Using Dynamic Fielding To Improve Sample Image Quality

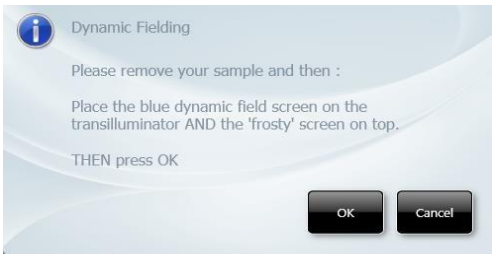
The Dynamic Fielding option allows you to correct the image for uneven lighting. This can cause problems when quantifying bands or spots across a large sample. The image of the dynamic field is normalised for light illumination. This normalisation is then applied to the gel image, such that uneven light illumination generated by the light source is addressed. For details of Dynamic Fielding screens and lighting combinations refer to **Recommended Light / Dye / Accessory and Other Application Tables**.

In the **Dynamic Fielding** box check the **Use Dynamic Fielding** checkbox. Follow the onscreen messages.









Using A Selected Area To Improve Sample Image Quality

The **Select AutoExpose Area** function allows you to define an area of interest to set the Camera exposure. This can be used to improve an area of the image where the bands are very faint. The software determines the correct exposure settings for the defined area, resulting in a good image of the defined area. However, although this procedure may result in faint bands becoming more visible, more prominent bands may be overexposed (saturated).

Select the **Select AutoExpose Area** button 

. This introduces a yellow selector box onto the sample image. The yellow box can be dragged around and resized.

AUTOEXPOSE AREA SELECTOR BOX

You also have the option to use the area outside of the yellow box to set the exposure. This is useful if the bulk of the image is faint and only a small area contains prominent bands. The yellow box can be positioned to contain the prominent bands and then the **Use Area Outside ROI** checkbox can be checked. Exposure will then be based on the area outside the yellow box.

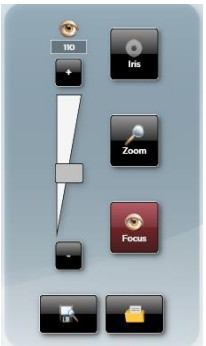
Lens Controls

Note: The lens controls that are available are Focus, Iris (aperture), and Zoom.

The available lens controls appear in the **Lens Control** pane.

LENS CONTROL - IRIS

LENS CONTROL – ZOOM



LENS CONTROL - FOCUS

With **Focus** control selected 

, the focal plane of the Camera can be moved up/down by moving the slider  up/down or by selecting the  /  buttons. As the **Focus** control is changed, the numbers in the box above the slider bar change. These numbers provide a reference for the **Focus** control.

With **Iris** control selected 

, the aperture or shutter opening of the Camera can be increased/decreased by moving the slider  up/down or by selecting the  /  buttons. As the **Iris** control is changed, the numbers (expressed in 'f' numbers) in the box above the slider bar change. The aperture numbers (f numbers) are counterintuitive, smaller numbers represent larger aperture openings, larger numbers represent smaller aperture openings. The aperture opening controls the amount of light that passes through the lens to the sensor. Larger aperture openings (smaller f numbers) will result in shorter exposure times and smaller aperture openings (larger f numbers) will result in longer exposure times.

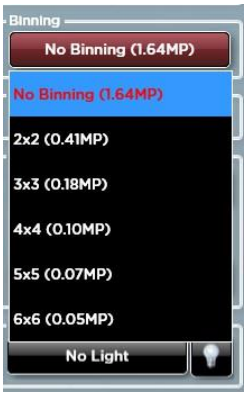
With **Zoom** control selected 

, the physical position of the sample relative to the camera is changed, allowing the User to concentrate on a smaller area of the sample, maximising resolution. This control works by raising / lowering the Stage by moving the slider  up/down or by selecting the  /  buttons.

9. Select the Camera resolution that you want to use to capture your sample image.

   The **Binning** function is a way of improving image capture times. By combining the outputs from adjacent pixels on the image sensor, in square groups, e.g. 2 x 2, 3 x 3, 4 x 4, etc, the pixels are effectively enlarged while being reduced in number. This provides faster image capture, due to the reduced number of data reading operations required, improved signal to noise ratios, but reduced spatial resolution, i.e. 2 x 2 binning on an 8 MP sensor effectively results in a 2 MP sensor with pixels four times the size of the 8 MP sensor pixels.

Select the **Binning** button and select the binning ratio you want to use from the drop- down list.



BINNING RATIO DROP-DOWN LIST

10. You are now ready to capture your sample image. You have two options; to let the GeneSys program set the exposure time automatically, or, you set the exposure time manually.

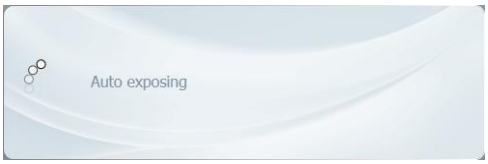
Manual Capture - Single Image With Auto Exposure

11a. Select the **Auto Capture** button 

.

The GeneSys program will decide the best exposure time for the settings you have entered. This time will appear in the **Exposure** function in the right hand pane. The Auto Capture function is designed to capture the maximum available number of grey scales without allowing image saturation. This function is useful for quantifying data.

The following pop-up message is displayed as the Instrument makes an image capture:



AUTO EXPOSING MESSAGE POP-UP

The **Exposure Timing** icon  appears at the bottom of the screen. This changes to display the progress of the exposure as a coloured bar progressing around the icon.

While the exposure is progressing, and this may take several minutes, it is possible to navigate away from the Manual Capture screen and browse, view and edit previously captured images.

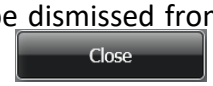
Once the image is captured, it appears in the left hand pane and also as a thumbnail in the central **Image Pool** pane. If more images are captured, these also appear in the **Image Pool**. When initially captured, images in the **Image Pool** are unsaved and are outlined in red.

UNSAVED IMAGE POOL IMAGE

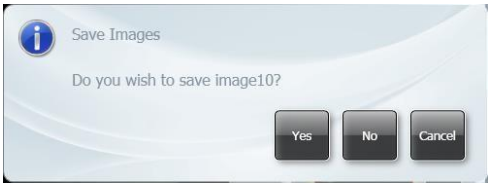
11b. To save a captured image, select the image in the **Image Pool** and select the Save icon  . Once saved, images in the **Image Pool** are outlined in green and their filename appears below the image.

SAVED IMAGE POOL IMAGE

If further images are captured, additional images appear in the **Image Pool**, stacked vertically.

Images can be dismissed from the **Image Pool** by selecting them and then selecting the **Close** button 

. If an image has not been saved you will see a Save prompt.



SAVE PROMPT

(i) If multiple images are captured without any images being saved, multiple images can be selected and saved in a single operation. Check the **Multi Select Mode** checkbox in the **Image Pool** and select multiple images.

(ii) To save the selected images, select the **Save** icon  .

Manual Capture - Single Image With Manual Exposure

12a. Set an exposure time:

The **Exposure** controls are simple plus/minus buttons for adjusting the following time periods; hours (**h**) , minutes (**m**) , seconds (**s**) , and milliseconds (**ms**) .

MANUAL EXPOSURE CONTROLS

Using the **Exposure** plus/minus buttons enter an exposure time for the image.

12b. Select the **Capture** button 

.

The following pop-up message is displayed as the Instrument makes an image capture:

AUTO EXPOSING MESSAGE POP-UP

The **Exposure Timing** icon  appears at the bottom of the screen. This changes to display the progress of the exposure as a coloured bar progressing around the icon.

While the exposure is progressing, and this may take several minutes, it is possible to navigate away from the Manual Capture screen and browse, view and edit previously captured images.

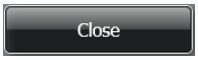
Once the image is captured, it appears in the left hand pane and also as a thumbnail in the central **Image Pool** pane. If more images are captured, these also appear in the **Image Pool**. When initially captured, images in the **Image Pool** are unsaved and are outlined in red.

UNSAVED IMAGE POOL IMAGE

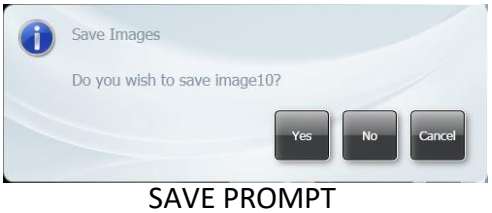
12c. To save a captured image, select the image in the **Image Pool** and select the **Save** icon  . Once saved, images in the **Image Pool** are outlined in green and their filename appears below the image.

SAVED IMAGE POOL IMAGE

If further images are captured, additional images appear in the Image Pool, stacked vertically.

Images can be dismissed from the **Image Pool** by selecting them and then selecting the **Close** button 

. If an image has not been saved you will see a Save prompt.



SAVE PROMPT

(i) If multiple images are captured without any images being saved, multiple images can be selected and saved in a single operation. Check the **Multi Select Mode** checkbox in the **Image Pool** and select multiple images.

(ii) To save the selected images, select the **Save** icon  .

Manual Image Capture – Series

13. Select the **Series** button from the **Image Capture** options.

You must now define the number of images you want in your series. In the right hand pane the **Number of images** selector is displayed.

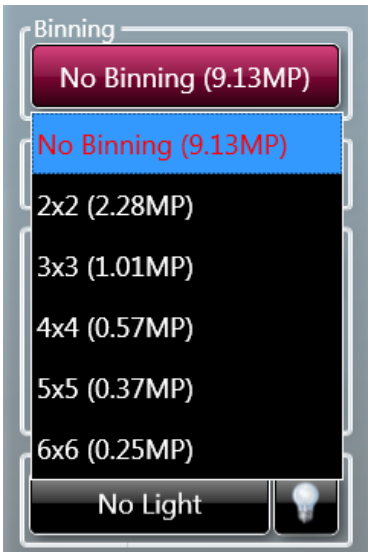
NUMBER OF IMAGES SELECTION

14. Use the **+** / **-** buttons to select the number of images you want to capture, then select the **Next** arrow  . For this example, set to 3 by selecting the **+** button.

You must now define a Camera resolution for your series of images. In the right hand pane the **Binning** selector is displayed.

BINNING SELECTOR

15. Select the **No Binning (9.13MP)** button and select the binning ratio you want to use from the drop-down list, then select the **Next** arrow  , or if you want to use the full resolution just select the **Next** arrow  .



BINNING RATIO DROP-DOWN LIST

16. You must now set the interval time (time between captures in the series), the exposure times for each image in your series of images, and the lighting/filter sets for your images. The controls for these are displayed in the right hand pane.

SERIES EXPOSURE CONTROLS – FIRST IMAGE

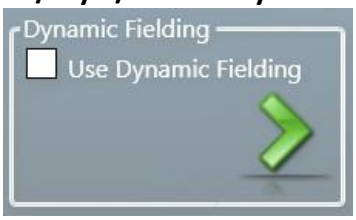
SERIES EXPOSURE CONTROLS - SECOND IMAGE
SAME AS PREVIOUS UNSET

SERIES EXPOSURE CONTROLS - THIRD IMAGE
SAME AS PREVIOUS UNSET

The display is almost the same for each image in the series and by default starts at image 1.
The **Capture Interval** controls are simple **+** / **-** buttons for adjusting the following time periods; hours (**h**) , minutes (**m**) , seconds (**s**) , and milliseconds (**ms**) .
Using the **Capture Interval + / -** buttons enter an interval time for the series of images.
The manual **Exposure** controls are simple **+** / **-** buttons for adjusting the following time periods; hours (**h**) , minutes (**m**) , seconds (**s**) , and milliseconds (**ms**) .
To set a manual exposure time select the **Manual** button and use the **Exposure + / -** buttons enter an exposure time for the first image. Alternatively, selecting the **Auto** button after you have selected the lighting and filters allows the system to automatically select the most appropriate exposure time for the image 1.

Use the **Lighting** and **Filters** functions in the right hand pane to make your lighting and filter selections as described previously.

17. Select the **Next** arrow to make the settings for image 2. Select the **Last** arrow to apply the settings you have entered for image 1 to all of the remaining images in your series. Go to Step 14.
18. By default the **Same as previous** checkbox is checked, making the settings for the second image the same as the settings for the first image, and the setting boxes are greyed out meaning that no manual changes can be made. To make changes for the second and subsequent images, uncheck the **Same as previous** checkbox.
19. Enter the settings for all the images in your series.
20. Select the **Next** arrow .
21. If the Dynamic Fielding option is available, determined by your lighting/filter selections, you now have to decide whether or not to apply Dynamic Fielding.
    The Dynamic Fielding option allows you to correct the image for uneven lighting. This can cause problems when quantifying bands or spots across a large sample. The image of the dynamic field is normalised for light illumination. This normalisation is then applied to the gel image, such that uneven light illumination generated by the light source is addressed. For details of Dynamic Fielding screens and lighting combinations refer to **Recommended Light / Dye / Accessory and Other Application Tables**.



MANUAL SERIES DYNAMIC FIELDING

To apply Dynamic Fielding check the **Use Dynamic Fielding** checkbox and select the **Next** arrow and follow the onscreen messages.

22. The exposure/interval/lighting/filter choices that you have selected are now displayed as a set of Current Protocols in the right hand pane.

SERIES PROTOCOLS

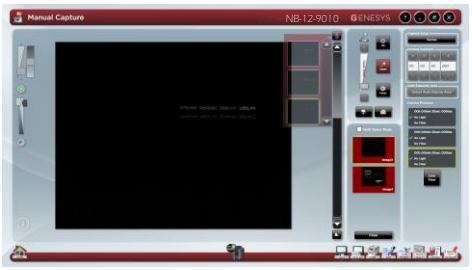
23. Position the sample and improve the the preview sample image as much as possible using the Light / Digital Zoom / Grid / Select Autoexpose Area / Lens Controls, as described previously.

24. Select the **Capture** button 

.

    The **Exposure Timing** icon  appears at the bottom of the screen.
    This changes to display the progress of the exposures as concentric coloured bars progressing around the icon  .
    While the exposures are progressing, and this may take several minutes, it is possible to navigate away from the Manual Capture screen and browse, view and edit previously captured images.
    The Current Protocol display changes as the series of captures is made. As a capture is made using a protocol, the protocol box is highlighted yellow. When the capture is complete a green tick appears inside the protocol box and the yellow highlight is removed. The yellow highlight then appears on the next protocol box in the series, once that capture has commenced.

SERIES EXPOSURE - FIRST IMAGE BEING CAPTURED



SERIES EXPOSURE - ALL THREE CAPTURES COMPLETE

As the first image is captured, it appears as the main image in the left hand **Image** pane, as a thumbnail in the **Image** pane, and as a thumbnail in the central **Image Pool** pane. As subsequent images in the series are captured, these also appear as thumbnails in the **Image** pane, the images being stacked vertically. The main image in the **Image** pane changes as each image is captured, displaying the current image. The thumbnail image in the **Image Pool** also changes as each capture is made, displaying a combined image.

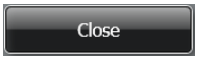
UNSAVED IMAGE POOL IMAGE

25. The series of images captured can be viewed individually as a large image in the left hand pane by selecting the desired image from the series of thumbnail images.

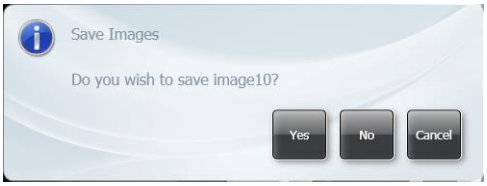
The thumbnail images in the **Image** pane overlay and partially obscure the main image. To view the entire main image, select the minimise icon in the top right hand corner above the first thumbnail image. This hides the thumbnails, leaving just a banner containing a minimise icon. Selecting the minimise icon in the banner displays the thumbnail images again.
The best image or images can then be saved, and the unwanted images can be deleted.

26. To save a captured image, select the image in the **Image** pane or the **Image Pool** and select the **Save** icon  .
Once saved, images in the **Image Pool** are outlined in green and their filename appears below the image.

SAVED IMAGE POOL IMAGE

Images can be dismissed from the **Image Pool** by selecting them and then selecting the **Close** button 

. If an image has not been saved you will see a Save prompt.



SAVE PROMPT

(i) If multiple images are captured without any images being saved, multiple images can be selected and saved in a single operation. Check the **Multi Select Mode** checkbox in the **Image Pool** and select multiple images.

(ii) To save the selected images, select the **Save** icon  .
For more information on saving refer to **Common Screen Functions and Tools**.

Manual Image Capture - Additive Series

27. Select the **Additive Series** button from the **Image Capture** options.
You must now define the number of images you want in your series. In the right hand pane the **Number of images** selector is displayed.

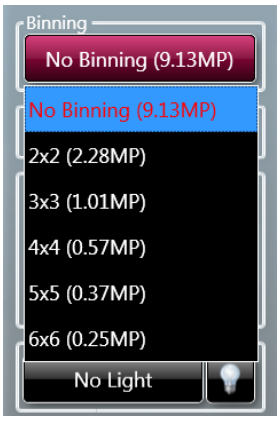
NUMBER OF IMAGES SELECTION

28. Use the **+** / **-** buttons to select the number of images you want to capture, then select the

Next arrow . For this example, set to 3 by selecting the **+** button.
You must now define a Camera resolution for your series of images. In the right hand pane the **Binning** selector is displayed.

BINNING SELECTOR

29. Select the **No Binning (9.13MP)** button and select the binning ratio you want to use from the drop-down list, then select the **Next** arrow , or if you want to use the full resolution just select the **Next** arrow .



BINNING RATIO DROP-DOWN LIST

30. You must now set the exposure time, capture intervals, and select lighting and filter options for image 1. This process is the same as that for **Manual Image Capture - Series**.
31. The display is almost the same for each image in the series and by default starts at image 1.
32. The **Capture Interval** controls are simple **+** / **-** buttons for adjusting the following time periods; hours (**h**) , minutes (**m**) , seconds (**s**) , and milliseconds (**ms**) .
33. Using the **Capture Interval + / -** buttons enter an interval time for the series of images.
34. The manual **Exposure** controls are simple **+** / **-** buttons for adjusting the following time periods; hours (**h**) , minutes (**m**) , seconds (**s**) , and milliseconds (**ms**) .
35. To set a manual exposure time select the **Manual** button and use the **Exposure + / -** buttons to enter an exposure time for the first image. Alternatively, selecting the **Auto** button after you have selected the lighting and filters allows the system to automatically select the most appropriate exposure time for the image 1.
36. Use the **Lighting** and **Filters** functions in the right hand pane to make your lighting and filter selections as described previously.
37. Select the **Next** arrow to make the settings for image 2. Select the **Last** arrow to apply the settings you have entered for image 1 to all of the remaining images in your series.

38. By default the **Same as previous** checkbox is checked, making the settings for the second image the same as the settings for the first image. To make changes for the second and subsequent images, uncheck the **Same as previous** checkbox.
39. Enter the settings for all the images in your series.
40. Select the **Next** arrow  .
41. If the Dynamic Fielding option is available, determined by your lighting/filter selections, you now have to decide whether or not to apply Dynamic Fielding.
    The Dynamic Fielding option allows you to correct the image for uneven lighting. This can cause problems when quantifying bands or spots across a large sample. The image of the dynamic field is normalised for light illumination. This normalisation is then applied to the gel image, such that uneven light illumination generated by the light source is addressed. For details of Dynamic Fielding screens and lighting combinations refer to **Recommended Light / Dye / Accessory and Other Application Tables**.

MANUAL SERIES DYNAMIC FIELDING

To apply Dynamic Fielding check the **Use Dynamic Fielding** checkbox and select the **Next** arrow  and follow the onscreen messages.

42. The exposure/lighting/filter choices that you have selected are now displayed as a set of Current Protocols in the right hand pane.

ADDITIVE SERIES PROTOCOLS

43. Position the sample and improve the preview sample image as much as possible using the Light / Digital Zoom / Grid / Select Autoexpose Area / Lens Controls, as described previously.
44. Select the **Capture** button 

.

The **Exposure Timing** icon  appears at the bottom of the screen.

This changes to display the progress of the exposures as concentric coloured bars progressing around the icon  .

While the exposures are progressing, and this may take several minutes, it is possible to navigate away from the Manual Capture screen and browse, view and edit previously captured images.

ADDITIVE SERIES PROTOCOLS - WITH CAPTURES TAKEN

The Current Protocol display changes as the series of captures is made. As a capture is made using a protocol, the protocol box is highlighted yellow. When the capture is complete a green tick appears inside the protocol box and the yellow highlight is removed. The yellow highlight then appears on the next protocol box in the series, once that capture has commenced.

ADDITIVE SERIES EXPOSURE - READY TO START CAPTURES

ADDITIVE SERIES EXPOSURE - ALL THREE CAPTURES COMPLETE

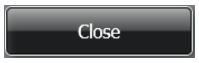
As the first image is captured, it appears as the main image in the left hand **Image** pane and also as a thumbnail in the left hand pane. As subsequent images in the series are captured, these also appear as thumbnails in the **Image** pane, the images being stacked vertically. The main image in the **Image** pane changes as each image is captured, as each of the newly made captures is added to the main image to produce a combined or additive image.

Once the series of captures is complete, the combined image appears as the main image in the **Image** pane, along with the stack of series captured images, and also as a thumbnail in the central **Image Pool** pane. When initially captured, images in the **Image Pool** are unsaved and are outlined in red.

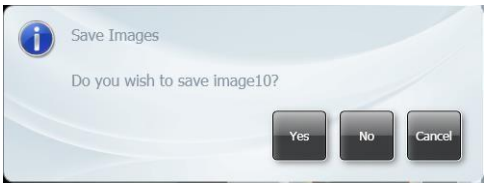
UNSAVED IMAGE POOL IMAGE

45. To save a captured image, select the image in the Image Pool and select the **Save** icon  .
    Once saved, images in the **Image Pool** are outlined in green and their filename appears below the image.

SAVED IMAGE POOL IMAGE

Images can be dismissed from the **Image Pool** by selecting them and then selecting the **Close** button 

. If an image has not been saved you will see a Save Images prompt.



SAVE PROMPT

(i) If multiple images are captured without any images being saved, multiple images can be selected and saved in a single operation. Check the **Multi Select Mode** checkbox in the **Image Pool** and select multiple images.

(ii) To save the selected images, select the **Save** icon 
. For more information on saving refer to **Common Screen Functions and Tools**.

Manual Image Capture - Multiplex

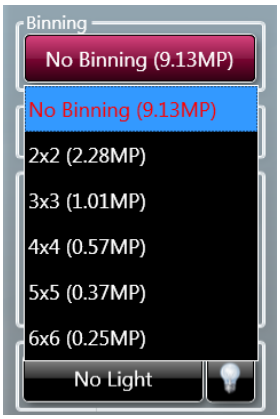
46. Select the **Multiplex** button from the **Image Capture** options.
You must now define the number of images you want in your series. In the right hand pane the **Number of images** selector is displayed.

NUMBER OF IMAGES SELECTION

47. Use the **+** / **-** buttons to select the number of images you want to capture, then select the **Next** arrow 
. For this example, set to 3 by selecting the **+** button.
You must now define a Camera resolution for your series of images. In the right hand pane the **Binning** selector is displayed.

BINNING SELECTOR

48. Select the **No Binning (9.13MP)** button and select the binning ratio you want to use from the drop-down list, then select the **Next** arrow  , or if you want to use the full resolution just select the **Next** arrow  .



BINNING RATIO DROP-DOWN LIST

49. You must now set the exposure time, and select lighting and filter options for image 1. The display is almost the same for each image in the series and by default starts at image 1.
    The **Capture Interval** controls are simple **+** / **-** buttons for adjusting the following time periods; hours (**h**) , minutes (**m**) , seconds (**s**) , and milliseconds (**ms**) .
    Using the **Capture Interval + / -** buttons enter an interval time for the series of images.
    The manual **Exposure** controls are simple **+** / **-** buttons for adjusting the following time periods; hours (**h**) , minutes (**m**) , seconds (**s**) , and milliseconds (**ms**) .
    To set a manual exposure time select the **Manual** button and use the **Exposure + / -** buttons to enter an exposure time for the first image. Alternatively, selecting the **Auto** button after you have selected the lighting and filters allows the system to automatically select the most appropriate exposure time for the image.
    Use the **Lighting** and **Filters** functions in the right hand pane to make your lighting and filter selections as described previously.
50. Select the **Next** arrow  to make the settings for image 2. Select the **Last** arrow  to apply the settings you have entered for image 1 to all of the remaining images in your series.
51. Enter the settings for all the images in your series.
52. Select the **Next** arrow  .
53. If the Dynamic Fielding option is available, determined by your lighting/filter selections, you now have to decide whether or not to apply Dynamic Fielding.

The Dynamic Fielding option allows you to correct the image for uneven lighting. This can cause problems when quantifying bands or spots across a large sample. The image of the dynamic field is normalised for light illumination. This normalisation is then applied to the gel image, such that uneven light illumination generated by the light source is addressed. For details of Dynamic Fielding screens and lighting combinations refer to **Recommended Light / Dye / Accessory and Other Application Tables**.

MANUAL SERIES DYNAMIC FIELDING

To apply Dynamic Fielding check the **Use Dynamic Fielding** checkbox and select the **Next** arrow  and follow the onscreen messages.

54. The exposure/lighting/filter choices that you have selected are now displayed as a set of Current Protocols in the right hand pane.

MULTIPLEX PROTOCOLS

55. Position the sample and improve the the preview sample image as much as possible using the Light / Digital Zoom / Grid / Select Autoexpose Area / Lens Controls, as described previously.
56. Select the **Capture** button 

.

The **Exposure Timing** icon  appears at the bottom of the screen.

This changes to display the progress of the exposures as concentric coloured bars progressing around the icon  .

While the exposures are progressing, and this may take several minutes, it is possible to navigate away from the Manual Capture screen and browse, view and edit previously captured images.

The Current Protocol display changes as the series of captures is made. As a capture is made using a protocol, the protocol box is highlighted yellow. When the capture is complete a green tick appears inside the protocol box and the yellow highlight is removed. The yellow highlight then appears on the next protocol box in the series, once that capture has commenced.

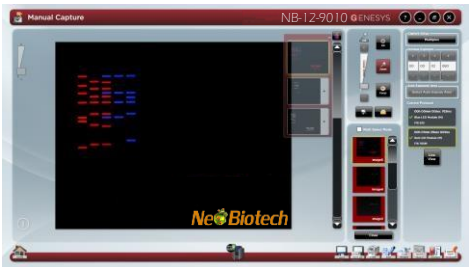
As the first image is captured, it appears as the main image in the left hand **Image** pane, as two vertically stacked thumbnails in the **Image** pane, and as a thumbnail in the

central **Image Pool** pane.

As subsequent images in the series are captured, the main image in the **Image** pane and the top image in the thumbnail stack change, becoming combined images. Also the newly captured image is added to the bottom of the thumbnail stack. The thumbnail stack of images represents the combined image and the separate images that make it up. By default the main image is the selected image from the thumbnail stack, this is indicated by a yellow highlight around the top image in the stack.

Once the series of captures is complete, the combined image appears as the main image in the **Image** pane along with the stack of series captured images, and also as a thumbnail in the central **Image Pool** pane. The thumbnail stack in the **Image** pane will consist of one more image than the number of images selected on the **Number of images** selector since it displays the individual capture images and the combined image.

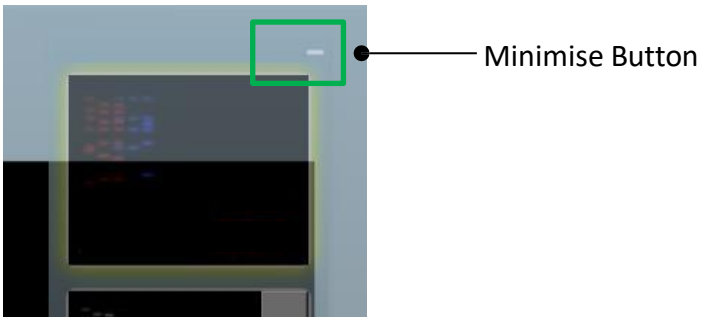
MULTIPLEX EXPOSURE - READY TO START CAPTURES



MULTIPLEX EXPOSURE - ALL TWO CAPTURES COMPLETE

In the left hand pane the main image displayed is the image in the thumbnail stack that is selected, this is indicated by a yellow highlight around the thumbnail. By default this is the combined image.

(i) To make one of the individual capture images in the stack the main image, select the drawing side of the thumbnail. The yellow highlight will move from the default thumbnail to the selected thumbnail.



MINIMISE BUTTON

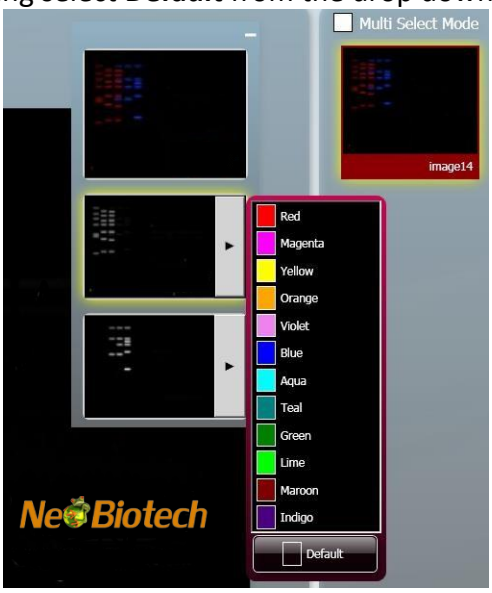
(ii) To view the complete main image in the left hand pane, select the **Minimise** button above the thumbnail stack.

(iii) To view the thumbnail stack once more, select the **Minimise** button again.

The appearance of the individual captured images can be manipulated if desired to improve the appearance of the overall combined image, e.g. by changing the colour of the coloured bands to produce a greater colour contrast.

(iii) Select the right arrow at the side of the thumbnail image you want to change and select a new colour from the drop down menu. To reject a colour and return to

the original setting select **Default** from the drop down menu.



CAPTURED IMAGE COLOUR CHANGE

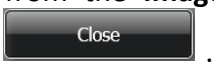
When initially captured, images in the **Image Pool** are unsaved and are outlined in red.

UNSAVED IMAGE POOL IMAGE

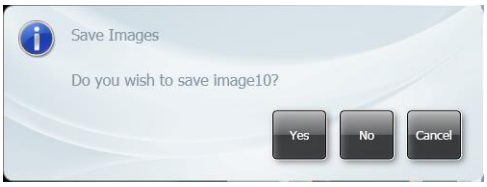
57. To save a captured image, select the image in the Image Pool and select the Save icon  .

Once saved, images in the **Image Pool** are outlined in green and their filename appears below the image.

SAVED IMAGE POOL IMAGE

Images can be dismissed from the **Image Pool** by selecting them and then selecting the **Close** button 

. If an image has not been saved you will see a Save prompt.



SAVE PROMPT

(i) If multiple images are captured without any images being saved, multiple images can be selected and saved in a single operation. Check the **Multi Select Mode** checkbox in the **Image Pool** and select multiple images.

(ii) To save the selected images, select the **Save** icon . For more information on saving refer to **Common Screen Functions and Tools**.

Manual Image Capture - Image Actions Following Capture

Further actions can be performed on captured images by selecting **Image Action** icons. The function of these is explained in other parts of this User Guide.

IMAGE ACTION ICONS

Protocols- Saving, Opening and Editing

Introduction

The GeneSys software can make the running of repeated workflows easier by storing a workflow as a protocol. Protocols can be:
Easily created
Have a wide variety of settings
Easily re-used
Easily modified

Creating and Saving a Protocol

From the Home Screen

To create a Protocol for a **Gel** from the Standard View Home screen:

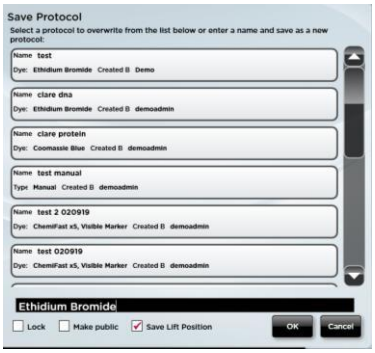
1. Work through the following process; select the Gels icon 

, select your sample type, select your dye, position your sample, and capture an image.
Once the image has been captured the Saved Protocols pop-up appears.

SAVED PROTOCOLS POP-UP

(i) Select the **Yes** button.

The **Save Protocol** pop-up appears.



SAVE PROTOCOL POP-UP

(ii) Follow the prompt in the pop-up and either select an existing Protocol from those displayed (which will be overwritten by you saving your new Protocol), or enter a name for your new Configuration in the **Enter configuration name here…** box, e.g. **Ethidium Bromide**.
By default when you save the Protocol that you have just created, the software will only allow you to access it. This behaviour can be modified using the two checkboxes at the bottom left of the pop-up.
Use the **Lock** checkbox to prevent adjustments being made to the Configuration. Use the **Make public** checkbox to make the Configuration accessible to other Users.

(iii) Use the **Save Lift Position** checkbox to save the position of the Stage in the Configuration file. This will allow GeneSys to accurately duplicate the NEOCHEMI setup you were using when you saved the Configuration each time you use the saved Configuration in the future. This checkbox is ticked by default.

(iv) Select the **OK** button to save the Configuration.

The new saved Configuration **Stain free gel** appears on the Home screens, eg on the Standard View Home screen:

NEW PROTOCOL - ADDED TO BOTTOM OF LIST

To create a Configuration for a **Blot** from the Standard View Home screen:
Work through the following process; select the Blots icon 

, select your sample type/imaging type, select your dye, position your sample, and capture an image.
Once the image has been captured the Saved Protocols pop-up appears.

SAVED PROTOCOLS POP-UP

(i) Select the **Yes** button. The **Save Configuration** pop-up appears.

SAVE PROTOCOLS POP-UP

(ii) Follow the prompt in the pop-up and either select an existing Configuration from those displayed (which will be overwritten by you saving your new Configuration), or enter a name for your new Configuration in the **Enter configuration name here…** box, e.g. **coomassie blue**.

By default when you save the Configuration that you have just created, the software will only allow you to access it. This behaviour can be modified using the two checkboxes at the bottom left of the pop-up.

Use the **Lock** checkbox to prevent adjustments being made to the Configuration. Use the **Make public** checkbox to make the Configuration accessible to other Users.

(iii) Use the **Save Lift Position** checkbox to save the position of the Stage in the Configuration file. This will allow GeneSys to accurately duplicate the NEOCHEMI setup you were using when you saved the Configuration each time you use the saved Configuration in the future. This checkbox is ticked by default.

(iv) Select the **OK** button to save the Configuration.

The new saved Configuration **VisibleBlotAutomatic** appears on the Home screens, eg on the Standard View Home screen:

NEW PROTOCOL- ADDED TO BOTTOM OF LIST

In Auto Image Capture Mode

To create a Protocol in Auto Image Capture mode:

Work through the workflow for the type of test sample that you are going to image.Once the image has been captured the Saved Protocols pop-up appears.

SAVED PROTOCOLS POP-UP

(i) Select the **Yes** button.
The **Save Configuration** pop-up appears.

SAVE CONFIGURATION POP-UP

(ii) Follow the prompt in the pop-up and either select an existing Configuration from those displayed (which will be overwritten by you saving your new Configuration), or enter a name for your new Configuration in the **Enter configuration name here…** box, e.g. **Gel Automatic 6-TET**.
By default when you save the Configuration that you have just created, the software will only allow you to access it. This behaviour can be modified using the two checkboxes at the bottom left of the pop-up.
Use the **Lock** checkbox to prevent adjustments being made to the Configuration. Use the **Make public** checkbox to make the Configuration accessible to other Users.

(iii) Use the **Save Lift Position** checkbox to save the position of the Stage in the Configuration file. This will allow GeneSys to accurately duplicate the NEOCHEMI setup you were using when you saved the Configuration each time you use the saved Configuration in the future. This checkbox is ticked by default.

(iv) Select the **OK** button to save the Configuration.

The new saved Configuration **manual capture** appears on the Home screen.

NEW PROTOCOL- ADDED TO BOTTOM OF LIST

In Manual Image Capture Mode

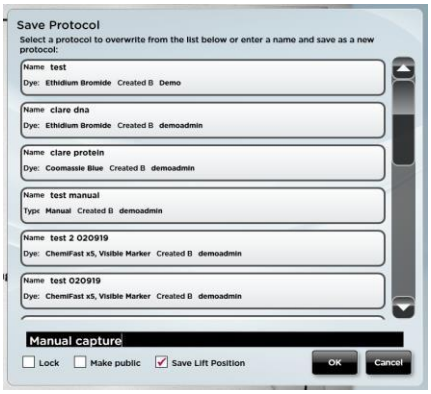
To create a Configuration in Manual Image Capture mode:

1. Work through the Manual Image Capture process described previously and capture an image.

Select the Save Protocol icon from the **Image Action** icons.

(i) Select the **Save Protocol** icon  .

The **Save Protocol** pop-up appears.



SAVE CONFIGURATION POP-UP

(ii) Follow the prompt in the pop-up and either select an existing Protocol from those displayed (which will be overwritten by you saving your new Protocol), or enter a name for your new Protocol in the **Enter Protocol name here…** box, e.g. **Manual Capture 1**.

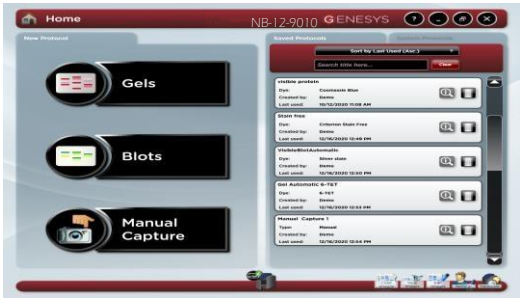
By default when you save the Protocol that you have just created, the software will only allow you to access it. This behaviour can be modified using the two checkboxes at the bottom left of the pop-up.

Use the **Lock** checkbox to prevent adjustments being made to the Protocol. Use the **Make public** checkbox to make the Protocol accessible to other Users.

(iii) Use the **Save Lift Position** checkbox to save the position of the Stage in the Protocol file. This will allow GeneSys to accurately duplicate the NEOCHEMI setup you were using when you saved the Protocol each time you use the saved Protocol in the future. This checkbox is ticked by default.

(iv) Select the **OK** button to save the Protocol.

The new saved Protocol **Manual Capture 1** appears on the Home screen



NEW PROTOCOL - ADDED TO BOTTOM OF LIST

Using Protocols

Opening a System Protocol

System protocols are pre-installed configurations that the user can use for imaging some of the more common applications.

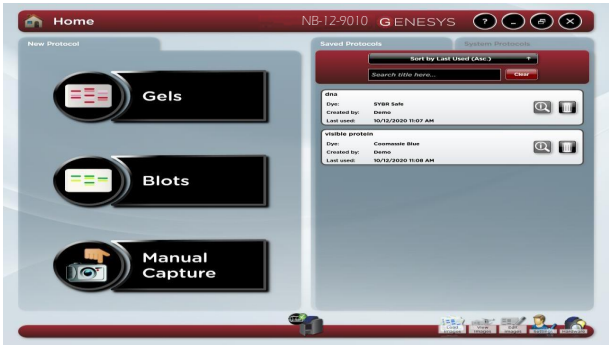
To open and use a system Protocol from the Home screen:

1. On the home screen select the 'System Protocols' tab
2. Select the Protocol you wish to use

If the Protocol is in Auto Image Capture mode the system will display the Sample Positioning screen. if the Protocol is in the Manual Image Capture mode the system will display the revelant Manual Capture screen with the defined protocols displayed.

Position the sample and complete the appropriate Automatic or Manual Image Capture process as described previously.

All accessible previously created and saved Protocols appear on the Home screens.



HOME SCREEN

Opening a Protocol

To open and use an existing Protocol from the Home screen:

1. On the Home screen select the Protocol you want to use.
   On the Standard View Home screen you can sort and search saved Protocols:
   Sort By options are: **Last Used**, **Title**, **Author**, **Type/Dye**.
   Search is by entering text in the Search title here... field. There is also a **Clear** button to clear entered search text.
   The software will configure your Neochemi Instrument based on the data in the Protocol file and will take you to the following point in the image capture process:
   If the Protocol is in Auto Image Capture mode the system will display the Sample Positioning screen, as shown below:

AUTOMATIC CAPTURE SAMPLE POSITIONING

If the Configuration is in Manual Image Capture mode the system will display the relevant Manual Capture screen with the defined protocols displayed, typically as shown below:

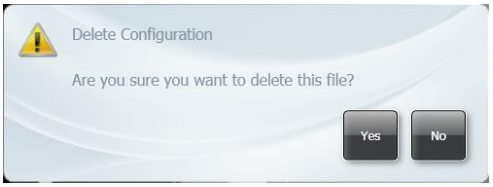
TYPICAL MANUAL CAPTURE SAMPLE POSITIONING

Position the sample and complete the appropriate Automatic or Manual Image Capture process as described previously.

Deleting a Protocol

To delete a Protocol from the Home screen:

1. Select the **Delete Protocol** button  in the Configuration that you want to delete.



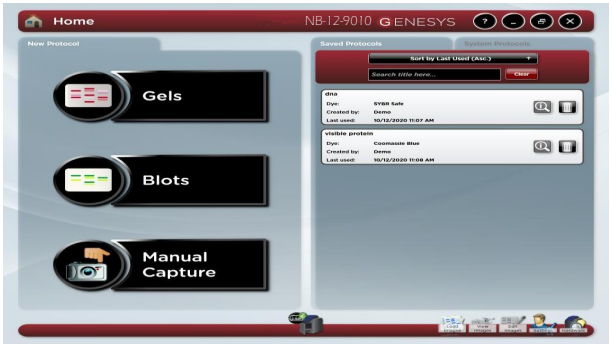
DELETE CONFIGURATION POP-UP

In the **Delete Protocol** pop-up select the **Yes** button.

The selected Protocol is deleted and is no longer visible on the Home screen.

Editing a Saved Protocol

All accessible previously created and saved Protocols appear on the Home screen.



HOME SCREEN

To edit a previously saved Protocol, first open the Protocol as described previously. Then use the normal controls/actions available on the Auto Image Capture Sample Positioning screen or Manual Capture screen to change the settings.

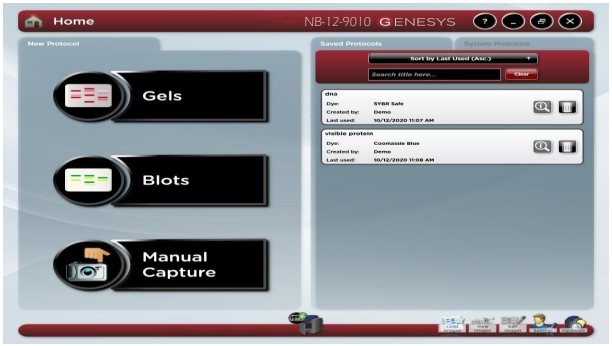
For Auto Image Capture Sample Positioning screen refer to **Automatic Image Capture Mode**. For Manual Capture screen refer to **Manual Image Capture Mode**.

If you make changes to an existing Configuration and want to save the new Configuration as a new Configuration, refer to **Creating and Saving a Protocol**.

Image Function

Load Images Screen

Previously saved images can be located and browsed through from the Home screen.



HOME SCREEN

Select the **Load Images** icon  on the Standard View Home screen or the **Load Images** icon 

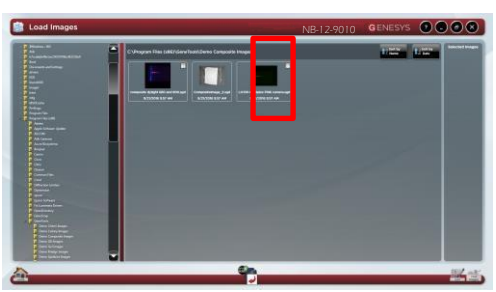
on the Classic View Home screen. This displays the Load Images screen.

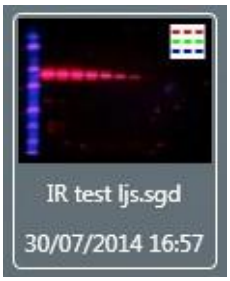
LOAD IMAGES SCREEN

- By default the software navigates to the default save location and displays thumbnail size images of all the saved images at that location. The software also maps the current drives that it can detect and connect to and displays this in the standard Windows format in the left hand pane. Images saved in other locations can be displayed by navigating to their location using the tree structure displayed in the left hand pane.
- Recovered images at the default save location are displayed in the central pane. Also displayed at the top of the central pane is the drive/folder path.
- Images displayed in the central pane of the Load Images screen can be sorted by two parameters; **Sort by Name** or **Sort by Date**. Select one of the two icons at the top of the central image pane.

SORT ICONS

- **Sort by Name** sorts the files in the displayed drive/folder alphabetically with 'A' at the top.
- **Sort by Date** sorts the files in the displayed drive/folder by date with the most recent at the top.
- Multiplexed images can be identified by a pattern of coloured dashes in the top right hand corner of the thumbnail image, as shown below:





Multiplexed Image Thumbnail

Series images can be identified by a pattern of overlapping images in the top right hand corner of the thumbnail image, as shown below:

Series Image Thumbnail

If more images than can be displayed are available then a scroll bar appears, scrolling allows you to display the initially non-displayed images.

Selecting an image or images in the central pane adds the selected image or images to the **Selected Images** pane. At the same time the image(s) selected in the central pane turn green, as shown below.

SELECTED IMAGES

To de-select an image, select the image again in the central pane or select the red **Dismiss** icon  in the corner of the image in the **Selected Images** pane.

Image Actions from Load Images Screen

Once you have located your image(s) using the Load Images screen there are two image actions available; **View Images** and **Edit**. The two **Image Action** icons are displayed at the bottom of the Load Images screen.

Initially these icons are initially greyed-out (unavailable), only becoming active once an image has been selected.

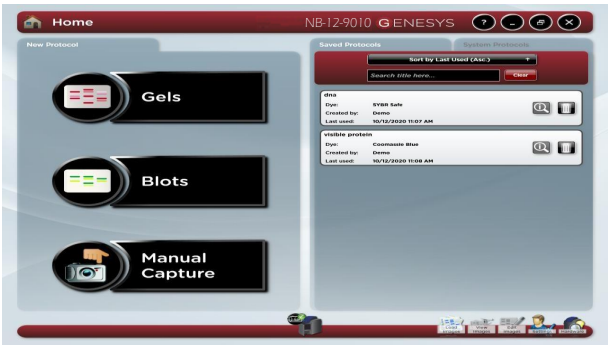
Selecting the **View Images** icon opens the View Images screen with the image(s) selected on the Load Images screen displayed in the view pane.

Selecting the **Edit** icon opens the Image Edit screen with the image(s) selected on the Load Images screen displayed in the **Selected Images** pane.

For the actions that can be performed using these screens refer to **View Images Screen** and **Image Edit Screen** sections of this Guide.

View Images Screen

The View Images screen is used to view and compare captured images. Images can be saved or unsaved. The View Images screen can be accessed as follows:



HOME SCREEN

The View Images function is only available when captures have been made during the current GeneSys session and images have been saved, are unsaved, or when previously saved images have been selected using the Load Images function.

From the Home screen - by selecting the **View Images** icon  .

The View Images screen can also be accessed from any other screen displaying the **View Images** icon  in the **Image Action** icons.

Note: Selected function buttons turn red. They stay red and the function remains active until the function button is re-selected.

VIEW IMAGES SCREEN - SINGLE IMAGES ONLY DISPLAYED DISPLAYED

VIEW IMAGES SCREEN - SINGLE AND MULTIPLEXED IMAGES

View Images Screen - Single Images

Single image captures selected for viewing are all displayed in a division of the main left hand pane labelled **Single Images**.

View Images Screen - Multiplexed Images

Multiple image capture files, e.g. multiplexed images, selected for viewing are each displayed in a division of the main left hand pane labelled with name given to the multiplexed image file, e.g. **composite dylight 680 and 800.sgd** in the example above. The multiplexed image plus all of its constituent separate image captures, if saved, are displayed.

View Images Screen - Image Display Options

The View Images screen or the images displayed on it can be altered in several ways using the following options:

Zoom
Change Layout
Manage Images
Hide/Show

ZOOM

Images are displayed as thumbnails on the View Images screen. The size of the images can be changed by adjusting the **Zoom Slider** control.

ZOOM SLIDER

CHANGE LAYOUT

Two options are available using the **Change Layout** controls.

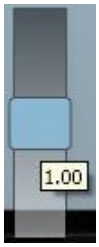
CHANGE LAYOUT CONTROLS

By default the View Images screen opens with the **View** button selected and when you select two or more images (up to four images) the **View** button changes to the **Compare** button.

Selecting the **Compare** button  displays the Compare Images version of the View Images screen.

VIEW IMAGES - COMPARE IMAGES SCREEN

The left hand pane contains the following controls for each individual image:
The **Gamma** slider changes the tone of the overall image. With reference to the histogram mentioned previously, the Gamma function changes the relative brightness of the recorded midrange tones by shifting them either towards the dark end or the white end of the graph, without changing the extreme dark or extreme white values. This gives the recorded image an overall darker or lighter appearance.



GAMMA SLIDER

Scroll bars allow you to view the entire area of an image. A horizontal scroll bar appears when the **Zoom** function is used on an image.
The right hand pane contains the following controls:
The **Change Layout** controls.
The **Link** controls.

TWO IMAGES - LINKED

TWO IMAGES - UNLINKED

THREE IMAGES

The default setting is for images being compared to be unlinked. The numbers in the **Link** boxes correspond to the positions of the images in the left hand pane.

With the images unlinked, adjustments made using the **Scroll** bars or the **Zoom and Range** controls are applied only to the selected image. The selected image is indicated in the **Link** boxes by the selected image number being outlined red.

Images can be linked by selecting the **Link**  button. With the images linked, adjustments made using the **Scroll** bars or the **Zoom and Range** controls are applied equally to all of the linked images.

Selecting one of the images in the left hand pane or one of the numbered **Link** boxes unlinks the images.

Unlinked images can be zoomed into and panned around by positioning the cursor over the selected image and when the cursor changes hold and drag to move the image around in its viewing window.

A Histogram button  is displayed for each image, below the vertical **Scroll** bar. Selecting this displays a histogram or graphical representation of the distribution of grey scales recorded by the camera sensor; with black to the extreme left, w hite to the extreme right.

HISTOGRAM DISPLAY

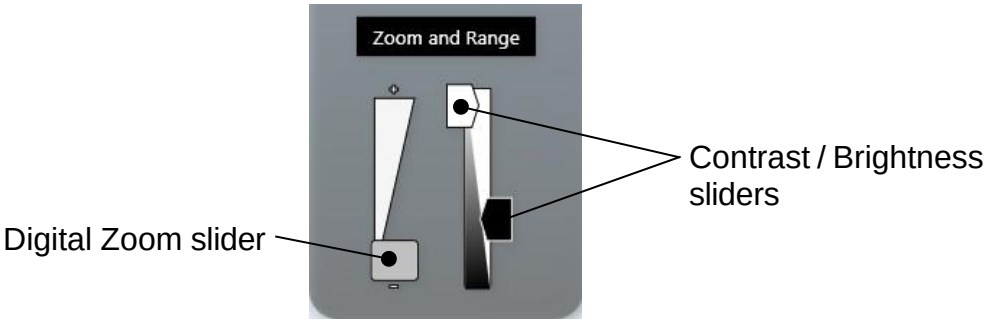
The **Histogram** button turns red to indicate that the function has been selected. Selecting the button again cancels the **Histogram** function.
The histogram is a graph showing the number of pixels in the image at each different intensity value found in that image. For a 16-bit image there are a possible 65535 different intensities so the histogram will graphically display 256

numbers showing the distribution of pixels amongst those grayscale values. If the graph is bunched up to the left it indicates that not many grayscale levels have been captured and the red lines on the histogram graph may need to be adjusted to see bands. If the graph reaches to the far right (65535 grayscales) this indicates that the image may be saturated.

The image **Key**.

IMAGE KEY

The **Key** displays the filenames of the displayed images. As with the **Link** controls, the **Key** numbers correspond to the image positions in the left hand pane.
The **Zoom and Range** controls.



ZOOM AND RANGE CONTROLS

The **Digital Zoom** slider allows you to zoom in or out of the displayed image. Dragging the slider towards the **+** sign zooms in, dragging the slider towards the
- sign zooms out.
Contrast is a measure of how bright highlights are in an image. Brightness is a measure of how bright shadows are in an image. Use the **Contrast** slider to control how bright the lightest objects in an image are displayed. Use the **Brightness** slider to control how bright dark objects in an image are displayed.

Selecting the **File Display** button 

when on the View Images - Compare Images screen takes you back to the standard View Images screen.

MANAGE IMAGES
Two options are available using the **Manage Images** controls.

MANAGE IMAGES CONTROLS

Selecting the **Close** button closes only the selected image file(s).
Selecting the **Close All** button closes all image files.

HIDE/SHOW

Selecting the arrow 

(inactive) 

(active) next to an image title on the View screen hides the image(s) associated with that title, i.e. the thumbnails are not displayed but the image title is still displayed. This provides more area for the other images to be displayed in. The up arrow changes to a down arrow.
Hidden images can be displayed again by selecting the down arrow.

View Images Screen - Combining Single Images into a New Multiplexed Image

More than one single image can be combined to produce a new mutliplexed image using the **Create Multiplexed Image** icon  which is displayed with the **Image Action** icons at the bottom right of the screen. The **Multiplexed Image** icon  only becomes active once files are selected in the View Images main pane.

Note: Selected function buttons turn red. They stay red and the function remains active until the function button is re-selected.

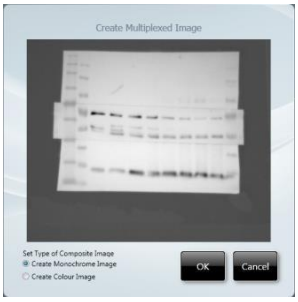
To create a new multiplexed image:

2. In the **Single Images** display, select the images that you want to combine. This function can also be utilised from the **Change Layout - Compare** function, in which case the images are already selected, i.e. the images you have selected to compare.

CREATE MULTIPLEXED IMAGE - IMAGES SELECTED

6. Select the Create Multiplexed Image button  . This displays the **Create Multiplexed Image** pop-up. This shows what the multiplexed image will look like.
   Two options are available using the **Set Type of Composite Image** buttons; **Create Monochrome Image** or **Create Colour Image**.

MULTIPLEXED IMAGE - COLOUR IMAGE



MULTIPLEXED IMAGE - MONOCHROME IMAGE

7. Select the **OK** button to create the multiplexed image or select the **Cancel** button to cancel the multiplexed image creation. The multiplexed image created is displayed on the View Images screen.

MULTIPLEXED IMAGE CREATED

The newly created multiplexed image now has its own row in the main left hand pane, the multiplexed image plus all of the selected constituent images are displayed.

Image Edit Screen

The Image Edit screen provides a wide variety of image manipulation options. The Image Edit screen can be accessed from other screens by selecting the **Edit** icon from the **Image Action** icons.

Image Edit Screen - Image Editing Main Options

The Image Edit screen provides a variety of image editing options grouped into four main options:

General
Annotate
Enhance 3D View

By default the Image Edit screen opens in General mode.

Note: Selected function buttons turn red. They stay red and the function remains active until the function button is re-selected.

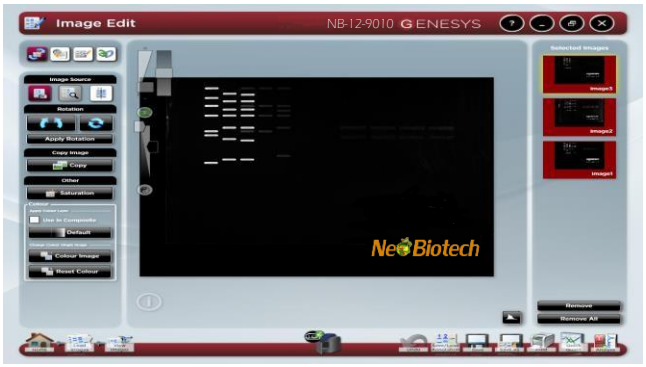


IMAGE EDIT SCREEN - GENERAL MODE

The other main option modes are selected using the buttons in the top left hand pane.

IMAGE EDIT SCREEN - MAIN OPTION SELECTION BUTTONS

Image Edit Screen - General Option

The **General** option provides a range of basic image manipulation tools. The lower left hand pane of the **General** screen provides the following controls/functions:

Image Source
Rotation
Copy Image
Other

Note: Selected function buttons turn red. They stay red and the function remains active until the function button is re-selected.

GENERAL CONTROLS/FUNCTIONS

IMAGE SOURCE

As you make changes to an image file the GeneSys software makes a copy of the file to which the changes are made. There are therefore two versions of the image file; the original unchanged image file, and the changed image file. The **Image Source** function allows you to view either of these two files. To view the unchanged file select the **View Original Image** button  . To view the changed file select the **View Processed Image** button  . To enhance an image to help with detecting more bands particularly those weaker bands on chemiluminescent western bots select 'View Enhanced Image (Chemi Single Only)' button  .

ROTATION

Displayed images can be rotated freely by selecting the **Allow Rotation** button  . Once the image has been rotated the new image orientation can be fixed by selecting the **Allow Rotation** button a second time. Image orientation can be reset to its original position by selecting the **Reset Rotation** button  .

COPY IMAGE

An image can be copied to the Windows Clipboard by selecting the **Copy** button 

This allows you to paste the image into another package.

OTHER

The Other functions provided are **Saturation** and **Colour**.

The **Saturation** function can be used to check if areas of the image are going to be over-exposed; over-exposed white bands will be highlighted in red on the image, over-exposed black bands will be highlighted in blue on the image. This function is useful if the **Select AutoExpose Area** function has been used. Please note that saturated bands are not quantifiable. To use this function select the **Saturation** button 

.

The **Colour** function can be used to improve the appearance of an image by changing the colour of the coloured bands to produce a greater colour contrast, this can make seeing faint bands more visible. Select the **Default** button 

and select a new colour from the drop-down menu. To reject a colour and return to the original setting select **Default** from the drop down menu.

OTHER FUNCTIONS - DEFAULT COLOUR MENU

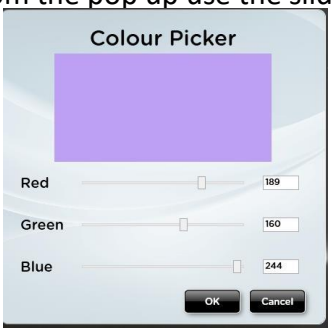
The **Default** function can also be used to applied a colour wash that emulates different dyes.

- Select the green colour wash to emulate a SYBR Green DNA gel.
- Select the yellow colour wash to emulate a SYBR Gold DNA gel.
- The orange-blue-red colour wash makes a protein gel appear silver, Coomassie blue and SYPRO red stained.

If the image being edited is a multiplex image, the colour change is applied to all of the individual exposure captures but not the composite image. To apply the colour change to the composite image as well check the **Use in Composite** checkbox.

Use the colour picker to add a custom colour to a single image. Select the 'Colour Image' button 

and then from the pop up use the slider bars to create a custom colour.



Press the 'Reset Colour' button 

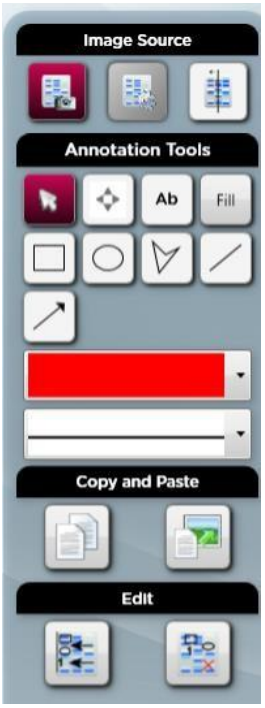
to remove the custom colour.

Image Edit Screen - Annotate Option

The **Annotate** option provides a means of adding both textual and graphical annotations to an image. The lower left hand pane of the **Annotate** screen provides the following controls/functions:

Image Source
Annotation Tools
Copy and Paste
Edit

Note: Selected function buttons turn red. They stay red and the function remains active until the function button is re-selected.

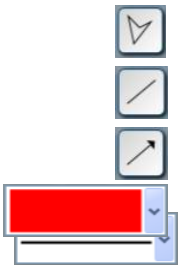


ANNOTATE CONTROLS/FUNCTIONS

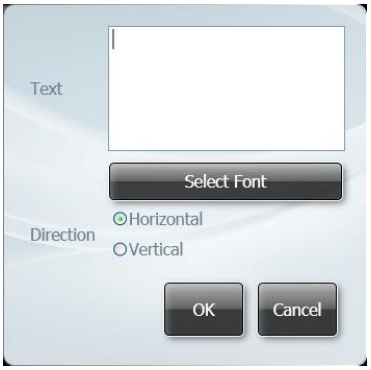
IMAGE SOURCE
This function is as described previously in **Image Edit Screen - General Option**. ANNOTATION TOOLS
The following image annotation tools are available:

Select tool
Pan tool
Text tool
Fill/No Fill tool
Rectangle tool
Ellipse tool

Polygon tool
Line tool
Arrow tool
Select Colour tool
Select Line Style tool



The **Select** tool enables you to select text or objects that you have added to an image.
The **Pan** tool enables you to pan around an image if you have enlarged it so that not all of the image is viewable in the central image viewing pane. Select the tool icon and then click and drag or touch and drag to move the image around.
The **Text** tool enables you to add text in text boxes to your image. Select the tool and position the cursor roughly where you want the annotation to appear and left click/tap, and then start typing. Using the **Select** tool you can then position the text box exactly where you want it, and resize the text box horizontally and vertically. Double clicking/tapping the text enables you to change the text and the text parameters using the pop-up dialogue boxes shown below.



TEXT POP-UP 1

TEXT POP-UP 2

The font selection pop-up dialogue box is opened by selecting the **Select Font** button on the text dialogue box.
The parameters you can change are:

- The text itself. The text previously typed in the text box appears in the **Text** box. This text can be edited directly.
- Text direction (horizontal or vertical)

- Font
- Size
- Style (normal/italic/oblique) and (normal/bold)

The **Fill/No Fill** tool enables you to fill shapes that you have added to the image. Select the shape, then select a colour for the fill using the **Select Colour** tool.
The **Rectangle** tool enables you to add 4-sided shapes to an image. Draw the shape, then select it using the **Select** tool, and the shape can be positioned by dragging and resized using the visible 'handles'. A rectangle can be filled using the **Fill/No Fill** and **Select Colour** tools. The outline of a rectangle can be coloured and the style of the line can be changed using the **Select Colour** and **Select Line Style** tools.

The **Ellipse** tool enables you to add ellipses (circles) to an image. Draw the shape, then select it using the **Select** tool, and the shape can be positioned by dragging and resized using the visible 'handles'. An ellipse can be filled using the **Fill/No Fill** and **Select Colour** tools. The outline of an ellipse can be coloured and the style of the line can be changed using the **Select Colour** and **Select Line Style** tools.

The **Polygon** tool enables you to add freehand shapes to an image. Draw the shape, then right click/double tap to stop drawing. Using the **Select** tool the shape can be 're-shaped' using the visible 'handles'. Shapes can be filled using the **Fill/No Fill** and **Select Colour** tools. The outline of the shape can be coloured and the style of the line can be changed using the **Select Colour** and **Select Line Style** tools.

The **Line** tool enables you to draw straight lines, at any angle and of any length, on an image. Draw the line, then select it using the **Select** tool, and the line can be positioned by dragging and resized using the visible 'handles'. The line can be coloured and the style of the line can be changed using the **Select Colour** and **Select Line Style** tools.

The **Arrow** tool enables you to draw a straight line with an arrowhead at one end, at any angle and of any length, on an image. Draw the arrow, then select it using the **Select** tool, and the arrow can be positioned by dragging and resized using the visible 'handles'. The arrow can be coloured and the style of the arrow can be changed using the **Select Colour** and **Select Line Style** tools.
The **Select Colour** and **Select Line Style** tools are used as described above.

COPY AND PASTE
The **Copy and Paste** function enables you to copy and paste annotations created as described above. If the paste function is used on the same image, then the pasted annotation appears directly transposed over the top of the source annotation. The pasted annotation can then be dragged to where it is required and modified/changed as described previously. A copied annotation can also be pasted into a different image, where it can be modified/changed as described previously.
To copy an annotation of any type, first select the annotation, then select the **Copy Selected Annotations** button  . To paste the copied annotation, first select the destination image, then select the **Paste Annotations** button  .

EDIT

The **Edit** function enables you to align and delete annotations created as described above. The align and delete functions only apply to annotations which have been selected.

To align annotations, first select the annotations (more than one selection is made by holding down the **Ctrl** key on the PC keyboard), select the **Align Selected Annotations** button  , then from the drop-down menu select the alignment direction.

ANNOTATION ALIGNMENT DROP-DOWN MENU

To delete annotations, first select the annotations, then select the **Delete Selected Annotations** button  .

Note: The **Delete** key on the PC keyboard can also be used to delete selected annotations.

Image Edit Screen - Enhance Option

The lower left hand pane of the **Enhance** screen provides the following controls/functions:

Image Source
Enhancement Tools
Resolution

Note: Selected function buttons turn red. They stay red and the function remains active until the function button is re-selected.

ENHANCE OPTION TOOLS/CONTROLS/FUNCTIONS

IMAGE SOURCE

This function is as described previously in **Image Edit Screen - General Option**.

ENHANCEMENT TOOLS

The following image enhancement tools are available:

Sharpen tool		Flip Vertical tool	
Smooth tool		Flip Horizontal tool	
Invert tool		Define area to be cropped tool	
Speckle Correct tool		Crop area tool	

The **Sharpen** tool applies a sharpening filter to the selected image. The sharpening filter should make the edges of bands more pronounced. However, there may also be an increase in graininess.

The **Smooth** tool applies a smoothing filter to the selected image. This can be useful if the image has specks of dust or bubbles present. However, there may also be a reduction in band sharpness.

The **Invert** tool reverses the image, i.e. white appears black, black appears white. This can be useful when trying to view very faint bands on an image.

The **Speckle Correct** tool can be used to remove white speckles or 'hot pixels' from an image.

The **Flip Vertical** tool mirrors the selected image in the vertical plane. This can be useful if the sample has been placed in the Darkroom Drawer the wrong way round.

The **Flip Horizontal** tool mirrors the selected image in the horizontal plane. This can be useful if the sample has been placed in the Darkroom Drawer the wrong way round.

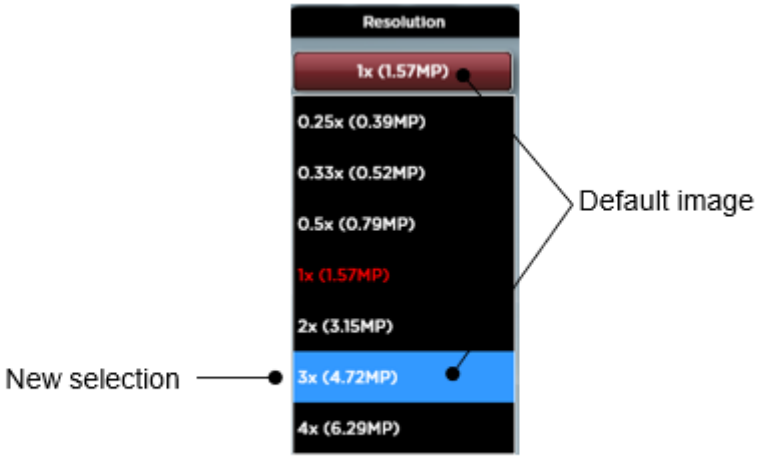
The **Define area to be cropped** tool enables you to select an area of the selected image so that you can isolate the chosen portion of the image from the rest of the image in order to view that portion more closely. Select the **Define area to be cropped** icon and draw a rectangle that covers the area you want to examine. The rectangle is outlined in pink and filled with a transparent pink fill. Select the fill area and the selection rectangle can be accurately positioned by dragging and resized using the visible 'handles'. This enables you to finely control the selected area of interest. Selecting the **Define area to be cropped** tool once more cancels the selection rectangle just made, but leaves the cursor in selection mode, allowing you to restart the selection process. Selecting the **Define area to be cropped** tool twice more cancels the selection rectangle just made and also cancels the selection function.

Once you have defined the area you want to examine more closely using the **Define area to be cropped** tool, select the **Crop area** tool to perform the crop function. The defined area is 'cut out' of the image, the rest of the image is discarded, and the cropped or 'cut out' selection is enlarged to the full viewing area.

RESOLUTION

The **Resolution** tool can be used to change the resolution of the selected image. When the **Enhancement Tools** option is selected the system displays the current/default resolution of the selected image in the **Resolution** box.

To change the resolution of the current displayed image select the Resolution tool and select a new resolution from the drop-down menu.



RESOLUTION MENU

The options displayed in the Resolution drop-down menu depend on the resolution that the image is captured at, an example is shown below:

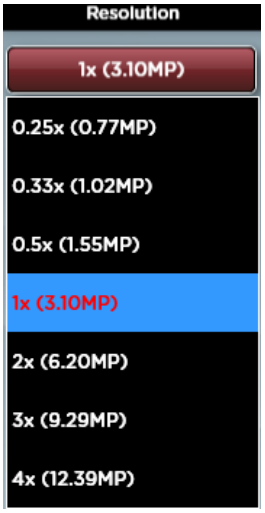


Image Edit Screen - General / Annotate / Enhance Options Common Controls

The central image viewing pane of the General, Annotate and Enhance options of the Image Edit Screen provide a common set of image controls.

Note: Selected function buttons turn red. They stay red and the function remains active until the function button is re-selected.

IMAGE SLIDER CONTROLS

The following controls are available to adjust the display of a captured image.

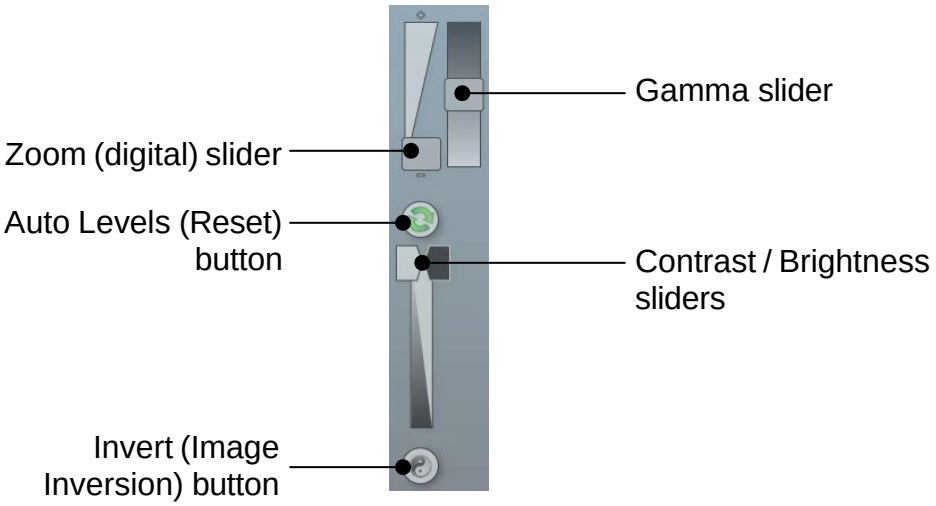


IMAGE SLIDER CONTROLS

The **Zoom** slider allows you to zoom in or out of the displayed image. Dragging the slider towards the **+** sign zooms in, dragging the slider towards the **-** sign zooms out.

The **Gamma** slider changes the tone of the overall image. With reference to the histogram mentioned previously, the Gamma function changes the relative brightness of the recorded midrange tones by shifting them either towards the dark end or the white end of the graph, without changing the extreme dark or extreme white values. This gives the recorded image an overall darker or lighter appearance.

Contrast is a measure of how bright highlights are in an image. Brightness is a measure of how bright shadows are in an image. Use the **Contrast** slider to control how bright the lightest objects in an image are displayed. Use the **Brightness** slider to control how bright dark objects in an image are displayed.
If you make changes using the sliders you can undo the changes by selecting the **Auto Levels** icon.
Use the **Invert** button to invert the image, i.e. white appears black, black appears white. This can help when making changes with the slider controls. Selecting the **Invert** button a second time changes the image back to how it was originally.

CAPTURED IMAGE INFORMATION

Select the **Image Information** icon  . This displays a pop-up window displaying captured image information. The information displayed is as follows:

- Dye
- Image capture date / time
- Filter
- Light
- Exposure time
- Iris f number
- Image size

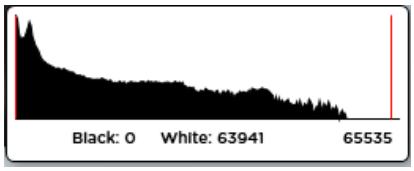
- Range (range of grey scales captured)

IMAGE INFORMATION POP-UP WINDOW

The **Image Information** icon turns red. Selecting the **Image Information** icon a second time closes the pop-up window.

IMAGE HISTOGRAM

Select the **Histogram** button  this displays a histogram or graphical representation of the distribution of grey scales recorded by the camera sensor; with black to the extreme left, white to the extreme right.



HISTOGRAM DISPLAY

The **Histogram** button turns red to indicate that the function has been selected. Selecting the button again cancels the **Histogram** function.

The histogram is a graph showing the number of pixels in the image at each different intensity value found in that image. For a 16-bit image there are a possible 65535 different intensities so the histogram will graphically display 256 numbers showing the distribution of pixels amongst those grayscale values. If the graph is bunched up to the left it indicates that not many grayscale levels have been captured and the red lines on the histogram graph may need to be adjusted to see bands. If the graph reaches to the far right (65535 grayscales) this indicates that the image may be saturated.

Image Edit Screen - 3D View Option

The **3D View** screen presents the selected image in three-dimensional form, revealing gel thickness, and with the peaks representing (and being proportional to) the distribution of grey scales recorded by the camera sensor.

IMAGE EDIT SCREEN - 3D VIEW OPTION

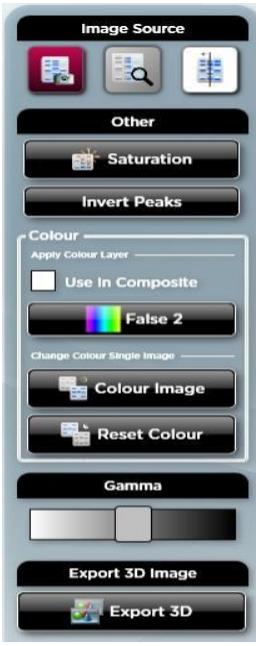
The lower left hand pane of the **3D View** version of the screen provides the following controls/functions:

Image Source

Other

Gamma

Note: Selected function buttons turn red. They stay red and the function remains active until the function button is re-selected.



3D VIEW OPTION CONTROLS/FUNCTIONS

IMAGE SOURCE

This function is as described previously in **Image Edit Screen - General Option**.

OTHER

The **Saturation** and **Default** functions are as described previously in **Image Edit Screen - General Option**.

INVERT PEAKS

Select invert peaks to invert the band peaks on the 3D view.

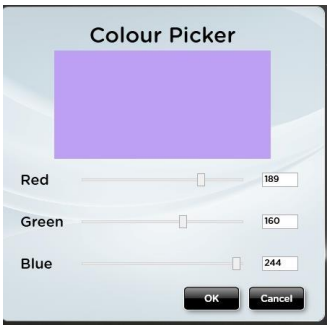
COLOUR

The **Colour** function can be used to improve the appearance of an image by changing the colour of the coloured bands to produce a greater colour contrast; this can make seeing fainter bands more visible.

The image being viewed in the 3D view is a multiplex; the colour change is applied to all of the individual exposure captures but not the composite image. To apply the colour change to the composite image as well check the **Use in Composite** check box.

Use the colour picker to add a custom colour to a single image. Select the 'Colour Image' button 

and then from the pop up use the slider bars to create a custom colour.



Press the 'Reset Colour' button 

to remove the custom colour. GAMMA

The **Gamma** slider changes the tone of the overall image. With reference to the histogram mentioned previously, the Gamma function changes the relative brightness of the recorded midrange tones by shifting them either towards the dark end or the white end of the graph, without changing the extreme dark or extreme white values. This gives the recorded image an overall darker or lighter appearance.

EXPORT 3D IMAGE

Select to '**Export 3D image**' to save as a TIFF, JPEG or BMP file format.

IMAGE EDITING FUNCTIONS

The central image viewing pane of the **3D View** option of the Image Edit Screen provides the following functions for altering the view of the displayed image:

Pan Up control Reset Pan button Pan Down control Pan Left control Pan Right control

Rotate Right control Rotate Forward control Rotate Anti-clockwise control Reset Rotation button Rotate Clockwise control Rotate Backward control Rotate Left control

Selecting an action by clicking or tapping on an icon once moves the image in the relevant direction by a programmed amount or step. The image can be moved in the relevant direction continuously by 'holding down' the icon.
Selecting either of the **Reset** icons resets the image back to its original position.
The **Zoom** control, located in the upper left-hand corner of the viewing pane, magnifies/reduces the size of the image within the viewing pane.

ZOOM SLIDER

The **Scale** control, located in the lower left hand corner of the viewing pane, increases/decreases the vertical axis used to display the distribution of grey scales information.

SCALE SLIDER

Image Edit Screen - All Options Common Controls

ACTION ICONS

All four of the Image Edit main option screens provide the same **Action** icons across the bottom of the screen.
The left hand group of **Action** icons is as follows:

- Selecting the **Load Images** icon takes you back to the Browse Images screen, allowing you to search for images.
- Selecting the **View Images** icon takes you back to the View Images screen, allowing you to view and compare captured images.

The right hand group of **Action** icons is as follows:

- The **Undo last change** icon only becomes active once you have performed an action on an image, e.g. added an annotation. Selecting the active **Undo last change** icon takes you back to the position you were in prior to your last action,
  e.g. the annotation you just added is removed.

- The **Save/Load Annotations** icon saves any annotations that you have made on an image into a separate annotation file. This separate annotation file can be opened and the annotations applied to more than one image. This is useful when capturing a series of similar images which need to be annotated identically for comparison purposes.

Selecting the **Save/Load Annotations** icon calls up a Save/Load Annotations dilaogue box which you use to either save your annotations to a particular file, or load a previously saved set of annotations.

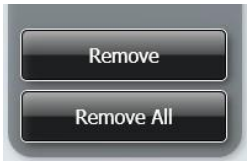
SAVE / LOAD ANNOTATIONS DIALOGUE BOXES

RIGHT HAND PANE

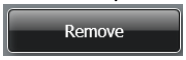
The right hand pane of all four of the Image Edit main option screens provides the same information.

The right hand pane contains the image pool of images selected for editing. Each image is displayed in the image pool as a thumbnail. If more than one image thumbnail is displayed, the currently displayed image is highlighted yellow. To change the image displayed, select the image in the right hand pane.

At the bottom of the right hand pane there are two buttons for dismissing images from the image pool, as follows:



REMOVE / REMOVE ALL BUTTONS

Selecting the **Remove** button 

dismisses the currently selected image from the image pool.

Selecting the **Remove All** button 

dismisses all images from the image pool.

Common Screen Functions and Tools

The following general **Action** icons are available when using the GeneSys software:

The **Home** icon  when selected takes you back to the GeneSys Home screen. The **Save** icon  is used to save captured/modified images.

The **Print** icon is used to print an image.

The **Analyse** icon is used to export an image to the GeneTools package for further analysis.

The **Quick Quant** icon is used to perform a quick analysis on the image.

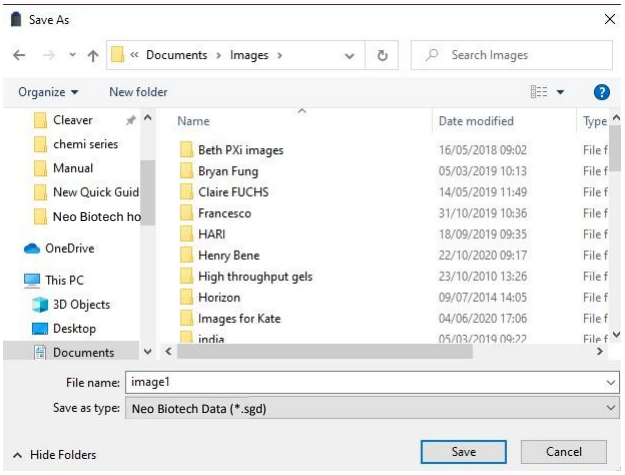
Action icons can only be selected once they are active, i.e. they are coloured in.

Saving Images

Any time that an image is captured or in some way changed, e.g. annotated, colour washed for increased contrast, etc, and the **Save** icon is active, using the GeneSys software you have the opportunity to save the image.

Select the **Save** icon from the bottom of the screen. This displays the **Save** screen.

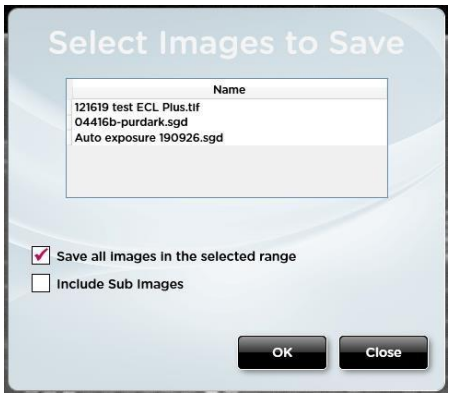
From the pop-up save dialog box browse the file saving location and easily edit the file name before saving. All images will be saved in the .sgd file format which is a Neo Biotech data file which contains lots of useful diagnostic information particularly important if you have any support questions. **N.B** the windows pop up only appears if you are saving a single image.



To save batches of images at the same time which is particularly useful for multiplexed images, if you have captured a series of images or if you have captured several images in one session then check the' Multi select mode' check box and then select the images you wish to save from the image pool then select the save icon.

From the pop-up window the list of images that you have selected will appear. Check the box to save all images in the selected range or to include sub images. Then press ok.

From the pop-up window the list of images that you have selected will appear. Check the box to save all images in the selected range or to include sub images. Then press ok.



SELECTED IMAGES SAVE SCREEN

If 'OK' button has been selected then a second save screen will appear showing a preview image once an image has been selected. Enter a save path by using the browse button. Check the box to 'Remember the Path' if saving images to the same location each time.

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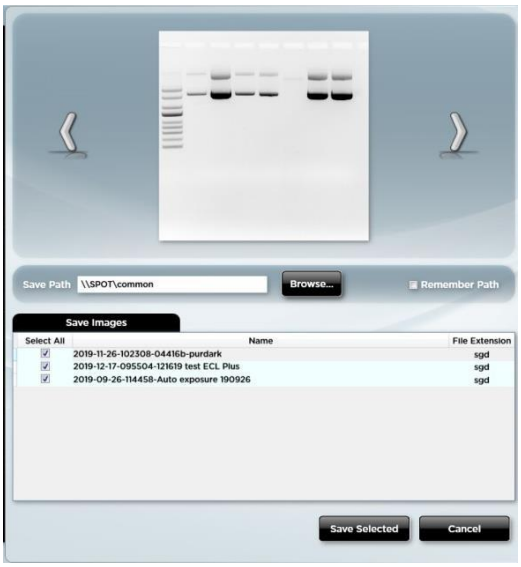
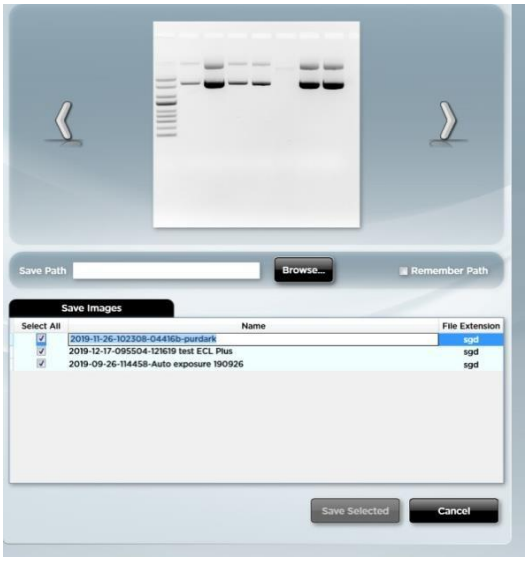


Note Save selected button will be greyed out until a 'Save Path 'has been entered.

From the save screen the file name can be changed the default is set to the date and time the image was captured. To change the file name select the image from the list and type the new file name in the box.



CHANGING FILE NAME

Select 'Save Selected' button 

to save your images in the Neo Biotech file format .sgd.

Save As

The 'Save As'  feature in GeneSys allows the user to save the image in the following file formats Tiff, Bmp and Jpg. From the pop up window use the drop down menu's to select which image to export from to which image to export to.

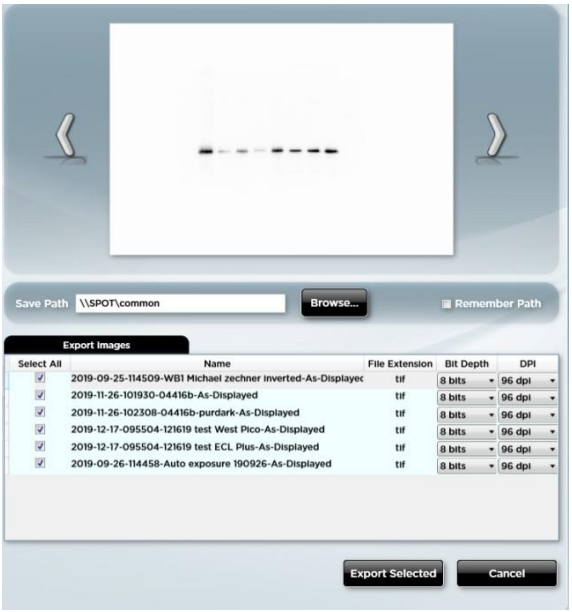
Check the box to export all images in the selected range. Then select to export as 'displayed' or as captured'. As displayed will export your image with any edited features you may have performed such as, changing the contrast and brightness of an image or if you have rotated or cropped the image. As captured will export the image as it was captured.
You can also from the capture or edit screen check the 'multi select mode' check box and then select the images you wish to export from the image pool.
From the pop-up window the list of images that you have selected will appear. Check the box to export all the images in the selected range and then 'as displayed' or 'as captured'. Then press ok.

Select 

to continue to save images or select 

Select an image from the list to see a preview and select the browse button to choose where to export your images.
Note Save selected button will be greyed out until a 'Save Path 'has been entered. To save time when exporting images check the box to remember the path.

You easily edit the file name of any image selected and if you change the file name of an image that has sub images associated to it GeneSys will automatically change the file name for all the sub images too.
You can export your images as Tiff, bmp or jpeg file formats. Select your preferred file format from the drop down list. – this can also be selected as a default setting in the setting menu.
For publication purposes you can adjust the bit depth and dpi of tiff images.



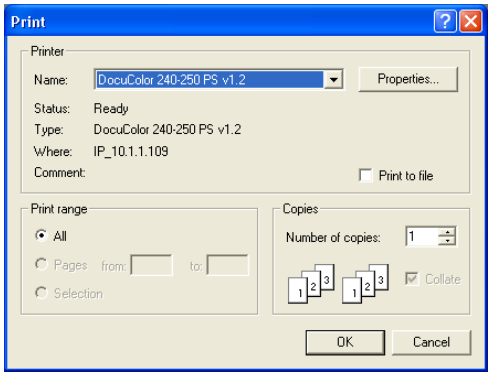
Select 'Save Selected' button 

to save your images in the file format of your choice.

Printing

Any time that an image is captured, viewed, or in some way changed, e.g. annotated, colour washed for increased contrast, etc, and the **Print** icon is active, using the GeneSys software you have the opportunity to print the image.

Note: The **Print** dialogue box will change depending on the version of Windows™ that you are using.



TYPICAL PRINT DIALOGUE BOX

Select your printer in the **Printer** box, **Name:** field.

Select the range of pages you want to print in the **Print range** box.
Select the printer settings you want to use by selecting the **Properties...** button.
Select the number of copies you want to print in the **Copies** box, **Number of copies:** field.

What is printed depends on the selections made on the User Preferences screen, as follows:

- **Full Report** - checking this checkbox sets the Instrument to generate a Full Report for each test. The Full Report content can be controlled using the additional checkboxes, check to include the feature:
  - Image
  - File Description
  - Capture Properties
- **Basic Report** - checking this checkbox sets the Instrument to generate a Basic Report for each test. Additional features are:
  - Basic Report Image Only - if the checkbox is checked, the printed report contains only the captured image for the test. If not checked, the report contains the image plus some basic information, e.g. filename / username / date / time / sample / filter, etc.
  - Preview Before Printing - if the checkbox is checked, the screen displays a preview of the report before it is printed. If not checked, the report is printed without a preview being displayed. If this option is checked when you select more than one image and then select print you have to go through a print preview stage for each image.

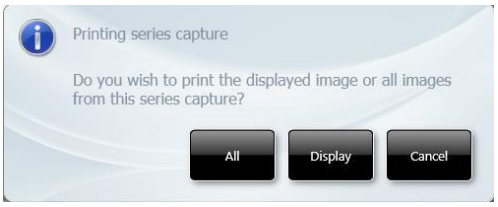
The print function is actioned by selecting the **Print** icon  from the bottom of the screen. What is printed also depends on the following:

- Printing from the View Images screen.
- Printing from the Image Edit screen.
- Printing a single image capture.
- Printing an additive series capture.
- Printing a multiplex capture.

SINGLE IMAGE CAPTURE
From View Images, single images can be selected and printed individually or multiple single images can be selected and printed collectively.
From Image Edit, single images can be selected and printed individually.

ADDITIVE SERIES CAPTURES
OPTION 1
From View Images, to print the constituent images:
Select the additive image.

Select the **Print** icon . The **Printing series capture** dialogue box is displayed.

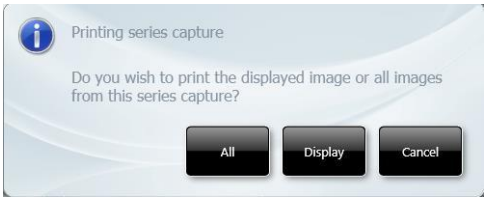


PRINTING SERIES CAPTURE DIALOGUE BOX

Select the **All** button. All of the constituent image captures print. The additive image does not print.

OPTION 2
From View Images, to print the additive image:
Select the additive image.

Select the **Print** icon . The **Printing series capture** dialogue box is displayed.



PRINTING SERIES CAPTURE DIALOGUE BOX

Select the **Display** button. The additive image prints (blank sheet).

OPTION 3
From View Images, to print a single constituent image: Select the constituent image.

Select the **Print** icon .
The selected constituent image prints.

OPTION 4
From View Images, to print more than one constituent image:
Select the constituent images.

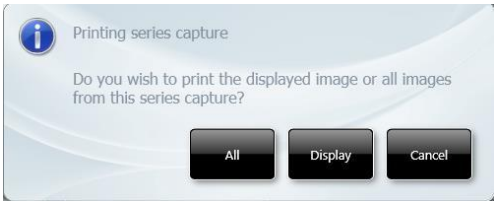
Select the **Print** icon .
The selected constituent images print.

OPTION 5

From Image Edit, to print all of the constituent images:

Select any one of the constituent image thumbnails.

Select the **Print** icon  . The **Printing series capture** dialogue box is displayed.



PRINTING SERIES CAPTURE DIALOGUE BOX

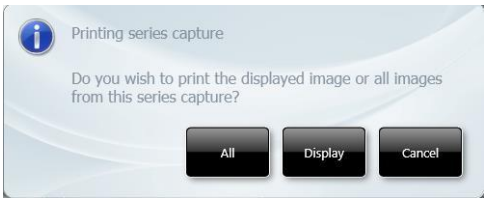
Select the **All** button. All of the constituent image captures print. The additive image does not print.

OPTION 6

From Image Edit, to print any one constituent image:

Select one of the constituent image thumbnails.

Select the **Print** icon  . The **Printing series capture** dialogue box is displayed.



PRINTING SERIES CAPTURE DIALOGUE BOX

Select the **Display** button. The selected constituent image prints.

MULTIPLEX CAPTURES

OPTION 1

From View Images, to print the multiplexed image plus the constituent images:

Select the multiplex image.

Select the **Print** icon  . The **Printing multiplex** dialogue box is displayed.

PRINTING MULTIPLEX CAPTURE DIALOGUE BOX

Select the **All** button. The multiplexed image (blank page) plus all of the constituent images print.

OPTION 2
From View Images, select the additive image:

Select the **Print** icon  . The **Printing multiplex** dialogue box is displayed.

PRINTING MULTIPLEX CAPTURE DIALOGUE BOX

Select the **Display** button. The currently displayed image prints.

OPTION 3
From View Images, to print a single constituent image: Select the constituent image.

Select the **Print** icon  .
The selected constituent image prints.

OPTION 4
From View Images, to print more than one constituent image:
Select the constituent images.

Select the **Print** icon  .
The selected constituent images print.

OPTION 5
From Image Edit, to print the multiplexed image plus the constituent images: Select the multiplexed image from the thumbnails.

Select the **Print** icon . The **Printing multiplex** dialogue box is displayed.

PRINTING MULTIPLEX CAPTURE DIALOGUE BOX

Select the **All** button. The multiplexed image plus all of the constituent images print.

OPTION 6

From Image Edit, to print the multiplexed image:

Select the multiplexed image from the thumbnails.

Select the **Print** icon . The **Printing multiplex** dialogue box is displayed.

PRINTING MULTIPLEX CAPTURE DIALOGUE BOX

Select the **Display** button. The selected multiplexed image prints.

OPTION 7

From Image Edit, to print the multiplexed image plus the constituent images:

Select one of the constituent image thumbnails.

Select the **Print** icon . The **Printing multiplex** dialogue box is displayed.

PRINTING MULTIPLEX CAPTURE DIALOGUE BOX

Select the **All** button. The multiplexed image plus all of the constituent images print.

OPTION 8

From Image Edit, to print any one constituent image:

Select one of the constituent image thumbnails.

Select the **Print** icon . The **Printing series capture** dialogue box is displayed.

PRINTING MULTIPLEX CAPTURE DIALOGUE BOX

Select the **Display** button. The selected constituent image prints.

Full Report Print Options

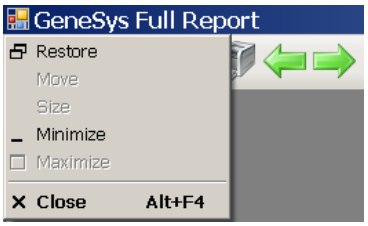
If the **Full Report** option is selected on the User Preferences screen, when you select the **Print** icon you can view pages of the report and access the print settings screens using the icons at the top of the screen.

The following actions are available:

Zoom in		Printer Setup	
Zoom out		Print	
No zoom		Previous	
		Next	

Exit Without Printing

Having made your selections, if for some reason having previewed the report, either Full or Basic, you do not want to print the report you can exit the Print function without printing by selecting the **Report** icon at the top left of the screen and selecting **Close** from the drop-down menu.



EXIT WITHOUT PRINTING

Operator Maintenance

Looking After a Neochemi Instrument

A Neochemi Instrument does not require regular maintenance or calibration other than occasional checking and cleaning.

Cleaning a NeochemI Instrument

⚠ **WARNING**	**Switch off the instrument and unplug the mains power cord from the electrical supply.**

The outside of the NEOCHEMI Instrument can be cleaned using a soft lint-free cloth, moistened if required with a little water. Mild detergent may be used, if necessary. Do not use abrasive or solvent based cleaning materials. Always perform a patch test on an inconspicuous area before you clean the entire surface.

Surfaces which may become contaminated with biochemical materials/reagents, e.g. the interior surfaces of the Darkroom, the Black Tray or a transilluminator module, can be cleaned using a soft lint free cloth and a non-fluorescent cleaning agent such as; a neutral detergent or 70% ethanol solution.

Avoid spilling any liquid into the body of the instrument and clean any external spills immediately. If any liquid enters the main body of the instrument, make the instrument inoperative and contact the supplier.

Contacting Neo Biotech

If it becomes necessary to contact Neo Biotech the following information will be required:

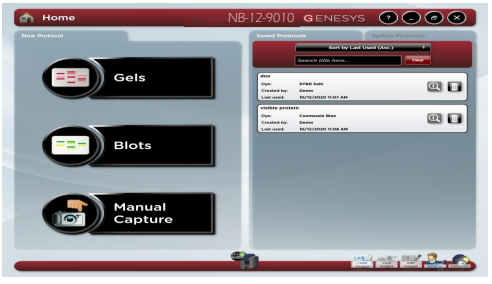
Unit Serial Number

Camera

GeneSys Version

Database Version

The Unit Serial Number can be found on a sticker on the back of the Darkroom. The other system information can be found from the GeneSys Home screens, as shown below:



HOME SCREEN

On the Standard View Home screen, select the  icon in the Title Bar. The About GeneSys pop-up appears:

ABOUT GeneSys POP-UP

Select the **OK** button to close the pop-up.

Further information concerning the whole range of NEOCHEMI Instruments can be found on the Neo Biotech website; www.neo-biotech.com. Here you can access; Application Notes, Technical Articles, FAQs and Quick Guides.

Technical support for your NEOCHEMI Instrument can be accessed by telephone or email: Tel: +33977400909

Email: info@neo-biotech.com

Troubleshooting

Troubleshooting

Troubleshooting

No power to the darkroom

- Check connection of main power cord to main power port on the rear of the NEOCHEMI Mini.
- Try another power socket within lab.

Transilluminator will not turn on

- Check power cord by sliding Transilluminator fully out from cabinet. If loose push back in.
- If still not on, remove power cord and attach another one plugged in elsewhere. If Transilluminator comes on there is an electrical supply problem within the NEOCHEMI Mini. If it still does not come on it is likely the Transilluminator has failed. Contact Neo Biotech. **NOTE: Please take UV precautions.**

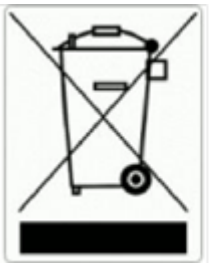
Darkroom door will not open

- The Neochemi FL mini 9 door cannot be opened manually, instead use the door open icon within GeneSys  .
- If it still does not open, on the rear panel of the Neochemi FL mini 9 turn the ON/OFF power switch OFF. This will release the electromagnetic door catch.

Disposal

Disposing of a Neochemi mini

The Waste Electrical and Electronic Equipment (WEEE) Directive



OR

A label with a crossed-out wheeled bin symbol and a rectangular bar indicates that the product is covered by the Waste Electrical and Electronic Equipment (WEEE) Directive and must not be disposed of as unsorted municipal waste. Any products marked with this symbol must be collected separately, and in accordance with the regulatory guidelines in a local area.

The objectives of the WEEE Directive are to preserve, protect and improve the quality of the environment, protect human health, and utilise natural resources prudently and rationally. Specific treatment of WEEE is indispensable in order to avoid the dispersion of pollutants into the recycled material or waste stream. Such treatment is the most effective means of protecting the environment.

WEEE Instructions for Neochemi Instruments

The requirements for waste collection re-use, recycling, and recovery programs are set by the local regulatory authority. Contact your local Responsible Person (such as the Laboratory Manager) or authorised representative for information regarding applicable disposal regulations. For information specific to the Neochemi Instrument, contact Neo Biotech at:

Website: www.neo-biotech.com
Email: info@neo-biotech.com
Neo Biotech Europe office
74 rue des suisses
Nanterre
92000
France
Tel: +33977400909

Note: Products from other manufacturers may form a part of your Neochemi Instrument. These other manufacturers are directly responsible for the collection and processing of their own waste products under the terms of the WEEE Directive. Please contact these manufacturers directly before disposing of any of their products.