GelPro User Guide

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NOTICE TO USERS

All possible care has been taken in the preparation of this User Guide, but Cleaver Scientific Limited accepts no liability for any inaccuracies that may be found.

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SAFETY INSTRUCTIONS

Safety Practices

This document describes the general safety practices and precautions that must be observed when operating a GelPro 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 organisation.

Please consult all documentation supplied with the GelPro System before starting to work with the instrument. Carefully read the safety information in this document and in the other documentation supplied. When setting up the instrument or performing analysis or maintenance procedures, strictly follow the instructions provided.

Warning Notices

Within this User Guide WARNINGS are used to highlight information or instructions that **must** be followed in order to avoid personal injury to yourself or other people in the vicinity, e.g. switch off the mains voltage and remove the mains cord before cleaning.

WARNINGS appear as below:

WARNING	**Switch off the mains voltage and remove the mains cord before cleaning.**

WARNING	**Ensure that all instrument users read and understand the precautions listed below.**

WARNING	**You are advised to post a copy of the precautions near to or on the instrument itself.**

Precautions

The following precautions must be observed when using a GelPro System:

- Be sure that the voltage of the GelPro System corresponds to the voltage available where it is to be installed.
- Never remove the side or back panels of the GelPro System without first shutting down the instrument and disconnecting the mains cord.

General Operating Conditions

GelPro Systems have been designed and tested in accordance with the safety requirements of the International Electrotechnical Commission (IEC). GelPro Systems conform to IEC61010-1:2010 (Safety Requirements for electrical equipment for measurement, control and laboratory use) as it applies to IEC Class 1 (earthed) appliances, and therefore meet the requirements of EC directive 2006/95/EC.

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 a GelPro System may be unsafe, make it inoperative. In particular, a GelPro System 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 unfavorable conditions.

Environmental Conditions

GelPro Systems should only be used under the following conditions:

- Indoors.
- At altitudes below 2000m.
- In ambient temperatures between 5°C and 40°C.
- With 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 environmental conditions do not lie within these parameters.**

Electrical Safety

GelPro Systems are designed to protect the user 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 mains power, removing the instrument covers is likely to expose live parts.** **Even when the power switch is off, high voltages can still be present – capacitors within the instrument may still be charged even if the instrument has been disconnected from all live voltage sources.**

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

WARNING	**Any interruption of the protective conductor inside or outside the GelPro System, 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 mains supply socket on the instrument is not obstructed, i.e. leave a gap to allow easy disconnection of the mains cord.**

WARNING	**If the mains power cord has to be replaced, ensure that the replacement cord is appropriately rated and approved for the intended use.**

When working with the GelPro System:

- Connect the instrument to a correctly installed mains power outlet that has a protective conductor connection.
- 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 GelPro System documentation.
- Disconnect the instrument from all live voltage sources before opening it to make any adjustments, replacements, maintenance or repair. If the opened instrument must be operated for further adjustment, maintenance or repair, this must only be done by a supplier's Service Engineer.

- If 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:
    - It has any signs of visible damage.
    - If it has been subjected to prolonged storage in unfavourable conditions.
    - If it has been subjected to severe stress during transportation.

Changing a Fuse

There are two User accessible fuses that may need to be replaced:

- These are located in the mains power socket on the rear panel of the GelPro instrument and are only accessible when the mains power cord has been removed.

To change the fuses:

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

- Gently pull out the fuse holder.
- Replace the fuses with new fuses of the same type and rating. The fuse type is 20 mm x 5 mm IEC 60127-1:2006, AMD1:2011 and AMD2:2015 CSV for instruments in all countries.
- Replace the fuse holder.

Note: Accessories such as the Transilluminator may have their own fuse.

Note: If the instrument still does not work correctly after replacing the fuses with the correct replacements, or if the fuses blow repeatedly, contact the supplier's Office or Representative.

Electrical Protection

- Insulation: Class I rating for external circuits. Only connect equipment that meets the requirements of IEC 61010-1:2010, IEC 60950-1:2005, AMD1:2009 and AMD2:2013 CSV or equivalent standards.
- Installation Category: The instruments are able to withstand transient overvoltages typically present on the mains supply. The normal level of transient overvoltages is impulse withstand (overvoltage) category II of IEC 60664-1:2007.
- Pollution Degree 2: Normally only non-conductive pollution occurs. Occasionally, however, temporary conductivity caused by condensation must be expected.

EMC Compliance

EC Directive

The GelPro System is designed and tested to meet the requirements of the EC directive 2004/108/EC and 93/68/EEC. The instrument complies with the EMC standard EN61326-1:2013 (EMC standard for electrical equipment for measurement, control and laboratory use) and EN 55011:2009 and A1:2010 (ISM) class A (rf emissions).

FCC Rules and Regulations

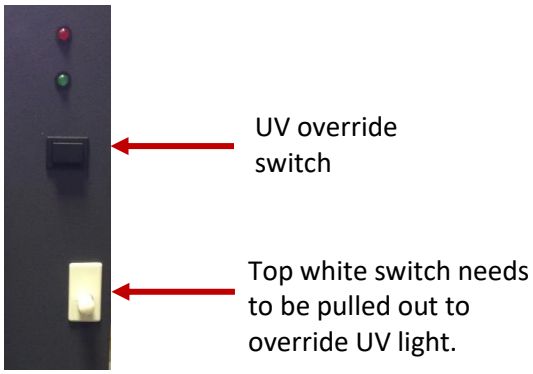
The GelPro System is classified as a digital device used exclusively as industrial, commercial or medical test equipment. It is exempt from the technical standards specified in Part 15 of the FCC Rules and Regulations based on Section 15.103 (c).

UV Safety

The GelPro System uses epi mid wave UV tubes and UV transilluminator. If the door is opened the image capture software will automatically switch off the UV light.

To override the UV light when the door is open for cutting bands out of your gel please follow the instructions listed below;

1. Open the GelPro door and locate the top white switch under the black square button. Pull the top white switch out.
2. Then press the black square button and hold for a few seconds until you hear the UV transilluminator switch on.



WARNING	**Please ensure that Personal Protective Equipment (PPE) is used when overriding UV light source.** **It is recommended that a laboratory coat is worn, a UV visor and gloves.**

Warning Labels

Warning labels attached to the instrument draw attention to specific hazards - refer to this User Guide and other documentation provided with the instrument for more details concerning potential hazards and any precautions or other actions that must be taken.

WARNING	**To prevent potential personal injury and damage to the instrument, switch OFF all components in the system and disconnect them from the mains power supply before altering, or making any new electrical connections.**

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UNPACKING A GELPRO SYSTEM

Removing from the Packaging

Visual Inspection

Upon taking delivery of a new GelPro 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 GelPro Instrument is packaged in a large carton which is securely strapped. Some Instruments may be shipped as a carton only, others may be shipped with the carton strapped onto a wooden pallet. Accessories are shipped in one or more separate cartons.

To unpack a typical GelPro Instrument:

WARNING	**A GelPro Instrument requires two people to lift it safely. A GelPro Instrument complete weighs approximately 37 (Standard models) or 45 kg (Stretch models).**

UNPACKING A GELPRO	
Original packing of GelPro	Remove the strapping and tape
Open the cardboard carton top flaps	Remove the carton and gently lift the GelPro out

 Attach the camera, slide the transilluminator into place, and put on camera cover	 GelPro ready for use

6. Carefully unpack the accessories.

TYPICAL ACCESSORIES
Mains power cord - suitable for country of use
Darkroom to lens lead (15-way D-type female to 15-way D-type male)
Camera to PC lead (USB Mini-B to USB Type A)
Darkroom to PC lead; serial lead (9-way D-type male to 9-way D-type female) plus serial/USB converter (9-way D-type male to USB Type A)
Pre-ordered Emission Filters
Transilluminator
UltraBright LED blue light transilluminator
Visible light converter screen
White light pad

OVERVIEW

GelPro Overview

The GelPro is a high resolution systems capable of imaging all your fluorescence requirements. GelPro system can be used for a wide range of imaging applications including; DNA/RNA gels, Fluorescence and visible gels.

The GelPro Instrument comprises two main components:

Darkroom - this provides a completely black environment into which the sample to be imaged is enclosed. Samples can be placed into the Darkroom directly onto a screen, a transilluminator or a white light pad.

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

- UV lamps of known wavelengths (254-nm, 302-nm and 365-nm) located above the LED light modules on either side of the instrument. These illuminate the sample from above.
- Blue LED lights on transilluminators, providing side and through lighting of samples, an alternative is to use a blue converter screen over the UV transilluminator.
- UV lights on transilluminators, providing side and through lighting of samples.
- A white light pad , an alternative is to use a 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 screen with spaces for up to 7 filters to be inserted. The screen is indexed, enabling the location and specification of each installed filter to be specified to the GenePIX software.

GelPro Instruments have a new generation of camera - having 5 million pixels, giving the system range outstanding sensitivity and versatility.

GelPro Range

The GelPro as detailed below:

	SPECIFICATIONS
	GelPro
Image resolution (megapixels)	5
Effective resolution (megapixels)	15.3
A/D	12/16 bit
Greyscales	65 536
Quantum efficiency @ 425nm	52%
Cooling - regulated	n/a
Lens (motor driven)	f1.2 with feedback
Filter wheel (7 position)	●
UV filter*	●
Use with external PC	●
Darkroom - standard	●
EPI LED white lights	●
EPI UV 302nm**	●
Visible light converter (33 x 31 cm)	●
White light pad for visible stains (20 x 14 or 20 x 30 cm)	●
UltraBright LED blue light transilluminator (20 x 16 cm)	●
UV transilluminator 302nm (20 x 20 cm)***	●
Maximum image area (cm)	32.5 x 24.1
Minimum image area (cm)	5.6 x 4.2
W x H x D (cm)	57 x 84 x 45
Weight (kg)	37
Supply voltage (V ac)	115 / 240

* other emission filters are available
** other wavelengths are available
*** other sizes and wavelengths are available including dual wavelength

The GelPro is suited to the applications detailed below:

APPLICATIONS
GelPro
Affordable system for routine fluorescent and visible gel imaging.
High resolution 5MP camera for good spatial resolution.
Effective resolution up to 15.1MP.
Motor driven lens with feedback
Integral white LED lighting for sample positioning, visible light applications and colorimetric markers.
Motor driven 7-position filter wheel with UV filter to extend applications.
Automatic or manual control using GenePIX.
Pre-defined 1-click protocols for rapid imaging.
Unlimited user saveable protocols.
Use with UV transilluminator for DNA imaging.
Use converter screen for visible light applications such as protein gels.
Use with blue LED UltraBright transilluminator for safe-dye applications.
Includes unlimited copies of GeneQUANT analysis software.
IQ/OQ qualification protocols as available.

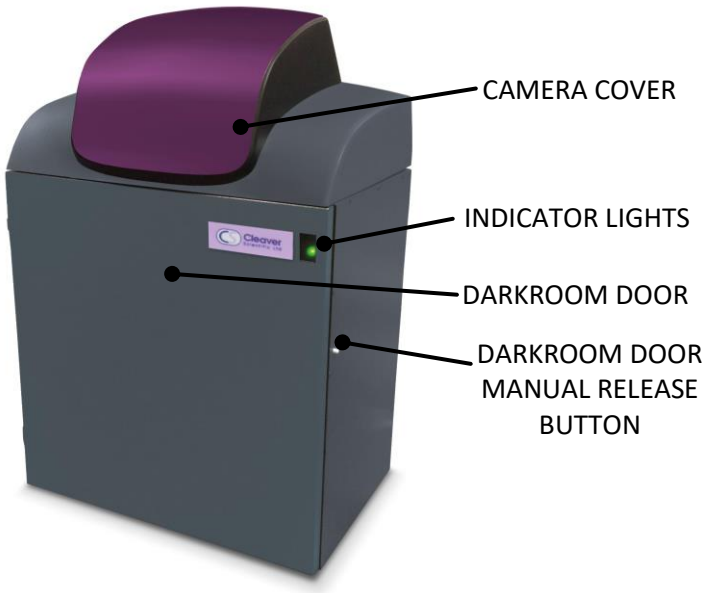
	APPLICATIONS INDEX
	GelPro
DNA gels	●
Protein gels	●
Multiplex gels - 3 or more colours	
Colony counting	●
2D Gels (DIGE)	
Chemiluminescence blots	
Colorimetric blots	●
Stain free imaging	
Films	●
IR imaging	
Bioluminescence	
GFP plant imaging	

GenePIX Software

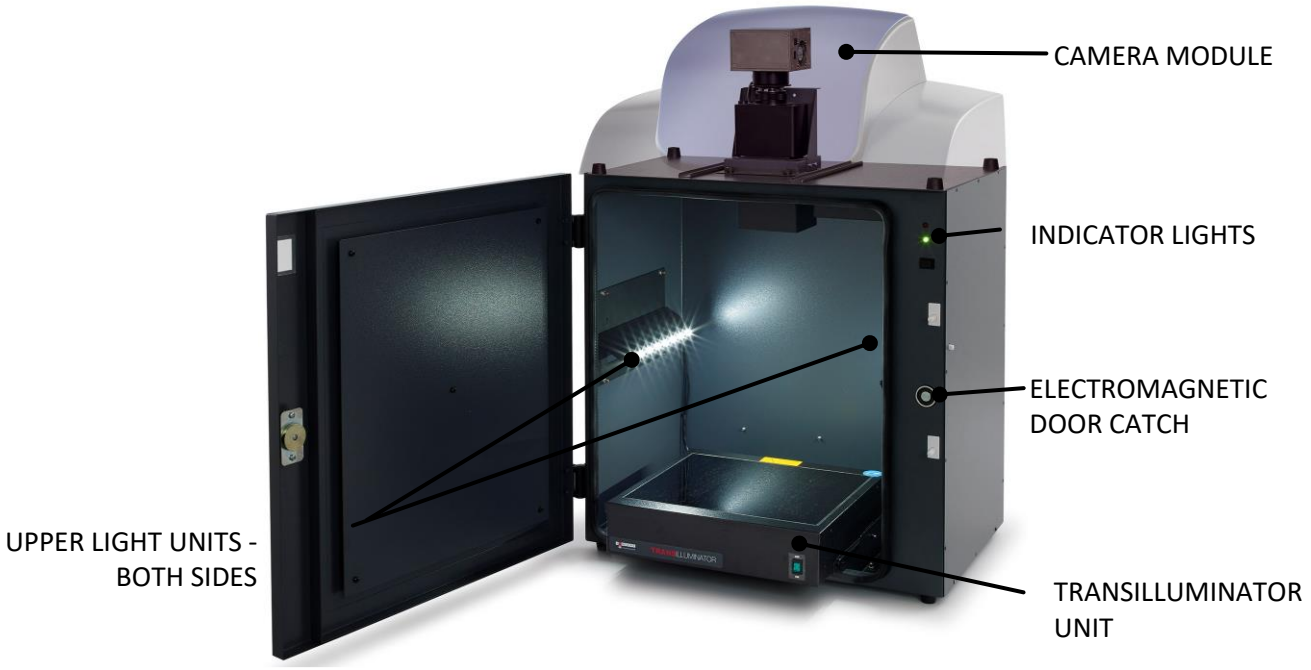
The GenePIX image capture software runs in a standard Windows environment and provides an application driven and time-saving workflow for running a variety of life-science applications.
The basic GelPro Instrument is controlled and operated by the GenePIX software running on an external PC operating a standard Microsoft Windows environment. Two cable connections are required between the PC and the GelPro Instrument; one for the Darkroom, and one for the Camera.
The raw data recorded by the digital camera is processed by the GenePIX software to generate the images and technical files which are the GelPro Instrument's basic outputs.

The GenePIX software provides both automatic and manual modes of control of the GelPro hardware and has an inbuilt database of application specific data 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



TYPICAL STANDARD GELPRO – FRONT



TYPICAL STANDARD GELPRO - DARKROOM DOOR OPEN

SOFTWARE INSTALLATION

Minimum System Requirements

The GenePIX software can operate on the following Microsoft Windows Operating Systems:

Windows 7 Professional SP3 (32 bit and 64 bit versions),Windows 8 Professional and Windows 10

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

Please contact Cleaver Scientific for the up-to-date minimum system requirements.

Software Installation

A GelPro Instrument needs to have the GenePIX software installed on the associated PC from which the instrument is to be controlled.

The GenePIX 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 Instrument 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

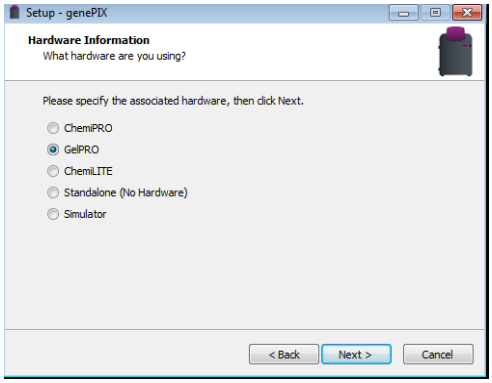
Run the Set-up Program

1. Insert the GenePIX USB stick/CD ROM and run the **Set-Up Program**. The following screen will appear:

SETUP - GenePIX - WELCOME TO THE GenePIX SETUP WIZARD SCREEN

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

Select the Instrument Hardware Information

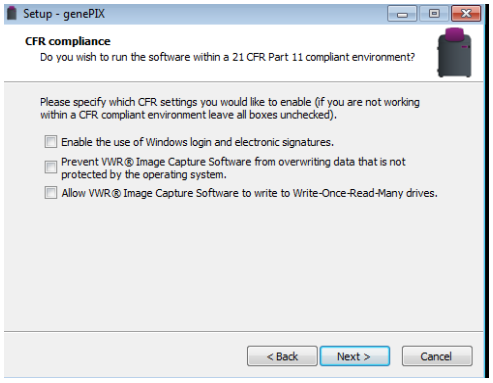


SETUP – GenePIX - FIRST HARDWARE INFORMATION SCREEN - INSTRUMENT TYPE

3. Select the instrument type that you have by selecting the appropriate radio button, i.e. GelPro.

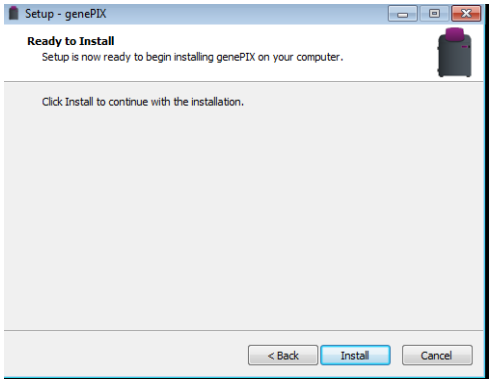
4. Click on the **Next >** button. The Setup - GenePIX Select Destination Location screen will appear.

Select if running GenePIX software in a CFR21 part 11 Compliance environment



SETUP - GenePIX – CFR COMPLIANCE

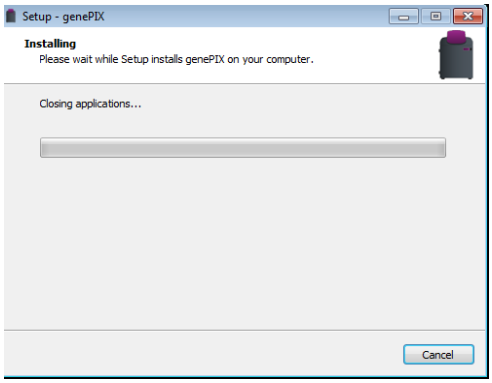
Start GenePIX installation



SETUP - GenePIX – start installation

5. Select install to begin the installation process.

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

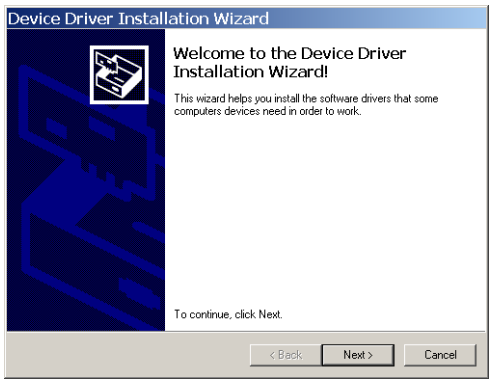


SETUP - GenePIX – Installing

6. The Device Driver Installation Wizard screen will appear.

Install Device Drivers using the Device Driver Installation Wizard

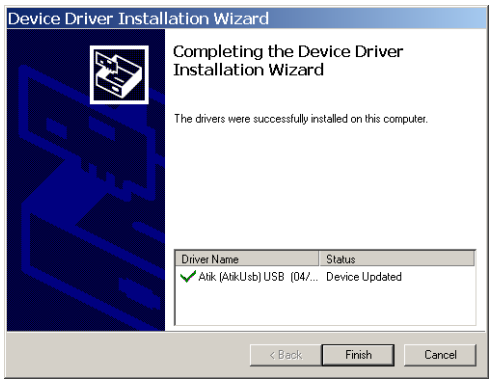
This part of the installation process installs the software drivers that some computers need in order to complete the installation.



DEVICE DRIVER INSTALLATION WIZARD WELCOME SCREEN

7. Click on the **Next >** button. The Wizard (a sub-program, part of the GenePIX software) will automatically install the necessary device drivers on the PC that the hardware device you selected previously 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.



DEVICE DRIVER INSTALLATION WIZARD FINISH SCREEN

8. Click on the **Finish** button.

9. The Setup - GenePIX Completing the GenePIX Setup Wizard screen will appear. This indicates that the installation process has finished successfully.

SETUP - GenePIX - COMPLETING THE GenePIX SETUP WIZARD SCREEN

10. Click on the **Finish** button to complete the **Set-Up** process.

11. Remove the GenePIX USB stick/CD ROM.

Your GenePIX software is now ready for use.

Note: For a GelPro Instrument connected to an external PC running Windows 7 or Windows 8, two levels of operator access are available; User and Administrator. User accounts have limited privileges within the GenePIX software, Administrator accounts have full privileges.

12. Check your desktop, you should have a GenePIX icon visible, i.e. .

OPERATING

Operator Controls

Rear Panel

The rear panel of the GelPro Instrument contains two User controls:

- An ON/OFF rocker switch, used for energising/de-energising the instrument.
- A Stage Safety Cut-out switch, used to reset the power supply to the Stage mechanism if it has been automatically isolated due to the mechanism jamming or drawing too much power.

Touch Screen PC

As an aid to cleanliness and good housekeeping the PC used to run the GenePIX software can utilise a touch screen. This can be operated quite easily while wearing surgical gloves and can be wiped clean as required.

Operations using the touch screen are limited to two basic actions; tapping, and touching and dragging.

- Tapping corresponds to clicking on a 'conventional' computer mouse.
- Double tapping corresponds to double-clicking on a 'conventional' computer mouse.
- Touching and dragging corresponds to scrolling or dragging using a 'conventional' computer mouse.

Connected PC

The keyboard and mouse of an external PC connected to a GelPro Instrument function as normal.

Instrument Set-up

Make sure that the Laboratory bench is strong enough to support the GelPro Instrument and is stable and level.

Caution	**Do not energise any of the components until instructed to.**

Make the following cable connections:

1. Connect the mains power cord between a power supply socket and the Instrument. DO NOT switch on.

WARNING	**Ensure that the mains supply socket on the Instrument is not obstructed, i.e. leave a gap to allow easy disconnection of the mains cord.**

2. Connect the Camera to PC lead to the USB Mini-B connector on the Camera. DO NOT connect to the PC.

3. Energise the Darkroom - ON/OFF switch on the back of the Darkroom.

4. Install the Transilluminator into the runners. Connect the flying mains lead from the back of the Darkroom to the socket on the back of the Transilluminator. Energise the Transilluminator - ON/OFF switch on the front of the unit. Set the Transilluminator Power rocker switch on the front of the unit to 100%.

5. Startup the PC and install the GenePIX software.

6. Connect the Camera to PC lead to a USB Type A connector on the PC. The Camera and PC will automatically start to communicate and the Camera drivers will start to load onto the PC. If a warning box appears on the PC monitor containing a message that the drivers are unsigned or unverified, then choose the option to proceed with the installation.

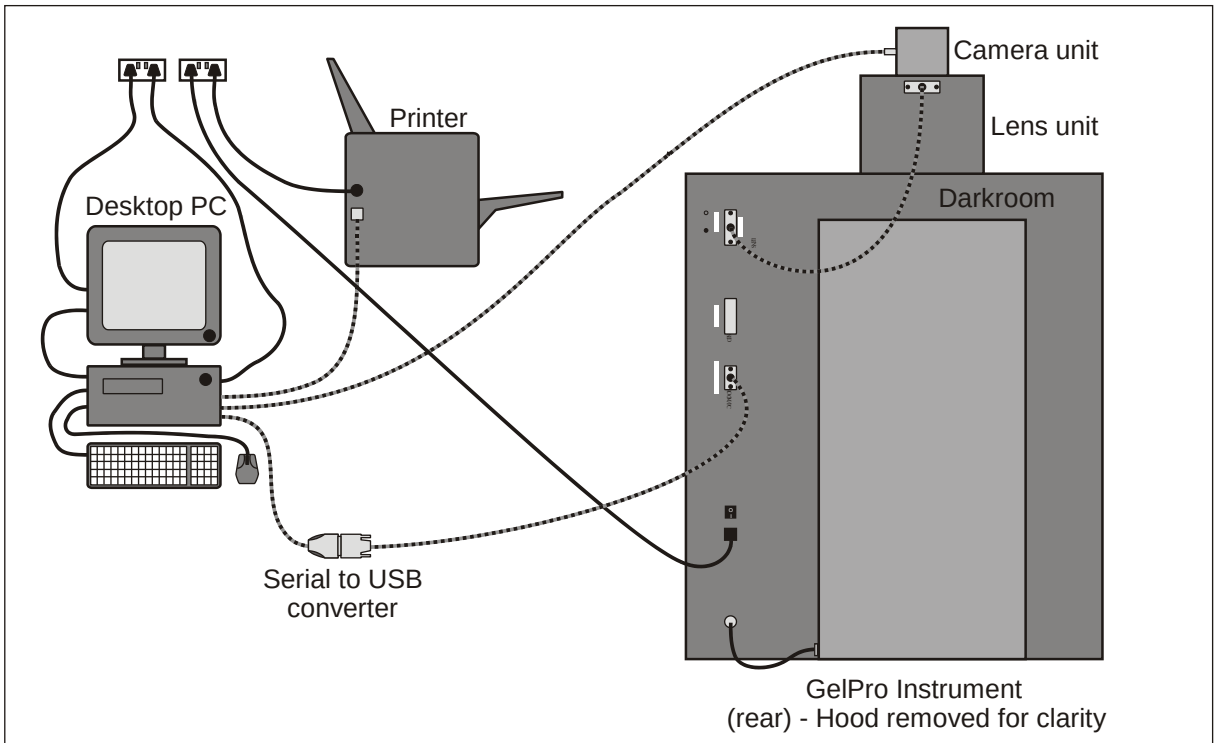
7. Connect the Darkroom to PC lead to the 9-way D-type connector on the Darkroom. Connect the other end of the lead to the 9-way D-type connector on the serial/USB converter. Then connect the converter to a USB Type A connector on the PC.

Note: If the PC has a serial 9-way D-type male connecter, then the female 9-way D-type connector on the Darkroom to PC lead may be connected directly to the PC, without attaching the converter.

Note: The GenePIX software requires the PC to be equipped with an OpenGL compatible graphics card with a resolution of at least 1280 x 900 with true colour, with DPI set to normal size (96 DPI).

8. The GeneQUANT software will install automatically.

9. Double click the icon to start the GenePIX software.



GelPro INSTRUMENT - POWER AND DATA CONNECTIONS

Operator Mountable Accessories

Lights

Additional light sources can be positioned in the Darkroom, as required. A socket is available at the back right hand corner of the Drawer to power these light sources; either a UV Transilluminator, an UltraBright LED Blue Light Transilluminator, or a White Light Pad.

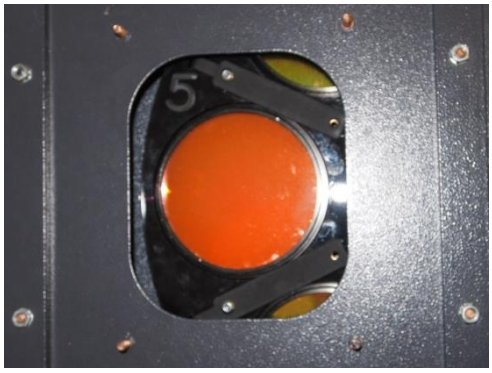
UV TRANSILLUMINATOR IN THE DARKROOM - STANDARD GELPRO

Filters

The GelPro Instrument 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 seven circular filters to be installed. These are numbered 1 - 7 so that filter locations can be identified within the GenePIX software. Access to the Filter Holder is gained by removing the Lens and Camera Units.

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. Remove the Hood.
2. Remove the Lens and Camera Units.
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. Each Filter Slot is clearly numbered.

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.

11. Replace the Hood.

Switching Instrument On

To switch on a GelPro Instrument:

1. Switch on and log on to your PC as normal.

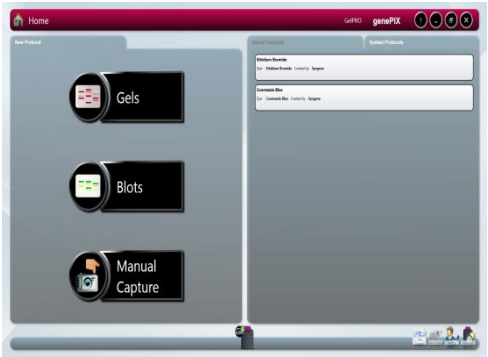
2. Connect the mains power cord between a power supply socket and the instrument.

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.

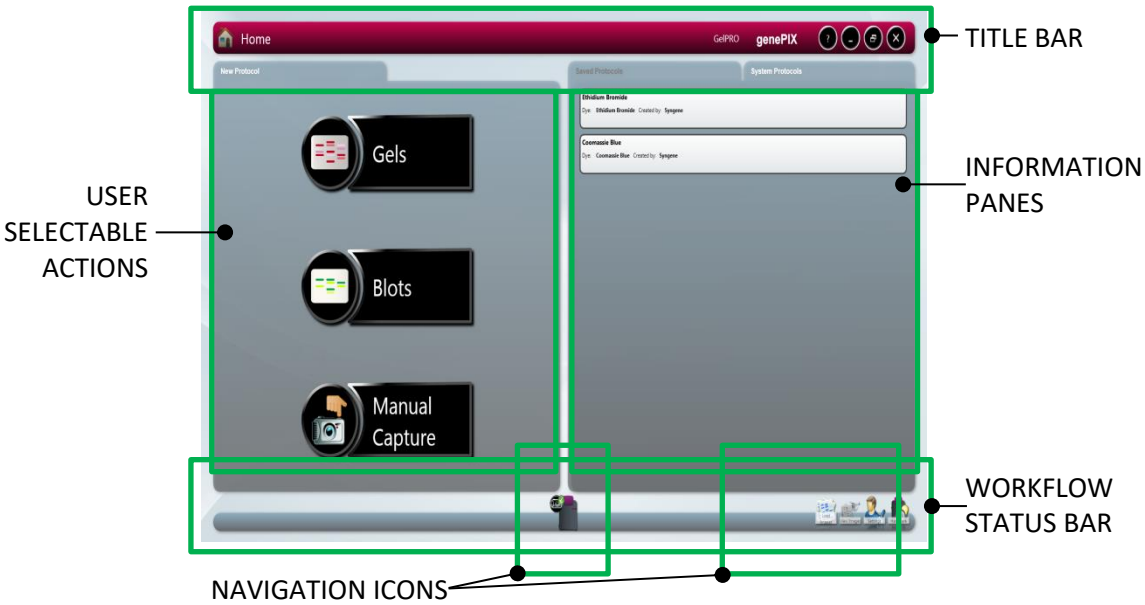
5. Check that the green indicator light on the front of the Instrument lights.

Once the GenePIX software has started up the **Home** screen will appear. At first start-up the GenePIX software defaults to **Standard View** and the following **Home** screen will appear. The display can be changed from **Standard View** to **Classic View** on the **User Preferences** screen. See **Entering Personal Preferences**.



GenePIX STANDARD VIEW HOME SCREEN

GenePIX Standard View Home Screen Layout



TITLE BAR

Displays an icon to show where you are in the GenePIX program, e.g. here it shows the icon to show that you are on the Home Screen. On other screens within the GenePIX 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 GelPro with a 5MP camera is installed and the GenePIX 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 GelPro 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 the Darkroom is not connected

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

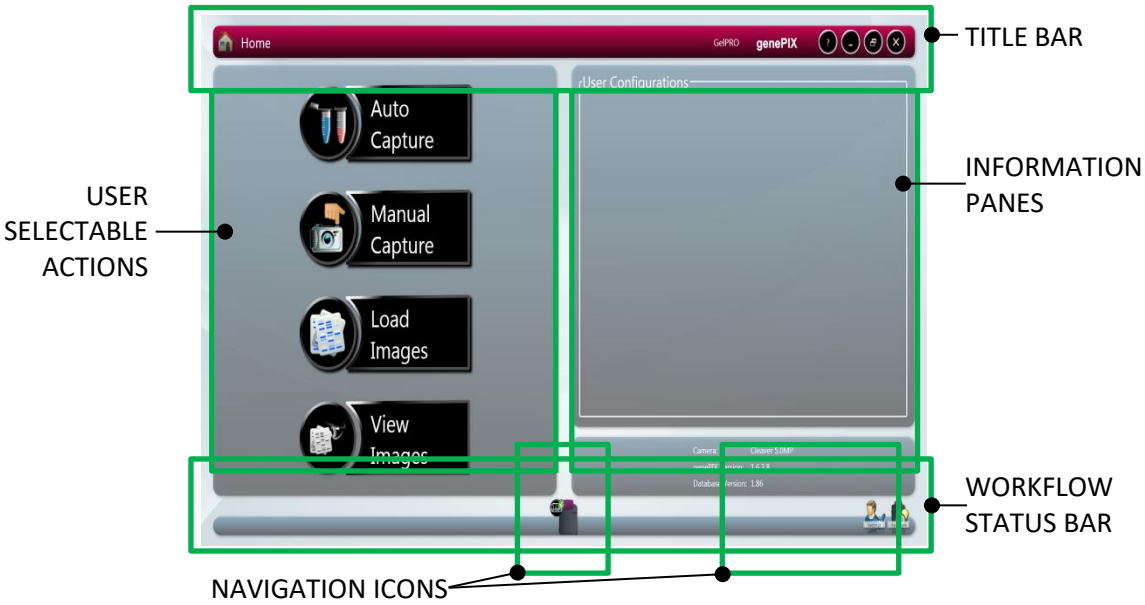
View Images icon, to navigate to View Images screen

Settings icon, to navigate to User Preferences screen

Hardware icon, to navigate to Hardware screen

GenePIX CLASSIC VIEW HOME SCREEN

GenePIX Classic View Home Screen Layout



TITLE BAR Same as the Standard View Home screen.

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:

Access to the automatic image capture process, from

.

Access to the manual image capture process, from

.

Access to the browse images process, from

.

Access to the view images process, from

.

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

The Home screen is split into two panes:

User Configurations (also referred to as Protocols) - saved sets of specific setting combinations that form repeatable workflows.

System data - camera hardware and program version information.

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 the 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 the Darkroom is not connected

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 not displayed:

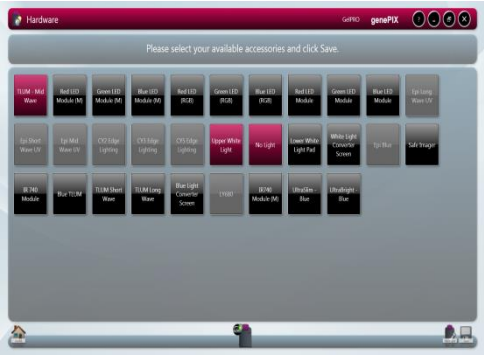
Settings icon, to navigate to User Preferences screen

Hardware icon, to navigate to Hardware screen

Entering Hardware Details

Now that you have installed your GelPro Instrument you need to enter the details of the light sources and filters that are installed into the GenePIX 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 Cleaver Scientific 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 .

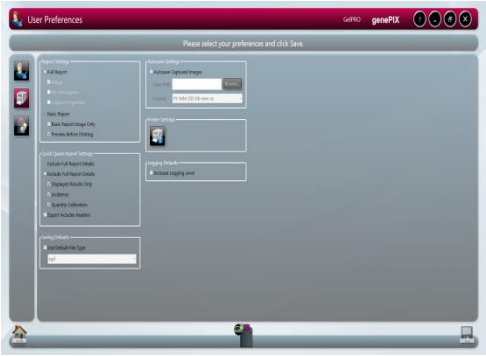
Note: Ensure that you save your selections before you leave the Hardware screen.

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

Entering Personal Preferences

Every individual who logs on to a GelPro 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 SCREENS

2. Set your preferences:

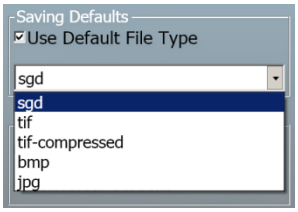
REPORT SETTINGS

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.

SAVING DEFAULTS

- **Saving Defaults** - enables you to select and set as a preset default the file format that the GenePIX Software saves your images in. If you do not set a preference here, the GenePIX Software will use the *.sgd format by default. To set a preference for a different file format uncheck the **Use Default File Type** checkbox and select your preferred file format from the drop-down menu.



AVAILABLE FILE FORMATS

AUTOSAVING SETTINGS

- **AutoSaving Defaults**-enables you to autosave captured images. Select the save path and format (e.g. YY-MM-DD-hh-mm-ss).

LOGGING DEFAULTS

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

SCREEN CHANGING PROMPTS

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

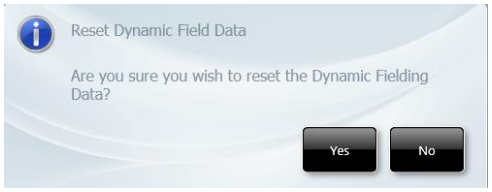
AUTO CAPTURE DEFAULTS

- **Auto Capture Defaults** - checking this checkbox sets the GenePIX 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.

CAMERA SETTINGS

- **Camera Settings** - enables you to perform a Dynamic Fielding operation. The GenePIX 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.

REGIONAL POWER FREQUENCY

- **Regional Power Frequency** - enables you to set up your GelPro to suit the frequency of the local mains supply. Around the world there are two mains

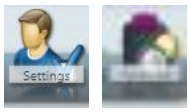
frequencies in use; 50 Hz or 60 Hz. Check the checkbox against the frequency matching your local supply.

PRINTER SETTINGS

- **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.

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.
- **Sample Size**- if you prefer to not see the sample size pop-up box when using the automated mode please un-check this checkbox.
- **Manual/chemi series capture defaults**- The default for GenePIX is to automatically autoscale images ensuring the best image is displayed if you prefer to view the full dynamic range of the images captured in a series checking this checkbox will allow you do to this.
- **Group autoscale series images-** checking this checkbox allows you to group autoscale images captured in a series.
- **Network Broadcast settings-** Check the status of an image capture and access your recently captured images from any computer, smartphone or tablet on the same network as GelPro system by checking the broadcast status over network checkbox.
- **Annotation handle size Defaults-** checking this checkbox will increase the handle size on the annotation box.

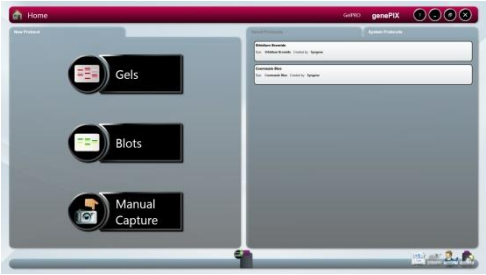
3. To save any changes you make, select the **Save** icon . If you attempt to navigate away from the User Preferences screen without first saving the changes, the following pop-up message is displayed:

SAVE CHANGES MESSAGE POP-UP

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

Adjusting Basic Screen Viewing Size

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



STANDARD VIEW HOME SCREEN - DEFAULT

STANDARD VIEW HOME SCREEN - ADJUSTED

CLASSIC VIEW HOME SCREEN - DEFAULT

CLASSIC VIEW HOME SCREEN - ADJUSTED

Recommended Light / Dye / Accessory and Other Application Tables

LIGHTING AND FILTER OPTIONS			
APPLICATION	**SAMPLE TYPE**	**LIGHT SOURCE / ACCESSORY**	**FILTER**
Fluorescence	Gel (e.g. EtBr™* / SYBR Gold™	Ultra-slim blue light LED Transilluminator	FiltUV/FiltSW
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

Ultra-bright Blue Light LED Transilluminator Installed

The UltraBright LED blue light Transilluminator, if required to be used, should be installed in place of the UV Transilluminator.

Place the test sample centrally on the Transilluminator screen.

White Light Pad Installed

The White light pad, if required to be used, should be installed in place of the UV Transilluminator.

Place the sample centrally on the White light pad screen.

Automatic Image Capture Mode

Automatic image capture can be carried out from either Home screen. In Standard View the sample defining process has been simplified but once you have specified your sample type the remainder of the process is the same as in Classic View

Automatic Image Capture Using Standard View

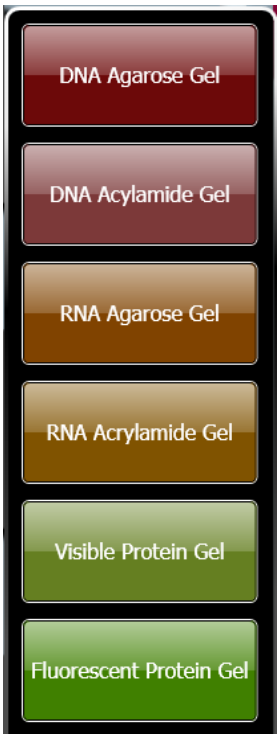
1. Open the Darkroom Door and position the sample.

2. Proceed based on your sample type:

2a. If you have a Gel sample.

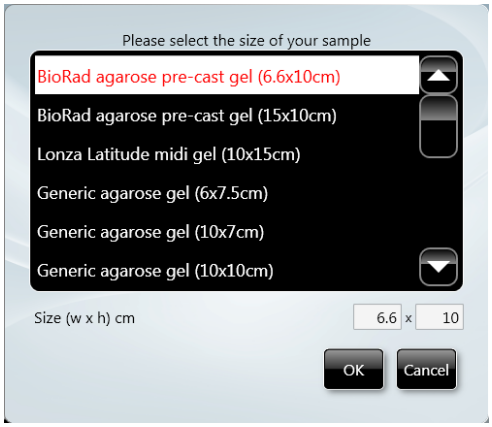
(i) Select the Gels icon

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



GELS DROP-DOWN LIST

(ii) Select your Gel type from the drop-down list. This displays a Sample Size pop-up dialogue box.



SAMPLE SIZE POP-UP

(iii) 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.

(iv) Select the **OK** button. This displays the Dye Selection screen. Proceed to **Automatic Image Capture - Step 2 Dye Selection**.

Manual Image Capture Using Standard View

Manual image capture from the Standard View Home screen follows the same process as manual image capture from the Classic View Home screen. Proceed to **Manual Image Capture Mode**.

Automatic Image Capture Using Classic View

The basis of the Auto Capture mode is a series of steps that form a structured workflow. The workflow takes the User through a series of steps which define the sample and how it is to be imaged, enabling the software to determine the optimum hardware setup using the pre-specified lighting types installed. The workflow is navigated through using the green 'bouncing' arrow in the bottom right hand corner of the screen to move forward to the next screen. The grey status bar shows the progress of the workflow. Selecting any of the icons moves between any of the stages that make up the workflow.

Automatic Image Capture Basic Workflow

The following image represents the Automatic Image Capture workflow, with each of the icons representing a stage in the process.

AUTOMATIC IMAGE CAPTURE WORKFLOW

AUTOMATIC IMAGE CAPTURE WORKFLOW STEPS

Automatic Image Capture - Step 1 Sample Selection

1. Open the Darkroom Door and position the sample.

2. Select the **Auto Capture** icon

on the Home screen. This displays the Sample Selection - Sample Format screen.

AUTO CAPTURE SAMPLE SELECTION - SAMPLE FORMAT SCREEN

GEL SAMPLE SELECTED

3. In the Sample Format pane select **Gel**.

4. Select the bouncing green arrow . This displays the Sample Selection - Sample Type screen.

AUTO CAPTURE SAMPLE SELECTION - SAMPLE TYPE SCREEN

5. In the Sample Type pane select **Protein**, **DNA** or **RNA,** depending on the type of sample being imaged.

5a. Select **Protein**.

(i) Select the bouncing green arrow . This displays the Sample Selection - Dye Type screen.

AUTO CAPTURE SAMPLE SELECTION - DYE TYPE SCREEN

(ii) In the Dye Type pane select **Fluorescent Dye** or **Visible Stain**.

(iii) Select the bouncing green arrow . This displays the Dye Selection screen. Proceed to **Automatic Image Capture - Step 2 Dye Selection**.

5b. Select **DNA** or **RNA** (illustrated is DNA).

(i) Select the bouncing green arrow . This displays the Sample Selection - Matrix Type screen.

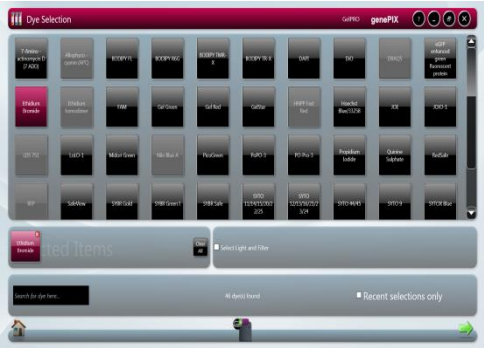
AUTO CAPTURE SAMPLE SELECTION - MATRIX TYPE SCREEN

(ii) In the Matrix Type pane select Acrylamide or Agarose.

(iii) Select the bouncing green arrow . This displays the Dye Selection screen. Proceed to **Automatic Image Capture - Step 2 Dye Selection**.

Automatic Image Capture - Step 2 Dye Selection

The GenePIX program incorporates an extensive database of dye information covering a variety of applications, e.g. fluorescence, chemiluminescence, chemifluorescence, and visible stains. The dye selection displayed is particular to the sample selections made previously. Some examples are shown below.



AUTO CAPTURE DYE SELECTION

Note: The **Sample** icon has been added to the Workflow.

DYE SELECTION

- By default the upper pane displays all dyes in the database that the GenePIX software has determined are relevant to the selections made previously. Scroll vertically to view the entire selection.
- The lower pane displays the total number of relevant dyes found in the database.
- To limit the dye selections displayed in the upper pane check the **Recent selections only** checkbox. Only recently used dyes will be displayed.
- Use the **Search for dye here...** box to search for a dye by name. Enter the dye's name in the box.
- Selected dyes turn red and the dye also appears in the **Selected Items** pane.
- If more than one dye has been used on the sample, then select each dye used in turn. Up to five dyes can be selected if you want to multiplex.
- Press the **Clear All** button to remove selected dyes and restart dye selection.

6. Select your dye(s) from the list.

ACCEPT GenePIX PROGRAM OPTIMAL PROTOCOL OR CHOOSE YOUR OWN PROTOCOL

- If you now check the **Select Light and Filter** checkbox, and then select the bouncing green arrow , the Protocol Selection screen is displayed. Proceed to **Automatic Image Capture - Step 3 Protocol Selection**.
- If you leave the **Select Light and Filter** checkbox unchecked, and select the bouncing green arrow , the Protocol Selection stage is bypassed, and the Sample Positioning screen is displayed. Proceed to **Automatic Image Capture - Step 4 Sample Positioning**.
- With the **Select Light and Filter** checkbox unchecked, the optimal protocol calculated by the GenePIX program is automatically selected, and the Dyes and Protocols icons are added to the Workflow on the Sample Positioning screen.

Automatic Image Capture - Step 3 Protocol Selection

The GenePIX program then calculates the optimal imaging conditions for your sample from the hardware set-up of your system plus the excitation and emission curves of the dye(s) selected, producing a set of instrument settings referred to as a protocol. The Protocol Selection screen displays by default the best imaging condition set available.

SINGLE DYE SELECTED

MULTIPLE DYES SELECTED

Note: The **Dyes** icon has been added to the Workflow.

- To display all available sets of imaging conditions check the **More Options** checkbox.

MULTIPLE DYES SELECTED - MORE OPTIONS CHECKED

Note: Where green arrows appear in the protocol panes, as in the Ethidium Bromide set, these indicate that horizontal scrolling is required to view all possible protocols available.

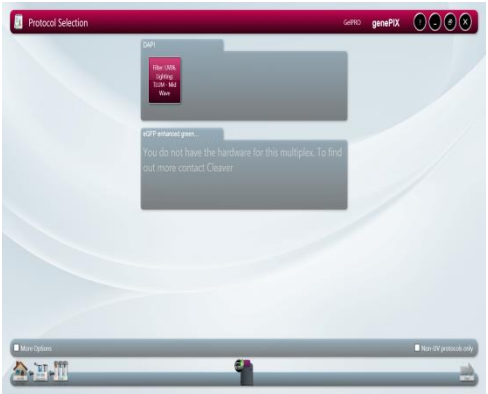
MULTIPLE DYES SELECTED - SCROLL TO VIEW ALL

7. Select a protocol or multiple protocols.

   - Selected protocols turn red.
   - To display only safe dyes, such as SYBR Green, SYBR Gold, etc, that can be imaged using blue light, preventing possible damage caused by UV light, check the **Non-UV protocols only** checkbox.

- Some combinations may result in error messages appearing, for example:

SELECT DIFFERENT FILTER



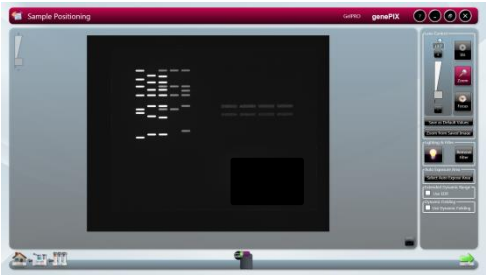
HARDWARE NOT AVAILABLE

Note: If you see these error messages please contact Cleaver Scientific for further assistance.

8. Select the bouncing green arrow . This displays the Sample Positioning screen.

Automatic Image Capture - Step 4 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.



AUTOMATIC CAPTURE SAMPLE POSITIONING

Note: The **Protocols** icon has been added to the Workflow.

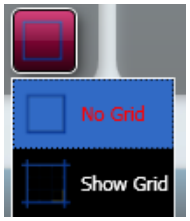
9. Position the sample and improve the preview sample image as much as possible using the controls/functions described below, prior to making the sample image capture to be saved.

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.

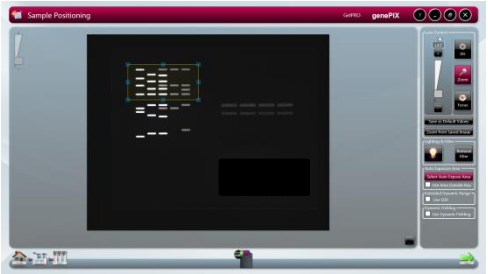
TYPICAL DYNAMIC FIELDING MESSAGES

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.

LIGHTING & FILTER OPTIONS TO IMPROVE SAMPLE IMAGING

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

icon informs the GenePIX 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

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

LENS CONTROL - FOCUS

LENS CONTROL - IRIS

LENS CONTROL - ZOOM

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

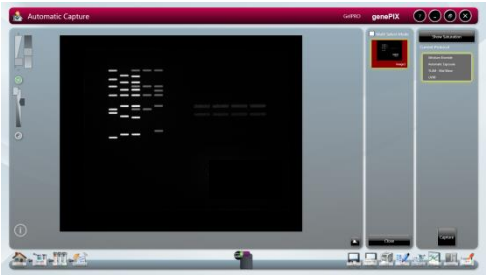
, the aperture or shutter opening of the Camera can be increased/decreased by moving the slider up/down or by selecting the / buttons. As the **Iris** control is changed, the numbers (expressed in 'f' numbers) in the box above the slider bar change. The aperture numbers (f numbers) are counterintuitive, 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.

10. Select the bouncing green arrow . This displays the Automatic Capture screen.



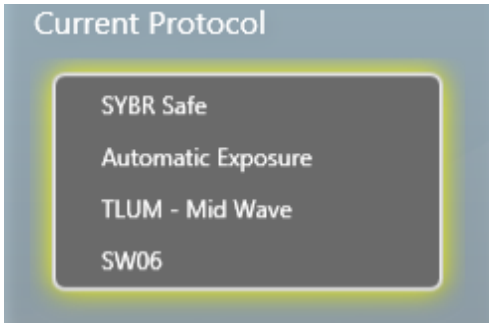
AUTOMATIC CAPTURE SCREEN

Note: The **Positioning** icon has been added to the Workflow.

The Automatic Capture screen contains a range of information display and User selectable actions, as outlined below.

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

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.

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.

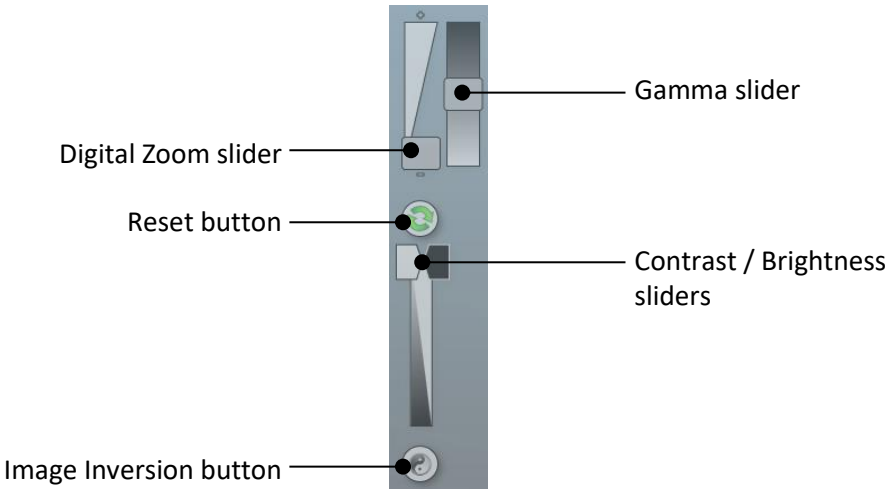


IMAGE SLIDER CONTROLS

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

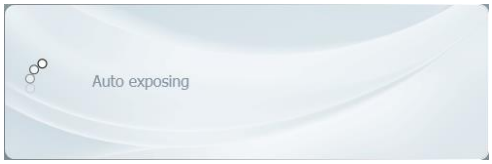
The **Image Information** icon turns red. Selecting the **Image Information** icon a second time closes the pop-up window.

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

Automatic Image Capture - Capturing the Image

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

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

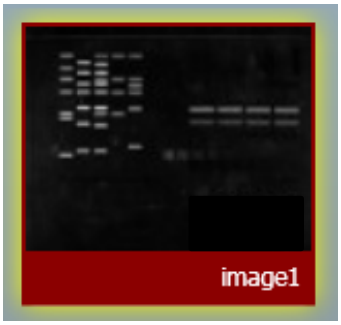


AUTO EXPOSING MESSAGE POP-UP

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.



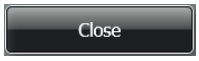
UNSAVED IMAGE POOL IMAGE

13. 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.

SAVE PROMPT

14. 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.

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

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.

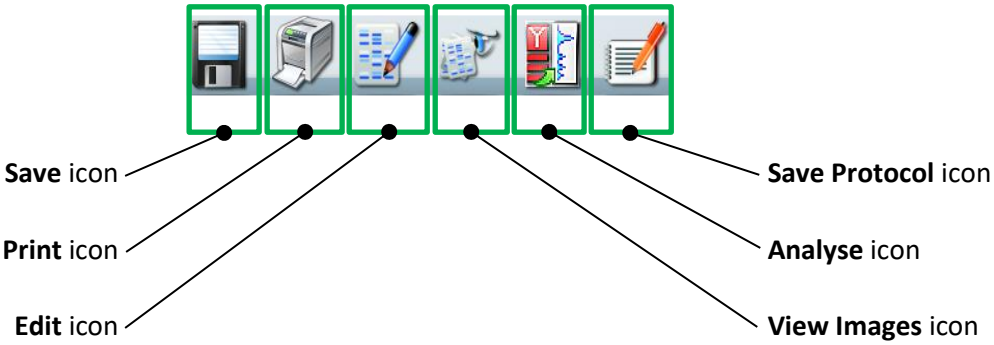


IMAGE ACTION ICONS

Manual Image Capture Mode

Manual Capture mode allows the User to take complete control of every function of a GelPro 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.

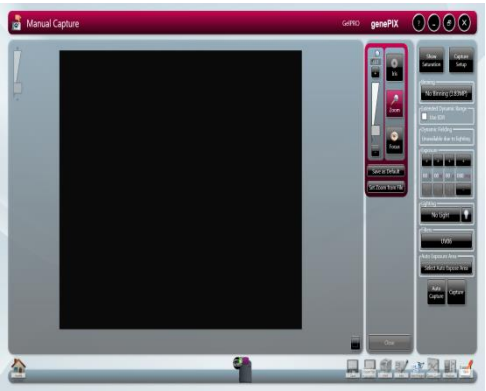
Within the Manual Capture mode, the following options are possible:

- **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

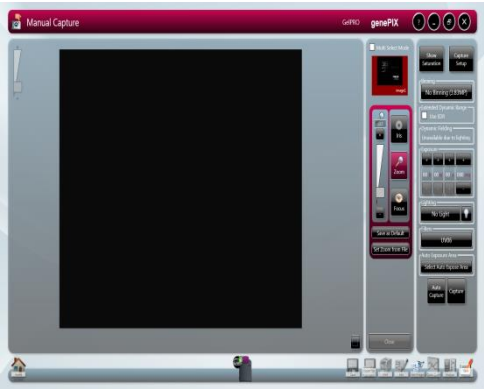
on the Home screen. This displays the basic Manual Capture screen.



MANUAL CAPTURE - BASIC SCREEN - DEFAULT

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

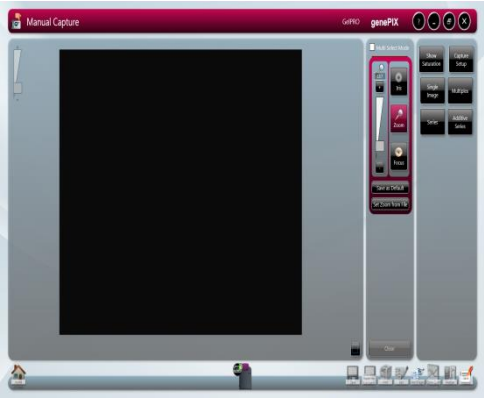
The Lens Controls can be dragged and dropped to any position on the screen, as shown below:



MANUAL CAPTURE - BASIC SCREEN - WITH LENS CONTROLS MOVED

4. To view the image capture options available select the **Capture Setup** button

. This displays the **Image Capture** options in the right hand pane.



MANUAL CAPTURE SCREEN - IMAGE CAPTURE OPTIONS

5. Select the type of image capture you want to make by selecting from the options in the right hand pane.

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**.

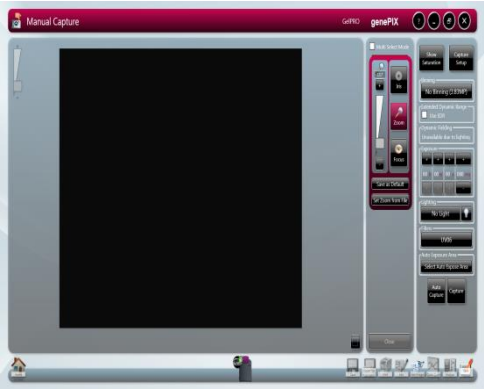
- To capture a series of images, with the same or different settings for each, which will then be combined into a single combined image press the **Additive Series** button. See **Manual Image Capture - Additive Series**.

- 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

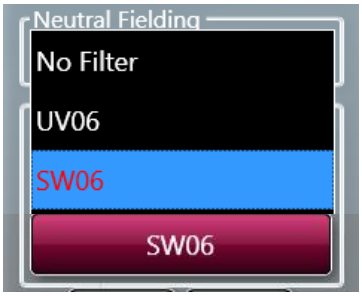
7. Using the **Lighting** and **Filters** functions in the right hand pane to make your lighting and filter selections.

LIGHTING AND FILTERS FUNCTIONS

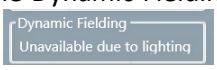
(i) Select the **Lighting** button and select your preferred light from the drop-down menu.

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

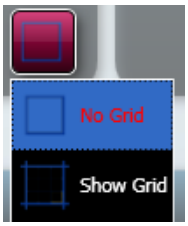
The **Lighting** function provides light inside the Darkroom for better aligning of the sample. Selecting the icon turns the interior white lights on, giving greater visibility of the sample in the Darkroom. Re-select the icon to turn the white lights off again.

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.



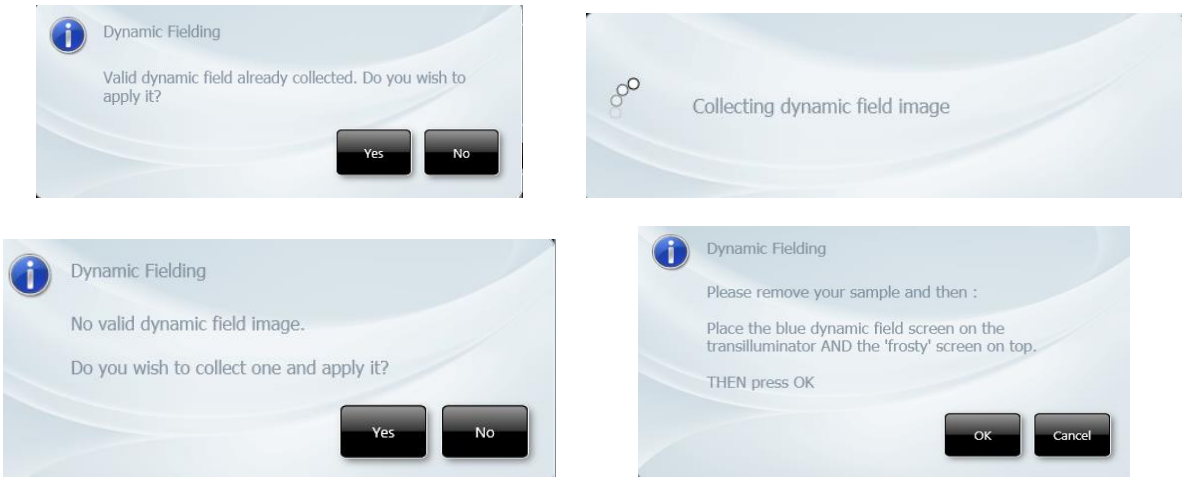
GRID MENU

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.



TYPICAL DYNAMIC FIELDING MESSAGES

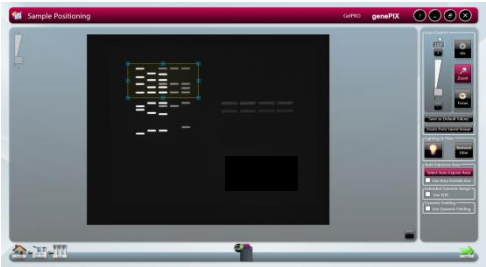
USING A SELECTED AREA TO IMPROVE SAMPLE IMAGE QUALITY

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.

LENS CONTROLS

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

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

LENS CONTROL - FOCUS

LENS CONTROL - IRIS

LENS CONTROL - ZOOM

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.

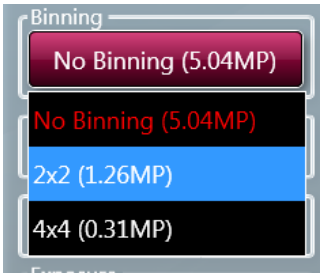
With **Zoom** control selected

, 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 GenePIX program set the exposure time automatically, or, you set the exposure time manually.

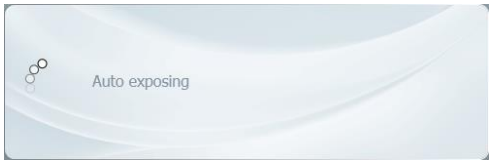
MANUAL CAPTURE - SINGLE IMAGE WITH AUTO EXPOSURE

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

.

The GenePIX 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:

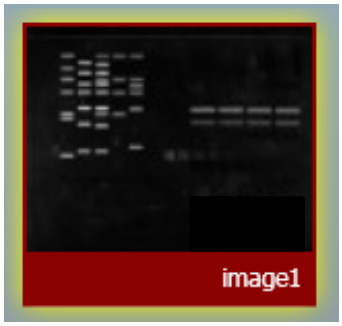


AUTO EXPOSING MESSAGE POP-UP

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

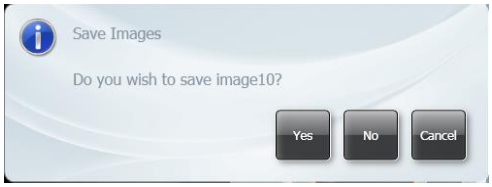
11b. To save a captured image, select the image in the **Image Pool** and select the Save icon .

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**) .

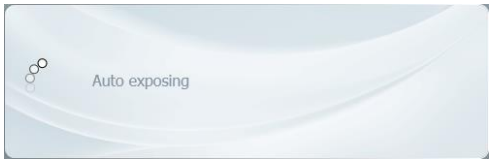
MANUAL EXPOSURE CONTROLS

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:

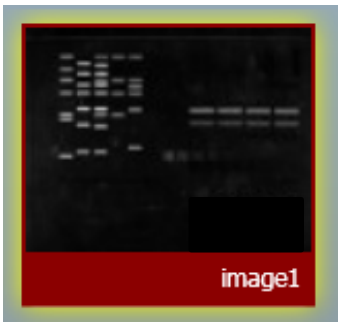


AUTO EXPOSING MESSAGE POP-UP

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

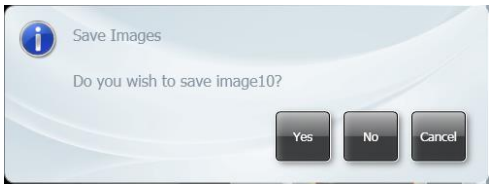
12c. To save a captured image, select the image in the **Image Pool** and select the **Save** icon .

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

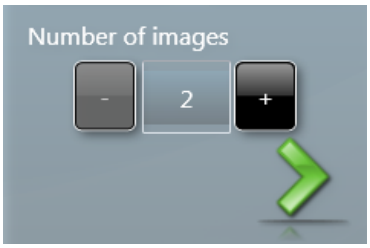
(i) If multiple images are captured without any images being saved, multiple images can be selected and saved in a single operation. Check the **Multi Select Mode** checkbox in the **Image Pool** and select multiple images.

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

Manual Image Capture - Series

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

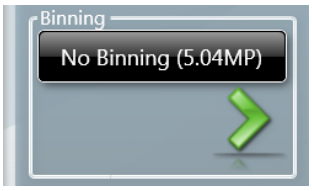
You must now define the number of images you want in your series. In the right hand pane the **Number of images** selector is displayed.



NUMBER OF IMAGES SELECTION

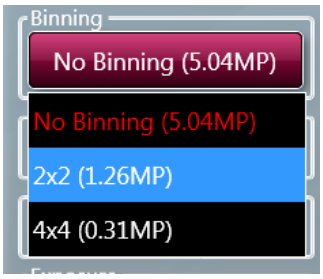
14. Use the **+** / **-** buttons to select the number of images you want to capture, then select the **Next** arrow . For this example, set to 3 by selecting the **+** button.

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 (5.04MP)** 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 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

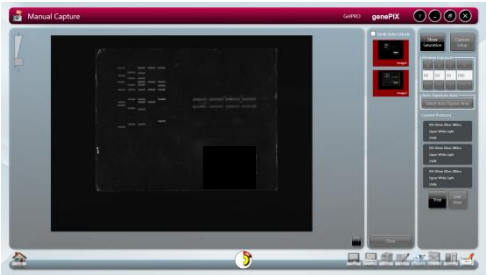
.

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

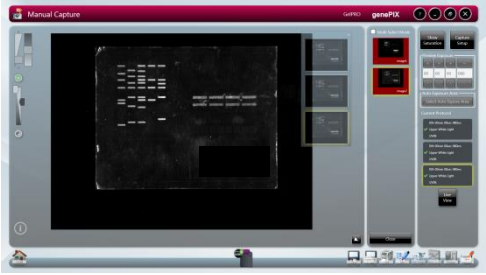
This changes to display the progress of the exposures as concentric coloured bars progressing around the icon .

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.



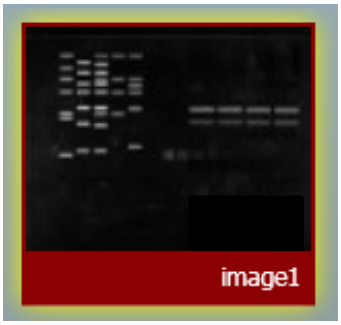
SERIES EXPOSURE - FIRST IMAGE BEING CAPTURED



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 are 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.

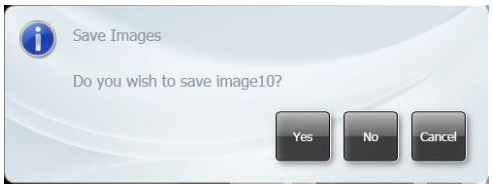
The best image or images can then be saved, and the unwanted images can be deleted.

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.

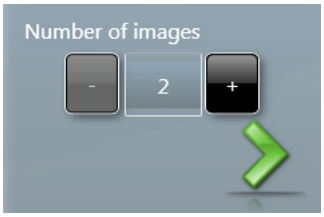
(ii) To save the selected images, select the **Save** icon .

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.

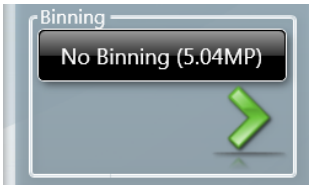
You must now define the number of images you want in your series. In the right hand pane the **Number of images** selector is displayed.



NUMBER OF IMAGES SELECTION

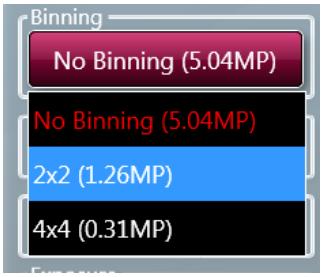
28. Use the **+** / **-** buttons to select the number of images you want to capture, then select the **Next** arrow . For this example, set to 3 by selecting the **+** button.

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 (5.04 MP)** 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 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.

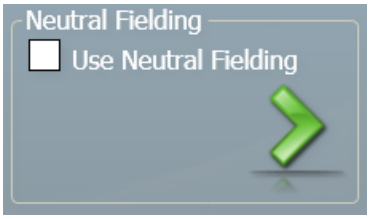
38. By default the **Same as previous** checkbox is checked, making the settings for the second image the same as the settings for first image. To make changes for the second and subsequent images, uncheck the **Same as previous** checkbox.

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.

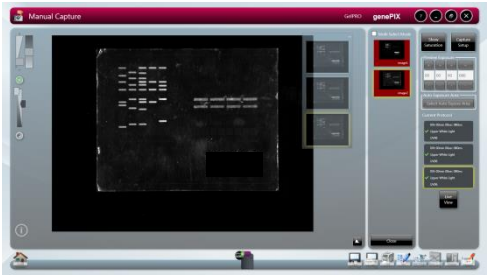
This changes to display the progress of the exposures as concentric coloured bars progressing around the icon .

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.

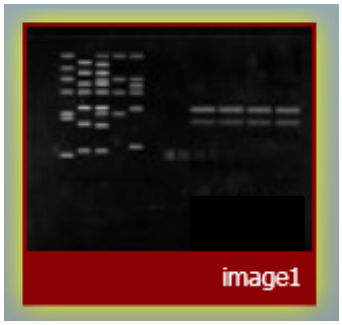
ADDITIVE SERIES EXPOSURE - READY TO START CAPTURES



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.

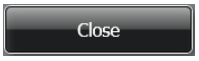


UNSAVED IMAGE POOL IMAGE

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.

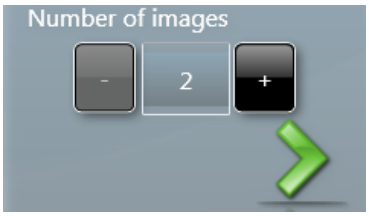
(ii) To save the selected images, select the **Save** icon .

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.

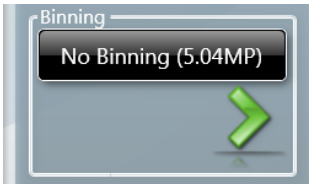
You must now define the number of images you want in your series. In the right hand pane the **Number of images** selector is displayed.



NUMBER OF IMAGES SELECTION

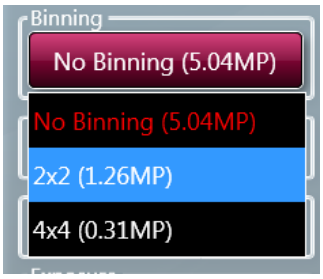
47. Use the **+** / **-** buttons to select the number of images you want to capture, then select the **Next** arrow . For this example, set to 3 by selecting the **+** button.

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 (5.04 MP)** 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 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 .

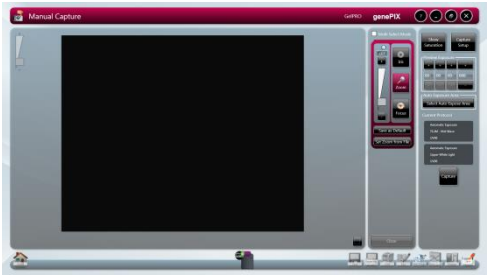
While the exposures are progressing, and this may take several minutes, it is possible to navigate away from the Manual Capture screen and browse, view and edit previously captured images.

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.

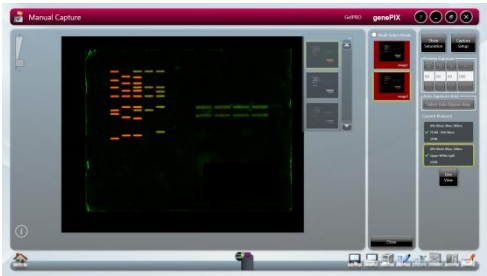
As the first image is captured, it appears as the main image in the left hand **Image** pane, as two vertically stacked thumbnails in the **Image** pane, and as a thumbnail in the central **Image Pool** pane.

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.



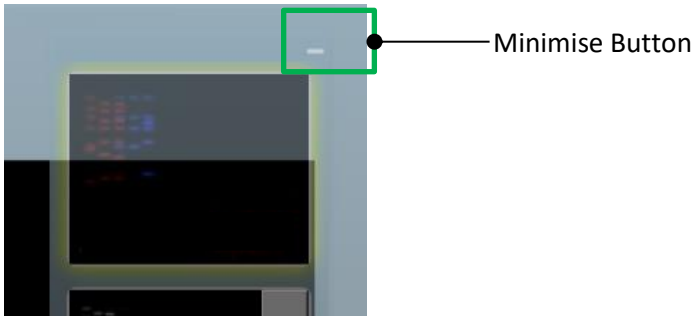
MULTIPLEX EXPOSURE - READY TO START CAPTURES



MULTIPLEX EXPOSURE - ALL THREE 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.



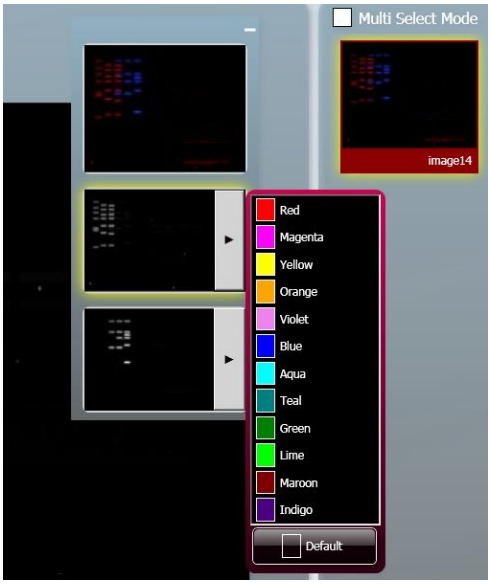
MINIMISE BUTTON

(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.

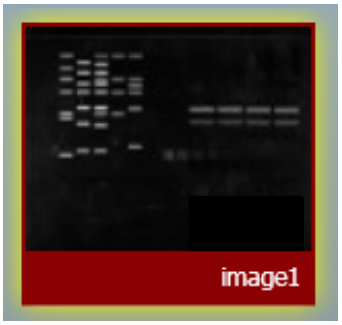
The appearance of the individual captured images can be manipulated if desired to improve the appearance of the overall combined image, e.g. by changing the colour of the coloured bands to produce a greater colour contrast.

(iv) 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.

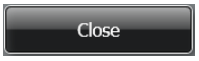


UNSAVED IMAGE POOL IMAGE

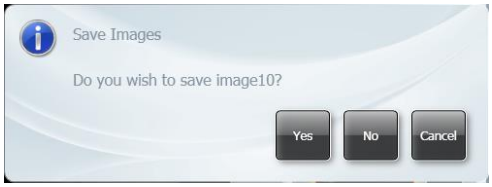
57. To save a captured image, select the image in the Image Pool and select the Save icon .

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.

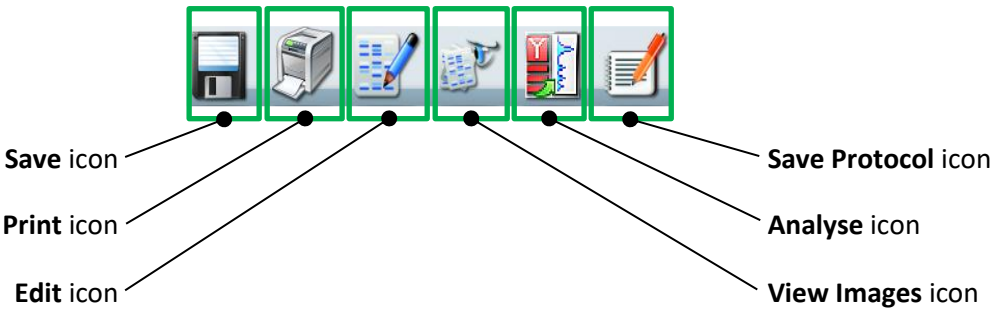


IMAGE ACTION ICONS

CONFIGURATIONS - SAVING, OPENING AND EDITING

Introduction

The GenePIX software can make the running of repeated workflows easier by storing a workflow as a Configuration (or Protocol). Configurations/Protocols can be:

- Easily created
- Have a wide variety of settings
- Easily re-used
- Easily modified

Creating and Saving a Configuration

From the Standard View Home Screen

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

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

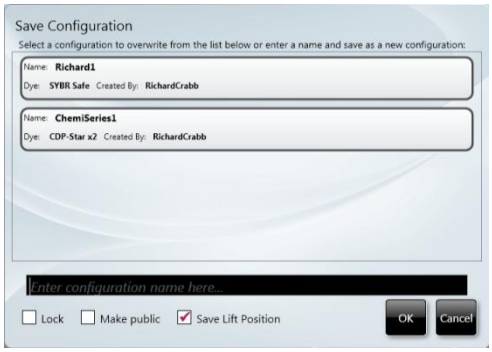
, select your sample type, select your dye, position your sample, and capture an image.

2. 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. **Stain free gel**.

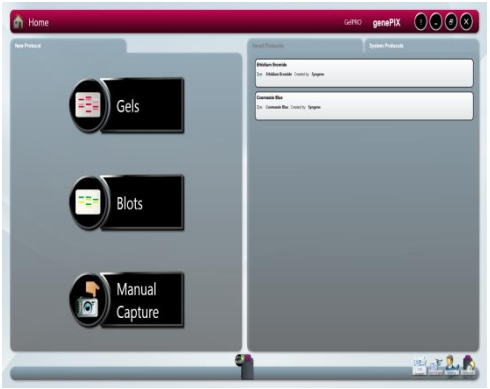
By default when you save the Configuration that you have just created, the software will only allow you to access it. This behaviour can be modified using the two checkboxes at the bottom left of the pop-up.

- 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 GenePIX to accurately duplicate the GelPro 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 appears on the Home screens, eg on the Standard View Home screen:



NEW CONFIGURATION - ADDED TO TOP OF LIST

To create a Configuration for a **Blot** from the Standard View Home screen:

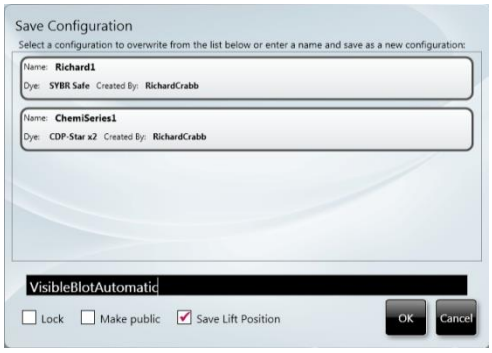
Work through the following process; select the Blots icon

, select your sample type/imaging type, select your dye, position your sample, and capture an image.

3. 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. **VisibleBlotAutomatic**.

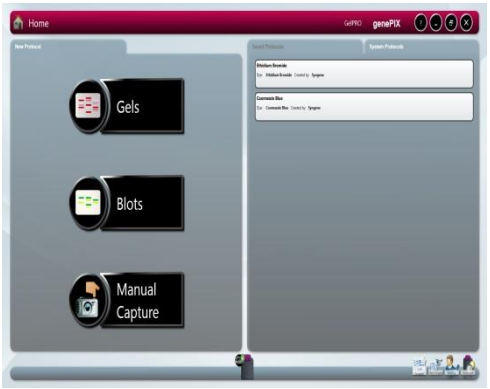
By default when you save the Configuration that you have just created, the software will only allow you to access it. This behaviour can be modified using the two checkboxes at the bottom left of the pop-up.

- 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 GenePIX to accurately duplicate the GelPro 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 CONFIGURATION - ADDED TO TOP OF LIST

In Auto Image Capture Mode

To create a Configuration in Auto Image Capture mode:

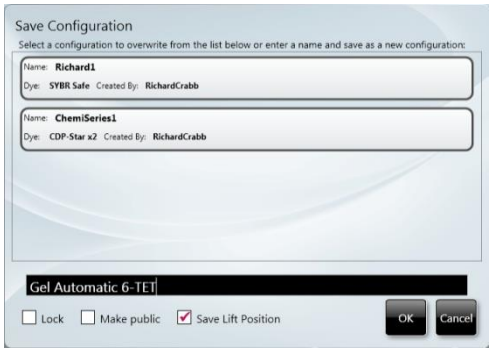
4. Work through the workflow for the type of test sample that you are going to image, i.e. Step 1 - Sample selection, Step 2 - Dye selection, Step 3 - Protocol selection, Step 4 - Sample positioning, and capture an image.

5. 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 GenePIX to accurately duplicate the GelPro 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 appears on the Home screens, eg on the Classic View Home screen:

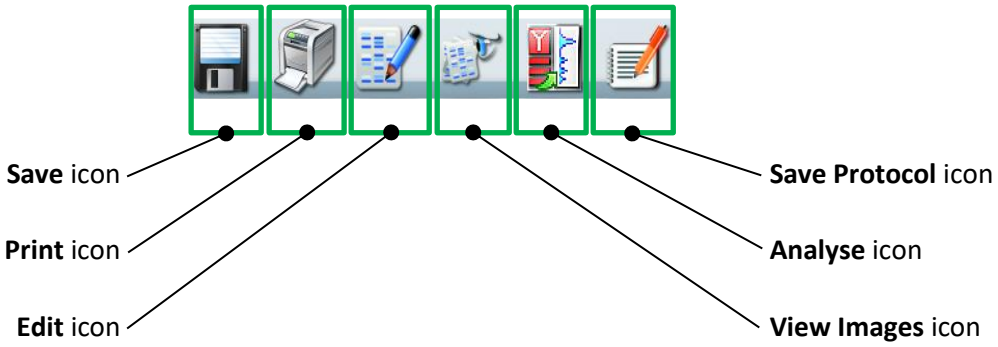
NEW CONFIGURATION - ADDED TO TOP OF LIST

In Manual Image Capture Mode

To create a Configuration in Manual Image Capture mode:

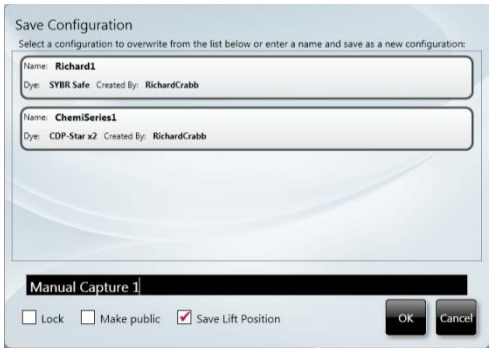
1. Work through the Manual Image Capture process described previously and capture an image.

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



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

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. **Manual Capture 1**.

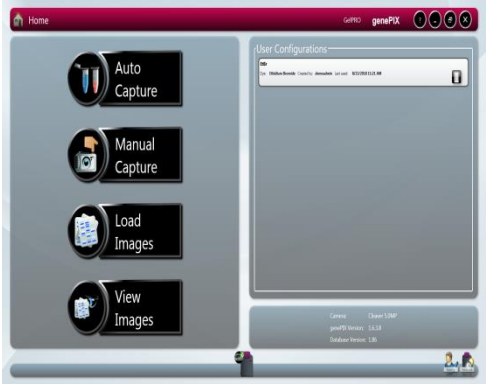
By default when you save the Configuration that you have just created, the software will only allow you to access it. This behaviour can be modified using the two checkboxes at the bottom left of the pop-up.

- 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 GenePIX to accurately duplicate the GelPro 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.

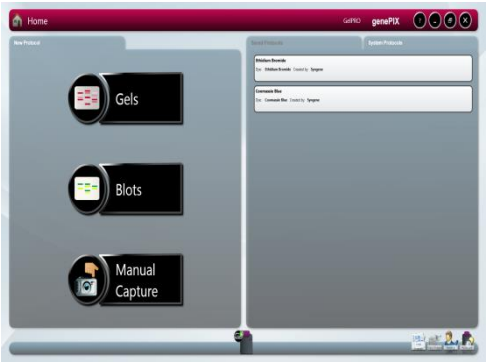
The new saved Configuration appears on the Home screens, eg on the Classic View Home screen:



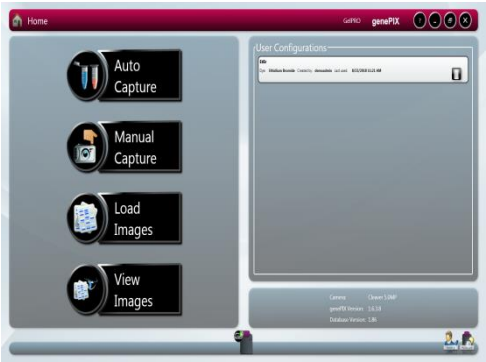
NEW CONFIGURATION - ADDED TO TOP OF LIST

Using Configurations

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



STANDARD VIEW HOME SCREEN



CLASSIC VIEW HOME SCREEN

Opening a Configuration

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 difined protocols displayed.

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

Opening an exisiting Configuration/Protocol

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

1. On the Home screen select the Configuration you want to use.

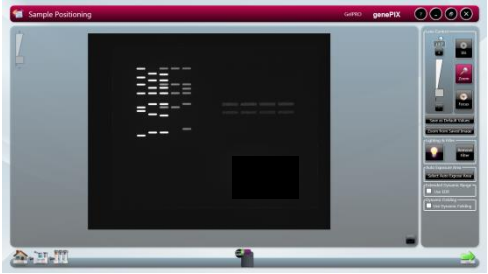
   On the Standard View Home screen you can sort and search saved configurations:

   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.

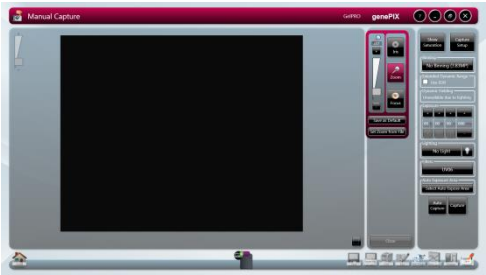
   The software will configure your GelPro Instrument based on the data in the Configuration file and will take you to the following point in the image capture process:

   If the Configuration 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:



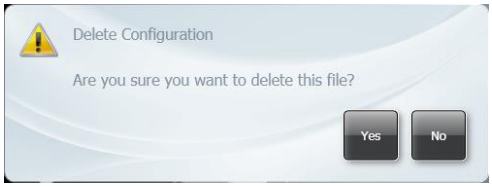
TYPICAL MANUAL CAPTURE SAMPLE POSITIONING

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

Deleting a Configuration

To delete a Configuration from the Home screen:

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



DELETE CONFIGURATION POP-UP

2. In the **Delete Configuration** pop-up select the **Yes** button.

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

Editing a Saved Configuration

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

STANDARD VIEW HOME SCREEN

CLASSIC VIEW HOME SCREEN

To edit a previously saved Configuration, first open the Configuration 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.

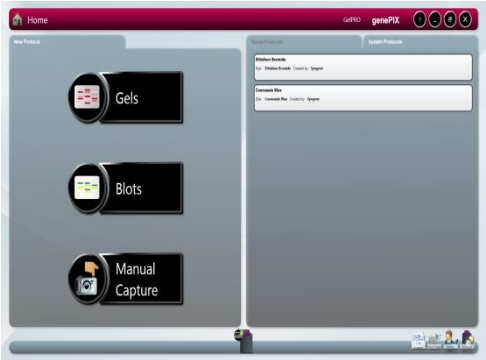
- For Auto Image Capture Sample Positioning screen refer to **Automatic Image Capture Mode**.
- For Manual Capture screen refer to **Manual Image Capture Mode**.

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 Configuration**.

IMAGE FUNCTIONS

Load Images Screen

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



STANDARD VIEW HOME SCREEN

CLASSIC VIEW HOME SCREEN

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

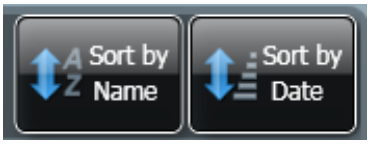
on the Classic View Home screen. This displays the Load Images screen.

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.

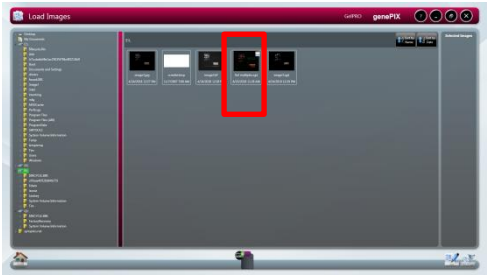
- Images displayed in the central pane of the Load Images screen can be sorted by two parameters; **Sort by Name** or **Sort by Date**. Select one of the two icons at the top of the central image pane.

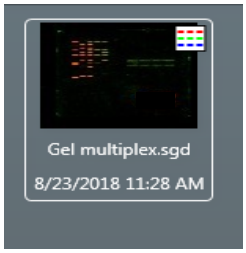


SORT ICONS

- **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.

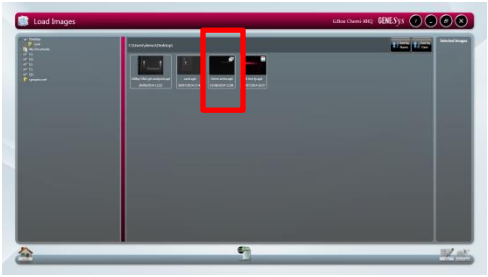
- Multiplexed images can be identified by a pattern of coloured dashes in the top right hand corner of the thumbnail image, as shown below:





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.

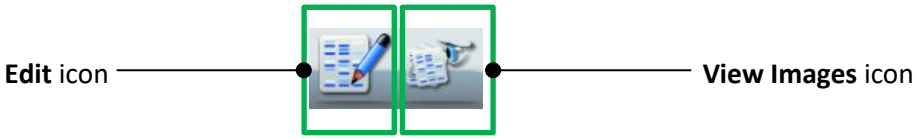
- Selecting an image or images in the central pane adds the selected image or images to the **Selected Images** pane. At the same time the image(s) selected in the central pane turn green, as shown below.

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

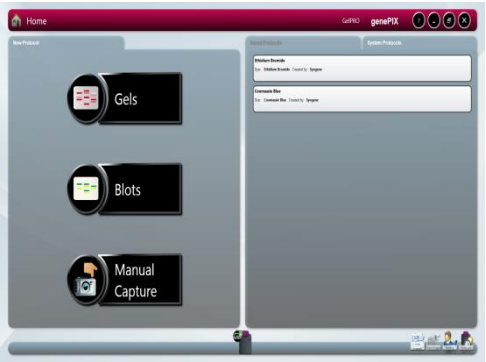
Once you have located your image(s) using the Load Images screen there are two image actions available; **View Images** and **Edit**. The two **Image Action** icons are displayed at the bottom of the Load Images screen.



- 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:



STANDARD VIEW HOME SCREEN

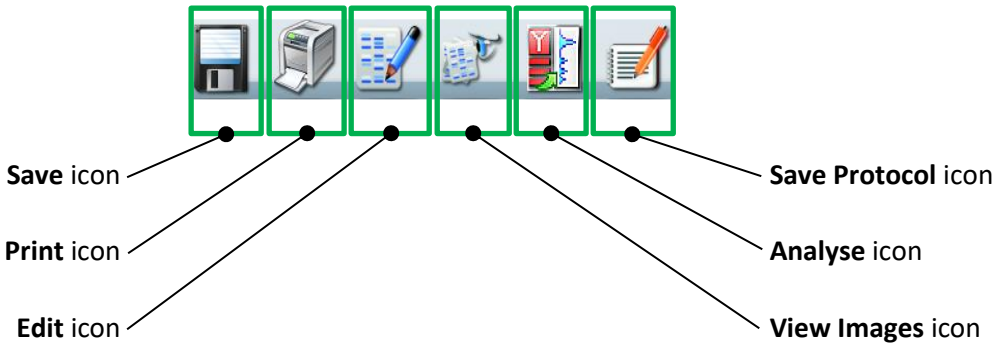
CLASSIC VIEW HOME SCREEN

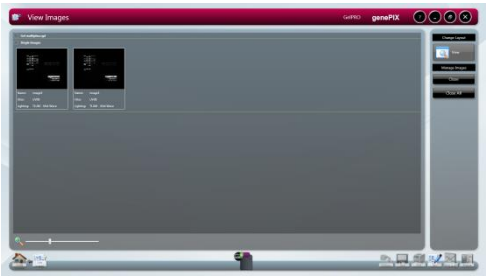
- The View Images function is only available when captures have been made during the current GenePIX session and images have been saved, are unsaved, or when previously saved images have been selected using the Load Images function.
- From the Standard View Home screen - by selecting the **View Images** icon .
- From the Classic View Home screen - by selecting the **View Images** icon

.

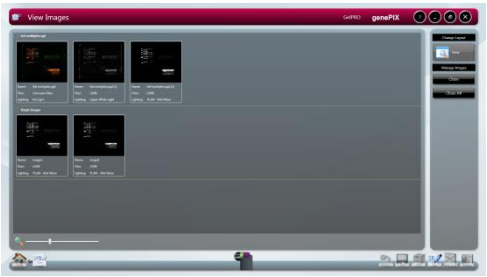
- The View Images screen can also be accessed from any other screen displaying the **View Images** icon in the **Image Action** icons.

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



VIEW IMAGES SCREEN - SINGLE AND MULTIPLEXED IMAGES DISPLAYED

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

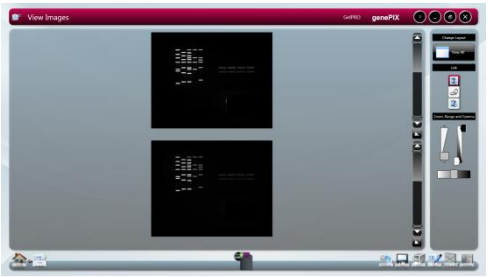
CHANGE LAYOUT

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

CHANGE LAYOUT CONTROLS

By default the View Images screen opens with the **File Display** button selected and the **Compare** button greyed-out (unavailable). The **Compare** button becomes active once files are selected in the View Images main pane.

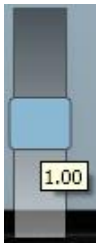
Up to four images can be selected and compared. Selecting the **Compare** button displays the Compare Images version of the View Images screen.



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.

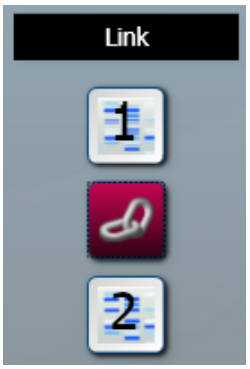


GAMMA SLIDER

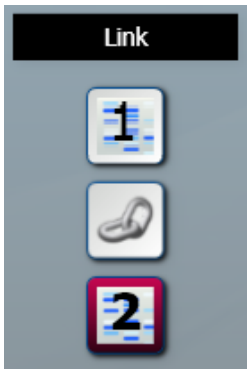
- **Scroll** bars allow you to view the entire area of an image. A horizontal scroll bar appears when the **Zoom** function is used on an image.

The right hand pane contains the following controls:

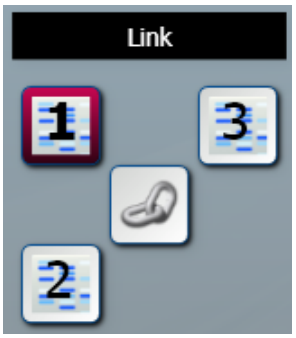
- The **Change Layout** controls.
- The **Link** controls.



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.

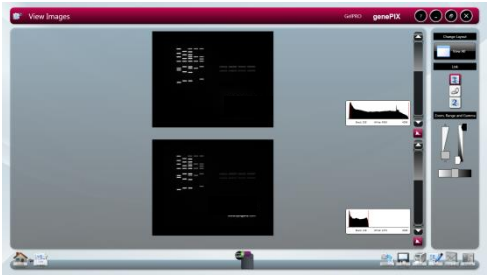
With the images unlinked, adjustments made using the **Scroll** bars or the **Zoom and Range** controls are applied only to the selected image. The selected image is indicated in the **Link** boxes by the selected image number being outlined red.

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, 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.

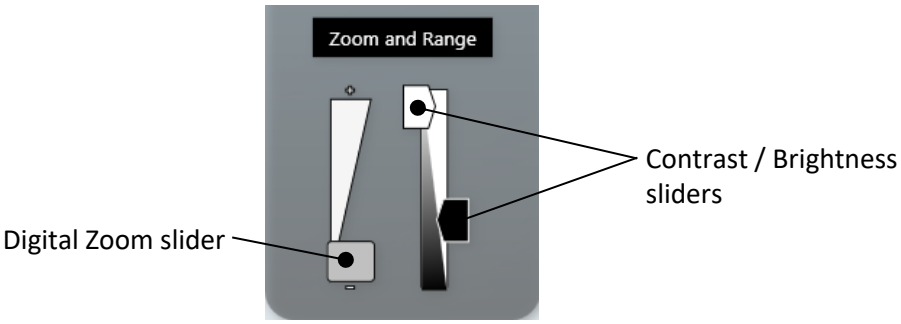
The histogram is a graph showing the number of pixels in the image at each different intensity value found in that image. For a 16-bit image there are a possible 65535 different intensities so the histogram will graphically display 256 numbers showing the distribution of pixels amongst those grayscale 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.

- 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

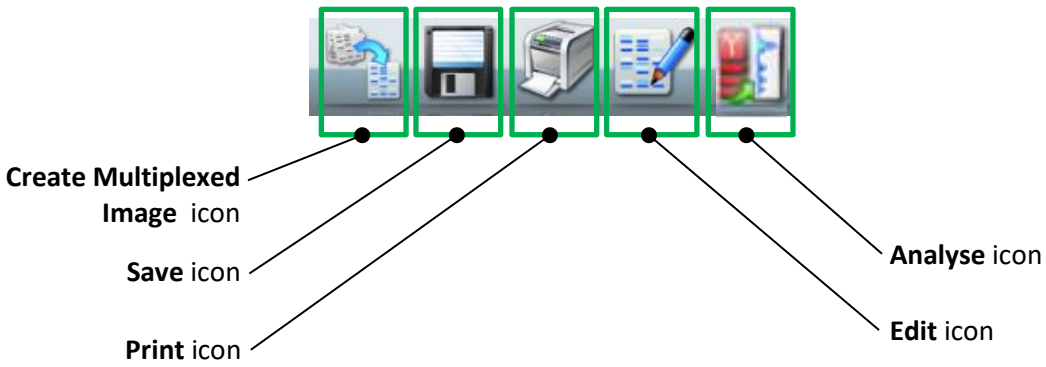
Selecting the arrow Single Images (inactive) Single Images (active)next to an image title on the View screen hides the image(s) associated with that title, i.e. the thumbnails are not displayed but the image title is still displayed. This provides more area for the other images to be displayed in. The 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

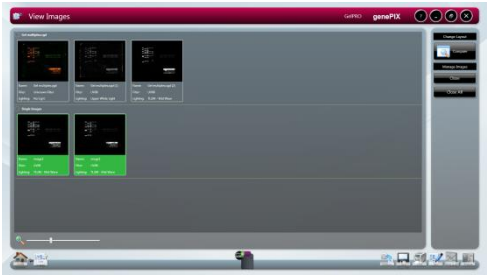
More than one single image can be combined to produce a new mutliplexed image using the **Create Multiplexed Image** icon which is displayed with the **Image Action** icons at the bottom right of the screen. The **Multiplexed Image** icon only becomes active once files are selected in the View Images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

1. 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.

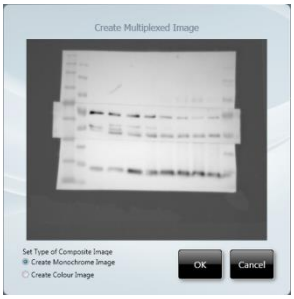


CREATE MULTIPLEXED IMAGE - IMAGES SELECTED

2. Select the Create Multiplexed Image button . This displays the **Create Multiplexed Image** pop-up. This shows what the multiplexed image will look like.

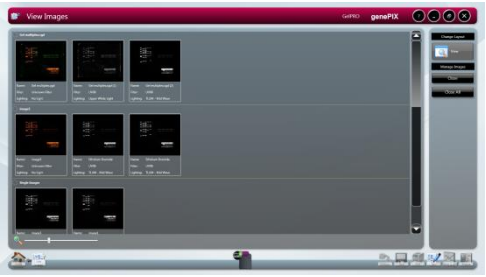
   Two options are available using the **Set Type of Composite Image** buttons; **Create Monochrome Image** or **Create Colour Image**.

MULTIPLEXED IMAGE - COLOUR IMAGE



MULTIPLEXED IMAGE - MONOCHROME IMAGE

3. 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.

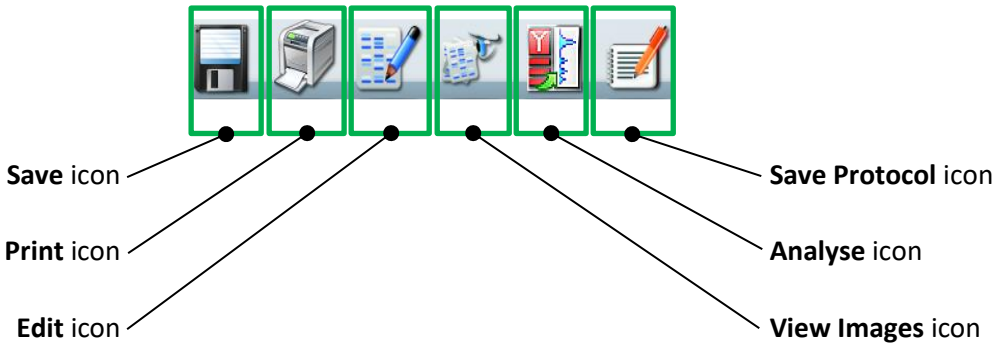


Image Edit Screen - Image Editing Main Options

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 GenePIX 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 .

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

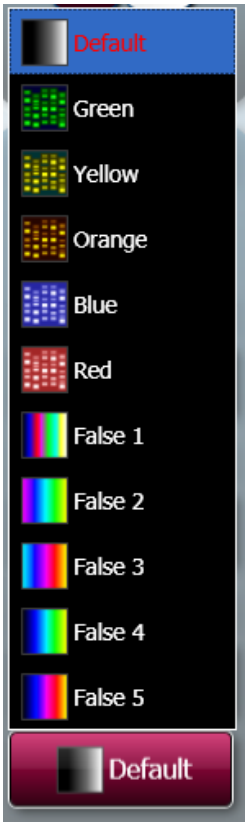
An image can be copied to the Windows Clipboard by selecting the **Copy** button Copy . This allows you to paste the image into another package.

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 Saturation .

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 Default 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.

Image Edit Screen - Annote 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:

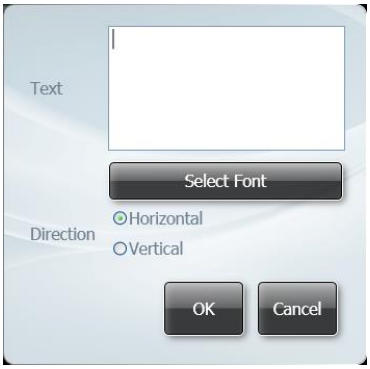
Select tool		Polygon tool	
Pan tool		Line tool	
Text tool	Abc	Arrow tool	
Fill/No Fill tool	Fill	Select Colour tool	
Rectangle tool		Select Line Style tool	
Ellipse tool			

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 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 cab 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.

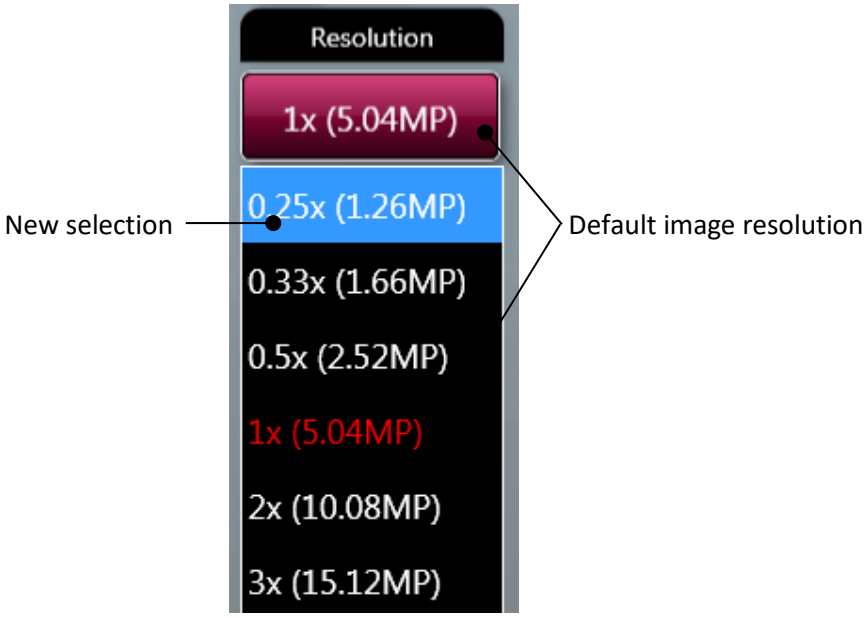
The **Define area to be cropped** tool enables you to select an area of the selected image so that you can isolate the chosen portion of the image from the rest of the image in order to view that portion more closely. Select the **Define area to be cropped** icon and draw a rectangle that covers the 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

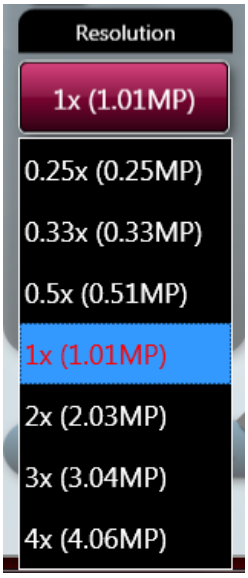
The **Resolution** tool can be used to change the resolution of the selected image. When the **Enhancement Tools** option is selected the system displays the current/default resolution of the selected image in the **Resolution** box.

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:



RESOLUTION MENU

Note: If you use the **Resolution** option, you can make and undo one change of image resolution. Having made a change and used the **Undo** button to revert to the original resolution, the **Resolution** option is greyed out and is unavailable. To try another resolution you must dismiss the image and reload it from the **Load Images** screen.

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.

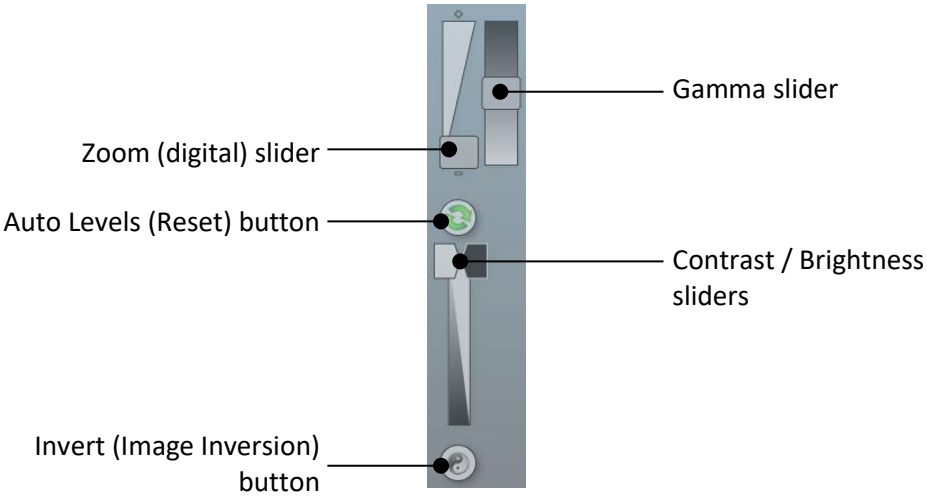


IMAGE SLIDER CONTROLS

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.

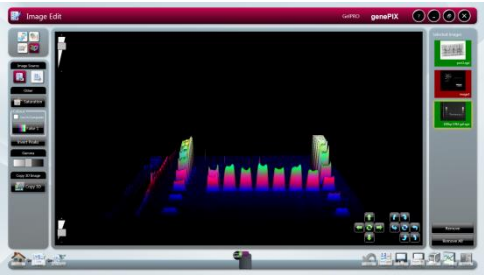


IMAGE EDIT SCREEN - 3D VIEW OPTION

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**.

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.

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		Rotate Right control	
Reset Pan button		Rotate Forward control	
Pan Down control		Rotate Anti-clockwise control	
Pan Left control		Reset Rotation button	
Pan Right control		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.

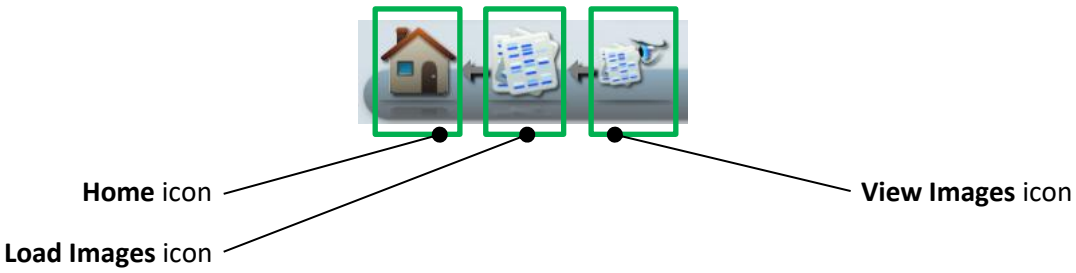
SCALE SLIDER

Image Edit Screen - All Options Common Controls

ACTION ICONS

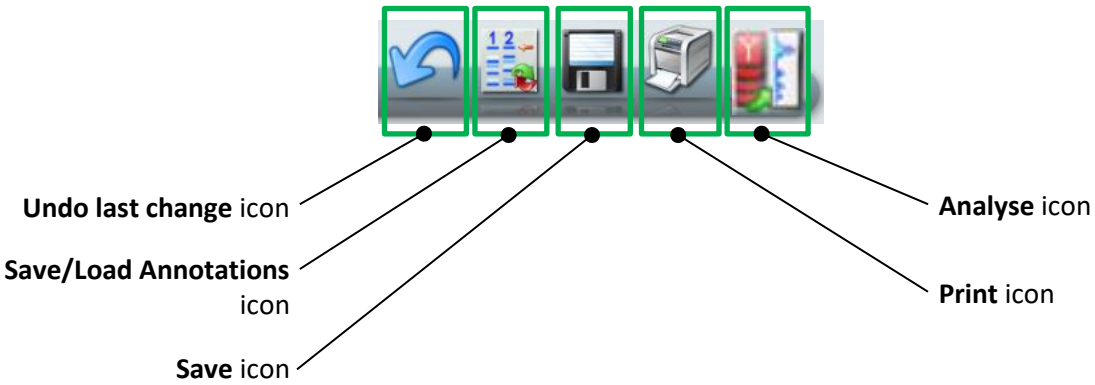
All four of the Image Edit main option screens provide the same **Action** icons across the bottom of the screen.

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



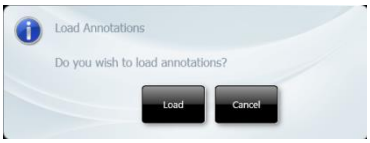
- Selecting the **Load Images** icon takes you back to the Browse Images screen, allowing you to search for images.
- Selecting the **View Images** icon takes you back to the View Images screen, allowing you to view and compare captured images.

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.



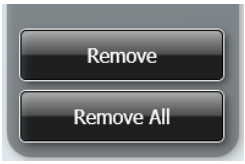
SAVE / LOAD ANNOTATIONS DIALOGUE BOXES

RIGHT HAND PANE

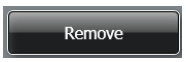
The right hand pane of all four of the Image Edit main option screens provides the same information.

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 GenePIX software:

The **Home** icon when selected takes you back to the GenePIX Home screen.

The **Save** icon is used to save captured/modified images.

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

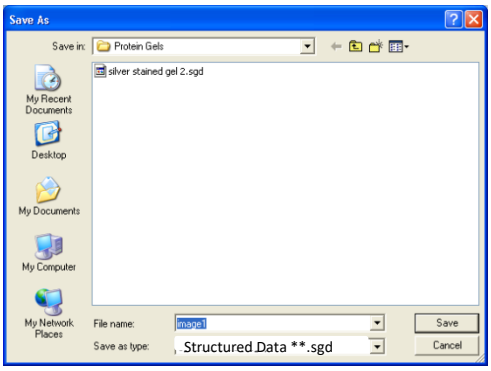
The **Analyse** icon is used to export an image to the GeneQUANT package for further analysis.

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

Saving Images

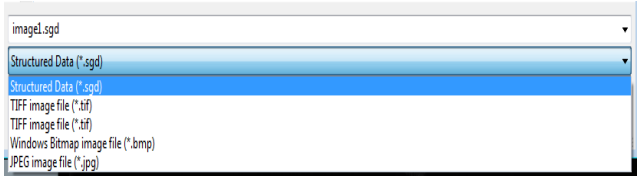
Any time that an image is captured or in some way changed, e.g. annotated, colour washed for increased contrast, etc, and the **Save** icon is active, using the GenePIX software you have the opportunity to save the image.

Select the **Save** icon from the bottom of the screen. This displays the standard Windows™ **Save As** screen.



SAVE AS SCREEN

- By default the software navigates to the default or last used save location.
- A different save location can be specified using the drives display down the left hand side and/or the **Save in:** field.
- You can specifiy a name for your file using the **File name:** field. The GenePIX software will give the image a default name of **imageX**, where X is a sequential number starting at 1.
- You can specify a file type for your file using the **Save as type:** field. The GenePIX software defaults to the Cleaver Scientific Data format file (*.sgd). Other file types available are:



SAVE FILE FORMAT TYPES

Select file destination, filename and file type, then select the **Save** button.

Note: For all file types the image will be saved as captured. This will save the image as originally captured- any brightness and contrast adjustments that have been made to the image since capture will not be saved. To save any changes to your image in Tiff, jpeg and bmp formats please use export to publication button.

SAVING ADDITIVE SERIES IMAGES

If you have captured a set of images using the **Manual Capture - Additive Series** function, the **Save** function changes. You can select from the following options:

OPTION 1 Save the additive image plus all constituent images, as a single file.

Select the **Save** icon , the following message pop-up will appear:

SAVING ADDITIVE SERIES CAPTURE POP-UP

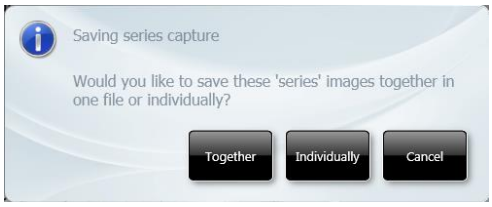
Select the **Together** button, you get the **Save As** screen.

Select file save location, name and type as detailed previously, or accept the system defaults.

The system saves all of the images in the series; each of the individual captures plus the additive image, in a single .sgd file.

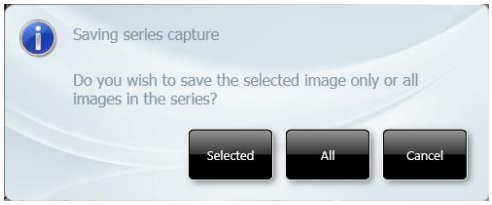
OPTION 2 Save all constituent captured images, as discrete files.

Select the **Save** icon , the following message pop-up will appear:



SAVING ADDITIVE SERIES CAPTURE POP-UP 1

Select the **Individually** button, the following message pop-up will appear:



SAVING ADDITIVE SERIES CAPTURE POP-UP 2

Select the **All** button to continue, you get a copy of the **Save As** screen for each of the captured images.

Select file save location, name and type as detailed previously for each image file. Select the **Save** button.

Once each capture has been saved, the following message pop-up will appear:

SAVING DISPLAYED IMAGE POP-UP

Make your choice based on the message and how you intend to use the saved image.

Select the **As displayed** button to save the image as it appears on the screen - complete with any brightness and contrast adjustments that have been made to the image.

Select the **As captured** button to save the image as it was originally captured - any brightness and contrast adjustments that have been made to the image since capture will not be saved.

Note: This process saves all of the captured images, but only the captured images, it does not save the additive image.

OPTION 3 Save selected constituent captured images, as discrete files.

Select the image you want to save.

Select the **Save** icon , the following message pop-up will appear:

SAVING ADDITIVE SERIES CAPTURE POP-UP 1

Select the **Individually** button, the following message pop-up will appear:

SAVING ADDITIVE SERIES CAPTURE POP-UP 2

Select the **Selected** button to continue, you get the **Save As** screen.

Select file save location, name and type as detailed previously for the image file. Select the **Save** button.

Once the image has been saved, the following message pop-up will appear:

SAVING DISPLAYED IMAGE POP-UP

Make your choice based on the message and how you intend to use the saved image.

Select the **As displayed** button to save the image as it appears on the screen - complete with any brightness and contrast adjustments that have been made to the image.

Select the **As captured** button to save the image as it was originally captured - any brightness and contrast adjustments that have been made to the image since capture will not be saved.

Note: This process saves only a single selected captured image, it does not save the additive image.

Once you have saved your selected image, you then have the option of choosing and saving another image from the series. In this way you can choose to save as many or as few images from a series as you want.

SAVING MULTIPLEXED IMAGES

If you have captured or created a multiplexed image the **Save** function changes. You can select from the following options:

OPTION 1 Save the combined image plus all constituent images, as a single file.

Select the combined image.

Select the **Save** icon , the following message pop-up will appear:

SAVING MULTIPLEX CAPTURE POP-UP

Select the **Together** button, you get the **Save As** screen.

Select file save location, name and type as detailed previously.

OPTION 2 Save the combined image plus all constituent images, as discrete files.

Select the combined image.

Select the **Save** icon , the following message pop-up will appear:

SAVING MULTIPLEX CAPTURE POP-UP

Select the **Individually** button, you get a non-compliance message pop-up:

SAVING NON-GLP IMAGE! POP-UP

Note: Saving the constituent image files of a multiplexed image as discrete files is considered to be non-GLP laboratory practice as it means that an individual file could be deleted and the full audit trail of the multiplexed image would therefore be lost.

Select the **Yes** button to continue, you get a copy of the **Save As** screen for each of the images (the combined image plus each of the individual constituent images).

Select file save location, name and type as detailed previously for each image file.

OPTION 3 Save selected image(s) in any selected combination.

Select the images you want to save.

Select the **Save** icon , you get a copy of the **Save As** screen for each of the selected images.

Select file save location, name and type as detailed previously for each image file.

OPTION 4 Saving an edited multiplexed image.

If you are in **Image Edit** mode and you make a change to a multiplexed image and then select the **Save** icon , the following message pop-up will appear:

SAVING MULTIPLEX CAPTURE POP-UP

Select the **Together** button, you get the **Save As** screen.

Select file save location, name and type as detailed previously.

Select the **Individually** button, the following message pop-up will appear:

EDITED IMAGE SAVING MULTIPLEX CAPTURE POP-UP

Select the **Selected** button you get a copy of the **Save As** screen for each of the selected images.

Select file save location, name and type as detailed previously for each image file.

Select the **All** button, you get a non-compliance message pop-up:

SAVING NON-GLP IMAGE! POP-UP

Note: Saving the constituent image files of a multiplexed image as discrete files is considered to be non-GLP laboratory practice as it means that an individual file could be deleted and the full audit trail of the multiplexed image would therefore be lost.

Select the **Yes** button to continue, you get a copy of the **Save As** screen for each of the images (the combined image plus each of the individual constituent images).

Select file save location, name and type as detailed previously for each image file.

Export for publication

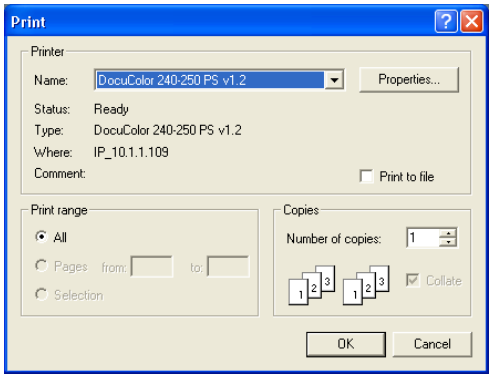
Export for publication feature in GenePIX allows the user to adjust the resolution, contrast and brightness of an image ensuring that it is of publication quality. The user can also select to save the image in the following file formats Tiff, Bmp and Jpg.

EXPORT FOR PUBLICATION-POP_UP

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 GenePIX 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.

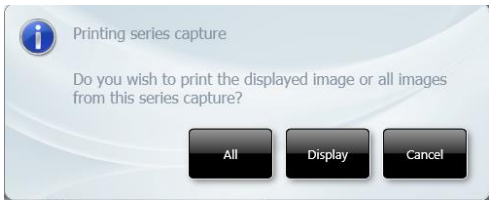
ADDITIVE SERIES CAPTURES

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

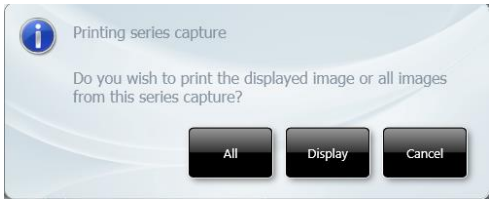
Select the **All** button. All of the constituent image captures print. The additive image does not print.

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 .

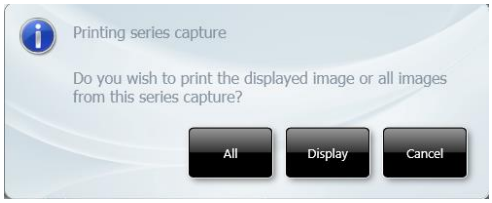
The selected constituent images print.

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

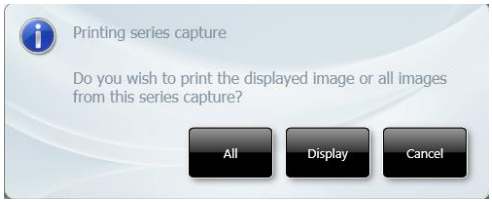
Select the **All** button. All of the constituent image captures print. The additive image does not print.

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

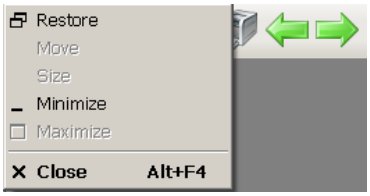
If the **Full Report** option is selected on the User Preferences screen, when you select the **Print** icon you can view pages of the report and access the print settings screens using the icons at the top of the screen.

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 GelPro Instrument

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

Cleaning a GelPro Instrument

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

The outside of the GelPro 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.

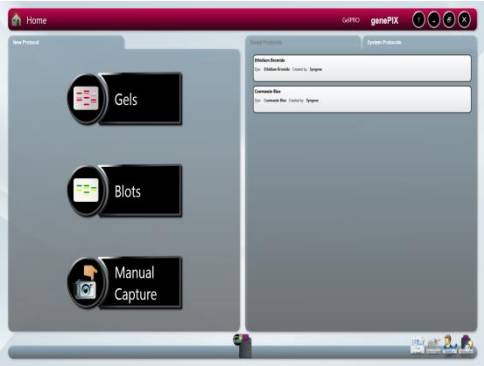
Avoid spilling any liquid into the body of the instrument and clean any external spills immediately. If any liquid enters the main body of the instrument, make the instrument inoperative and contact the supplier.

Contacting Cleaver Scientific

If it becomes necessary to contact Cleaver Scientific the following information will be required:

- Unit Serial Number
- Camera
- GenePIX 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 GenePIX Home screens, as shown below:



STANDARD VIEW HOME SCREEN

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

ABOUT GenePIX POP-UP

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

On the Classic View Home screen, the system information is also displayed in the bottom right hand pane.

CLASSIC VIEW HOME SCREEN

Further information concerning the GelPro Instrument can be found on the Cleaver Scientific website; www.cleaverscientific.com.

Technical support for your GelPro Instrument can be accessed by telephone or email:

Tel: +44 (0)1788 565300

Email: support@cleaverscientific.com

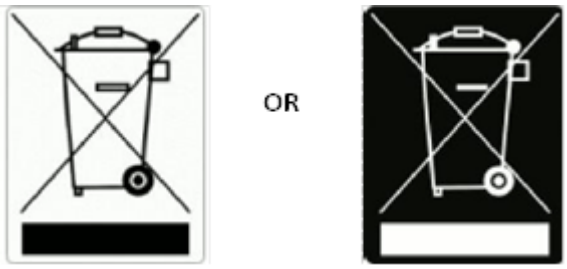
GelPro Troubleshooting

PROBLEM	POSSIBLE CAUSE	SOLUTION
Camera not connected or not responding.	Camera USB cable not plugged in. Software driver for the camera is missing.	Make sure all cables are connected as shown in Instrument Set-up and/or the Installation Quick Guide. Install camera driver. Press the refresh button on the GELPRO icon.
'Hardware not available' message displayed.	You do not have the correct filter or lighting for the dye you have selected. Check the 'hardware list' on the **Hardware** screen.	Contact support@cleaverscientific.com to upgrade your system. Programme in any extra lights or filters that you may have installed on the **Hardware** screen.
Dye not in list.	The dye that you are using is not currently listed in the database.	Contact support@cleaverscientific.com
Dye name is greyed out.	You do not have the appropriate hardware to image the dye that you have selected. Check the 'hardware list' on the **Hardware** screen.	Contact support@cleaverscientific.com to upgrade your system. Programme in any extra lights or filters that you may have installed on the **Hardware** screen.
Blue Light LED Transilluminator will not turn on.	Make sure the Transilluminator switch is in the ON position.	If the Transilluminator will not turn on then please contact support@cleaverscientific.com

DISPOSAL

Disposing of a GelPro

The Waste Electrical and Electronic Equipment (WEEE) Directive



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 GelPro 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 GelPro Instrument, contact Cleaver scientific at:

Website: www.cleaverscientific.com

Email: info@.cleaverscientificcom

Mail and telephone:

Cleaver Scientific

41 Somers Road

Rugby

Warwickshire

CV22 7DH

United Kingdom

Tel: +44 (0)1788 565300

Note: Products from other manufacturers may form a part of your GelPro 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.