SYNGENE

A DIVISION OF THE SYNOPTICS GROUP

PXi / PXi Touch User Guide

Issue 03
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NOTICE TO USERS

All possible care has been taken in the preparation of this User Guide, but Synoptics 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 PXi or PXi Touch 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 PXi / PXi Touch 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 PXi / PXi Touch System:

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

General Operating Conditions

PXi / PXi Touch Systems have been designed and tested in accordance with the safety requirements of the International Electrotechnical Commission (IEC). PXi / PXi Touch Systems conform to IEC61010-1 (Safety Requirements for electrical equipment for measurement, control and laboratory use) as it applies to IEC Class 1 (earthed) appliances, and therefore meet the requirements of EC directive 73/23/EEC.

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 PXi / PXi Touch System may be unsafe, make it inoperative. In particular, a PXi / PXi Touch 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

PXi / PXi Touch 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

PXi / PXi Touch 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 PXi / PXi Touch 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 PXi / PXi Touch 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 PXi / PXi Touch 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 PXi / PXi Touch 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 is only one User accessible fuse that may need to be replaced:

- This is located in the mains power socket on the rear panel of the PXi / PXi Touch instrument and is only accessible when the mains power cord has been removed.

To change the fuse:

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

- Gently pull out the fuse holder.
- Replace the fuse with a new fuse of the same type and rating. The fuse type is 20 mm x 5 mm IEC127 T 6.3 A H 250V for instruments in all countries.
- Replace the fuse holder.

Note: 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, IEC 60950 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 60364-4-443.
- Pollution Degree 2: Normally only non-conductive pollution occurs. Occasionally, however, temporary conductivity caused by condensation must be expected.

EMC Compliance

EC Directive

The PXi / PXi Touch System is designed and tested to meet the requirements of the EC directive 89/336/EEC and 93/68/EEC. The instrument complies with the EMC standard EN61326 (EMC standard for electrical equipment for measurement, control and laboratory use) and EN55011 (ISM) class A (rf emissions).

FCC Rules and Regulations

The PXi / PXi Touch 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 PXi / PXi Touch System uses a UV transilluminator and epi mid wave UV tubes. If the drawer is opened the image capture software will automatically switch off the UV light.

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 PXI/PXI TOUCH

Removing from the Packaging

Visual Inspection

Upon taking delivery of a new PXi/PXi Touch Instrument:

- Check the contents of the package 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 Syngene immediately

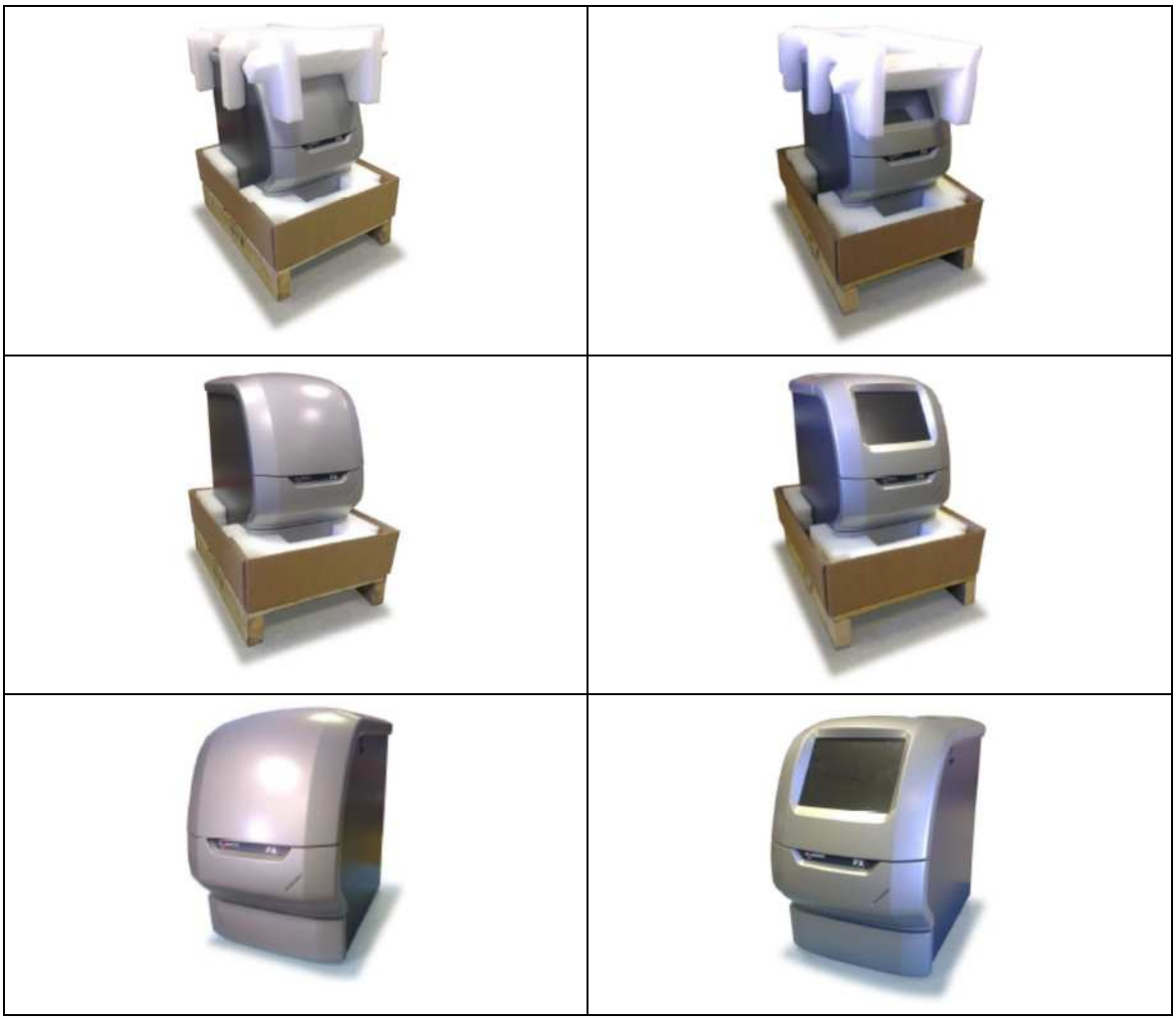
Unpacking the Box

To unpack a PXi/PXi Touch:

1. Remove the straps and open the box.
2. Remove the cardboard surrounding the PXi/PXi Touch.
3. Remove any loose-shipped accessories.
4. Carefully lift the PXi/PXi Touch Instrument out of the box and place it on a Laboratory bench.

WARNING	**A PXi/PXi Touch Instrument requires two people to lift it safely. A PXi/PXi Touch Instrument complete weighs approximately 31/37 kg.**

UNPACKING A PXi	UNPACKING A PXi TOUCH
	
	



Unpacking the PXi/PXi Touch Instrument and Accessories

5. Carefully remove the Front Cover and remove any packing materials/wrapping from around the Imager Unit in the top of the PXi/PXi Touch Instrument.

- Remove the Front Cover by holding both sides of the Cover and lifting it vertically upwards until its locating pins are free of the retaining holes in the Instrument casing.

- Replacement is a simple reversal of removal, hold the cover by both sides and lower it onto the Instrument making sure that the locating pins on the Cover slot into the retaining slots on the Instrument casing.

Note: On a PXi Touch Instrument be careful of the lead connecting the PC/Touch Screen Unit to the Instrument. The PC/Touch Screen Unit needs to be supported whenever the Front Cover is removed.

6. Carefully unpack the loose-shipped accessories.

TYPICAL ACCESSORIES	
PXi	**PXi Touch**
Mains power cord - suitable for country of use Darkroom to PC USB lead Camera to PC USB lead Pre-ordered Emission Filters Pre-ordered epi LED Modules (in pairs) Epi UV (optional) UV transilluminator (optional) Ultra-slim blue light LED Transilluminator (optional) Black anti-reflective screen White light pad (optional)	Mains power cord - suitable for country of use Pre-ordered Emission Filters Pre-ordered epi LED Modules (in pairs) Epi UV (optional) UV transilluminator (optional) Ultra-slim blue light LED Transilluminator (optional) Black anti-reflective screen White light pad (optional)

OVERVIEW

PXi/PXi Touch

The PXi and PXi Touch are high resolution, multi-application image analysis systems. PXi/PXi Touch can be used for a wide range of imaging applications including; chemiluminescence, fluorescent blots and gels, visible blots and gels, and even 2D gels.

The basic PXi/PXi Touch Instrument comprises two main components:

Darkroom Drawer - this provides a completely black environment into which the sample to be imaged is enclosed. Samples can be placed into the Darkroom Drawer directly onto the standard black anti-reflective screen or onto an optional UV Transilluminator or blue light LED Transilluminator.

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:

- LED lights of known wavelengths (red, green, blue and IR) located above the Darkroom Drawer on the front and back of the instrument. These illuminate the sample from above. These are modular units, replaceable by the operator.
- UV transilluminator (UV wavelengths 254-nm, 302-nm and 365-nm) this illuminates the gel from below.
- UV lamps of known wavelengths (254-nm, 302-nm and 365-nm) located above the LED light modules on the front of the instrument. These illuminate the sample from above.
- LED lights on the blue light LED Transilluminator, providing side and through lighting of samples.

In addition, white LED lights are provided at the front and back of the Darkroom Drawer to provide general illumination when positioning and setting up samples in the Drawer.

Between the Darkroom Drawer 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 GeneSys software.

PXi/PXi Touch has a new generation of camera - having 4, 6 or 9 million pixels, giving the system outstanding sensitivity.

GeneSys Software

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

The basic PXi Instrument is controlled and operated by the GeneSys software running on an external PC operating a standard Microsoft Windows environment. Two cable connections are required between the PC and the PXi Instrument; one for the Darkroom, and one for the Camera.

The PXi Touch Instrument takes the basic PXi Instrument and adds a built-in PC and touch screen display unit. The built-in PC and display unit operates a standard Microsoft Windows environment running the GeneSys software - making the external PC unnecessary.

The raw data recorded by the digital camera is processed by the GeneSys software to generate the images and technical files which are the PXi / PXi Touch Instrument's basic outputs.

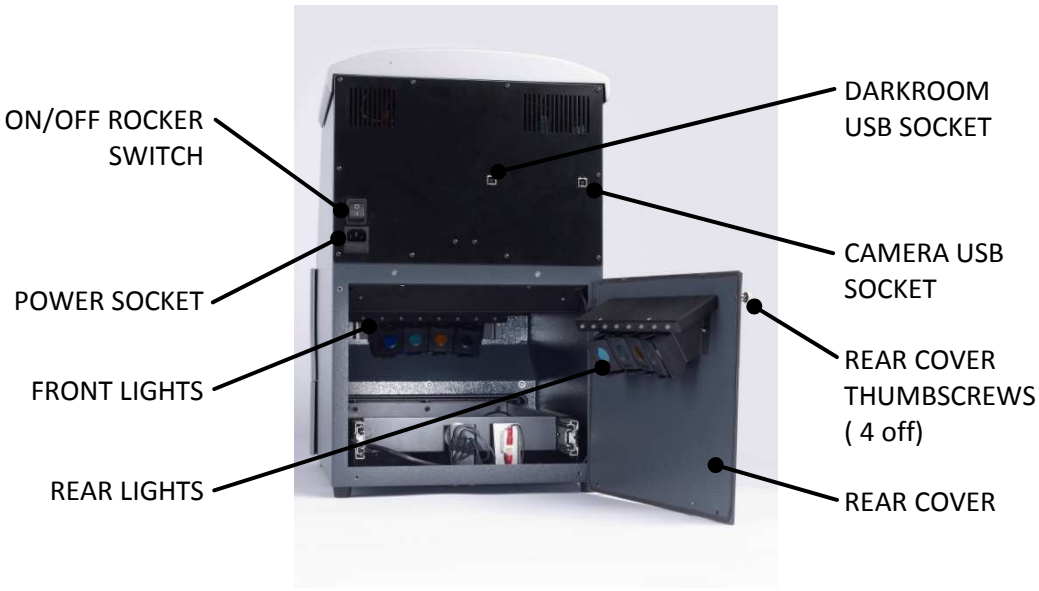
The Genesys software provides both automatic and manual modes of control of the PXi/PXi Touch hardware and has an inbuilt database of application specific data which it uses in automatic capture mode to optimise the hardware configuration in order to obtain the optimal sample image. The database contains 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

PXi - FRONT

PXi Touch - FRONT

PXi - FRONT VIEWS - DARKROOM DRAWER OPEN



PXi/PXi TOUCH – REAR

SOFTWARE INSTALLATION

Minimum System Requirements

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

Windows XP Professional SP3 (32 bit version only)
or
Windows 7 and 8 Professional

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

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

Software Installation

A PXi Instrument needs to have the GeneSys software installed on the associated PC from which the instrument is to be controlled. A PXi Touch Instrument will have had the GeneSys software pre-installed and configured at the factory.

The GeneSys software can only be installed from a Windows account that has Administrator rights. Installation is performed in the following order:

1. Run the Set-up Program
2. Select the 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 GeneSys USB stick/CD ROM and run the **Set-Up Program**. The following screen will appear:

SETUP - GeneSys - WELCOME TO THE GeneSys SETUP WIZARD SCREEN

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

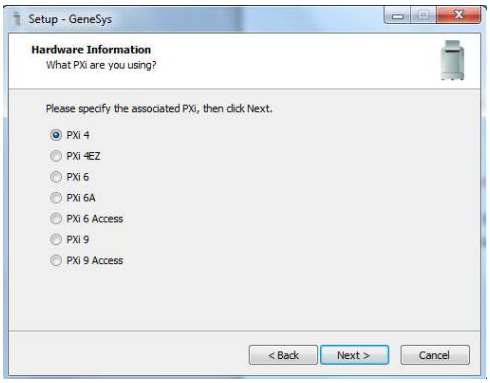
Select the Instrument Hardware Information

SETUP – GeneSys - FIRST HARDWARE INFORMATION SCREEN - INSTRUMENT TYPE

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

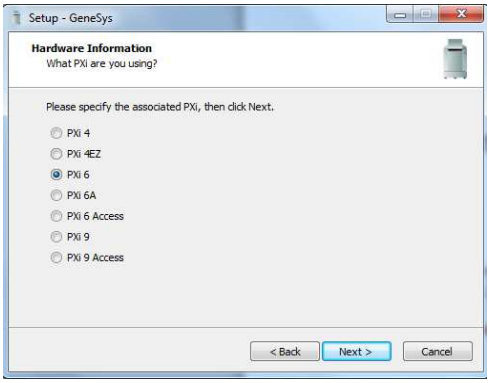
SETUP – PXi RADIO BUTTON SELECTED

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



SETUP - GeneSys - SECOND HARDWARE INFORMATION SCREEN - INSTRUMENT MODEL

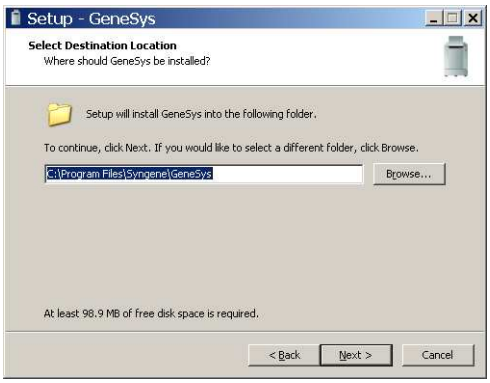
5. Select the particular model of instrument type that you have by selecting the appropriate radio button, i.e. PXi 6 for a PXi with a 6 megapixel Camera.



SETUP - PXi 6 (6MP CAMERA) SELECTED

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

Select the Installation Folder Destination Location



SETUP - GeneSys - SELECT DESTINATION LOCATION SCREEN

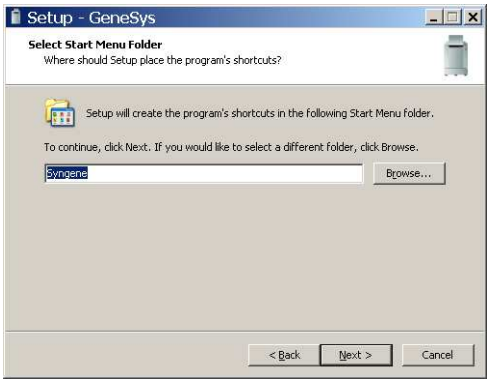
7. Select the folder in which you would like the GeneSys software to be installed:

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

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

8. The Setup - GeneSys Select Start Menu Folder screen will appear.

Select the Start Menu Folder



SETUP - GeneSys - SELECT START MENU FOLDER SCREEN

9. Select the folder in which you would like GeneSys program start shortcut to be installed:

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

10. 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

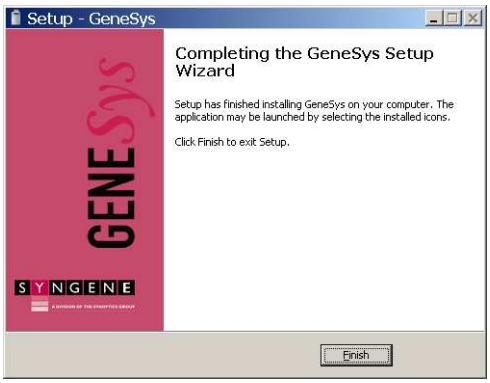
11. Click on the **Next >** button. The Wizard (a sub-program, part of the GeneSys software) will automatically install the necessary device drivers on the PC that the hardware device you selected previously needs in order to operate.

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

12. Click on the **Finish** button.

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



SETUP - GeneSys - COMPLETING THE GeneSys SETUP WIZARD SCREEN

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

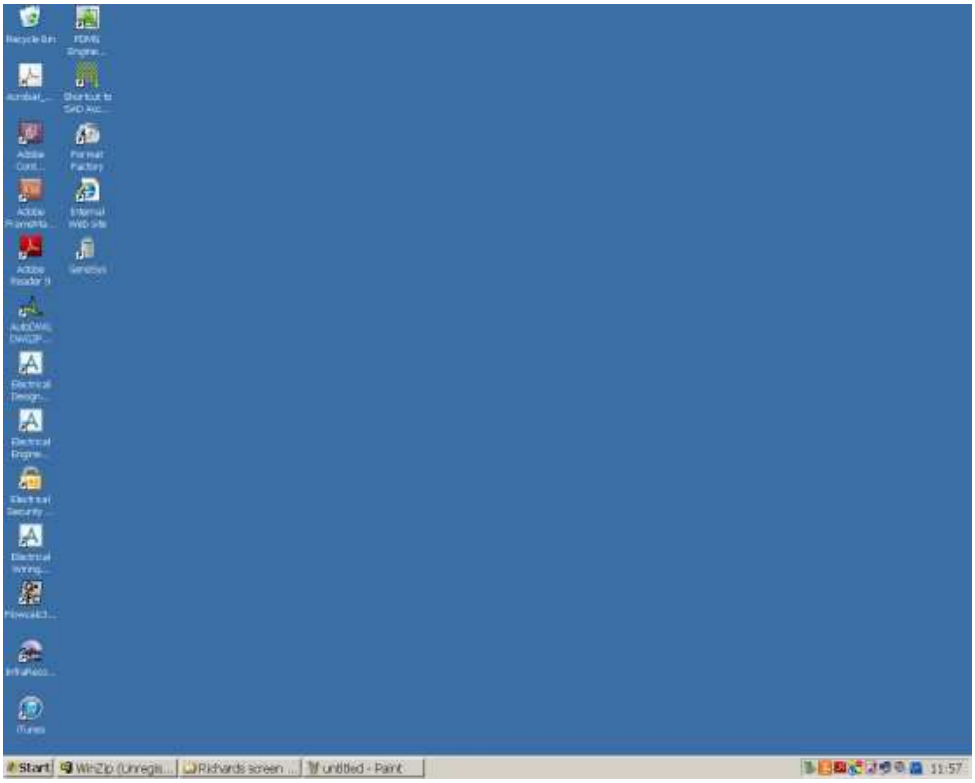
15. Remove the GeneSys USB stick/CD ROM.

Your GeneSys software is now ready for use.

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

16. Check your desktop, you should have a GeneSys icon visible, i.e. 

.



TYPICAL DESKTOP WITH GeneSys ICON

OPERATING

Operator Controls

Rear Panel

The rear panel of the PXi/PXi Touch Instrument contains a single User control:

- An ON/OFF rocker switch, used for energising/de-energising the instrument.

Touch Screen

As an aid to cleanliness and good housekeeping the PXi Touch uses a touch screen interface. 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 PXi Instrument function as normal.

Instrument Set-up

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

PXi Instrument

Make the following cable connections:

1. Connect the mains power cord between a power supply socket and the Instrument.

 **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.**

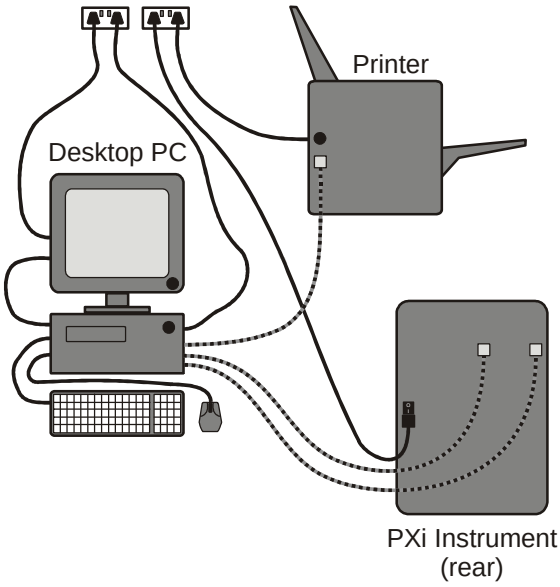
2. Connect the Darkroom to PC USB lead between the Darkroom USB socket on the Instrument and a USB slot on the PC.
3. Connect the Camera to PC USB lead between the Camera USB socket on the Instrument and a USB slot on the PC.

PXi Touch Instrument

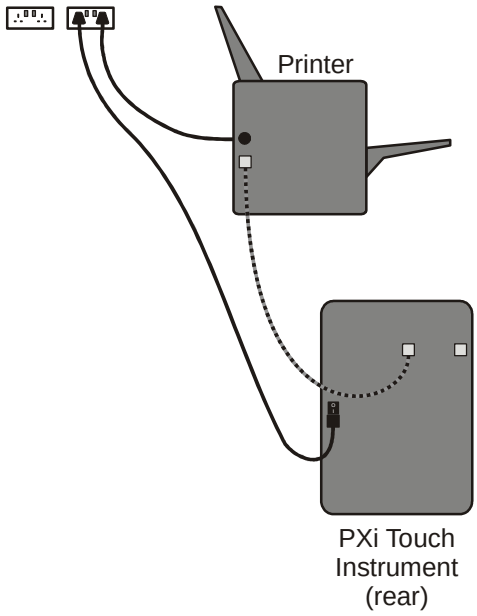
Make the following cable connections:

1. Connect the mains power cord between a power supply socket and the Instrument.

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.**



PXi INSTRUMENT - POWER AND DATA CONNECTIONS



PXi TOUCH INSTRUMENT - POWER AND DATA CONNECTIONS

Operator Mountable Accessories

Lights

The PXi/PXi Touch Instrument is provided with the following fixed standard overhead light sources:

- A UV Light mounted at the top front of the Darkroom
- Two LED White Lights, each consisting of a strip of eight white LEDs;
  - One located at the top front of the Darkroom, below the UV Light.
  - One at located on the Removable Panel, above the User Replaceable Light Module Cluster.
- Two User Replaceable Light Module Clusters, each capable of holding four specific colour output User Replacable Light Modules;
  - One located at the top front of the Darkroom, below the LED White Light.

- One located on the Removable Panel, below the LED White Light.

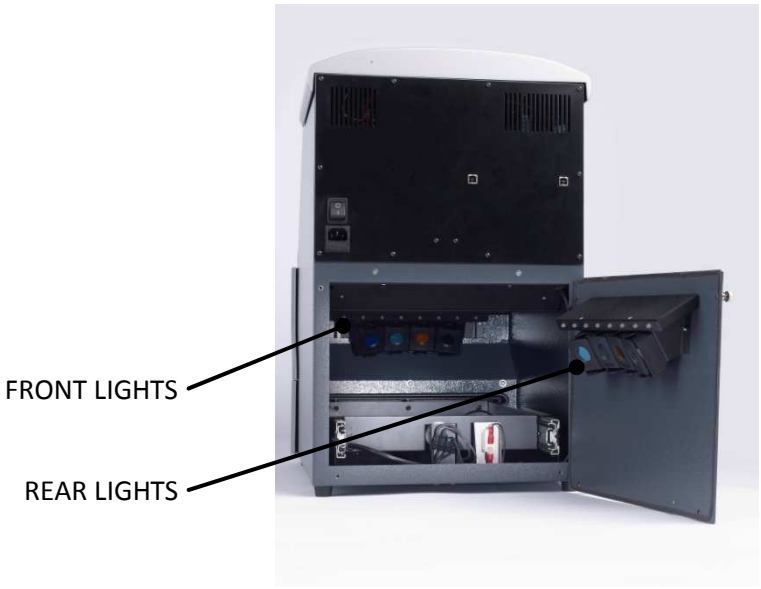
If replaceable Light Modules have been pre-ordered then these will normally be loose-shipped. These are installed as follows:

1. Turn the PXi/PXi Touch Instrument until the Rear Cover is safely accessible.

2. Remove the Rear Cover by undoing the four captive screws.

Note: Be careful of the lead connecting the light sources mounted on the rear of the Rear Cover to the Instrument. This severely limits the movement of the Rear Cover which can be propped against the side of the Instrument.

3. Prop the Rear Cover against the side of the PXI/PXi Touch Instrument for support.



REAR COVER REMOVED - LIGHT SOURCES EXPOSED

The Replaceable Light Modules are supplied in pairs:

- One from each pair is to be installed in the Front LED Light Bay

FRONT UV LIGHT, LED WHITE LIGHT AND USER REPLACEABLE LIGHT MODULE CLUSTER

- One from each pair is to be installed in the Rear LED Light Bay

REAR COVER REPLACEABLE LIGHT MODULE CLUSTER AND LED WHITE LIGHT

- Pairs of Light Modules should be installed in directly opposite locations in order to provide the most even lighting
- Note that Light Modules can be installed in any location, as long as one is in the Front Bay and one is in the Rear Bay
- Replaceable Light Modules are clearly identified by a white sticker on the left hand side of the Module

4. Identify a pair of matching Replaceable Light Modules.
5. Remove any blank Modules from the Front and Rear LED Light bays:
    - To remove a Module, grip it gently by the top and bottom edges
    - Press the clip on the bottom of the Module
    - Slide the Module out of its slot
6. Insert one of the Modules into a slot in the Rear LED Light Bay:
    - To insert a Module, grip it gently by the top and bottom edges
    - Slide the Module into an empty slot
    - Press gently on the front of the Module until it clicks into place

Note: Press only on the plastic lens surround, **not** directly on the coloured lens.

7. Insert the second of the Modules into the matching slot of the Front LED Light Bay.

Note: Replaceable Light Modules should be handled with care. Dropping a Module may damage it and render it inoperable.

REPLACEABLE LIGHT MODULE

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

DRAWER MOUNTED BLUE LED TRANSILLUMINATOR

DRAWER MOUNTED WHITE LIGHT PAD

Filters

The PXi/PXi Touch 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 GeneSys software. Access to the Filter Holder is via a removable panel located behind the removable Front Cover.

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 Front Cover.

FRONT COVER REMOVED SHOWING FILTER COVER

Note: On a PXi Touch Instrument be careful of the lead connecting the PC/Touch Screen Unit to the Instrument. The PC/Touch Screen Unit needs to be supported whenever the Front Cover is removed.

2. Remove the Filter Cover by undoing the two captive thumb screws.

FILTER COVER REMOVED

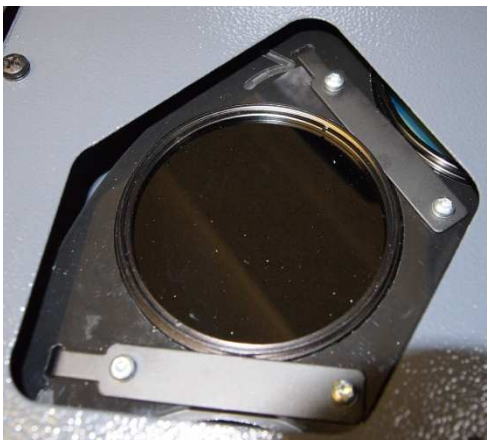
3. Check that there is no Filter installed in the visible Filter Slot in the Filter Holder.

4. Using a specialist allen key, slacken the screws on the Filter Retaining Strip on each side of the Filter Slot.

5. 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.

6. Tighten, but **do not over-tighten**, the screws on the Filter Retaining Strips.

7. 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.



FILTER HOLDER SHOWING FILTER SLOT NUMBER

8. 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 startup sequence.

9. Replace the Filter Cover, **do not over-tighten** the two thumb screws.

10. Replace the Front Cover.

Switching Instrument On

To switch on a PXi Instrument:

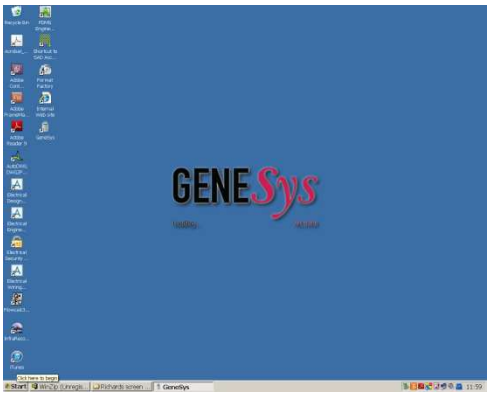
1. Switch on and log on to your PC as normal.
2. Connect the mains power cord between a power supply socket and the instrument.
3. Switch on the power supply socket (if provided with a switch).
4. Switch on the instrument using the ON/OFF rocker switch on the rear panel.
5. Check that the green indicator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

To switch on a PXi Touch Instrument:

1. Connect the mains power cord between a power supply socket and the instrument.
2. Switch on the power supply socket (if provided with a switch).
3. Check that the green indicator light on the front of the instrument lights.
4. Allow the instrument to complete its Windows startup fully (about 5 minutes).
5. Log on to Windows.
6. Double tap the 

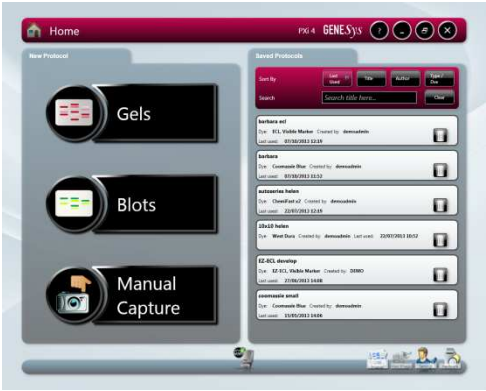
icon to start the GeneSys software.

The GeneSys startup screen will appear when the GeneSys software is launched.



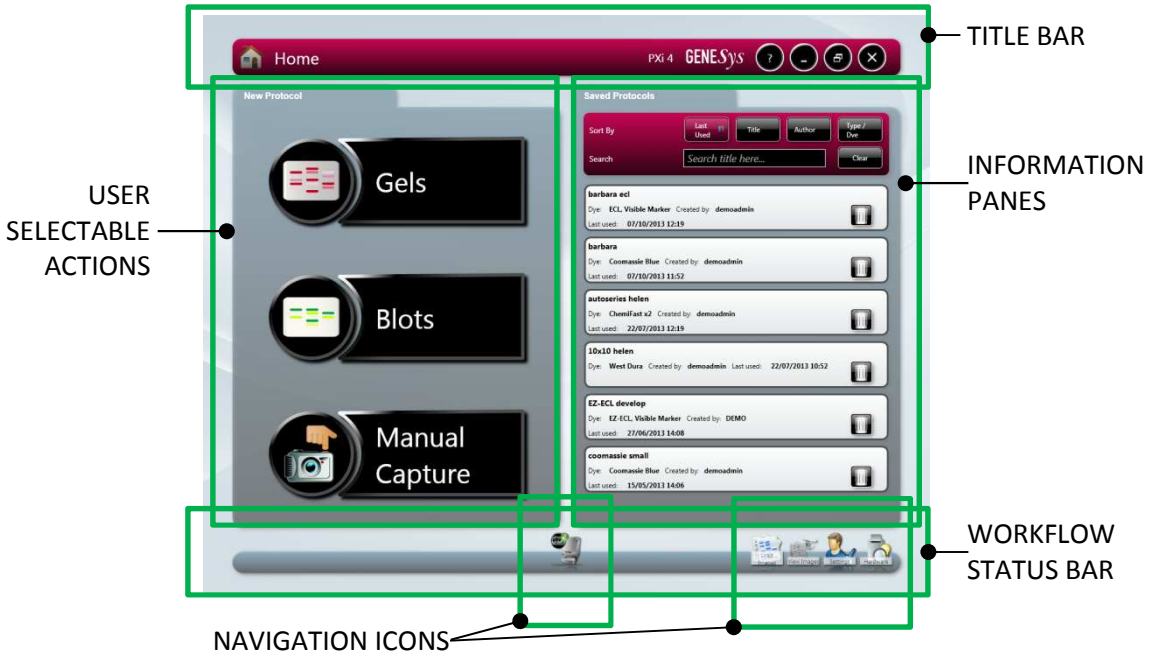
GeneSys SOFTWARE LAUNCHED SCREEN

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



GeneSys STANDARD VIEW HOME SCREEN

GeneSys Standard View Home Screen Layout



TITLE BAR

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

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

Displays the camera resolution and the program title 

, for this particular installation it shows that a 4MP camera is installed and the GeneSys program is running.

Displays the  icon, for accessing System data - camera hardware and program version information.

Also displays the standard Windows program buttons  , for minimise, maximise, and close.

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.

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

GeneSys CLASSIC VIEW HOME SCREEN

GeneSys 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.

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

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

HARDWARE SCREEN

2. Scroll the window vertically to view all available options.

3. Select each hardware option installed in your Instrument.

Note: If you have pre-specified your exact requirements at time of order then this operation may have been performed by Syngene 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.

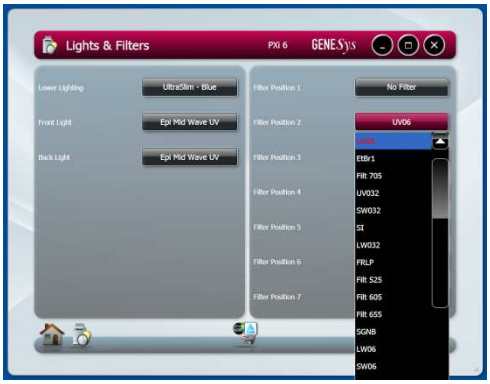
LIGHTS & FILTERS SCREEN

The Lights & Filters screen is used to specify the fixed lighting unit types installed in the front and rear of the Darkroom, and also to specify the accessory lighting that is installed in the Darkroom Drawer.

7. For the three lighting locations in the left hand pane; **Lower Lighting**, **Front Light**, and **Back Light**, select the data button and select the lighting type installed at that location from the drop down menu (illustrated is Back Light).

LIGHTS & FILTERS SCREEN - LIGHTING SELECTIONS

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 .

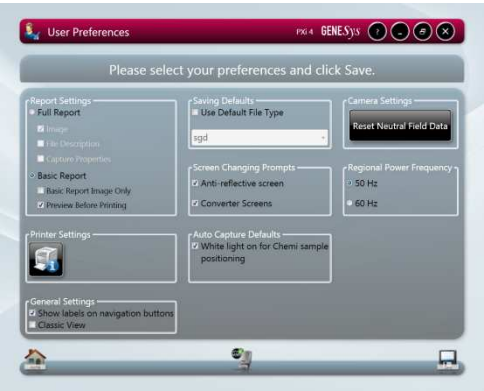
Note: Ensure that you save your selections before you leave the Hardware screen.

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

Entering Personal Preferences

Every individual who logs on to a PXi/PXi Touch 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 SCREEN

2. Set your preferences:

REPORT SETTINGS

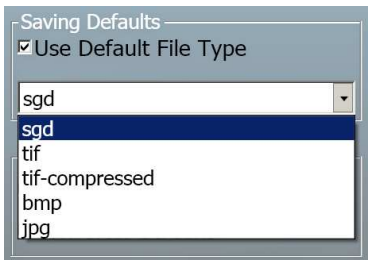
Report Settings enables you to preset some report defaults, this is useful where you are doing repetitive tests and want the same type of report for each test. The settable options are:

- **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 GeneSys Software saves your images in. If you do not set a preference here, the GeneSys Software will use the *.sgd format by default. To set a preference for a different file format check the **Use Default File Type** checkbox and select your preferred file format from the drop-down menu.



AVAILABLE FILE FORMATS

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.

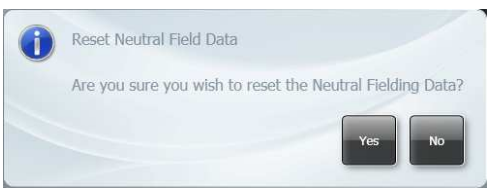
AUTO CAPTURE DEFAULTS

- **Auto Capture Defaults** - checking this checkbox sets the GeneSys Software so that whenever it gets to the Sample Positioning stage in a chemiluminescence image capture operation, it automatically switches on the interior white lights.

CAMERA SETTINGS

- **Camera Settings** - enables you to perform a Neutral Fielding operation. The GeneSys Software will then apply this default Neutral Fielding data set to your captured images when you select the **Use Neutral Fielding** checkbox in the **Neutral Fielding** box on a Sample Positioning screen.

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



RESET NEUTRAL FIELD DATA MESSAGE POP-UP

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

REGIONAL POWER FREQUENCY

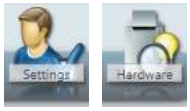
- **Regional Power Frequency** - enables you to set up your PXi/PXi Touch to suit the frequency of the local mains supply. Around the world there are two mains frequencies in use; 50 Hz or 60 Hz. Check the checkbox against the frequency matching your local supply.

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**.

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.

Recommended Light / Dye / Accessory and Other Application Tables

LIGHTING AND FILTER OPTIONS			
APPLICATION	**SAMPLE TYPE**	**LIGHT SOURCE / ACCESSORY**	**FILTER**
Chemiluminescence	Membrane	Anti-reflective black screen	No filter
Chemiluminescence with visible marker	Membrane	Anti-reflective black screen	No filter
Fluorescence	Gel (e.g. EtBr™* / SYBR Gold™	UV Transilluminator or Ultra-slim blue light LED Transilluminator	FiltUV/FiltSW
	Gel (e.g. Alexa Fluor, DyLight, Cy dyes, LI-COR)	RGB and IR LED modules (multiplexing and non-multiplexing)	Red LED Module - Filt705M Green LED Module - Filt605M Blue LED Module - Filt525 IR LED Module - FiltLY800
	Membrane (e.g. Alexa Fluor, DyLight, Cy dyes, LI-COR)	RGB and IR LED modules (multiplexing and non-multiplexing)	Red LED Module - Filt705M Green LED Module - Filt605M Blue LED Module - Filt525 IR LED Module - FiltLY800
Visible light	Gel (e.g. Coomassie blue and Silver stain)	White light pad	FiltUV
	Membrane (e.g. Ponceau Red)	White light pad	FiltUV
Stain-Free	Gel or Membrane	UV Transilluminator	FiltUV

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

NEUTRAL FIELDING (NF) OPTIONS	
LIGHT SOURCE	**NF SCREEN**
White / visible light	Use a NovaGlo converter screen as a NF screen.
UV light	If using an EtBr/UV or LP filter use a blue NF screen on the UV Transilluminator with a frosty NF screen on top. If using an SP filter use a frosty NF screen on the UV Transilluminator then a blue NF screen.
Epi-UV short and long wavelength light	Use a blue NF screen and place inside the drawer.

Loading Test Samples

Black Anti-reflective Screen Installed

The Black anti-reflective screen is magnetic and should be placed in the Darkroom Drawer such that the four holes in the corners line up with the four holes in the Drawer.

Place the test sample within the marked lines on the Black anti-reflective screen.

UV Transilluminator

The UV Transilluminator will sit directly into the Darkroom Drawer. The 2 screws positioned on the base of the UV transilluminator locate with the holes in the Black anti-reflective screen/Darkroom Drawer.

Place the test sample centrally on the transilluminator glass.

Ultra-slim Blue Light LED Transilluminator Installed

The Ultra-slim blue light LED Transilluminator will sit either directly into the Darkroom Drawer or on top of the Black anti-reflective screen. The four feet at the corners of the Ultra-slim blue light LED Transilluminator base locate in the four holes in the Black anti-reflective screen/Darkroom Drawer.

Place the test sample centrally on the dark 'screen' area.

White Light Pad Installed

The White light pad will sit either directly into the Darkroom Drawer or on top of the Black anti-reflective screen. The four feet at the corners of the White light pad base locate in the four holes in the Black anti-reflective screen/Darkroom Drawer.

Place the sample centrally on the White light pad.

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.

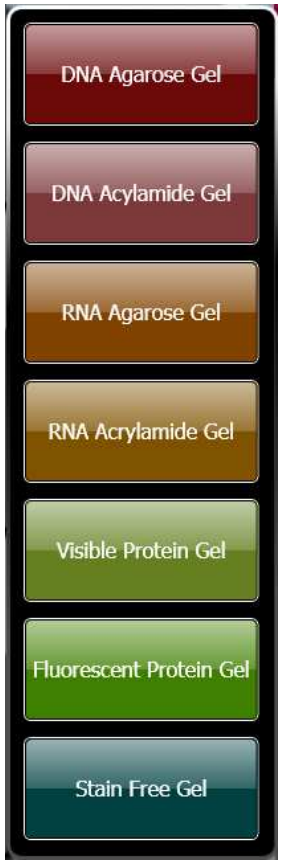
Automatic Image Capture Using Standard View

1. Open the Drawer and position the sample in the Drawer within the guidelines, as noted previously.

2a. If you have a Gel sample.

(i) Select the Gels icon 

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



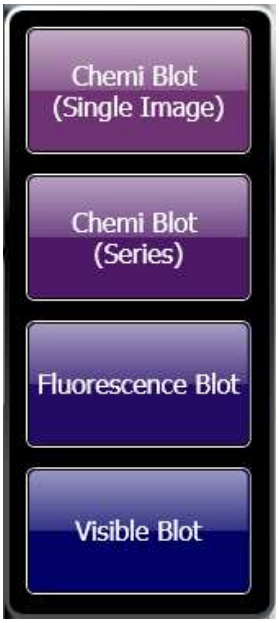
GELS DROP-DOWN LIST

(ii) Select your Gel type from the drop-down list. This displays the Dye Selection screen. Proceed to **Automatic Image Capture - Dye Selection**.

2b. If you have a Blot sample.

(i) Select the Blots icon 

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



BLOTS DROP-DOWN LIST

(ii) Select your Blot type from the drop-down list.

(iii) Select **Chemi Blot (Single Image)** from the drop-down list. This displays the Dye Selection screen. Proceed to **Automatic Image Capture - Blot / Chemi Selected** at Select **Auto (Single)**.

(iv) Select **Chemi Blot (Series)** from the drop-down list. This displays the Chemi Series Capture screen. Proceed to **Automatic Image Capture - Blot / Chemi Selected** at Select **Series**.

(v) Select **Fluorescence Blot** or **Visible Blot** from the drop-down list. This displays the Dye Selection screen. Proceed to **Automatic Image Capture - 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**.

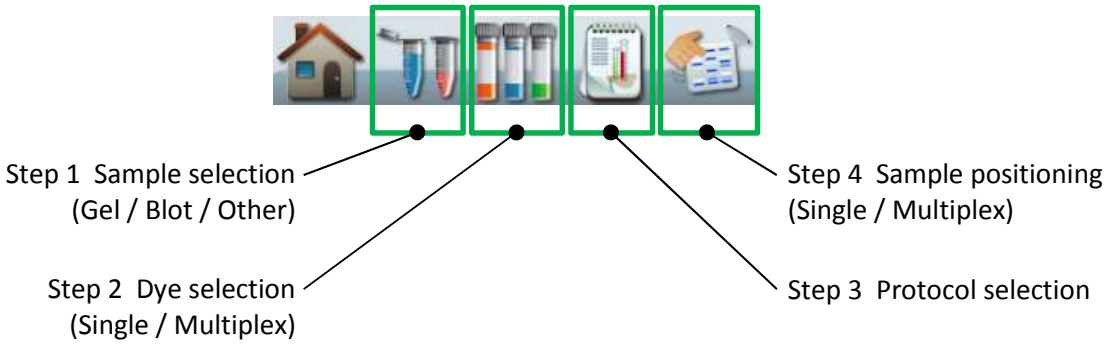
Automatic Image Capture Using Classic View

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



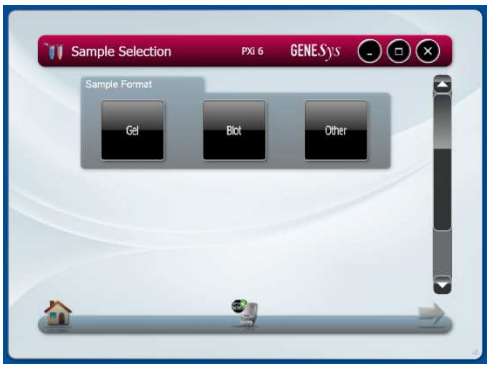
AUTOMATIC IMAGE CAPTURE WORKFLOW STEPS

Automatic Image Capture - Step 1 Sample Selection

1. Open the Drawer and position the sample in the Drawer within the guidelines, as noted previously.

2. Select the **Auto Capture** icon 

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

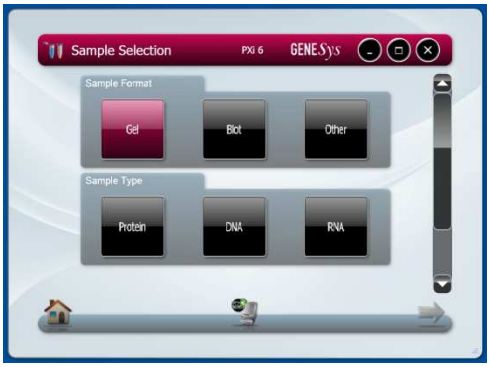


AUTO CAPTURE SAMPLE SELECTION - SAMPLE FORMAT SCREEN

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** or **Visible Stain**.

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

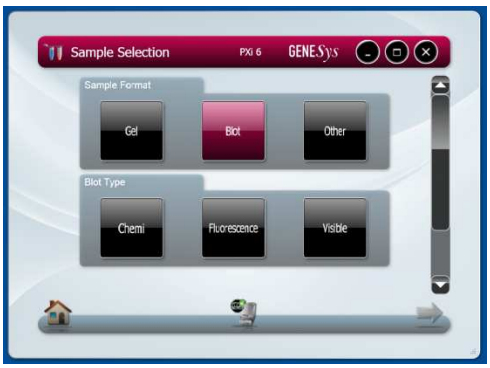
(ii) In the Matrix Type pane select Acrylamide or Agarose.

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

BLOT SAMPLE SELECTED

6. In the Sample Format pane select **Blot**.

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



AUTO CAPTURE SAMPLE SELECTION - BLOT TYPE SCREEN

8. In the **Blot Type** pane select Chemi, Fluorescence or Visible.

9. Select the bouncing green arrow  . This displays the Dye Selection screen. Proceed to **Automatic Image Capture - Dye Selection**.

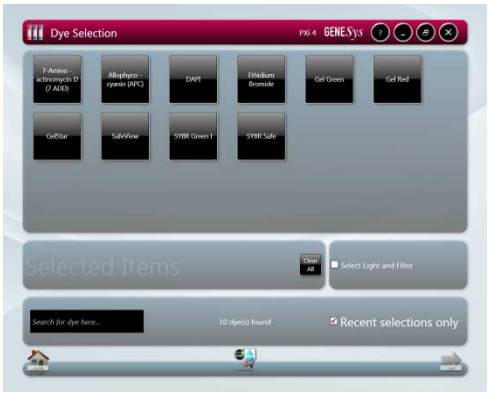
Note: The Dye Selection screen displayed depends on the selections made. If Blot then Chemi have been selected a different selection screen becomes available and the workflow is modified, see **Automatic Image Capture - Blot / Chemi Selected**.

OTHER SAMPLE SELECTED

10. In the **Sample Format** pane select Other. This takes you to **Manual Image Capture** mode.

Automatic Image Capture - Step 2 Dye Selection

The GeneSys program incorporates an extensive database of dye information covering a variety of applications, e.g. fluorescence, chemiluminescence, chemifluorescence, and visible stains.



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. Scroll vertically to view the entire selection.
- The lower pane displays the total number of 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, 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.

11. Select your dye from the list.

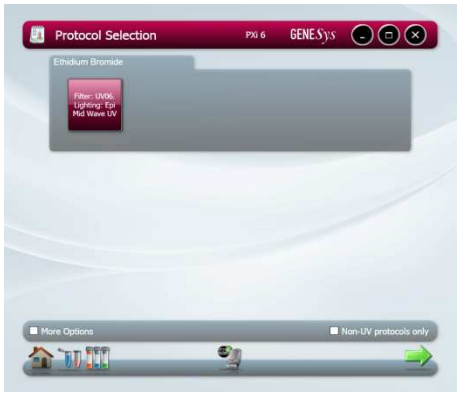
ACCEPT GeneSys PROGRAM OPTIMAL PROTOCOL OR CHOOSE YOUR OWN PROTOCOL

- 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 GeneSys program is automatically selected, and the Dyes

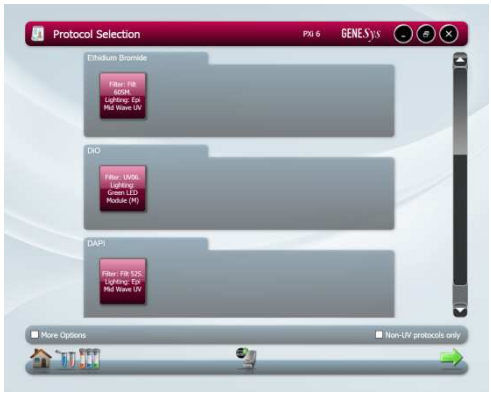
and Protocols  icons are added to the Workflow on the Sample Positioning screen.

Automatic Image Capture - Step 3 Protocol Selection

The GeneSys 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.

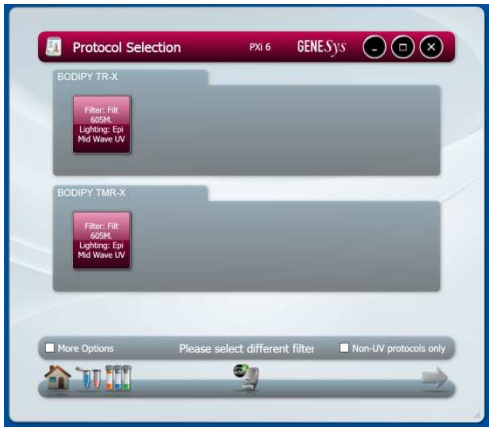
- To display all available sets of imaging conditions check the **More Options** checkbox.

MULTIPLE DYES SELECTED - MORE OPTIONS CHECKED

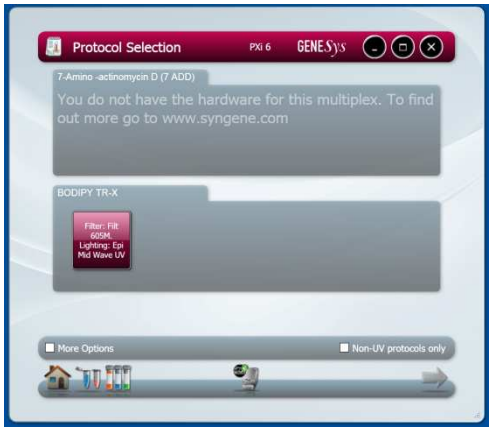
Note: Where green arrows appear in the protocol panes, as in the Ethidium Bromide set, these indicate that horizontal scrolling is required to view all possible protocols available.

12. 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 Syngene for further assistance.

13. 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.

14. 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.

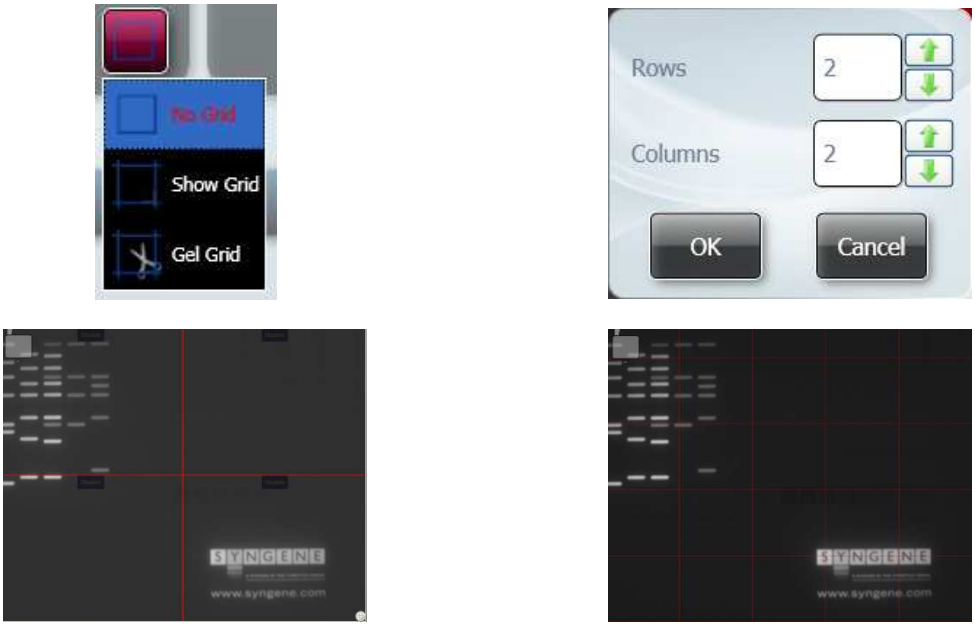
SAMPLE IMAGE ZOOMING

- 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 **Drawer Open** icon  to open the Drawer 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 grid projection.
    - **Gel Grid** option allows you to divide the image into different sections, particularly useful if imaging more than one gel or blot at the same time.



GRID MENU, SHOW GRID AND GEL GRID OPTIONS

USING NEUTRAL FIELDING TO IMPROVE SAMPLE IMAGE QUALITY

- The Neutral 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 neutral 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 Neutral Fielding screens and lighting combinations refer to **Recommended Light / Dye / Accessory and Other Application Tables**.

In the **Neutral Fielding** box check the **Use Neutral Fielding** checkbox.

Follow the onscreen messages.

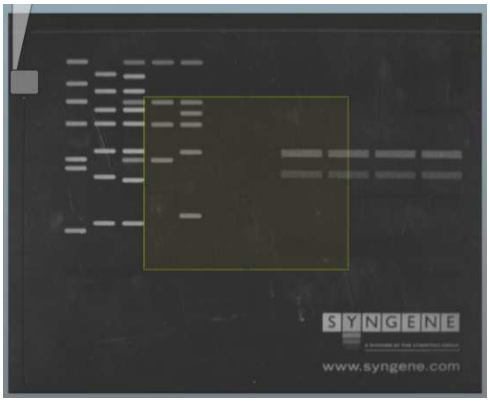
TYPICAL NEUTRAL FIELDING MESSAGES

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

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 GeneSys software to remove the emission filter so it is no longer in front of the Camera. The sample image should now appear much clearer. The

software will automatically place the emission filter back in front of the Camera when the green bouncing arrow is pressed.

LENS CONTROLS

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

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

LENS CONTROL - FOCUS

LENS CONTROL - IRIS

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.

15. 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.

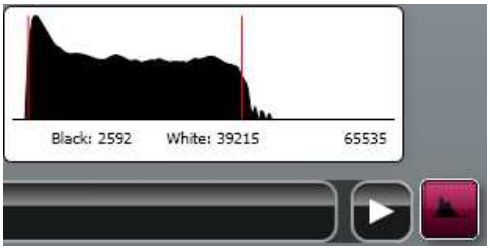
CURRENT PROTOCOL BOX

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.

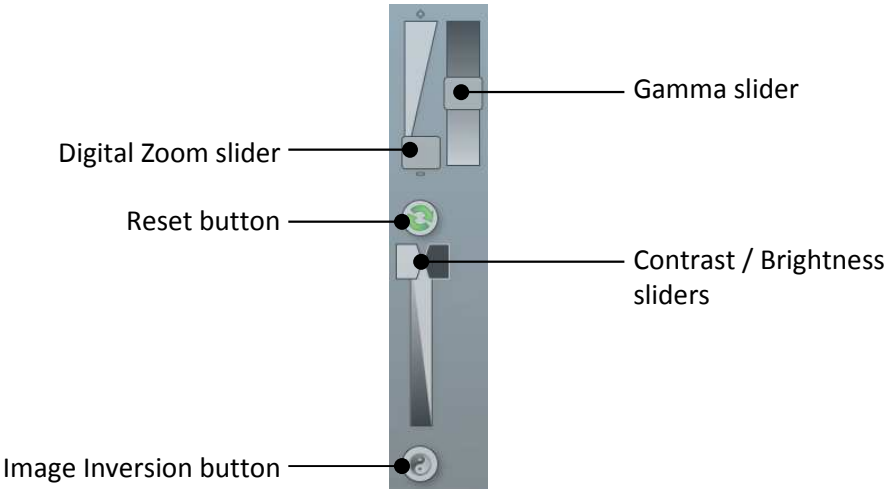


IMAGE SLIDER CONTROLS

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

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

.

17. 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.

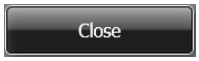
UNSAVED IMAGE POOL IMAGE

18. 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

19. 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.

20. 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.

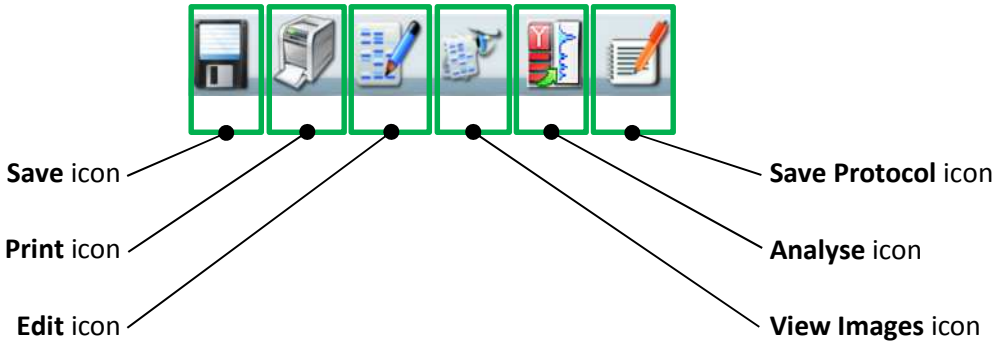


IMAGE ACTION ICONS

Automatic Image Capture - Blot / Chemi Selected

The following instructions apply if you have made the following selections in **Automatic Image Capture - Step 1 Sample Selection**:

Sample Format pane select **Blot**

Blot Type pane select **Chemi**

Note: Selecting **Blot** then **Chemi** in **Automatic Image Capture - Step 1 Sample Selection** changes the Workflow as detailed below. The following instructions replace **Automatic Image Capture - Step 2 Dye Selection** and **Automatic Image Capture - Step 3 Protocol Selection**. You should then return to the **Automatic Image Capture** process at **Automatic Image Capture - Step 4 Sample Positioning**.

21. Select the bouncing green arrow  . This displays the Sample Selection - Capture Method screen.

SAMPLE SELECTION - BLOT - CHEMI - CAPTURE METHOD SCREEN

22. In the Capture Method pane select **Auto (Single)** or **Series**.

22a. Select **Auto (Single)**.

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

BLOT - CHEMI - AUTO (SINGLE) - DYE SELECTION SCREEN

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

The Blot - Chemi - Auto (Single) - Dye Selection screen contains a range of options, as outlined below:

UPPER PANE

By default the upper pane displays all chemiluminescent substrates in the database. Scroll vertically to view the entire selection. A selected substrate turns red.

CENTRE PANES

Selected substrates appear in the **Selected Items** pane. Select the **Clear All** button to remove selected substrates and restart substrate selection.

Check the **Visible marker** checkbox if you have used a colorimetric marker on the sample. The GeneSys program will automatically take two separate image captures; one for your sample, one for the marker (with white light), and combine the two images together.

LOWER PANE

The lower pane displays the total number of chemiluminescent substrates found in the database.

To limit the chemiluminescent substrate selections displayed in the upper pane check the **Recent selections only** checkbox. Only recently used chemiluminescent substrates will be displayed.

Use the **Search for dye here...** box to search for a chemiluminescent substrate by name. Enter the chemiluminescent substrate's name in the box.

(ii) Select your substrate, direct or by searching.

(iii) Check the **Visible Marker** checkbox if you have used a colorimetric marker.

(iv) Select the bouncing green arrow  . This displays the Sample Positioning screen. See **Automatic Image Capture - Step 4 Sample Positioning**.

22b. Select **Series**.

(i) Select the bouncing green arrow  . This displays the Chemi Series Capture screen.

CHEMI SERIES CAPTURE SCREEN

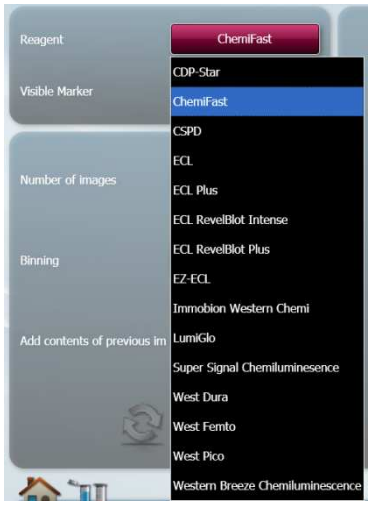
Note: The **Samples** icon  has been added to the Workflow.

The Chemi Series Capture screen contains a range of options, as outlined below:

UPPER LEFT HAND PANE

The upper left hand pane contains options for choosing your reagent/substrate type and an option for indicating whether or not you have used a colorimetric marker.

Select the **Reagent** button and select your substrate from the drop-down list.



REAGENT/SUBSTRATE LIST

Check the **Visible marker** checkbox if you have used a colorimetric marker on the sample. The GeneSys program will automatically take two separate image captures; one for the sample, one for the marker (with white light), and combine the two images together.

LOWER LEFT HAND PANE

The lower left hand pane contains options for; choosing how many images you want to capture, the level of binning that you want to use, and whether you want to add all the images in a multiple image capture process together.

Use the plus and minus buttons of the **Number of images** selector 

to set how many images of your sample that you want to capture. Select plus to increase the number, select minus to decrease the number.

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

The lower left hand pane also contains two buttons; a **Reset** button and a **Proceed** button.

(ii) Select your substrate.

(iii) Check the **Visible Marker** checkbox if you have used a colorimetric marker.

(iv) In the Number of images box select the number of images you want to capture.

(v) In the **Binning** box select the binning option you require.

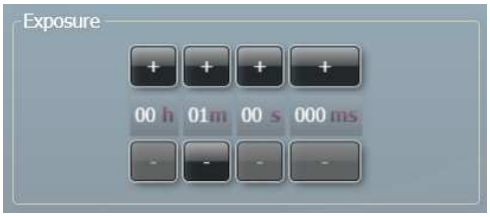
(vi) Check the **Add contents of previous image** checkbox if you want to capture multiple images and combine them together into a single composite image.

(vii) Select the **Next** button  to display the available options in the right hand pane. Once selected the **Next** button changes to  . At the same time the **Reset** button changes from  to  .

RIGHT HAND PANE

The right hand pane contains simple controls for setting exposure times for your image capture or series of captures. If you are taking multiple captures, checking the **Use the same exposure for all images** checkbox will use the exposure time that you set for each of the image captures in the series. These options are only displayed after you have selected the **Proceed** button in the left hand pane.

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



EXPOSURE CONTROLS

(viii) Check the **Use the same exposure for all images** checkbox if you want all images in a series to have the same exposure time.

(ix) If you want to set different exposure times for each image, leave the **Use the same exposure for all images** checkbox unchecked.

(x) Using the **Exposure** plus/minus buttons enter exposure times for each image in the series in turn. You will be prompted to enter a time for each image.

(xi) To cancel any settings made in the right hand pane select the **Reset** button  . Once selected the **Reset** button changes to  . At the same time the **Next** button changes from  to  and the options in the right hand pane are hidden and you can make changes to the options in the left hand pane.

(xii) Once you have finished making settings in both panes, select the bouncing green arrow  . This displays the Sample Positioning screen. See **Automatic Image Capture - Step 4 Sample Positioning**.

Manual Image Capture Mode

Manual Capture mode allows the User to take complete control of every function of a PXi or PXi Touch 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, different exposure settings could be used, the resulting captured images would be compared, and the best captured image saved.
- **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 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 Drawer and place either the Black anti-reflective screen or the Transilluminator Module into the Drawer.
2. Position the sample in the Drawer 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

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

Once Manual Capture has been selected, the Camera is live, meaning that the Camera lens controls are available and the live preview image as seen by the Camera is displayed in the left hand pane. It may appear that there is no image or only a very faint image as at this point there are no lights on in the Darkroom.

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 - 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.

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

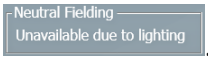
LIGHTING AND FILTERS FUNCTIONS

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

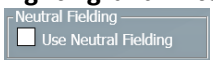
LIGHTING DROP-DOWN MENU

(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 Neutral Fielding function in the right hand pane will have been displaying the following; 

. Once you have made

Lighting and **Filters** selections the Neutral 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 Drawer for better aligning of the sample. 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.

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 **Drawer Open** icon  to open the Drawer 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 grid projection.
    - **Gel Grid** option allows you to move/resize the grid projection lines.

GRID MENU, SHOW GRID AND GEL GRID OPTIONS

USING NEUTRAL FIELDING TO IMPROVE SAMPLE IMAGE QUALITY

- The Neutral 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 neutral 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 Neutral Fielding screens and lighting combinations refer to **Recommended Light / Dye / Accessory and Other Application Tables**.

In the **Neutral Fielding** box check the **Use Neutral Fielding** checkbox.

Follow the onscreen messages.

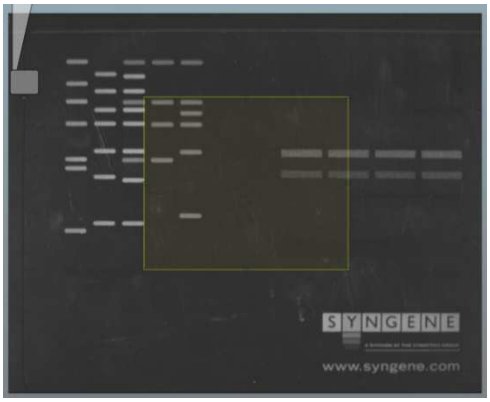
TYPICAL NEUTRAL FIELDING MESSAGES

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

LENS CONTROLS

Note: The lens controls that are available can vary, depending on the specification of the PXi/PXi Touch Instrument. There will be either two or three control functions available; Iris (aperture) and Focus or Iris, Focus and Zoom (optical).

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

LENS CONTROL – FOCUS LENS CONTROL - IRIS

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 

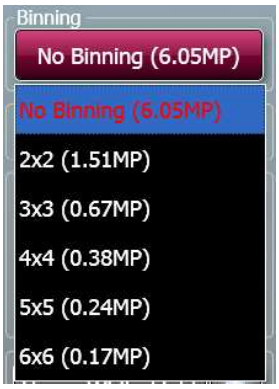
, the aperture or shutter opening of the Camera can be increased/decreased by moving the slider  up/down or by selecting the  /  buttons. As the **Iris** control is changed, the numbers (expressed in 'f' numbers) in the box above the slider bar change. The aperture numbers (f numbers) are counterintuitive,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

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

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

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



BINNING RATIO DROP-DOWN LIST

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

MANUAL CAPTURE - SINGLE IMAGE WITH AUTO EXPOSURE

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

.

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

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

AUTO EXPOSING MESSAGE POP-UP

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

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

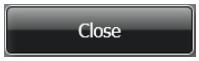
UNSAVED IMAGE POOL IMAGE

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. The **Exposure Timing** icon  remains displayed at the bottom of the screen. Selecting this icon at any time returns you to the Manual 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. 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 Close . 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.

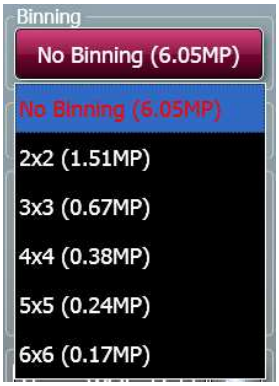
NUMBER OF IMAGES SELECTION

14. Use the plus/minus buttons to select the number of images you want to capture, then select the **Next** arrow  .

    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 (6.05MP)** 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

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

Using the **Capture Interval** plus/minus buttons enter an interval time for the series of images.

The manual **Exposure** controls are simple plus/minus 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** plus/minus buttons enter an exposure time for the first image. 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 **Finished** 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. 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 **Finished** arrow  .

21. If the Neutral Fielding option is available, determined by your lighting/filter selections, you now have to decide whether or not to apply Neutral Fielding.

The Neutral 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 neutral 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 Neutral Fielding screens and lighting combinations refer to **Recommended Light / Dye / Accessory and Other Application Tables**.

MANUAL SERIES NEUTRAL FIELDING

To apply Neutral Fielding check the **Use Neutral 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 **Exposure Timing** icon remains displayed at the bottom of the screen. Selecting this icon at any time returns you to the Manual Capture screen.

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 pane and also 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 Pool** pane, the images being stacked vertically. The main image in the left hand pane changes as each image is captured, displaying the current image.

UNSAVED IMAGE POOL IMAGE

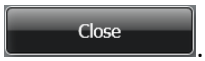
25. The series of images captured can be viewed individually as a large image in the left hand pane by selecting the desired image in the **Image Pool**.

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

26. 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  .

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.

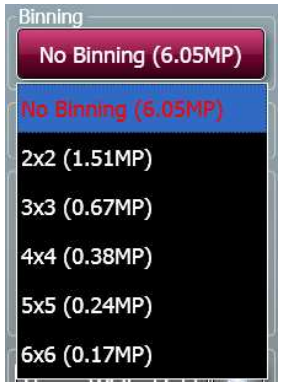
NUMBER OF IMAGES SELECTION

28. Use the plus/minus buttons to select the number of images you want to capture, then select the **Next** arrow  .

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 (6.05MP)** 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, and select lighting and filter options for image 1.

ADDITIVE SERIES EXPOSURE CONTROLS - FIRST IMAGE

The display is almost the same for each image in the series and by default starts at image 1.

The manual **Exposure** controls are simple plus/minus 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** plus/minus buttons enter an exposure time for the first image. 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 first image.

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

31. Select the **Next** arrow to make the settings for image 2.

32. 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.

33. Enter the settings for all the images in your series.

34. Select the **Finished** arrow .

35. If the Neutral Fielding option is available, determined by your lighting/filter selections, you now have to decide whether or not to apply Neutral Fielding.

The Neutral 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 neutral 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 Neutral Fielding screens and lighting combinations refer to **Recommended Light / Dye / Accessory and Other Application Tables**.

MANUAL SERIES NEUTRAL FIELDING

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

36. 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

37. 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.

38. 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 **Exposure Timing** icon  remains displayed at the bottom of the screen. Selecting this icon at any time returns you to the Manual Capture screen.

ADDITIVE SERIES PROTOCOLS

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 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 left hand pane, the images being stacked vertically. The main image in the left hand pane changes as each image is captured, as each of the newly made captures is added to the main image to produce a combined image.

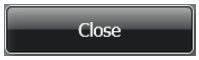
Once the series of captures is complete, the combined image appears as the main image in the left hand pane along with the stack of series captured images, and also as a thumbnail in the central **Image Pool** pane. When initially captured, images in the **Image Pool** are unsaved and are outlined in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

UNSAVED IMAGE POOL IMAGE

39. 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  .

Manual Image Capture - Multiplex

40. 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.

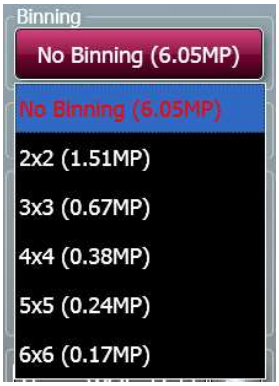
NUMBER OF IMAGES SELECTION

41. Use the plus/minus buttons to select the number of images you want to capture, then select the **Next** arrow  .

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

BINNING SELECTOR

42. Select the **No Binning (6.05MP)** 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

43. You must now set the exposure time, and select lighting and filter options for image 1.

MULTIPLEX EXPOSURE CONTROLS - FIRST IMAGE

The display is the same for each image in the series and by default starts at image 1.

The manual **Exposure** controls are simple plus/minus 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** plus/minus buttons enter an exposure time for the first image. 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 first image.

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

44. Select the **Next** arrow to make the settings for image 2.

45. Enter the settings for all the images in your series.

46. Select the **Next** arrow .

47. If the Neutral Fielding option is available, determined by your lighting/filter selections, you now have to decide whether or not to apply Neutral Fielding.

The Neutral 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 neutral 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 Neutral Fielding screens and lighting combinations refer to **Recommended Light / Dye / Accessory and Other Application Tables**.

MANUAL SERIES NEUTRAL FIELDING

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

48. 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

49. 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.

50. 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 **Exposure Timing** icon  remains displayed at the bottom of the screen. Selecting this icon at any time returns you to the Manual Capture screen.

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 pane, as two vertically stacked thumbnails in the left hand pane, and as a thumbnail in the central **Image Pool** pane.

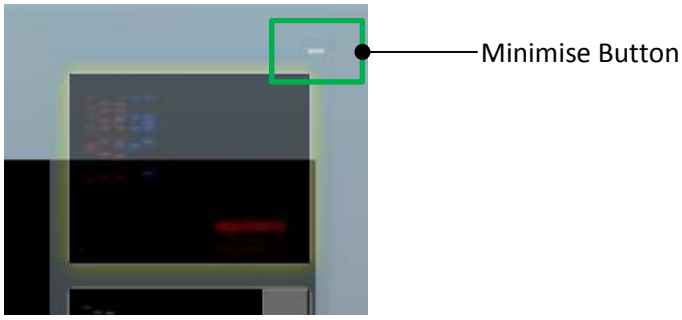
As subsequent images in the series are captured, the main image in the left hand pane and the top image in the thumbnail stack change, becoming combined images. Also the newly captured image is added to the bottom of the thumbnail stack. The thumbnail stack of images represents the combined image and 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 left hand 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 left hand 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.

MUTIPLEX CAPTURES

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.



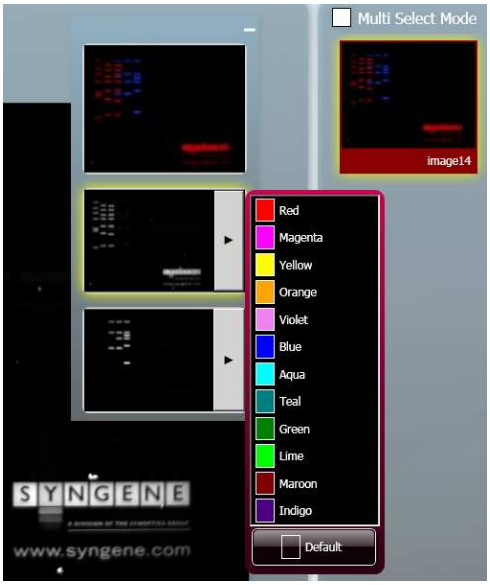
MINIMISE BUTTON

(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

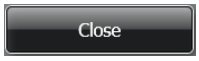
When initially captured, images in the **Image Pool** are unsaved and are outlined in red.

UNSAVED IMAGE POOL IMAGE

51. 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  .

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.

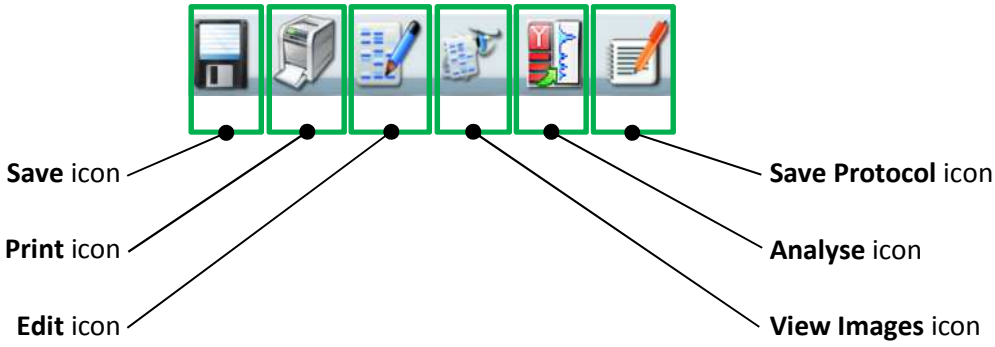


IMAGE ACTION ICONS

CONFIGURATIONS - SAVING, OPENING AND EDITING

Introduction

The GeneSys 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.

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

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

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

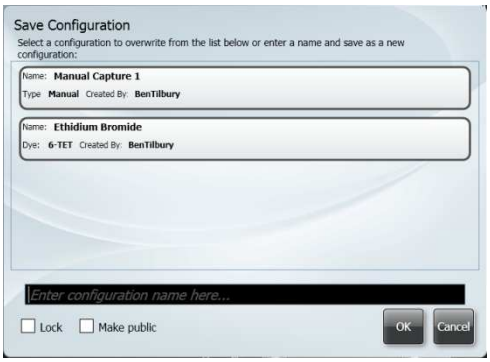
, select your sample type/imaging type, select your dye, position your sample, and capture an image.

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.

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

In Auto Image Capture Mode

To create a Configuration in Auto Image Capture mode:

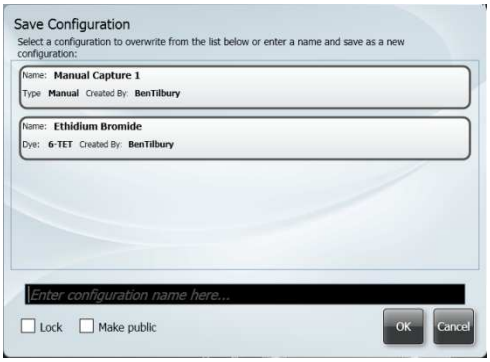
3. Work through the workflow for the type of test sample that you are going to image, i.e. Step 1 - Sample selection, Step 2 - Dye selection, Step 3 - Protocol selection, Step 4 - Sample positioning, and capture an image.

4. 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.

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.

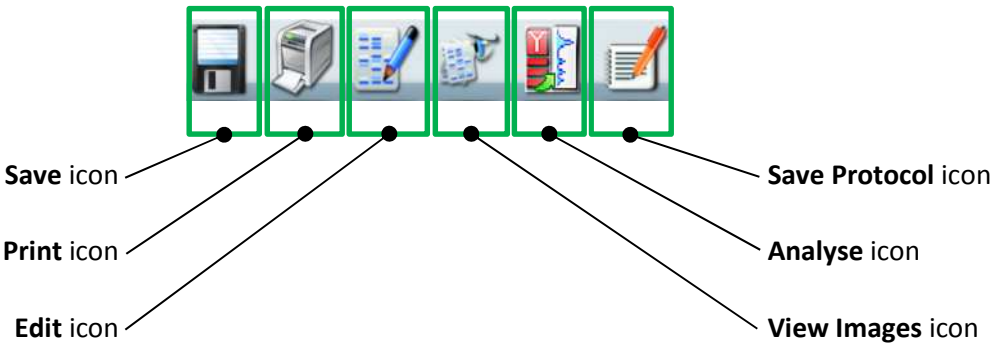
(iii) Select the **OK** button to save the Configuration.

In Manual Image Capture Mode

To create a Configuration in Manual Image Capture mode:

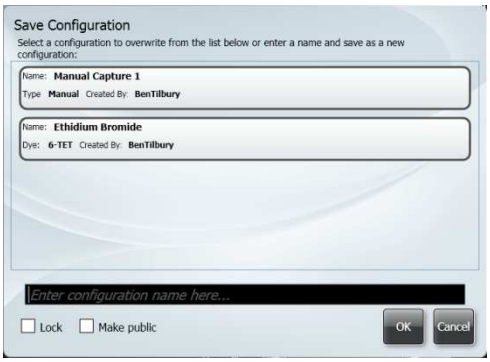
1. Work through the Manual Image Capture process described previously and capture an image.

2. Select the Configuration 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.

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.

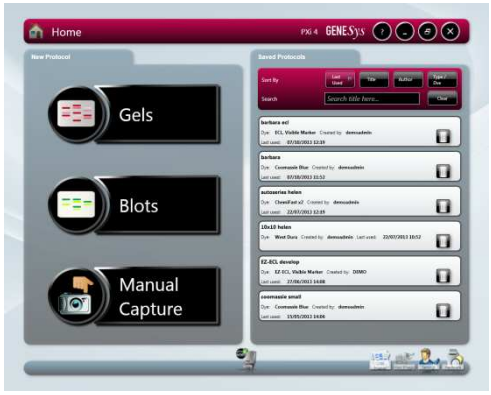
- Use the **Lock** checkbox to prevent adjustments being made to the Configuration.

- Use the **Make public** checkbox to make the Configuration accessible to other Users.

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

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

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 Pxi/Pxi Touch 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:

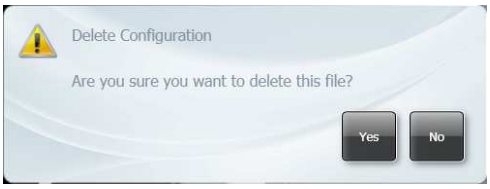
TYPICAL MANUAL CAPTURE SAMPLE POSITIONING

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.



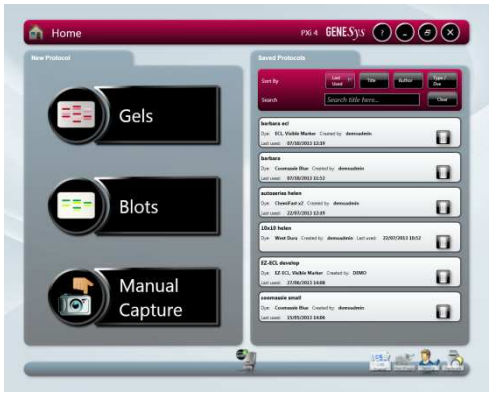
DELETE CONFIGURATION POP-UP

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.

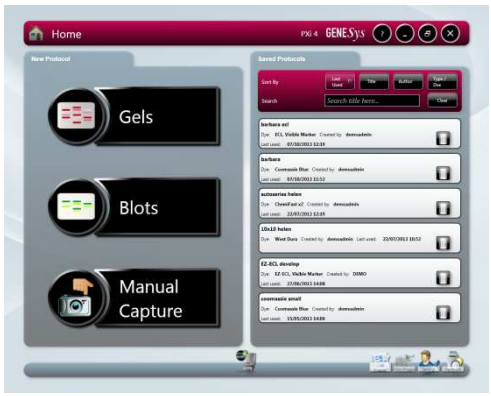
- For Auto Image Capture Sample Positioning screen refer to **Automatic Image Capture Mode**.
- For Manual Capture screen refer to **Manual Image Capture Mode**.

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

Browse 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 **Browse Images** icon 

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

BROWSE 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 Browse 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

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

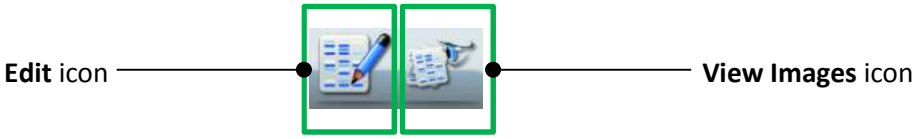
- Selecting an image or images in the central pane adds the selected image or images to the **Selected Images** pane. At the same time the image(s) selected in the central pane turn green, as shown below.

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 Browse Images Screen

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



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

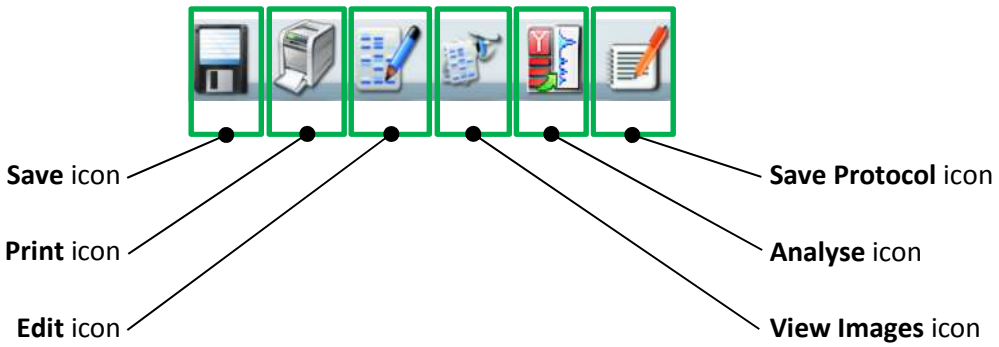
The View Images screen is used to view and compare captured images. Images can be saved or unsaved. The View Images screen can be accessed as follows:

STANDARD VIEW HOME SCREEN

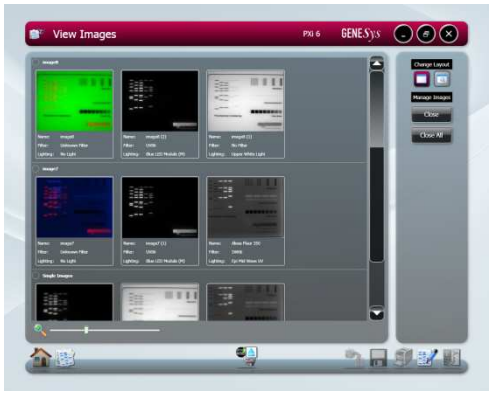
CLASSIC VIEW HOME SCREEN

- 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. **image7** and **image8** 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

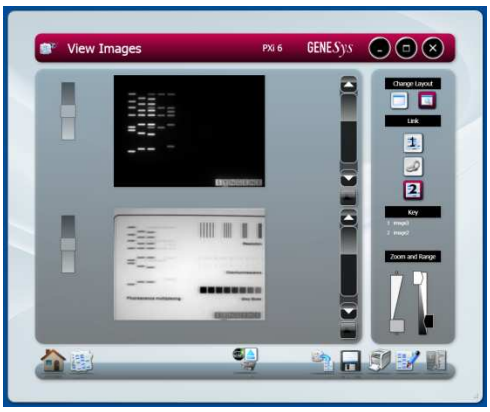
CHANGE LAYOUT

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.

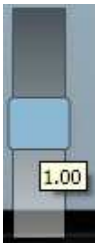
Selecting the **Compare** button  enables you to compare up to four selected images. This displays the Compare Images version of the View Images screen.



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.

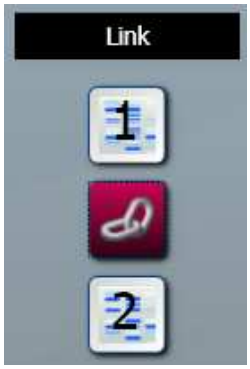


GAMMA SLIDER

- **Scroll** bars allow you to view the entire area of an image.

The right hand pane contains the following controls:

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



IMAGES LINKED

ONE IMAGE SELECTED - IMAGES NOT LINKED

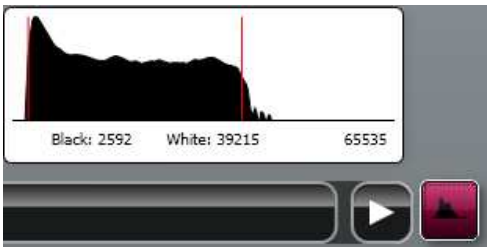
The default setting is for images being compared to be linked. Adjustments made using the **Zoom and Range** controls are applied equally to all of the linked images.

The numbers in the **Link** boxes correspond to the images in the left hand pane.

Selecting one of the images in the left hand pane or one of the numbered **Link** boxes unlinks the images. Adjustments made using the **Zoom and Range** controls are now applied only to the selected image.

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.

Hovering the cursor over an unlinked image displays a **Histogram** button  . 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**.

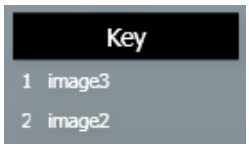
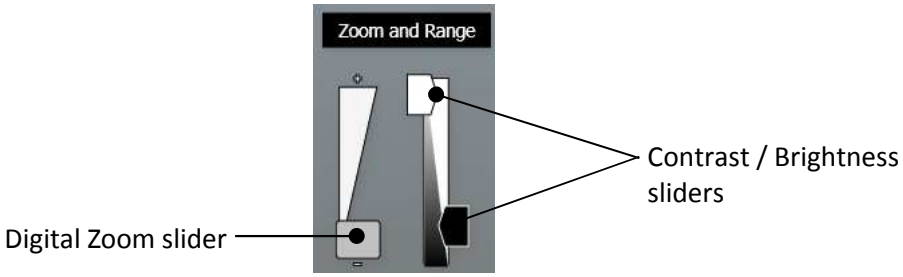


IMAGE KEY

As with the **Link** controls, the **Key** numbers correspond to the images in the left hand pane. If the images are unlinked by selecting an image, the corresponding **Key** entry will be highlighted.

- 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.

Selecting the **Close All** button closes all image files.

HIDE/SHOW

Selecting the arrow 

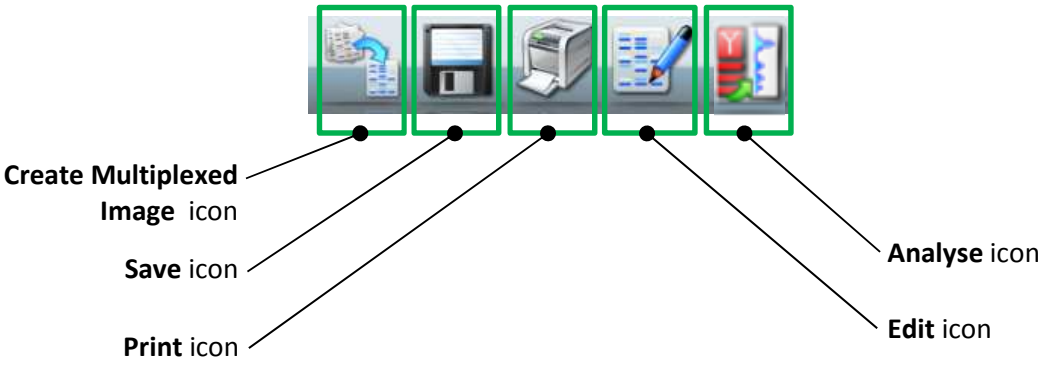
next to an image title on the View screen hides the image(s) associated with that title, i.e. the thumbnails are not displayed but the image title is still displayed. This provides more area for the other images to be displayed in. The up arrow changes to a down arrow.

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:

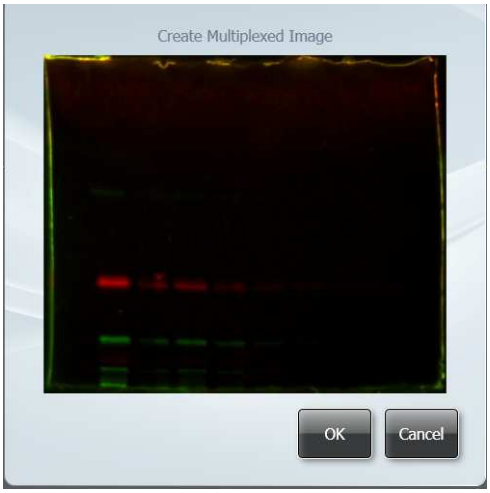
Note: Selected function buttons turn red. They stay red and the function remains active until the function button is re-selected.



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.

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



CREATE MULTIPLEXED IMAGE POP-UP

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, i.e. **image7**, 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.

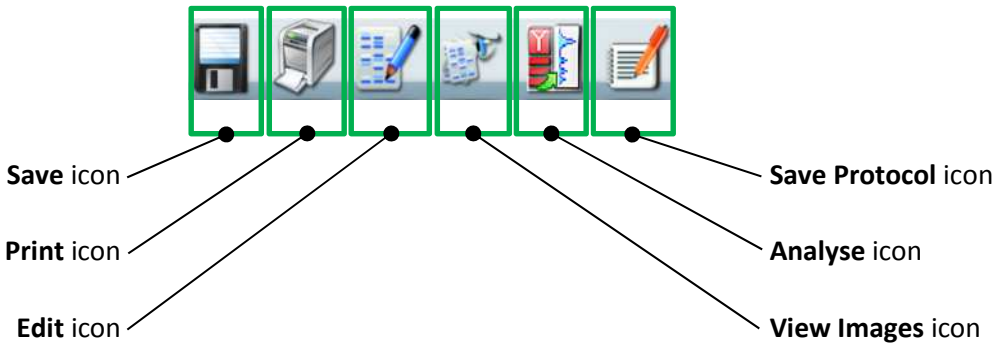


Image Edit Screen - Image Editing Main Options

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

- General Tools
- Annotation Tools
- Enhancement Tools
- 3D Tools

By default the Image Edit screen opens in General Tools 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 TOOLS MODE

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

IMAGE EDIT SCREEN - TOOL SELECTION BUTTONS

Image Edit Screen - General Tools Option

The lower left hand pane of the **General Tools** version of the Image Edit 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 TOOLS CONTROLS/FUNCTIONS

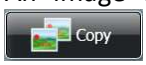
IMAGE SOURCE

As you make changes to an image file the GeneSys software makes a copy of the file to which the changes are made. There are therefore two versions of the image file; the original unchanged image file, and the changed image file. The **Image Source** function allows you to view either of these two files. To view the unchanged file select the **Original image** button  . To view the changed file select the **Processed image** button  .

ROTATION

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

COPY IMAGE

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

. This allows you to paste the image into another package.

OTHER

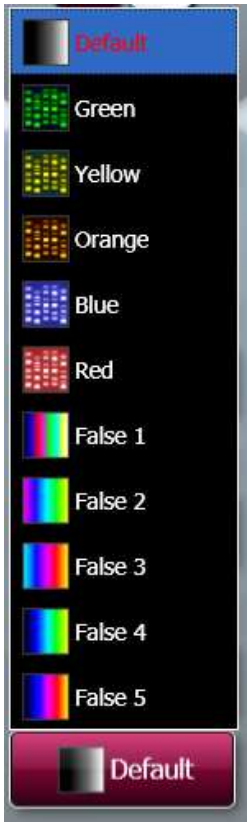
The Other functions provided are **Saturation** and **Default**.

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

.

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

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



OTHER FUNCTIONS - DEFAULT COLOUR MENU

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

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

Image Edit Screen - Annotation Tools Option

The lower left hand pane of the **Annotation Tools** version of the Image Edit 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.

ANNOTATION TOOLS CONTROLS/FUNCTIONS

IMAGE SOURCE

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

ANNOTATION TOOLS

The following image annotation tools are available:

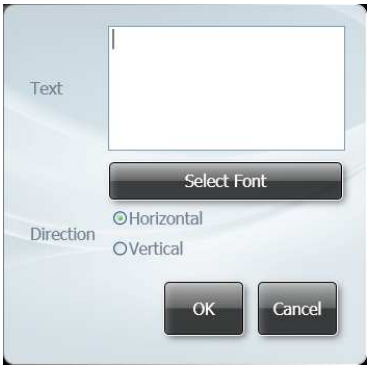
Select tool		Polygon tool	
Pan tool		Line tool	
Text tool		Arrow tool	
Fill/No Fill tool		Select Colour tool	
Rectangle tool		Line Style tool	
Ellipse tool			

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 start typing. Using the **Select** tool you can then position the text box where you want it, and

resize the text box horizontally and vertically. Double clicking/tapping the text enables you to change text parameters using the pop-up dialogue boxes shown below.



TEXT POP-UP 1

TEXT POP-UP 2

The parameters you can change are:

- 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 **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 **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 **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 **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 **Line Style** tools.

The **Select Colour** and **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** button  . To paste the copied annotation, first select the destination image, then select the **Paste** 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, 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 - Enhancement Tools Option

The lower left hand pane of the **Enhancement Tools** version of the Image Edit 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.

ENHANCEMENT TOOLS CONTROLS/FUNCTIONS

IMAGE SOURCE

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

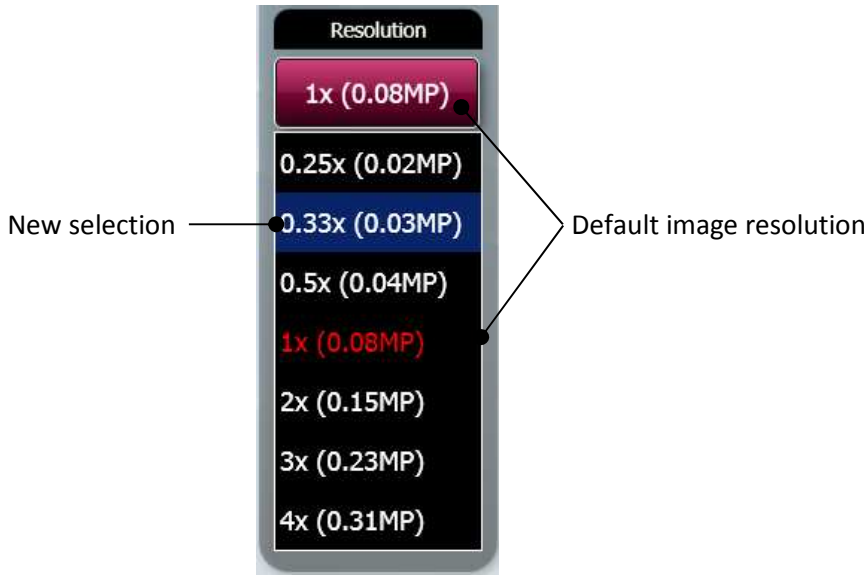
The **Define area to be cropped** tool enables you to select an area of the selected image so that you can isolate the chosen portion of the image from the rest of the image in order to view that portion more closely. Select the **Define area to be cropped** icon and draw a rectangle that covers the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

Image Edit Screen - General / Annotation / Enhancement Options Common Controls

The central image viewing pane of the General, Annotation and Enhancement 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.

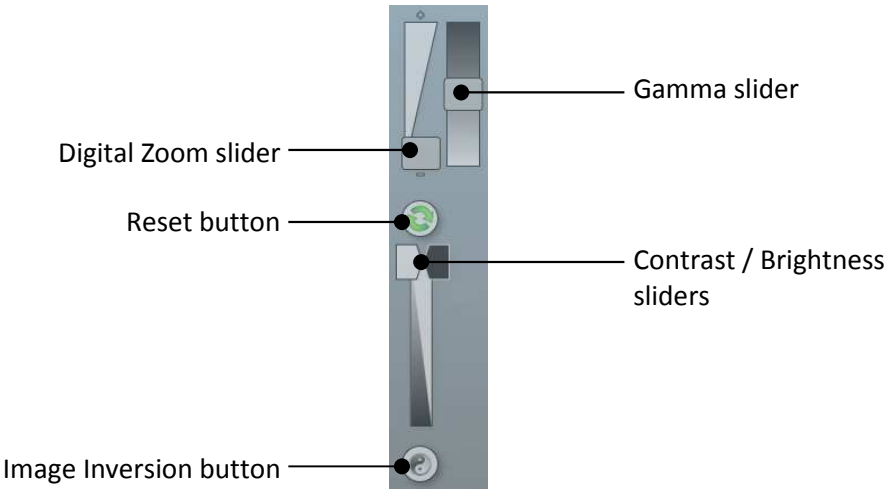


IMAGE SLIDER CONTROLS

The **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

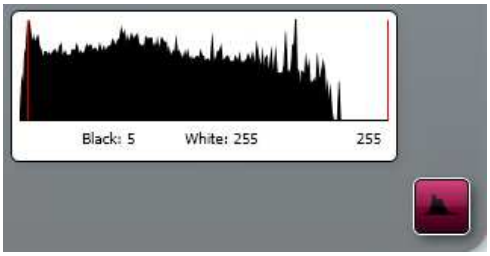
- Range (range of grey scales captured)

IMAGE INFORMATION POP-UP WINDOW

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

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 Tools Option

The 3D version of the Image Edit 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.

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

- Image Source
- Other Tools
- Gamma

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

3D TOOLS CONTROLS/FUNCTIONS

IMAGE SOURCE

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

OTHER

The **Saturation** and **Default** functions are as described previously in **Image Edit Screen - General Tools 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 option of the Image Edit Screen provides the following functions for altering the view of the displayed image:

Pan Up control

Reset Pan button

Pan Down control

Pan Left control

Pan Right control

Rotate Right control

Rotate Forward control

Rotate Anti-clockwise control

Reset Rotation button

Rotate Clockwise control

Rotate Backward control

Rotate Left control

Selecting an action by clicking or tapping on an icon once moves the image in the relevant direction by a programmed amount or step. The image can be moved in the relevant direction continuously by 'holding down' the icon.

Selecting either of the **Reset** icons reset 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.

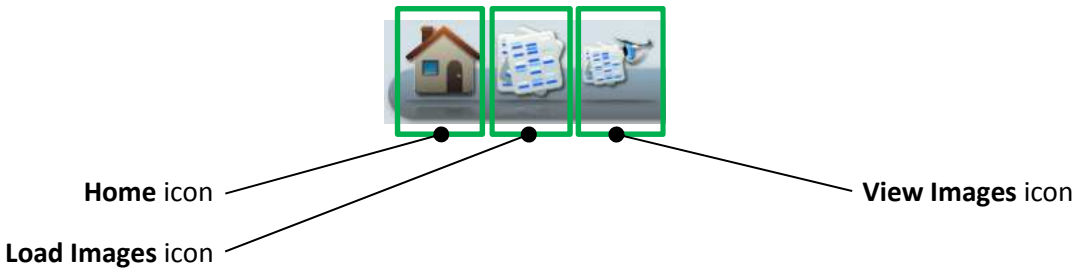
SCALE SLIDER

Image Edit Screen - All Options Common Controls

ACTION ICONS

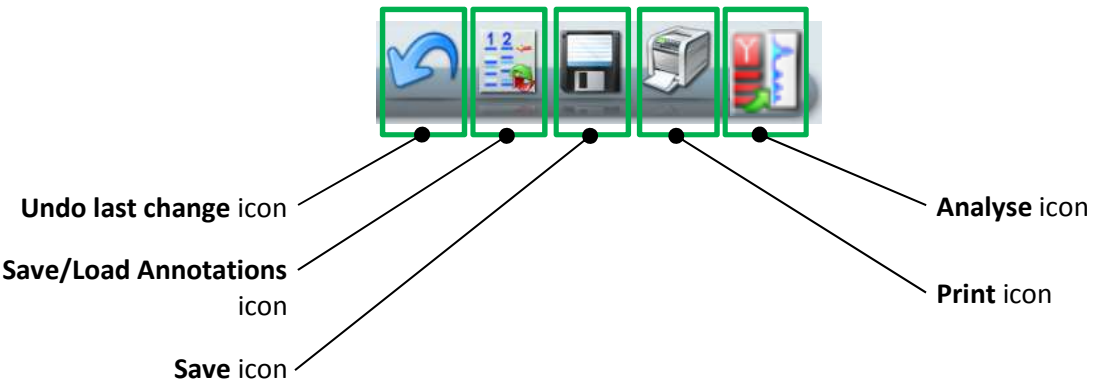
All four of the Image Edit main option screens provide the same **Action** icons across the bottom of the screen.

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 BOX

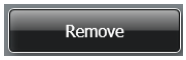
RIGHT HAND PANE

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

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

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

REMOVE / REMOVE ALL BUTTONS

Selecting the **Remove** button 

dismisses the currently selected image from the image pool.

Selecting the **Remove All** button 

dismisses all images from the image pool.

Common Screen Functions and Tools

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

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

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

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

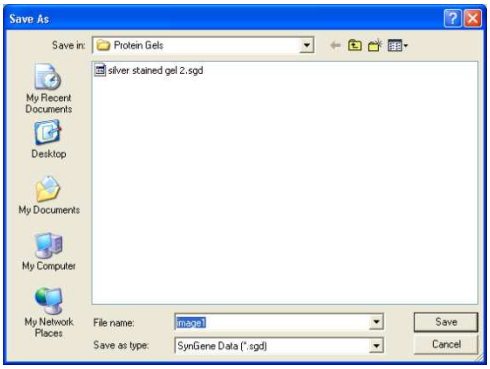
The **Analyse** icon  is used to export an image to the GeneTools package for further analysis.

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

Saving Images

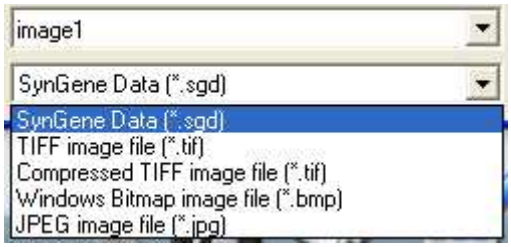
Any time that an image is captured or in some way changed, e.g. annotated, colour washed for increased contrast, etc, and the **Save** icon is active, using the GeneSys software you have the opportunity to save the image.

Select the **Save** icon  from the bottom of the screen. This displays the 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 GeneSys 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 GeneSys software defaults to the SynGene 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.

- If you have selected a file type other than the SynGene Data format file (*.sgd), 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.

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.

Printing

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

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

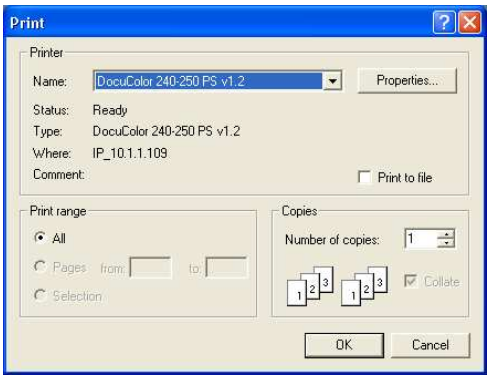
- **Full Report** - checking this checkbox sets the Instrument to generate a Full Report for each test. The Full Report content can be controlled using the additional checkboxes, check to include the feature:
  - Image
  - File Description
  - Capture Properties
- **Basic Report** - checking this checkbox 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.

Select the **Print** icon  from the bottom of the screen.

SINGLE IMAGES

Single images can be selected and printed individually or multiple single images can be selected and printed. For each single image the **Print** dialogue box is displayed.

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.

MULTIPLEXED IMAGES

When printing a multiplexed image, all the images in the multiplex set can be printed together or only selected images from the set can be printed.

To print all images in the set, select the **Print** icon  , then select the **All** button on the **Printing multiplex** dialogue box.

TYPICAL PRINT DIALOGUE BOX

To print selected images in the set, select the required images, select the **Print** icon  , then select the **Display** button on the **Printing multiplex** dialogue box.

TYPICAL PRINT DIALOGUE BOX

For each individual image the **Print** dialogue box is displayed. See above.

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

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 PXi / PXi Touch

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

Cleaning a PXi / PXi Touch Instrument

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

The outside of the PXi / PXi Touch 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 Drawer, 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.

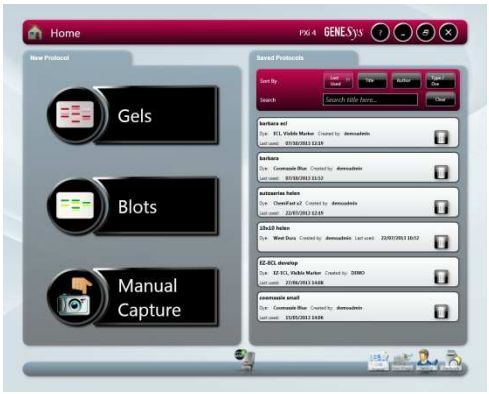
Avoid spilling any liquid into the body of the instrument and clean any external spills immediately. If any liquid enters the main body of the instrument, make the instrument inoperative and contact the supplier.

Contacting Syngene

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

- Unit Serial Number
- Camera
- GeneSys Version
- Database Version

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



STANDARD VIEW HOME SCREEN

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

ABOUT GeneSys POP-UP

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

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

CLASSIC VIEW HOME SCREEN

Further information concerning PXi / PXi Touch Instruments can be found on the Syngene website; www.syngene.com. Here you can access; Application Notes, Technical Articles, FAQs and Quick Guides.

Technical support for your PXi / PXi Touch Instrument can be accessed by telephone or email:

Tel: +44 (0)1223 727123

Email: support@syngene.com

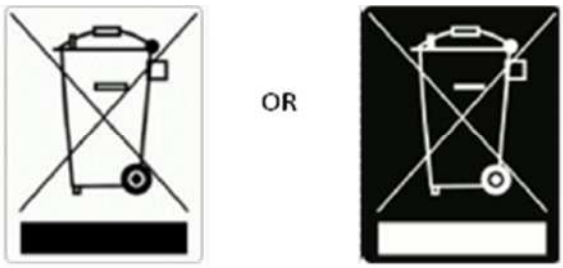
PXi / PXi Touch Troubleshooting

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 PXi 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@syngene.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@syngene.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@syngene.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@syngene.com.
Transilluminator will not turn on	Check the power cord is not loose. If it still does not come on it is likely the transilluminator has failed.	Please contact support@syngene.com.

DISPOSAL

Disposing of a PXi / PXi Touch

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 PXi / PXi Touch 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 PXi / PXi Touch Instrument, contact Syngene at:

Website: www.syngene.com

Email: sales@syngene.com

Mail and telephone:

Syngene Europe office	Syngene USA office
Beacon House	5103 Pegasus Court, Suite L
Nuffield Road	Frederick
Cambridge	MD 21704
CB4 1TF	USA
United Kingdom	
Tel: +44 (0)1223 727123	Tel: 800 686 4407/301 662 2863

Note: Products from other manufacturers may form a part of your PXi / PXi Touch 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.