

**PX*i***

Redefining gel  
and blot imaging



**S Y N G E N E**



A DIVISION OF THE SYNOPTICS GROUP

# PXi AND PXi TOUCH

Gel and blot imaging made easy

Syngene imaging systems are recognised world-wide as high quality, high performance instruments for the capture and analysis of fluorescence gels, chemiluminescence Western blots, protein samples and stain free techniques.

## The PXi range

The **PXi** is a new generation of system targeted for a range of applications. It is especially aimed at chemiluminescence and multi-spectral imaging users (multiplex) where high sensitivity is required. Its unique, compact design attracts the small format gel or blot user. As usual, Syngene leads the way in being the first to utilise the latest advancements in CCD technology giving industry-leading levels of sensitivity. All systems use the ground-breaking application led image capture software, GeneSys, and come complete with unlimited copies of GeneTools analysis software. With **PXi** you can image fluorescent gels, chemiluminescent Western blots, multiplexed blots, UV excited gels, blue light excited gels, bioluminescence, GFPs, stain free and visible stained blots and gels.

## Sensitivity

You can achieve superior sensitivity from the high quantum efficiency and low read out noise CCD cameras. All cameras have quantum efficiency levels of 73% at 425nm resulting in faster image capture and increased image sensitivity compared to current CCD cameras. Using the GeneSys image capture software, detection of even the faintest bands or spots on gels and blots can be achieved. The auto-expose functions of **PXi** ensure simple and automatic image capture for any sample type and are especially useful for working with the capture of chemiluminescent Western blots.

## Choice of system

Choose between two models - standalone with built-in processor and touch screen monitor or add your own PC - and a range of cameras 4m, 6m and 9m pixels to suit budgetary requirements and applications. The ergonomically designed **PXi** complements any laboratory with its small footprint and fully automated control and application driven image capture software, GeneSys.



**CONTENTS** // INTRODUCTION **2** / PXi HIGHLIGHTS **4** / POWERED BY GENESYS **6** /  
GEL AND BLOT ANALYSIS WITH GENETOOLS **8** / PXi APPLICATIONS **9** / PXi ACCESSORIES **10** /  
FILTERS **11** / PXi FEATURES AND BENEFITS **12** / PXi SPECIFICATIONS **13** //



“The PXi is a new generation of system targeted for a range of applications”



# PXi HIGHLIGHTS

What makes a PXi system special

## Cameras

PXi models feature exclusive new generation high sensitivity 16 bit CCD cameras with high quantum efficiencies. The 4m, 6m and 9m pixel options are cooled to  $-57^{\circ}\text{C}$ , have extremely low read out noise and deliver exceptional images for chemiluminescence and low light level fluorescence applications. Resolution for bands and spots is as low as  $40\mu\text{m}$ .

## Lenses

Each system has a carefully selected lens to maximise the use of the camera sensor and to produce the best possible performance in image quality. Each lens is 'fixed focal length' such that no zooming of the samples is required. Syngene's unique FlatFix technology ensures perfect background correction for all images while an automatic lens correction function is utilised to remove distortions that can sometimes affect images.

## Filter wheel

All PXis have a motor driven filter wheel which can house up to 7 different emission filters to cover a wide range of applications. The filter selection is controlled by GeneSys once the user has defined the application they are working with. User access to the filter wheel to fit more filters is via the removable front cover/monitor.

## Filters

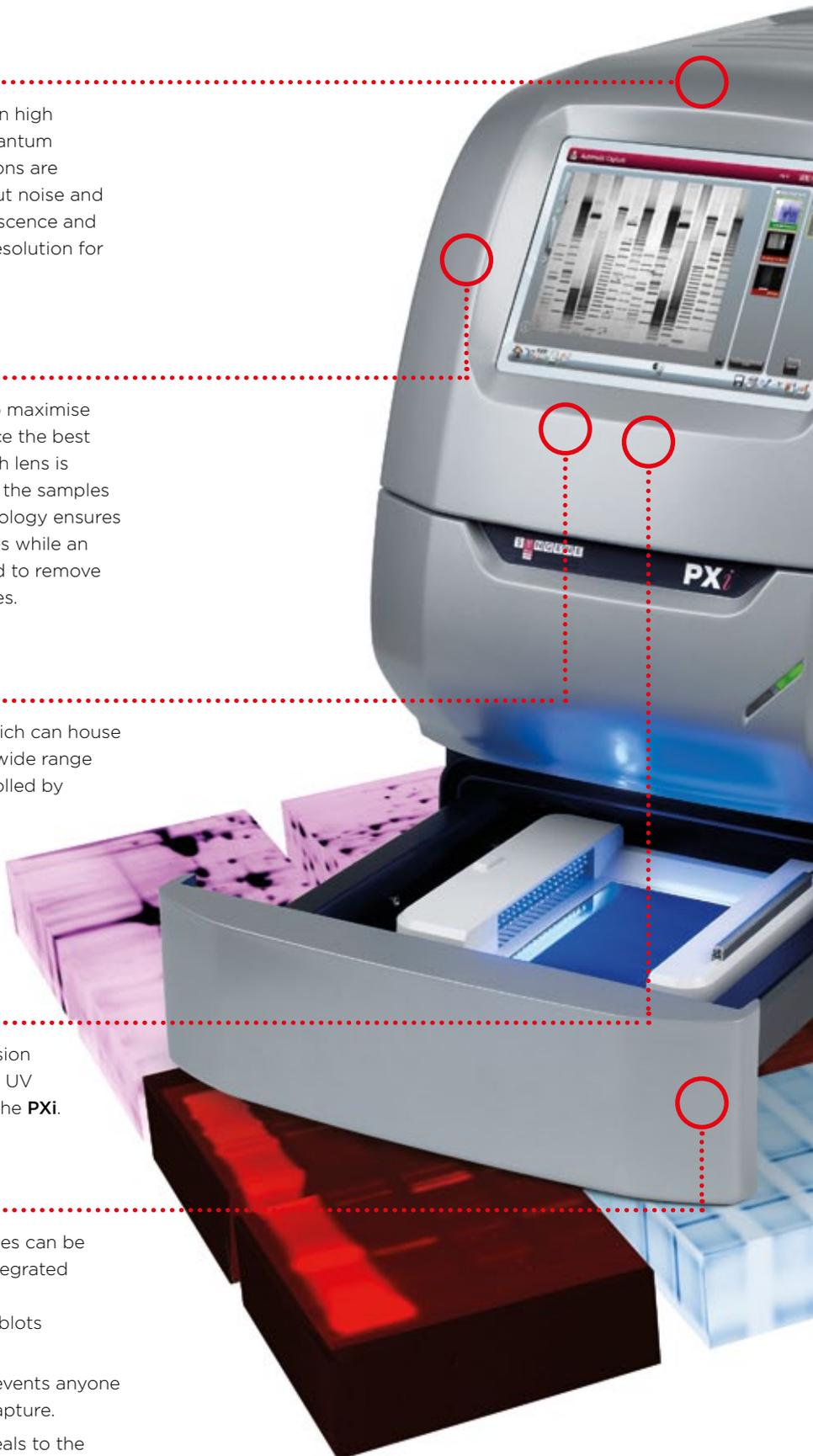
PXi can be fitted with a wide range of emission filters to extend its range of applications. A UV (orange) filter is supplied as standard with the PXi.

## Sample drawer

The PXi has a sliding sample drawer. Samples can be easily positioned in the drawer using the integrated alignment guide for the positioning of the transilluminator and any chemiluminescent blots being used.

The drawer has an electronic lock which prevents anyone from accessing the system during image capture.

PXi is a compact format system which appeals to the user of smaller gels and blots. Sample areas for the PXi systems are 15 x 11cm (PXi4), 13 x 10cm (PXi6) and 13 x 10cm (PXi9).





## System access

Access to the internal chamber is through an easy to remove light-tight rear panel. Here the LED light modules can simply be plugged into the built-in front and rear LED gantries. Further access for service is available by easy removal of the instrument top and front covers/monitor.

## Internal lighting

**PXi** has a range of lighting functions for different applications.

### UV lighting

This EPI illumination, which is standard in all models, provides 302nm UV, suitable for excitation of ethidium bromide stained DNA gels and also any stain-free imaging techniques.

### White light illumination

EPI white light LED lighting (standard on all **PXis**) is used for sample positioning, some white light applications and importantly for the imaging of colorimetric markers on chemiluminescent Western blots.

An optional white light transilluminator (white light pad) can be used for the imaging of gels stained with coomassie blue, silver stain or other visible stains.

### Blue light transilluminator option

A compact blue light LED transilluminator is perfect for 'safe' dye applications, eg, SYBR stains, UltraSafe blue and many more.

### Coloured LED light module options

**PXi** uses Syngene's unique plug and play LED modules for red, green, blue and IR applications.

The **PXi** is especially suitable for multiplexed applications. These high output modules produce good fluorescence from a wide range of fluorophores. Narrow band versions of the modules (M series) are designed to produce minimal 'cross talk' between light channels when working with multiplexed samples.

## System connections

All **PXi** systems have variable voltage input (100 - 240v).

The **PXi** is ready for use with any external PC (check web site for minimum PC specifications). The **PXi** has two USB ports (camera and darkroom) for output to the external PC.

The **PXi Touch** has a built-in processor and touch screen monitor. The monitor is a high resolution, glass faced screen displaying crystal clear, high definition images. This single touch heavy duty screen is safe to use with or without gloves and is sealed against liquid ingress.

The **PXi Touch** models have two USB ports on the rear suitable for mouse, keyboard or printer connection if required. They have an additional side mounted USB port which can be used for data download onto memory sticks or hard drives and a rear mounted network port allowing the system to be connected to the Internet or facility networks.



# POWERED BY GENESYS

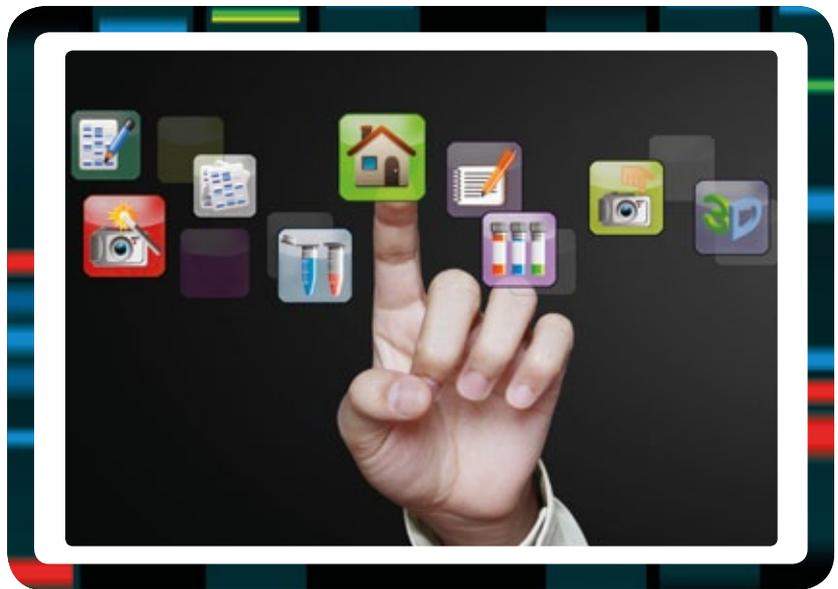
Applications at the touch of a button

## GeneSys control software

GeneSys is unique software for the control and image capture of any Syngene system including **PXi**. Unlike any other software, GeneSys is 'application driven'. At the heart of GeneSys is an extensive database which contains an impressive list of dye and protocol data. The user only needs to tell GeneSys which application they are using and the software will automatically configure the system for that application. The resulting captured images are of exceptional quality and can be reproduced time after time. GeneSys is a truly unique application driven software unequalled by others.

The system can be used in a fully automated mode which means the user needs no experience in image capture, or in manual mode for those who wish to use their own settings. To automate the system further, capture protocols for typical gel or blot applications are included on the Home page. There is no limit to the number of capture protocols that can be added by the user. Having pre-set protocols enables the user to click only one button to go from sample positioning to image capture. This is especially useful when running a number of similar applications.

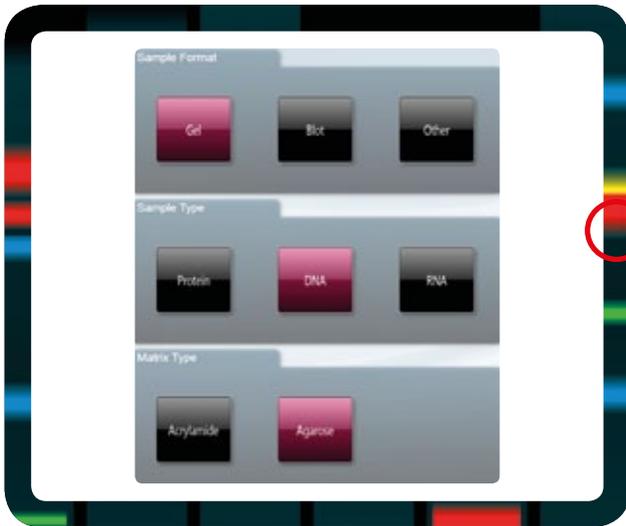
When it comes to multiplexing, GeneSys provides an impressive protocol which takes care of all lighting, filter and exposure settings for each fluorophore. Up to 5 different fluorophores can be imaged at a time which can then be displayed as a multichannel image as a colour overlay or as single images. No other system can give you such an automated process of multiplexing applications.



“GeneSys is a truly unique application driven software unequalled by others”

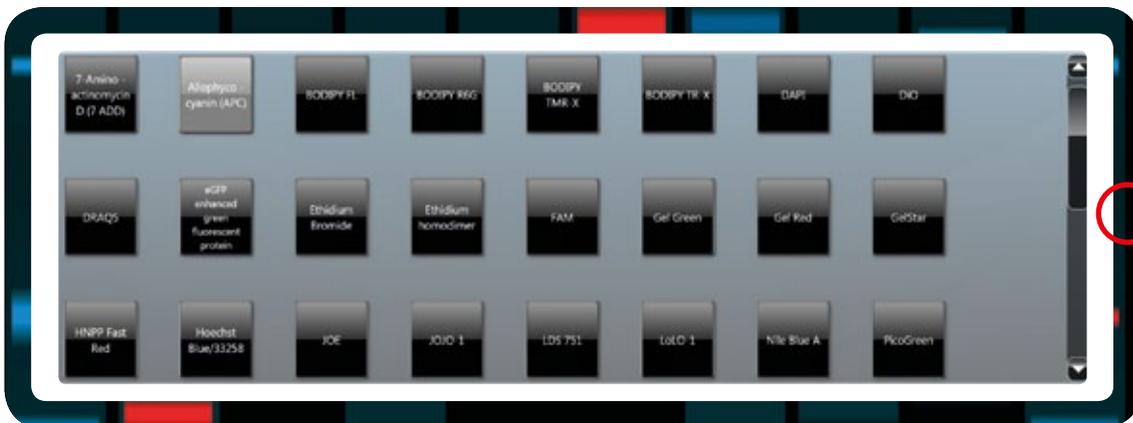
For Western blot applications GeneSys automatically determines the optimum settings for perfect images using any chemiluminescent reagent. Single images or a series of timed images can be captured if required. You can also use molecular weight or colorimetric markers which can be captured and displayed automatically with your images.

Other useful functions found within GeneSys include an image library, image editing and an image overlay option which allows you to compare data between blots and gels.

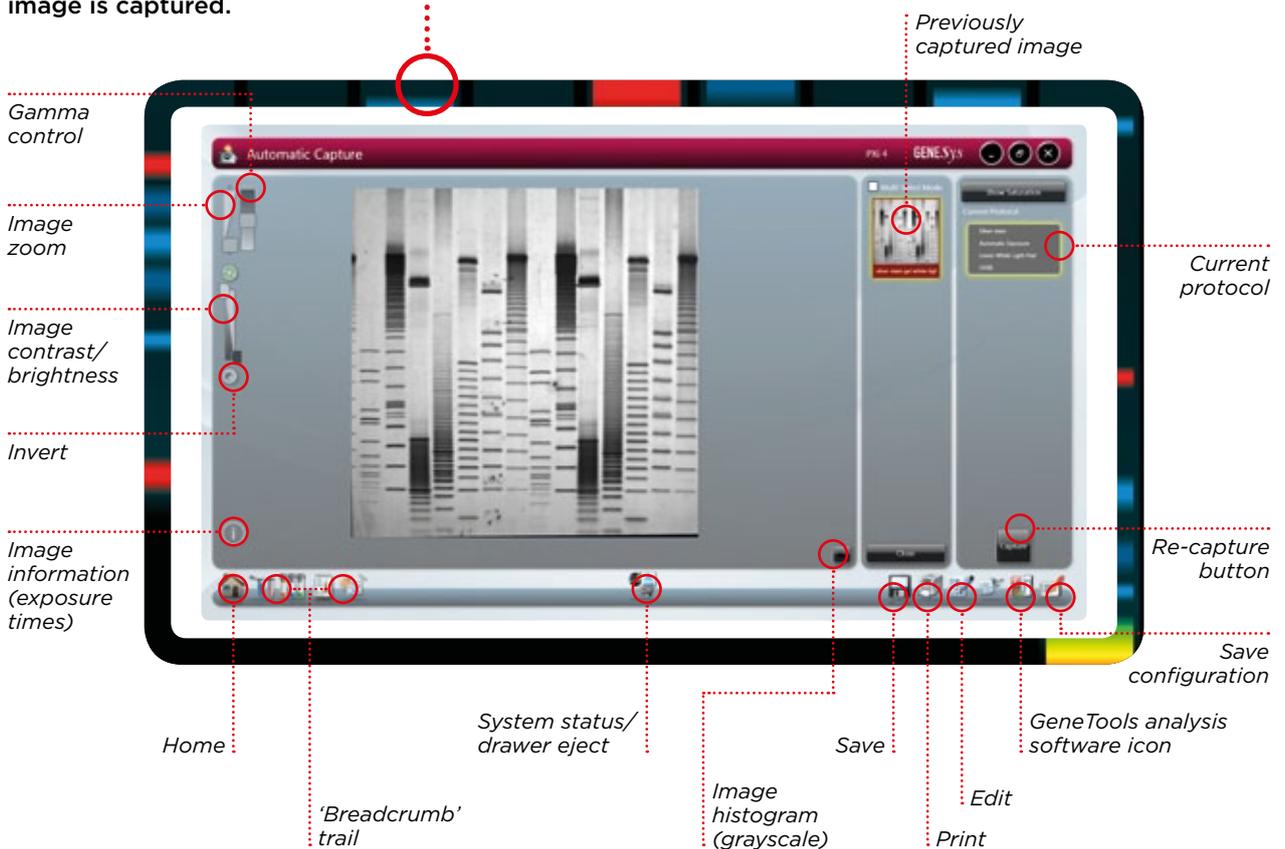


In auto-mode you simply select the gel or blot application you are working with.

From the extensive database of dyes and reagents the one being used is selected.



Functions available once the image is captured.



# GEL AND BLOT ANALYSIS WITH GENETOOLS

Automated analysis at the click of a button

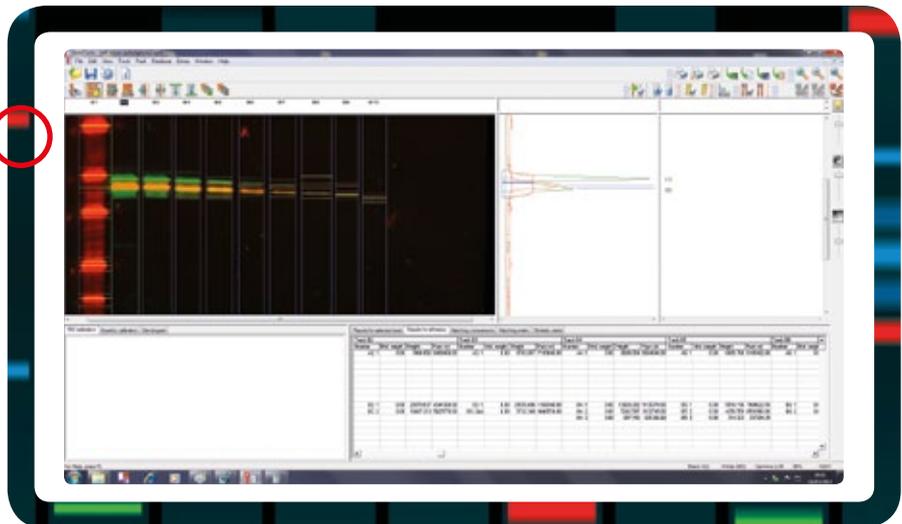
GeneTools analysis software provides rapid and powerful gel analysis. Automatic detection of lanes and bands, viewing densitometry profiles and user-friendly functions allow for customisation and adjustments to be made.

It has never been easier to analyse multiplexed gels or blots with GeneTools making it possible to view and analyse overlaid channels to automatically detect bands in separate channels at the same time and to also view individual channels.

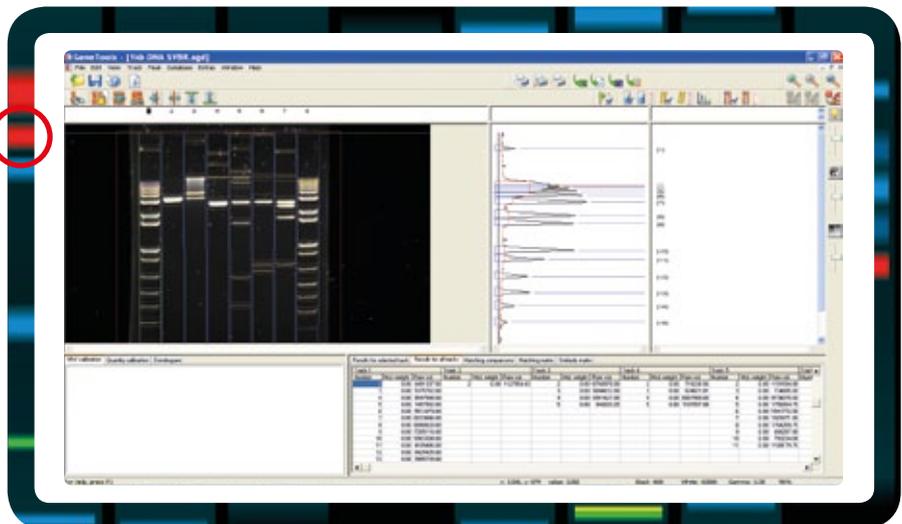
Share and export data easily. Save, open and analyse image files, export data reports directly to Microsoft Excel and Word.

“It has never been easier to analyse multiplexed gels or blots”

.....  
**Accurately quantify a multiplexed Western blot using GeneTools.**



.....  
**Automatically detect lanes and bands and easily add molecular weight ladders with GeneTools.**



- 1D gel analysis
- MW/BP calculation
- Quantification
- E-gels
- Band matching with dendrograms
- Spot blots
- Colony counting
- GeneDirectory (option) for extended band matching, cluster analysis, VNTR analysis, genotyping, RFLP studies, dendrogram generation and bootstrapping.



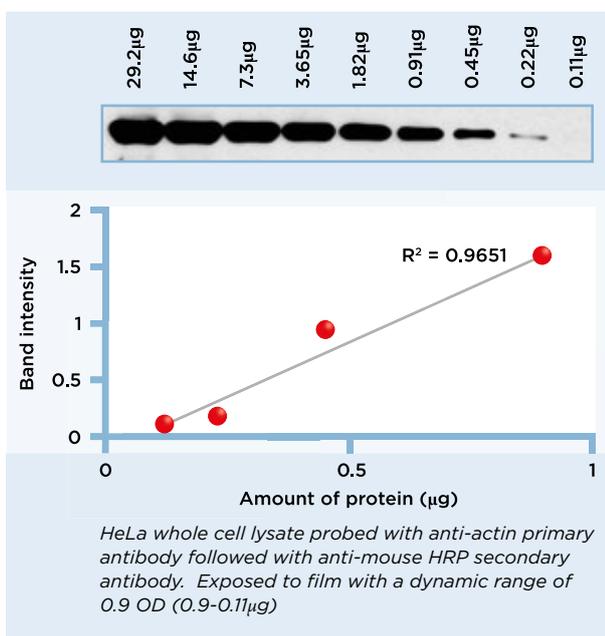
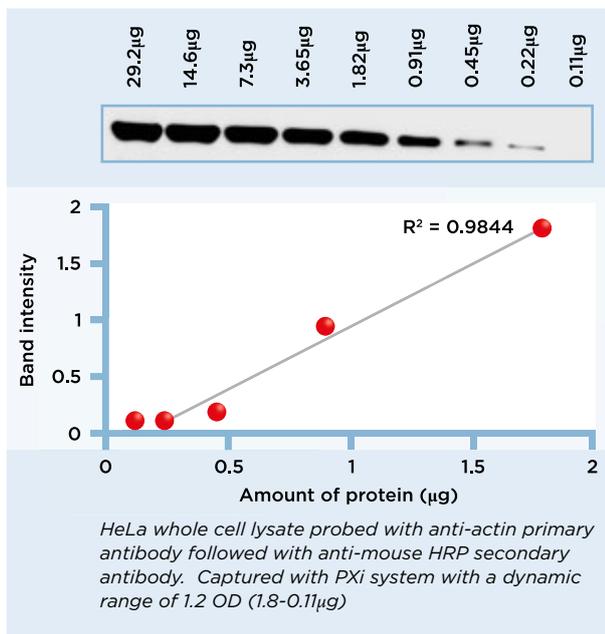
# PXi APPLICATIONS

Applications you can image with a PXi

## Chemiluminescence imaging

Automated imaging of chemiluminescent blots has never been easier with GeneSys. Achieve faster exposure times, choose between having a speedy image or opting for a high quality image and achieve a dynamic range that surpasses film to ensure fully quantifiable data.

Eliminate the guesswork of single event capture of blot signals with film and use GeneSys software to ensure you never saturate your bands and easily capture visible markers that are merged with your chemiluminescent image for molecular calculation.

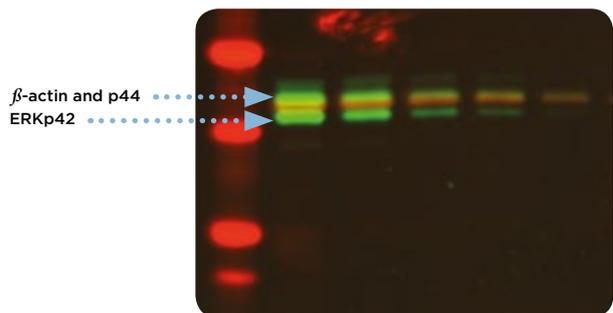


## Multiplex fluorescence detection

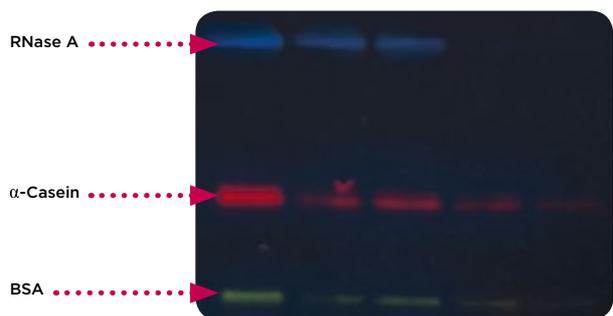
The PXi system offers superior sensitivity capable of capturing the broad dynamic range available with fluorescence ensuring outstanding linearity for accurate quantification.

Detecting multiple proteins simultaneously is effortless with the new PXi system and GeneSys. Detect up to five different fluorophores on the same gel or blot. Band intensity values can be normalised to another protein or a loading control eliminating the need to strip and re-probe.

Multiplexed imaging has made it easier to identify co-migrating proteins such as phosphorylated isoforms and proteins with a similar molecular weight. Image data from each fluorescent channel can be overlaid or viewed individually to detect overlapping bands.



*HeLa cell lysate probed with anti-ERK1/2 and beta-actin primary antibodies followed by IRDye<sup>®</sup> 680 and IRDye<sup>®</sup> 800 secondary antibodies.*



*Proteins were probed with anti-BSA, anti-alpha-Casein and anti-RNase A followed by G-Dye100, G-Dye200 and G-Dye300 secondary antibodies.*

PXi system is a versatile system capable of imaging a wide range of applications from DNA detection with ethidium bromide or 'safe' dyes to protein analysis of coomassie blue stain or silver stained gels and fluorescent stained gels and blots e.g. Chemiluminescence, Q-Dots, DyLight, Alexa Fluor, Cy Dyes, and LI-COR<sup>®</sup> IR dyes, bioluminescence and GFPs as well as stain free imaging.



# PXi ACCESSORIES

Extending the range of imaging applications



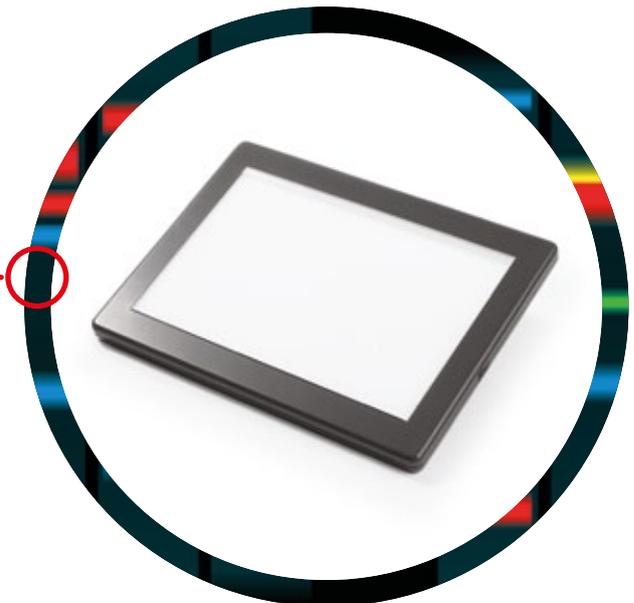
## UltraSlim

The UltraSlim LED blue light transilluminator can be used with the **PXi** for those applications requiring blue light excitation e.g. 'safe' dyes and also ethidium bromide stained UV gels.

Location points within the drawer of the **PXi** ensure accurate alignment of the UltraSlim. The unit has a dual array of high intensity blue light LEDs, powerful enough to excite all gels. Once connected to the **PXi** within the drawer, control of this lighting is taken care of by GeneSys.

## White light pad

This option is used within the **PXi** drawer and is suitable for all visible stain applications, such as, coomassie blue and silver stain. Like the UltraSlim, this white light pad is also controlled from within GeneSys.



## LED modules

Plug and play modules which have either red, green or blue LEDs and a corresponding excitation filter, provide a high intensity lighting option for use with an extensive range of coloured fluorophores. More specific 'M' versions of the modules are available for use with multiplexed applications.

IR versions of the modules are also available for imaging LI-COR® IR dyes and other IR dye alternatives.

Modules clip into an integral gantry which is accessed from the rear of the **PXi**. Front and rear gantries enable the use of up to 8 modules (normally modules are used as pairs - 1 back and 1 front).



# FILTERS

Emission filters for use with an impressive choice of applications

PXi has a 7 position motor driven filter wheel as standard. There is an extensive range of emission filters available for an array of applications. Check the Syngene Product and Application selector on [www.syngene.com](http://www.syngene.com) for more information.



Filter	Wavelength range nm	Description
UV06	572-625	UV filter for G:BOX Chemi and PXi systems
SW06	516-600	Short pass filter for G:BOX Chemi and PXi systems
LW06	611-641	Long pass filter for G:BOX Chemi and PXi systems
FILT440	427-457 peak 440	Qdot filter
FILT525	516-539 peak 525	Qdot filter also multiplexing filter for blue light applications
FILT565	556-579 peak 565	Qdot filter
FILT605	590-607 peak 605	Qdot filter
FILT605M	594-610 peak 605	Qdot filter also multiplexing filter for green light applications
FILT620	600-640 peak 620	Qdot filter
FILT655	633-660 peak 655	Qdot filter
FILT705	697-717 peak 705	Qdot filter
FILT705M	700-720 peak 705	Qdot filter also multiplexing for red light applications
FILT800	780-820 peak 800	Qdot filter
FRLP	670-780	Red light apps
IR780	782-900	IR applications
LY800	809-876	IR multiplexing filter suitable for IR dye 800 and DyLight 800
NEUTRAL DENSITY	N/A	For neutral fielding epi LED modules



# PXi FEATURES AND BENEFITS

Why you should be choosing a PXi for your work



Features	Benefits
<b>New generation very high quantum efficiency cameras</b>	Superior sensitivity – allows capture of very low light emissions from gels and blots
<b>Compact ergonomic design</b>	Perfect for users working with small format gels and blots
<b>Fully automatic control</b>	Effortless capture of chemiluminescent and multiplex images without ‘guesswork’
<b>Wide range of lighting options</b>	Fully programmable to work with any application including complex multiplex experiments



# PXi SPECIFICATIONS

Choose your PXi

	PXi4	PXi4 Touch	PXi6	PXi6 Touch	PXi9	PXi9 Touch
<b>System</b>						
Resolution [pixels m]	4	4	6	6	9	9
A/D	16 bit					
Greyscale	65536	65536	65536	65536	65536	65536
Cooling - regulated	-57c	-57c	-57c	-57c	-57c	-57c
Lens	f0.95	f0.95	f1.4	f1.4	f1.4	f1.4
Filter wheel	Yes	Yes	Yes	Yes	Yes	Yes
UV Filter**	Yes	Yes	Yes	Yes	Yes	Yes
Use with external PC *	Yes		Yes		Yes	
Output connections for external PC - USB ports	2		2		2	
Integral PC and monitor		Yes		Yes		Yes
USB ports		3		3		3
Network port		Yes		Yes		Yes
<b>Illumination</b>						
Epi LED White lights	Yes	Yes	Yes	Yes	Yes	Yes
EPI UV 302nm	Yes	Yes	Yes	Yes	Yes	Yes
EPI Red LED module	Optional	Optional	Optional	Optional	Optional	Optional
EPI Blue LED Module	Optional	Optional	Optional	Optional	Optional	Optional
EPI Green LED Module	Optional	Optional	Optional	Optional	Optional	Optional
EPI Red LED module M series for multiplexing	Optional	Optional	Optional	Optional	Optional	Optional
EPI Green LED Module M series for Multiplexing	Optional	Optional	Optional	Optional	Optional	Optional
EPI Blue LED Module M series for multiplexing	Optional	Optional	Optional	Optional	Optional	Optional
EPI IR LED module	Optional	Optional	Optional	Optional	Optional	Optional
White light pad for visible stains	Optional	Optional	Optional	Optional	Optional	Optional
UltraSlim LED Blue light transilluminator	Optional	Optional	Optional	Optional	Optional	Optional
<b>Dimensions</b>						
w x h x d [cm]	36 x 60 x 55					
Weight [kg]	31	37	31	37	31	37
Voltage	100-240v	100-240v	100-240v	100-240v	100-240v	100-240v
Warranty	3 years					

\*See web site for current specifications

\*\*See list of other available emission filters

The internal computer is an industrial computer motherboard.

Intel 3rd Generation i3 CPU (i3-3110), 4GB RAM, 320GB Hard disk running a 32 bit version of Windows 7 Professional.

The display is a 1024 x 768 capacitive touchscreen.

We reserve the right to alter specification without prior notice.

Over 75,000 scientists world-wide in pharmaceutical and biotech companies, as well as academic and government institutions, have chosen Syngene as their expert imaging partner. If you'd like to find out why, please contact us or one of our dealers for more information and a demonstration of the revolutionary **PXI**



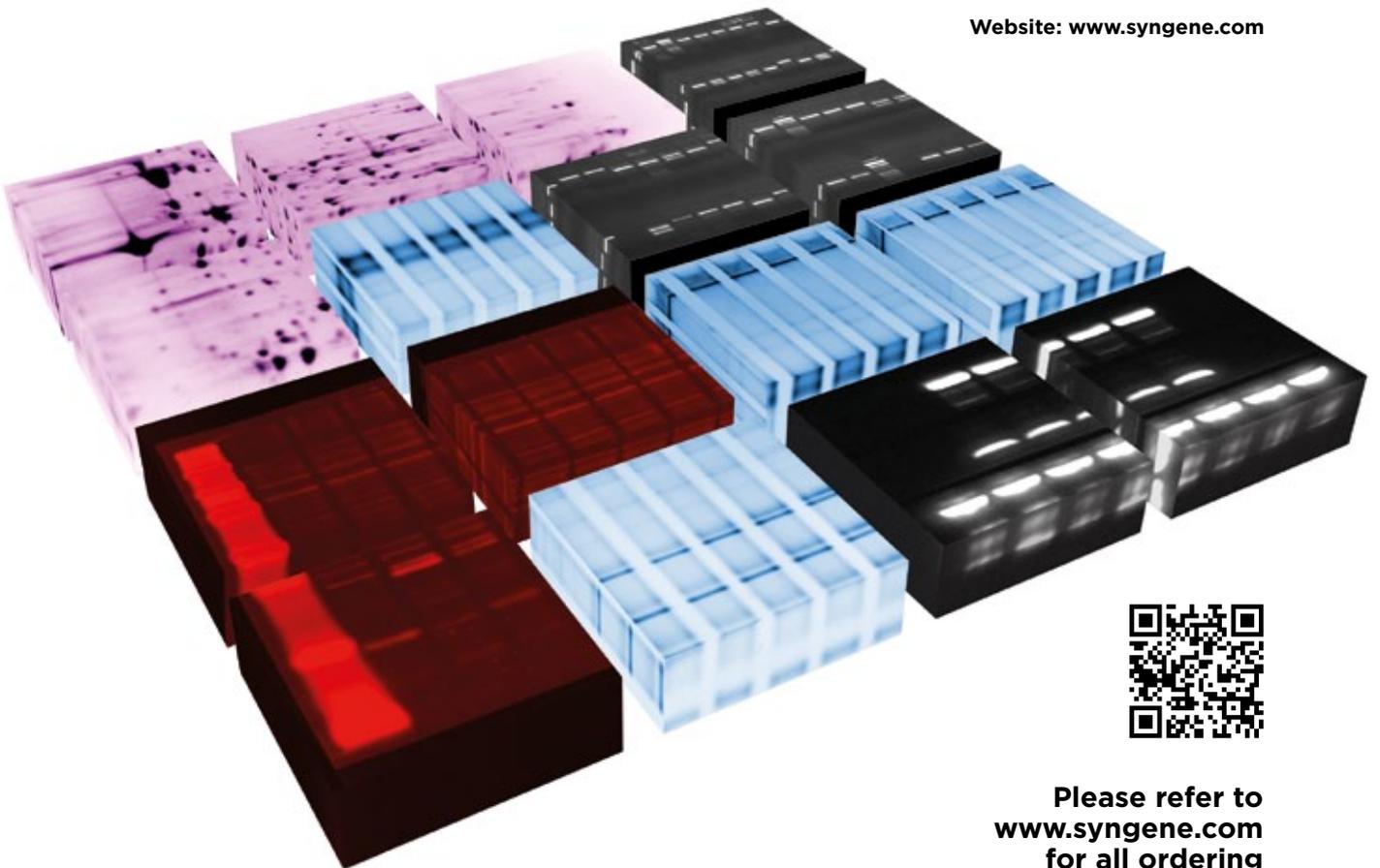
**Syngene Europe and International Headquarters:**

Beacon House Nuffield Road  
Cambridge CB4 1TF UK  
Tel: +44 (0)1223 727123  
Fax: +44 (0)1223 727101  
email: sales@syngene.com

**Syngene USA Headquarters:**

5108 Pegasus Court Suite M  
Frederick MD 21704 USA  
Tel: 800-686-4407/301-662-2863  
Fax: 301-631-3977  
email: ussales@syngene.com

**Website: [www.syngene.com](http://www.syngene.com)**



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