Discover the Details

DeltaPix Camera, Software and
Systems Overview

INFINITY X

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DeltaPix Scientific cameras

DeltaPix cameras are very well suited for a wide range of research and routine applications in laboratories, industry, hospitals, universities and more. On the camera comparison matrix on this page, help for selecting the right camera for most typical applications can be found. On our home page at www.deltapix.dk, examples of images captured in different applications and with different cameras can be found.

-Carefully cleaned and sealed aluminium enclosures with large surface and internal optimization of the heat flow, to keep the temperature of the components down.
-Electronic components of high quality for long and reliable durability

All Invenio II cameras are designed, manufactured and tested in Denmark to the highest scientific standards.

Stunningly high quality Images

The combination of extended focus and extended exposure (images captured at different exposure levels combined) in the InSight software and the extreme high resolution capability of the Infinity X-32 or other High resolution DeltaPix cameras is a unique capability. It makes it easy to capture stunningly high quality images with almost unlimited focus depth and dynamic range, ideal for many microscope- and macro- applications. The DeltaPix pixel shifting technique (DeltaVu) included in the Infinity X-32 camera, makes this probably the highest spatial and colour resolution C-Mount camera in the world.

How many pixels are needed?

The number of pixels needed depends on many factors, but one of the key factors is the magnification. The higher optical magnification, the fewer pixels are needed to resolve all details. For the best low magnification optics, more than 15Mpixels are needed, for the highest magnification (100x objectives) less than 2Mpixels will be sufficient. The number of pixels is not the only important parameter of a scientific camera. The pixel size, noise level, noise patterns, and the functions provided by the camera are no less important. The ideal camera would have very small pixels in order to resolve small details, big pixels for high dynamics and low noise, and fast frame rates for easy focusing and capture of moving objects. The best and most optimal solution for this is a pixel shifting camera like the Infinity X-32, but most DeltaPix cameras include functions to provide the best possible compromise, functions like "snapshot mode", sub sampling, binning and separate live view.

Camera Matrix

The camera matrix shown to the right includes the cameras that we currently have in the range.
Please note that this matrix will change as DeltaPix integrates the latest developments in sensor technology into our products.

DeltaPix can also provide cameras from other manufactures for special purposes.

DeltaPix Cameras	Invenio 3S	Invenio 5S	Invenio 5D	Invenio 1SM-II	Invenio 3S-II	Invenio 5S-II	Invenio 1D-II#	Invenio 3D-II#	Invenio 5D-II#	Invenio 8D-II#	DP450	Infinity X-32
Color	x	x	x		x	x	x	x	x	x	x	x
Mono				x		x					x	x
Sensor	½' CMOS	1/2.5' CMOS	1/1.8' Sony CCD	½' CMOS	½' CMOS	1/2.5' CMOS	½' Sony CCD	1/1.8' Sony High sensitive CCD	1/1.8' Sony CCD	1/1.8' Sony CCD	1/1.8' Sony High sensitive CCD	1/1.8' Sony High sensitive CCD
Max FPS at full/1x sub sample/binning resolution	5/15	3/9	3/10	30/100	12/35	7/30	15/30	5	5/12	3/25	12/30	12/30
Exposure time	1-180mS	1-400mS	0.1mS-20S	0.2ms-5S	0.2ms-5S	0.2ms-5S	0.2mS-20S	0.2mS-20S	0.2mS-20S	0.2mS-5S	0.2mS-30S	0.2mS-30S
Bit depth	8	8	8	8	8	8	12 (16)	12 (16)	12 (16)	12 (16)	12 (16)	12 (16)
Read noise	20e-	20e-	20e-	20e-	20e-	20e-	12e-	12e-	12e-	12e-	12e-	12e-
Max Resolution	2048x1536	2592x1944	2592x1944	1280x1024	2048x1536	2592x1944	1392x1040	2048x1536	2592x1944	3264x2448	1616x1216	1616x1216
Max DeltaVu still image Resolution	no	no	no	no	no	no	no	no	no	no	no	6400x4800
Binning	n	n	n	n	n	n	y	n	y	y	y	y
Sub sampling	y	y	y	y	y	y	y	n	y	y	y	y
Gain	1-16	1-16	1-16	1-6	1-6	1-6	1-6	1-6	1-6	1-6	1-16	1-16
Recommended Applications: 1-5stars 5 is best												
Brightfield/Darkfield	***	***	****	****	****	****	****	****	****	****	****	*****
DIC	***	***	****	****	****	****	****	****	****	****	****	*****
Live Cell Imaging	*	*	*	***	**	**	****	****	***	***	****	****
Histology/Pathology/Cytology	**	**	**	**	**	**	***	***	***	***	*****	*****
Semiconductor Inspection	***	****	****	**	***	***	****	****	****	****	****	*****
Metrology	***	****	****	**	***	****	**	***	****	****	****	*****
Documentation and Archiving	***	***	****	**	***	****	**	***	****	****	****	*****
Moderate Light Fluorescence	*	*	***	**	**	**	****	*****	****	****	****	*****
Low Light Fluorescence	*	*	**	**	*	*	***	***	**	**	***	***
Macro imaging	***	***	****	**	***	****	***	***	****	****	****	*****
GFP, FISH, NIR	*	*	**	****	**	**	****	****	**	**	****	****
Luminescence	*	*	**	****	***	***	****	****	***	***	****	****
HD Video High Speed	*	*	*	****	***	***	***	***	**	**	****	****

Preliminary, final data might differ from those written. DeltaPix takes no responsibility for errors and faults. DeltaPix Aps.
#=expected to be available March/April 2011

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DeltaPix Scientific Software

Modern user interface

DeltaPix InSight has a modern and intuitive user interface based on the ribbon band style known from Microsoft Office 2007.
Functionality has been grouped logically, and the program is easy to use. Features are:

- Camera panel for fine control of all camera parameters, like exposure, gain and much more
- Device panel for selection of camera and optics.
- Panorama view for easy image maneuvering in zoomed live and still images.
- Multiple image galleries with thumb view. Easy storing of images.
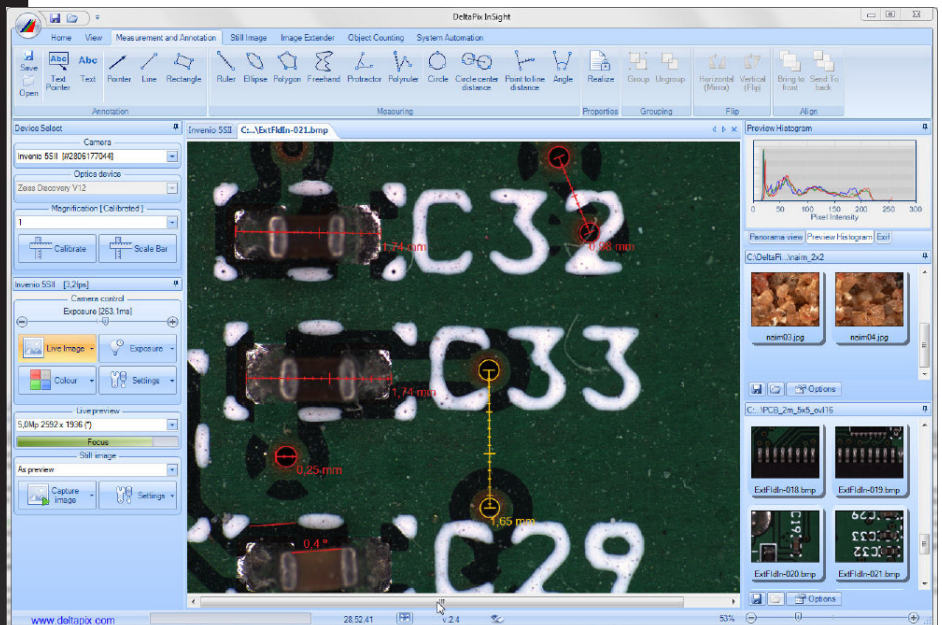
Camera

DeltaPix InSight supports multiple cameras connected to the computer at the same time, and switching between cameras can be done on the fly.
DeltaPix InSight stores camera setting for each camera, no need for time consuming parameter setting.

Camera parameters are stored along with images, this makes it incredible easy to revert to past camera settings. This can save a lot of time for complex camera settings.

DeltaPix InSight provides a fast and smooth live preview. In combination with the focus bar, this makes focusing easy.
DeltaPix InSight supports all DeltaPix cameras, including the high resolution modes in the Infinity X32 camera.
Images can be acquired in either 24 or 48 bit color mode.
Snapshot function for automatic conversion of high gain and binning to long exposure times in CCD cameras, in order to allow fast frame rates, even in low light applications like fluorescence.

The Insight Software is suitable for industrial, mechanical, scientific, material, biomedical and any other applications in which microscopes or macro-systems are used.
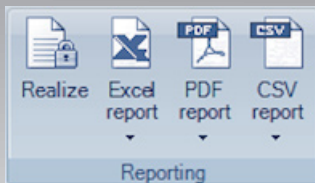
DeltaPix software includes a comprehensive report generating tool.

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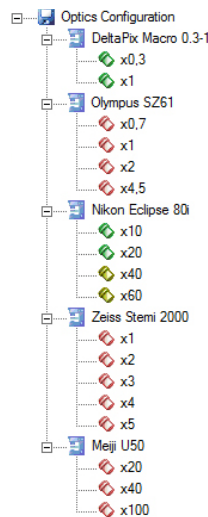
Calibration

Calibration is one of the most important tasks for a modern Microscope camera software.
DeltaPix has used feedback from end users to create a very comprehensive yet easy to use calibration and scale bar system.
Each optical device, objectives and cameras can be calibrated individually. In this way several microscopes and other optical systems can be managed by the same software installation.

By calibrating the optics in high resolution mode, precision to fractions of a μm can be achieved with the X-32 or other DeltaPix high resolution cameras. Scale bars change automatically when new optics are selected, even on the live video, and the scale is shown in metric (mm, micron), and number of decimals, font and colors can be pre-defined.
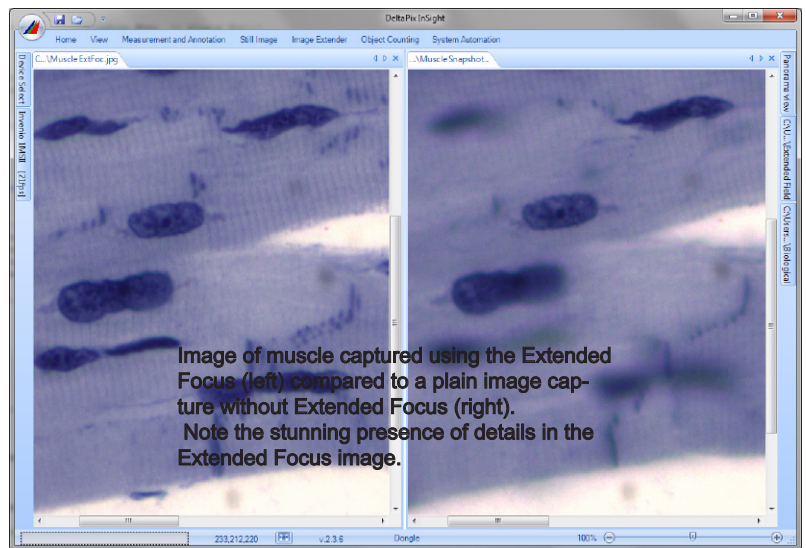

Image of muscle captured using the Extended Focus (left) compared to a plain image capture without Extended Focus (right). Note the stunning presence of details in the Extended Focus image.

Extended Focus

InSight has a state of the art Extended Focus function.
Both manual and automatic Extended Focus is possible. The automatic function uses the motor automation. Extended Focus function can combine images at different focus levels into one single sharp image. If the images have different angles to the optical axis, as it is the case in stereo microscopes, the software will automatically compensate for this.
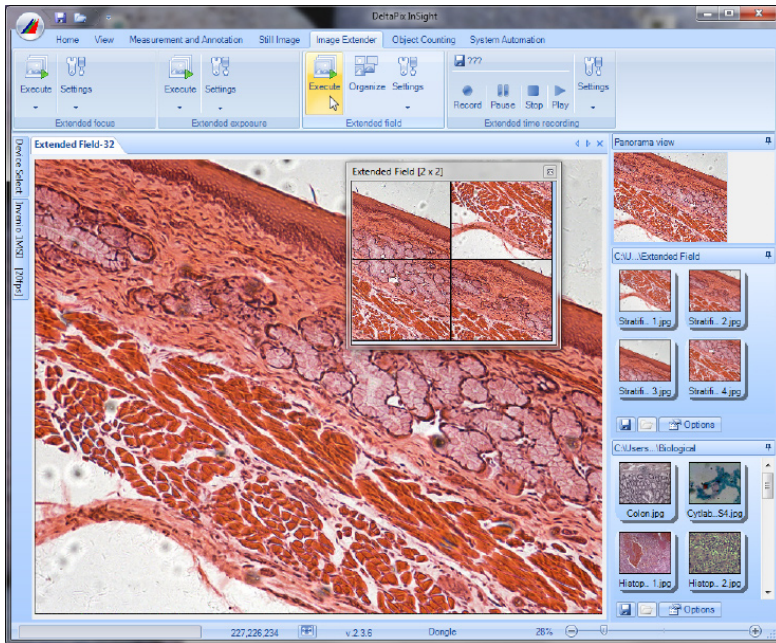
Manual and automatic stitching

With its intuitive user interface both automatic and manual stitching of single captured images, can be performed fast and precisely.

In the manual mode simply define the number of rows and columns, drag the images from the directory to the graphical guide and press the execute button to perform the stitching.
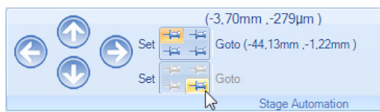
In the automatic mode (requires a motorized XY stage), simply move the stage to two opposite corners of the area to be scanned, and press the execute button.

The software will then automatically calculate how many images are needed, and scan them. Finally the stitching of the captured images is performed automatically.
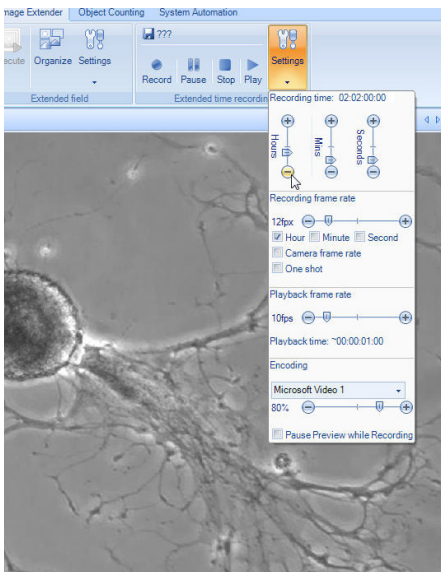
Time-lapse recording over long

periods up to several days is also possible.

This example shows the setup for monitoring a brain neuron for two days and two hours. 12 images are acquired per hour. Playing back at 10 images per second, the total playback time is one minute.

Object Counting

By setting parameters like threshold, area, morphology and others, the Insight software can automatically count objects of different size.

Module selection

DeltaPix InSight software is available with diffent modules, which can be added depending on the specific needs.

DeltaPix Scientific Software

Motor automation.

DeltaPix InSight can perform automatic Z and XY-control in combination with macro systems or microscopes with motorized focus and/or motorized XY stages.

Direct reading of XYZ-position and storing of different XYZ-positions is possible.

When calibrated, XYZ-measurements can be performed with high precision. Saving of multiple positions in XYZ can be combined with repeated scanning of these positions in a predefined scanning scheme defining number of scans, timing setup and image acquisition type at each position.

DeltaPix InSight provides direct interface to DeltaPix and Prior Scientific controllers, and most XYZ-equipment from various suppliers can be controlled.

One of the top advantages of DeltaPix software is the simplicity and ease of use. To use advanced motor control in combination with scanning, image capture and image processing, it is often necessary to use days of training and reading, to be able to perform even "simple tasks", but not with DeltaPix InSight software. The set-up and start of a scan which includes extended focus and extended exposure, is made with just a few intuitive clicks with the mouse, and the software, cameras and motors will do the rest.

| InSight Software Module functions. Modules can be combined to get multiple functionality.	Free ("Lite")	Basic	EE/EF	Z	XY	Count	DS
Camera control							
Exposure, gain, white balance, and other camera settings	x	x					
Calibration of multiple optical systems	x	x					
Insert of user definable calibration bar	x	x					
Snapshot mode for CCD cameras	x	x					
Force and add colors	x	x					
Shading correction	x	x					
Save in JPG,JPG2000, BMP and TIFF	x	x					
Freely configurable GUI	x	x					
Multiple camera connected simultaneously	x	x					
Advanced hotspot removal	x	x					
Language selection (14 different languages, including Chinese and Japanese)	x	x					
On line manual	x	x	x	x	x	x	x
Advanced functions							
Annotations and measurements on live and captured images		x					
Measurements from multiple images to single CSV file		x					
Reports (EXCEL)		x					
Comprehensive Image processing		x					
Extended focus (works also with stereo microscopes)			x				
Extended exposure			x				
Automatic counting, segmentation and area calculation						x	
Time laps and live video recording		x					
Interface to all "Direct show" cameras							x
Manual stitching		x					
Motor control							
XY- motor control					x		
Z-motor control				x			
Automatic extended focus		x					
Image capture and time laps recording on up to 100 pre set positions					x		
Automatic stitching and multi area scanning					x		
Z-measurement				x			

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Motorized Microscope focus

For focus motorization of Stereo- or other kind of microscopes of any brand, DeltaPix provides well approved solutions which includes both soft- and hardware integrated for extreme intuitive ease of use. With these advanced yet affordable solutions for capturing images with automatic extended focus, brilliant results can be achieved in seconds.
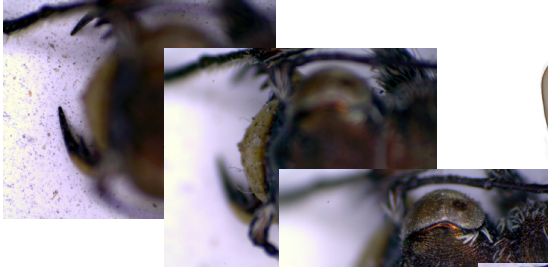

Macro-systems

DeltaPix provides macro systems for all kind of applications. This includes advanced systems including both motorized Z and XY axis. With such systems scanning with extended focus, extended exposure and auto stitching can be performed.
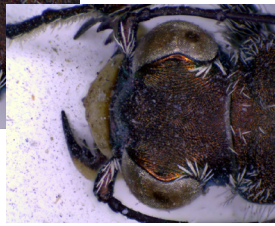
Macro Systems with Motorized XYZ.

DeltaPix has developed system configurations for applications not normally covered by standard microscopes or which will be too expensive to use for a specific use. One example is systems with a single high quality mono-zoom objective, with different kind of light sources (transmitted or reflected), a camera and a base with motorized XY stage. This is very useful for many industrial or research applications in which the same kind of scanning is repeated a multiple number of times with the same set-up.
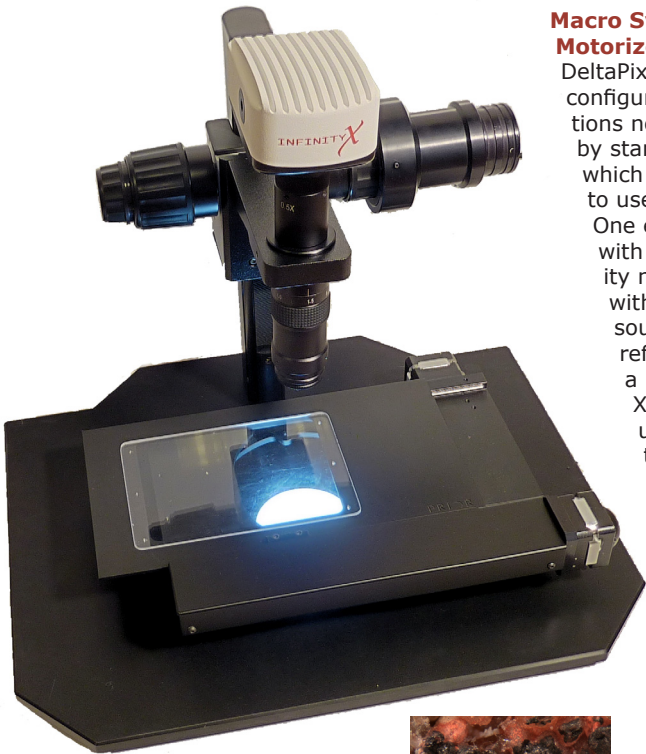
Software customizing

As most DeltaPix software is done in-house, we are able to offer customized software versions for special needs, with specialized functions or with private label and brand. DeltaPix can also provide consultancy services for any kind of specialized software, camera or optical system development.
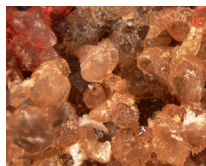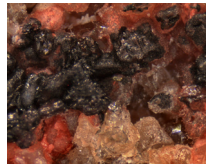
DeltaPix system Solutions

DeltaPix provides both full integrated microscope systems for special applications like scanning and industrial measurements, and all kinds of accessories for building motorized or non motorized systems for micro- and macro image capture of all possible kinds.

Most basic system is a stand with a camera and a lens plus a light source. Such system is a fundamental tool in many industrial and scientific applications.

For the most advanced use, DeltaPix can provide any kind of microscope with camera, software, light sources and motorized X, Y and Z.

Below is shown an image captured by a macro system with a mono zoom tube, a 4x microscope objective and motorized XYZ stages. The image is automatically stitched together from four input images each captured with automatic extended focus. The object is a drilled mineralogy sample from the Middle East used for petrology.

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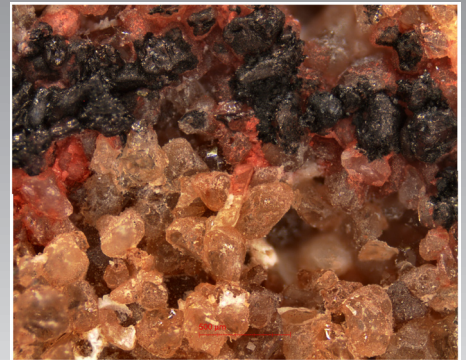
DeltaPix accessories

DeltaPix offers a large variety of different accessories for optical systems. A few examples is included on this page. Contact DeltaPix for more information.

DeltaPix user images

Million of images have been captured with DeltaPix cameras, software and equipment through out the last 10 years. A few examples are shown bellow, often made in extreme high resolution and clarity. Contact us to get the original images.

6x4 Auto stitched image captured with a 10x XYZ mono-zoom system and an Infinity X-32, showing a cut of a screw hole with a screw exposed to high temperature. Full overview is provided and details less down to 0.5 micron is resolved. Captured by "Haldor Topsoe".
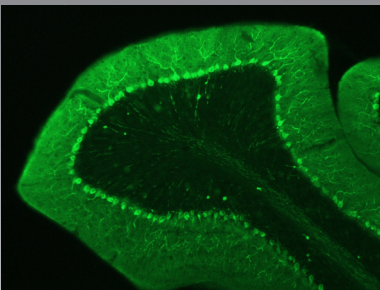
Cerebellum HH fluorescence image captured by Clas Johansson at Karolinska Stockholm with Infinity X-32.

Zoom mono scopes and optics.

For applications in which eyepieces are not necessary, a zoom mono-scope can be a very affordable solution, primarily as a replacement for a material microscope or a stereo microscope. For systems in which a larger field of view is needed DeltaPix is a specialist in finding the right high quality optics to match our ultra high resolution cameras.

Light sources

One of the most important component in all macro- or micro imaging systems is the light source. DeltaPix provides all kind of light sources from companies like "Photonic" or very affordable carefully selected Chinese products of good quality. This includes all kind of ring lights with or without area control, fiber spots, coax light and transmitted light sources.

Mechanical Accessories

To support cameras, optics and light sources, DeltaPix offer a number of stands, manual stages, calibration sliders, mechanical adapters and many other mechanical items, in order to supply all what is needed to build an advanced system for capturing micro images of any kind. Contact DeltaPix or your local dealer to know more, or to request data sheets for accesories.

DeltaPix works with a network of competent dealers who can provide you with the best local service and support.

Your DeltaPix contact:

www.DeltaPix.com