Camera and Measurement Software
DeltaPix InSight 4.0

Calibrations can be private, or shared among all users of the computer.

By calibrating the optics in high resolution mode, precision to fractions of a μm can be achieved.

For each objective, the Depth-of-Field and the preferred fixed or relative exposure time can be defined.

Measurement and Annotation

DeltaPix InSight has many measuring functions:

- Ruler
- Ellipse
- Protractor
- Three point circle
- Circle center distance
- Point to line distance

Modern user interface

DeltaPix InSight has a modern and intuitive user interface based on the ribbon band style known from Microsoft Office 2007 and Office 2010.

Functionality has been grouped logically, and the program is easy to use.

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, the DeltaPix Invenio CMOS and CCD camera series and the super resolution Invenio II and Infinity X32 cameras.

Images can be acquired in either 24 or 48 bit color mode.

The software includes a 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.

Calibration

Each optical device, objective and camera can be calibrated individually. In this way several microscopes and other optical systems can be managed by the same software installation.
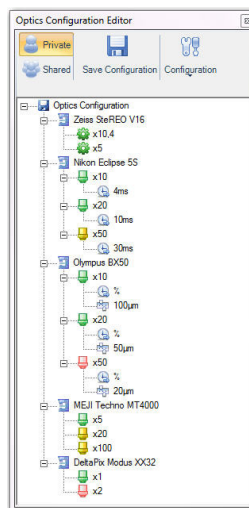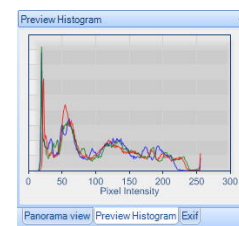
Measurements can be done on still images or directly on the live camera image.

Measurement precision and measuring unit can be selected individually.

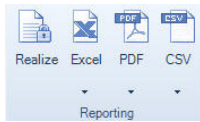A scale bar can automatically be inserted on images.

Histogram

A preview histogram can be used for achieving the right camera parameter setting.

Reporting

Measurement results and image can easily be exported to a Microsoft Excel spreadsheet. This allows further data processing in a flexible way.

Furthermore, the report can be automatically converted to a PDF report.

The reporting does not require installation of Microsoft Excel or a PDF writer.

Alternatively measurement data can be appended to a flat comma separated file.

Localization

DeltaPix InSight is international, and comes in multiple languages. Language can be switched on the fly, no need for download and installation of extra language packages.

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.
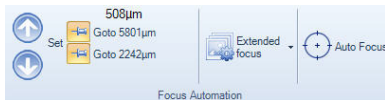
Direct reading of XYZ-position and storing of different XYZ-positions is possible. When calibrated, XYZ-measurements can be performed with high precision.

A configurable autofocus function is also available.

Saving of multiple positions in XYZ can be combined with repeated scanning of these positions in a predefined scanning scheme defining number of scanning's, 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.

Advanced motor control like controlling step size, speed and more is possible.

Auto Focus

The auto focus can be run as an integral part of most other functions. E.g. an auto focus can be performed when acquiring images for stitching large surfaces – this

ensures that the entire surface is well focused.

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.
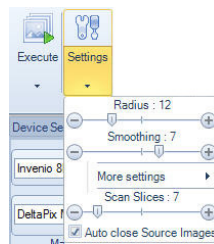
Extended Focus function can combine images at different focus levels into one single sharp image. If the images have different angles to the optical axis, as it is the case in stereo microscopes, the software will automatically compensate for this.

The number of required images can be automatically calculated from the objectives Depth-of-field.
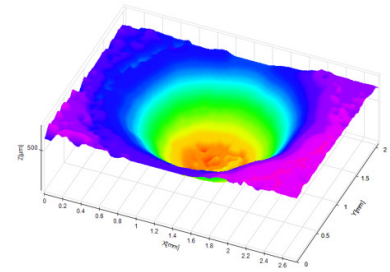
Topography 3D

Both manual and automatic topography imaging is possible. The automatic function uses the motor automation.

The topography function can combine images at different focus levels into one single 3D 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.

Topographic images can be elevated and tilted in any viewing angle.

Many different coloring options, like height zone coloring or real coloring, are available. Artificial light types and angles can be added for improved viewing experience.

Annotation labels with comments and XYZ information can be inserted anywhere

A 2D height profile from one point to another can be created.
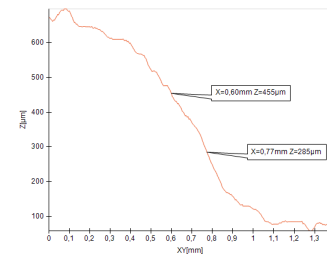
All 2D and 3D topography images can easily be rendered to e.g. a JPEG-file, printed or inserted in document by copy/paste.

Extended Exposure

Extended Exposure combines multiple images, each captured with different exposure time and having only a part of the image correctly exposed.

This is very useful when the object under inspection has reflections, very dark or very bright areas in combination, thereby making it impossible to expose the total image correctly with one single capture. InSight can combine these images into one single well exposed image. The extended exposure function can be automatically combined with the extended focus function.

Manuel and automatic stitching

With its intuitive user interface both automatic and manual stitching of single captured images, can be performed fast and precise. In the manual mode, simply define the number of rows and columns and drag the images from the directory to the graphical guide and press the execute button to perform the stitching.
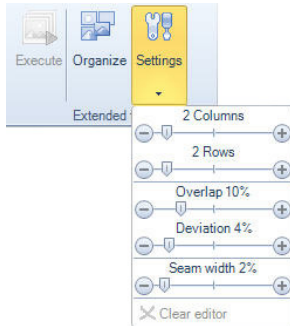
In the automatic mode (requires a motorized XY stage), simply move the stage to two opposite corners of the area to be scanned, and press the execute button.
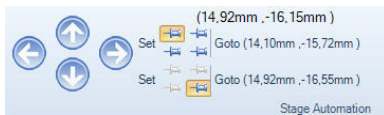
The software will then automatically calculate how many images that are needed, and scan them. Finally the stitching of the captured images is then performed automatically.

Video Capture

Insight can capture live video at high speed (>50fps) in combination with MPEG4 or similar codec.
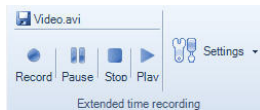
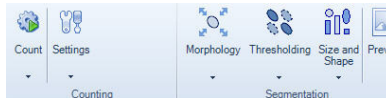Time-lapse recording over long periods up to several days is also possible.

EXIF Information

Images can have extra information added. This makes image management and browsing easier.

Object Counting

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

The objects can be colorized and numbered.

Prior to counting, morphologic operations can be performed – this may filter away undesired objects, or separate connected objects.

The counting result can be shown in a table.

#	Area	Unit	Diameter	Unit	M1	Orientation
001	901992,14	µm²	1071,66	µm	15	20
002	883557,54	µm²	1060,65	µm	15	32
003	880888,57	µm²	1059,05	µm	15	36
004	622742,06	µm²	890,45	µm	55	7
005	1037799,83	µm²	1149,51	µm	59	7
006	472720,37	µm²	775,81	µm	50	21
007	951709,69	µm²	1100,80	µm	30	12
008	878964,39	µm²	1057,89	µm	37	12
009	954316,60	µm²	1102,30	µm	30	16
010	488610,04	µm²	788,74	µm	66	4
011	1081993,34	µm²	1173,73	µm	37	6
012	932530,30	µm²	1089,65	µm	30	11
013	729749,63	µm²	963,92	µm	46	16
014	879771,29	µm²	1058,38	µm	36	40
015	555955,37	µm²	841,35	µm	60	12
016	584321,11	µm²	862,54	µm	56	4
017	1006454,96	µm²	1132,02	µm	52	7
018	473961,74	µm²	776,83	µm	50	16

Camera and Measurement Software
DeltaPix InSight 4.0

The software is modular

DeltaPix InSight is modular, and modules can easily be added as needed.

With all InvenioII cameras comes comprehensive free InSight LE software.

The Insight Basic is the base for add on modules-

The feature selection matrix provides an overview of the many possibilities.

Note that the matrix is a need-to-have list.

✔ : This module is needed to perform this function

ⓘ : This module might be needed also, please contact DeltaPix

⊘ : Not possible

As example the Autofocus requires the Z-module and the Basic module.

- 2 to 4 GB of RAM recommended.
- 10 GB of free disk space
- Windows XP, Windows Vista, Windows 7 or Windows 8
- A high resolution monitor is recommended

DeltaPix InSight works with Windows 32 and 64 bit versions.

Software Module / Added Functions	InSight LE	InSight Basic	EEEF	Z	XY	Segmentation and counting	Interface	Autofocus	Scanning	Direct Show	Topography
Basic functions											
Exposure, gain, white balance, color control, flip, and other camera settings and controls	✔	✔									
Full calibration of multiple optical systems	✔	✔									
Calibration of DOF and exposure for individual magnification settings	✔	✔									
Scale bar and scale grid	✔	✔									
Fluorescence support	✔	✔									
Language selection	✔	✔									
Advanced "Hot spot" removal	✔	✔									
Advanced annotation and measuring functions on live and captured images	⊘	✔									
Reports in Excel and PDF	⊘	✔									
Individual user login	✔	✔									
Camera settings saved with image	✔	✔									
Measurements from multiple images to one single CSV file	⊘	✔									
Advanced functions											
Extended focus and extended exposure (manual)	⊘	✔	✔								
Manual stitching (panorama, mosaic)	⊘	✔	✔								
Automatic counting, segmenting, phase and area calculating	⊘	✔				✔					
Time laps and live video recording	✔	✔									
Interface to all direct show cameras	⊘	✔								✔	
Topography		✔	✔								✔
Motorized stage related control											
Z-motor control	⊘	✔	✔	✔							
XY motor control with automatic stitching, scanning and auto acquisition in up to 100 pre-set positions	⊘	✔	✔	ⓘ	✔						
Z measurement	⊘	✔		✔							
Auto focus	⊘	✔		✔				✔			
Scanning of multiple slides and areas of interest.	⊘	✔	ⓘ	ⓘ	✔				✔		
Control of Zeiss motorised microscopes, Prior, Ludl and Marzhauser stages and equipments	⊘	✔		ⓘ	ⓘ		✔				
Automatic extended focus	⊘	✔	✔	✔			✔				
Automatic Topography	⊘	✔	✔	✔			✔				✔