Nikon

Imaging Software

NIS Elements

Advanced Solutions for your Imaging World

Nikon offers total software solution covering image capture,

NIS-Elements is an integrated software imaging platform developed by Nikon which delivers comprehensive microscope control, image capture, documentation, image analysis and data management. NIS-Elements handles multidimensional imaging tasks flawlessly with support for capture, display, peripheral device control, and analysis & data management of images of up to six dimensions. The system also contributes to experiment efficiency with an intuitive image analysis feature set and database building capabilities developed to handle archiving and management of large numbers of multidimensional image files.
Unified control of the entire imaging system offers significant benefits to microscopists for cutting-edge research, such as live cell imaging

The NIS-Elements suite is available in three packages scaled to address specific application requirements.

Ar NIS-Elements AR is optimized for advanced research applications, featuring fully automated acquisition and device control through full 6D (X, Y, Z, Lambda (Wavelength), Time, Multipoint) image acquisition and a wide range of image analysis.

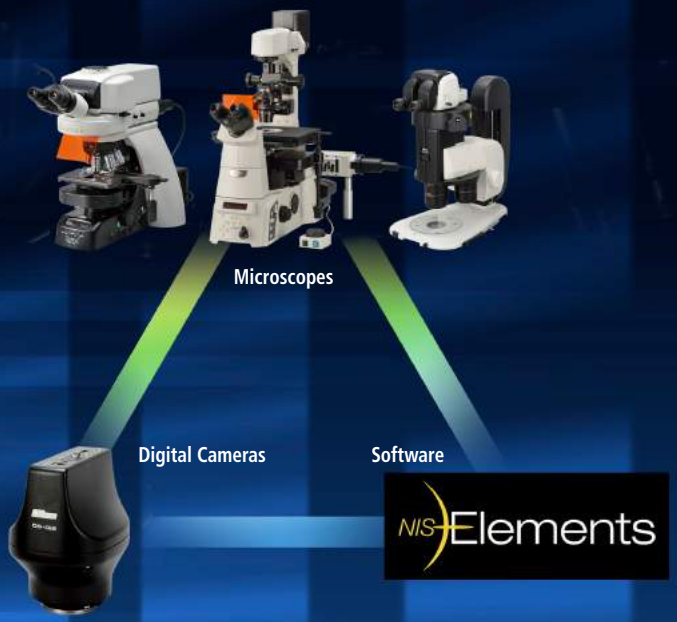
Br NIS-Elements BR is suited for standard research applications, photodocumentation of fluorescent samples and image analysis including intensity and counting measurements. It features acquisition and device control through 4D (up to four dimensions can be selected from X, Y, Z, Lambda (Wavelength), Time, Multipoint) acquisition.

D NIS-Elements D supports color documentation requirements in bioresearch, clinical and industrial applications, with basic measuring and reporting capabilities.

archiving, and analysis

Why NIS-Elements?

As a leading microscope manufacturer, Nikon realizes the importance of providing its customers with system-based solutions to free them to focus on their projects and research and not on the complexities of the microscope. Never before has a software package offered such comprehensive control of microscope systems, image acquisition, image analysis and data management.



Total Imaging Solution

In designing and bringing to market the most technologically advanced optical systems, Nikon has worked very hard to provide a "total imaging solution" that meets the ever-evolving demands of the microscope user.

•Highest Quality Optical Performance

The world-renowned Nikon CFI60 infinity optical system effectively set a new standard for optical quality by providing longer working distances, higher numerical apertures, and the widest magnification range and documentation field sizes.
As a leader in digital imaging technology, Nikon recognized the importance of adapting its optics to optimize the digital image. Nikon's new objectives and accessories are specifically engineered for digital imaging.
Because what you see depends greatly on the quality of your microscope, we strive to power our microscope systems with optical technologies that are nothing but state-of-the-art.

•Diverse Line of Powerful Digital Cameras

Image capture has become a high priority in microscopy and the demand for products that deliver high quality and versatile functionality has grown considerably in recent years. In accordance, Nikon offers a full line of digital cameras, addressing the varied needs of microscopists in multiple disciplines. Each Nikon digital camera is designed to work seamlessly with Nikon microscopes, peripherals, and software. With Nikon Digital Sight (DS) series cameras, even novice users can take beautiful and accurate microscopic images. For the advanced researcher, hiresolution image capture and versatile camera control is fast and simple. Together with Nikon's new software solutions, image processing and analysis have reached new levels of ease-of-use and sophistication.

•Intelligent Software Solutions

Designed to serve the needs of advanced bioresearch, clinical, industrial and documentation professionals, NIS-Elements provides a totally integrated solution for users of Nikon and other manufacturers' accessories by delivering automated intelligence to microscopes, cameras, and peripheral components. The software optimizes the imaging process and workflow and provides the critical element of information management for system based microscopy.

Multi-layer Document Structure

NIS-Elements uses a sophisticated image documentation structure making it possible to achieve non-destructive archiving of image data including annotation (arrows, lines, text notes), measurement data, binary data for storing results of threshold or classification processes, and meta-data information for recording acquisition and device conditions at the time of image acquisition.

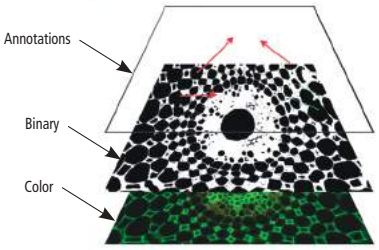


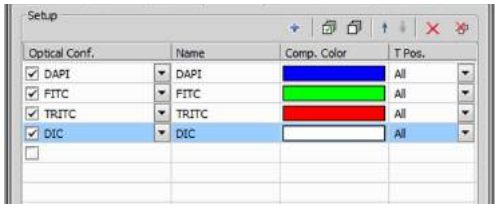
Image Acquisition

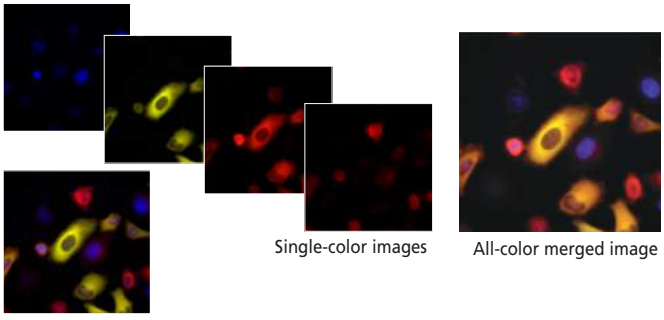
NIS-Elements offers the most suitable image acquisition for various applications with the integrated control of the camera, motorized microscope and peripheral devices.

Multichannel (multi color)

Ar Br

NIS-Elements can acquire full bit depth multi-color images, combining multiple fluorescence wavelengths and different illumination methods (DIC, phase contrast etc.), while offering independently scalable channels.





Single-color images

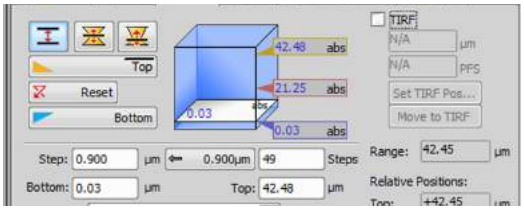
All-color merged image

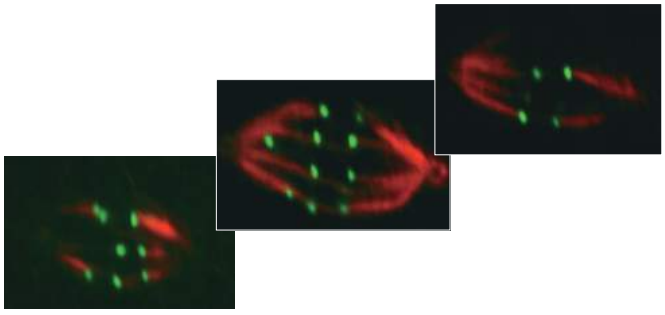
Specified-color merged image

Z-series

Ar Br D

Through motorized focus control, NIS-Elements reconstructs and renders 3D images from multiple Z-axis planes.

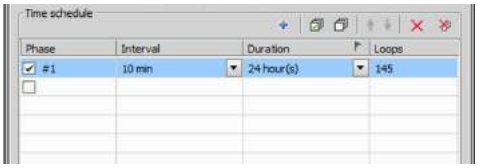


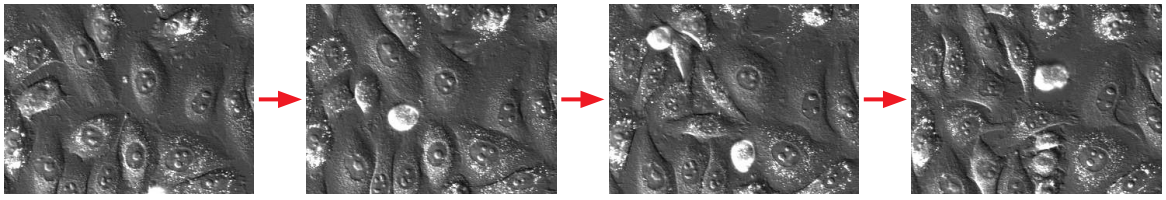


Time Lapse

Ar Br D

Time lapse imaging in NIS-Elements is easily configurable simply by setting the time interval and duration of capture.
The Perfect Focus System of the motorized inverted microscope Ti-E enables high-accuracy image capture without focus drifting even during extended time time-lapse experiments.

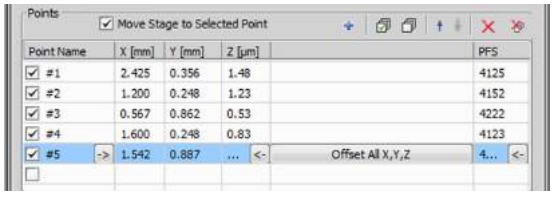




Multipoint Experiments

Ar Br D

NIS-Elements' motorized stage control offers automated travel to multiple stage points of the sample of a multi-well plate or dish. Stage points are memorized and can be saved and loaded for future imaging sessions.



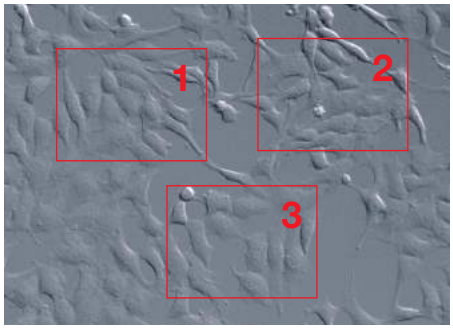
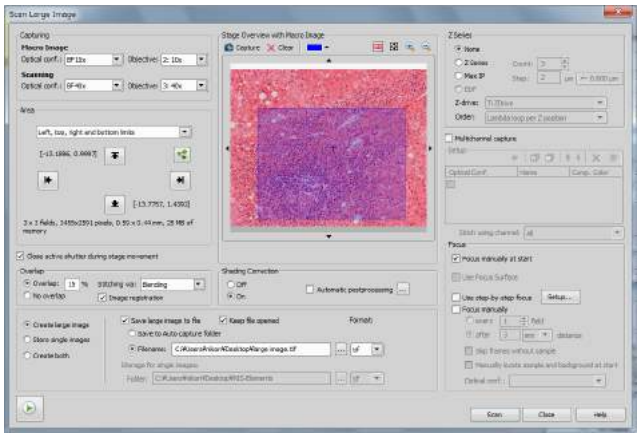
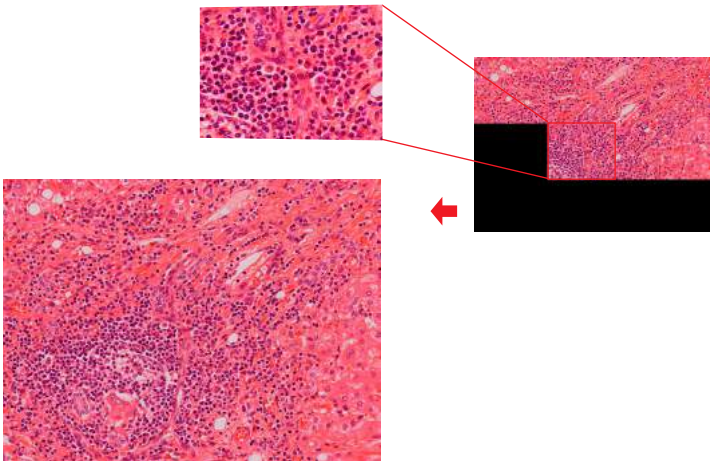


Image Stitching (Large image)

Ar Br D

Large Image Acquisition generates a single high-magnification wide field-of-view image by automatically stitching multiple adjacent frames from a multipoint acquisition using a motorized stage or from multiple single images captured from a previous session.
Users can easily select image acquisition ranges and areas from low magnification images.





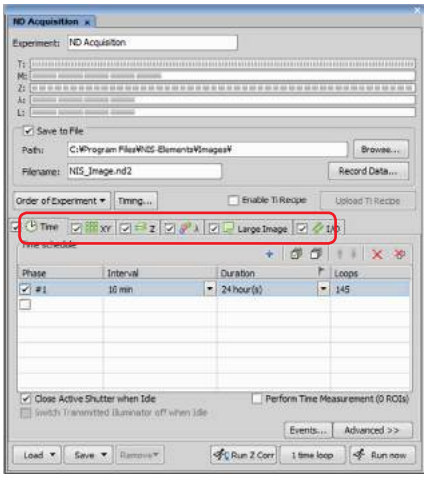
Multidimensional imaging

* Available dimensions vary depending on the package.

ND Acquisition

Option (Ar Br)

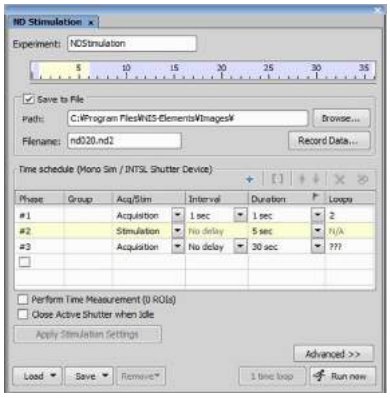
NIS-Elements captures images in a combination of multiple dimensions such as Time-Lapse, Multichannel, Z-series, and Multipoint. It is also possible to create and manage the acquisition of a multi-dimensional dataset with a thirty-minute time lapse of two wavelengths and a Z series across each well of a multi-well plate.



ND Stimulation

Option (Ar)

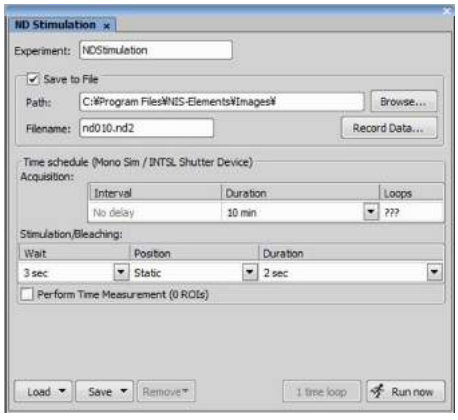
NIS-Elements controls photo stimulation and image acquisition.



ND Simultaneous Stimulation

NIS-Elements enables image acquisition during photo stimulation.

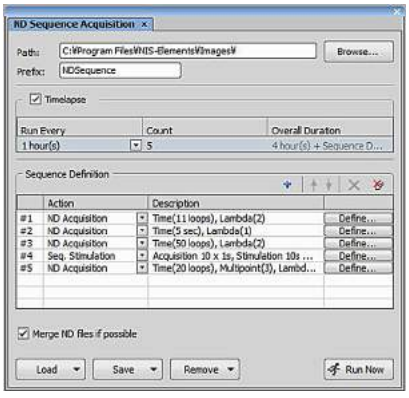
Option (Ar)



ND Sequential Acquisition

NIS-Elements allows various sequential imaging experiments to be combined with other functions, such as simultaneous photo stimulation and imaging, or multidimensional acquisition.

Option (Ar)

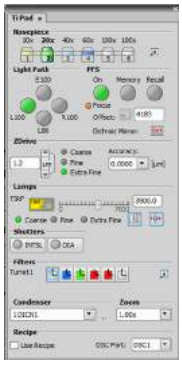


Optical Configuration

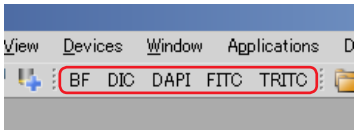
Ar Br D

Presets or 'Optical Configurations' can be saved for each observation method such as FITC fluorescence and DIC imaging, memorizing the settings of the microscope, camera and peripheral devices. The optical configurations are created through a one click set up and are displayed as icons in the tool bar for easy access and use.

Camera setting



Microscope Setting



Memorize settings of the camera and microscope

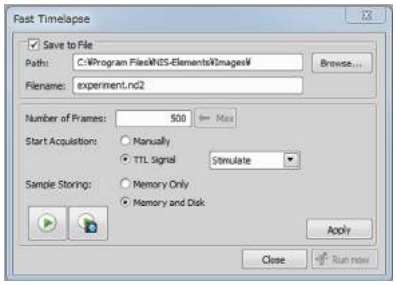
Movie Capture, Fast Image Capture

NIS-Elements has several options to observe and capture a sample's change and fast movement.

Fast Time Lapse

Ar

Fast Time Lapse is designed for ultra high-speed cameras. The hard disk drive can be used together with PC memory to enable a longer acquisition time.



RAM Capture

Ar

RAM Capture allows for acquisition at the fastest possible rate of the camera. A RAM buffer is utilized to enable capture and retrieve a high speed time lapse, which aids in the capture of fleeting events such as calcium sparks, motility and translocation.

AVI Live-Stream Capture

Ar Br D

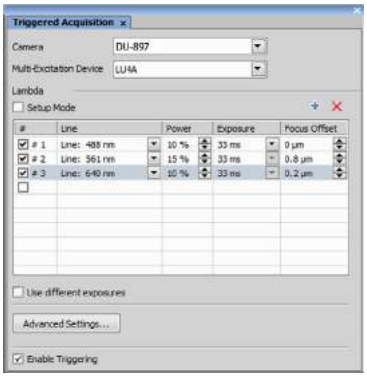
AVI Acquisition automatically captures live data into an easily exportable and viewable AVI format.

Time Saving Acquisition by Hardware Optimization

Triggered Acquisition

Ar Br

Triggering external devices directly from the camera enables synchronized control of various devices such as the laser unit without passing through the PC. This allows for the fastest performance of the system components for multi-wavelength excitation in TIRF observation.

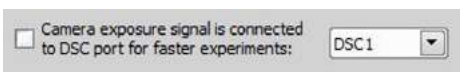


Ti-recipe

Ar Br

This function enables the HUB-A controller of the motorized inverted microscope Ti-E to control both image acquisition and change of fluorescent filter, motorized stage and fluorescent shutter by directly connecting the camera and a HUB-A controller without passing through a PC. As a result of optimizing the communication times of all connected devices, acquisition times for multi-dimensional datasets are greatly reduced.

*Some cameras are not compatible with this function. For more information, please contact Nikon or its authorized representative.



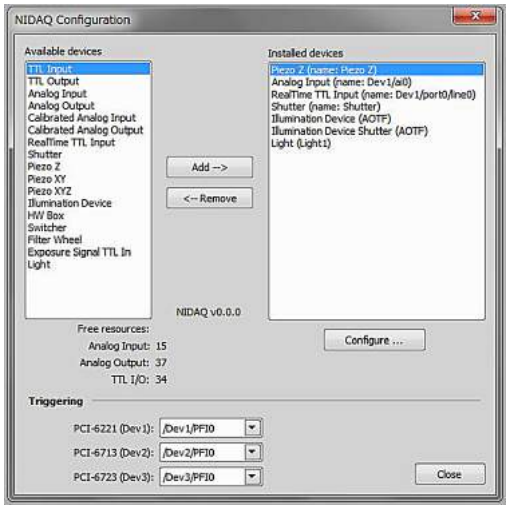
NI-DAQ Control

Option (Ar Br D)

TTL and analog signal input/output with NI-DAQ Control enables experiments using various triggerable devices.

Device triggering minimizes imaging time lag when used to control a Piezo Z device, shutter and wavelength switching, as it performs at the faster rate of the device without software communication delay.

The calibration of analog signal output from devices to such as temperature enables data to be measured and observed during experiments.



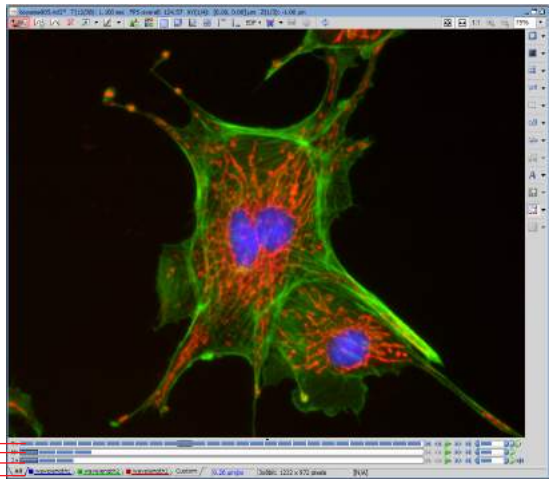
Display and Data Processing

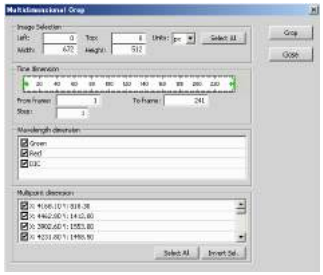
Various methods are available for displaying and processing captured images and datasets.

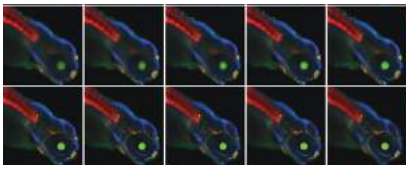
Multi-dimensional Image Display

Ar Br

NIS-Elements displays time lapse, multi-channel, multiple X, Y, Z positions in an intuitive layout, which allows for automatic playback and the ability to select subsections of the data to be saved as a new file.







Merge Channels

Ar Br D

Multiple single channel images (ex., two from three-channel acquisition images) can be merged together to create an overlay of full depth separately scalable images. With AR and BR, images can be merged by simply dragging the tab of one image onto another image. With D, images are merged by selecting each image for red, blue, green and brightfield channels

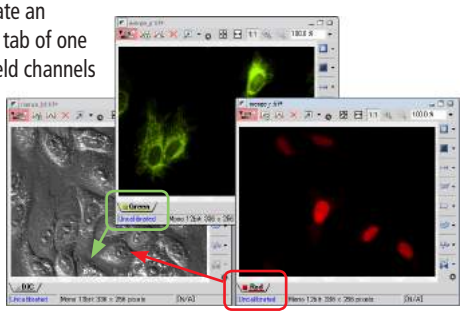


Image Processing

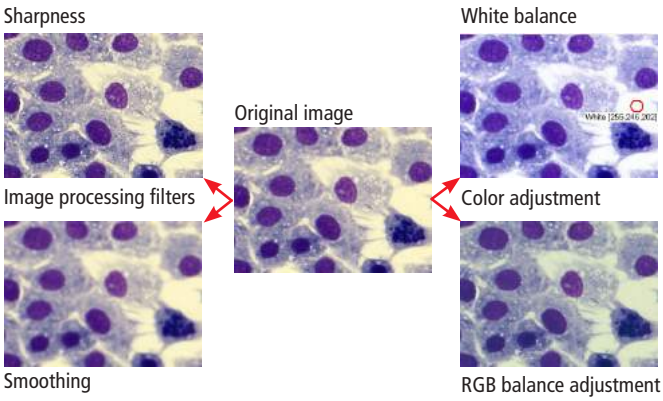
Ar Br **Option (D)**

Image Filtering, Color Adjustment

Ar Br D

*Usable functions vary depending on the package.

With NIS-Elements image processing tools, it is possible to modify image display and feature extraction using various filters for, for example, sharpness, smoothing and detection. White balance and RGB/HIS balance adjustment are additional available options.



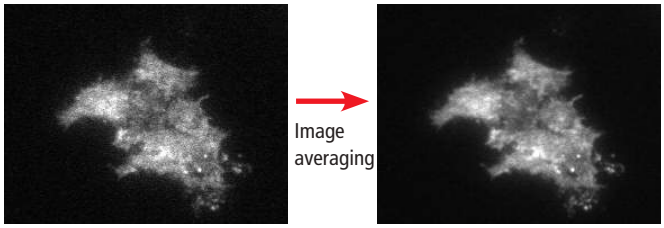
Arithmetic operation (Image arithmetic)

NIS-Elements enables arithmetic operations such as addition, subtraction, multiplication and division on an image or between multiple images. Arithmetic operation between multiple images is also possible.

Arithmetic operation (Image averaging)

Ar

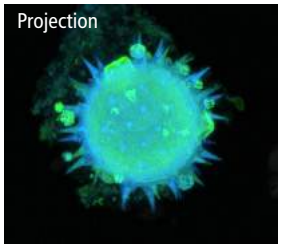
NIS-Elements reduces the noise of an image by averaging multiple sequential images such as time-lapse images. Rolling averaging that does not reduce frame rate is available as well.

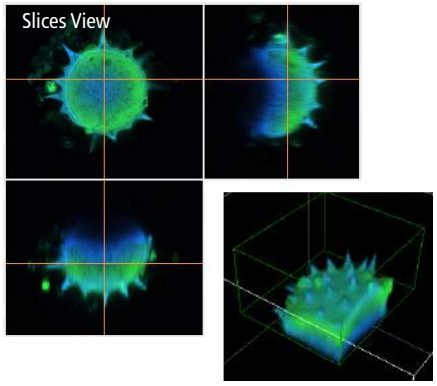


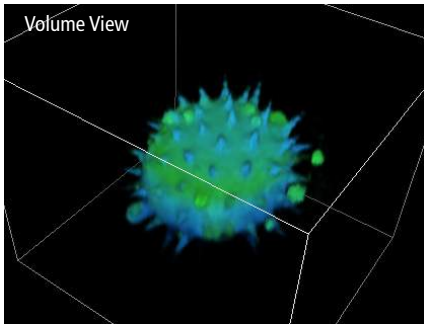
Z-Series Image Display

* Volume view and slice view are only possible with AR and BR. Ar Br D

Z-series images can be displayed in various formats such as max. and min. projections, X-Z axis and Y-Z axis cross–sectional slice view and 3D volume view. Rotatable 3D volume rendered views from 3D datasets are easily converted to an AVI or MOV format for file sharing and export.





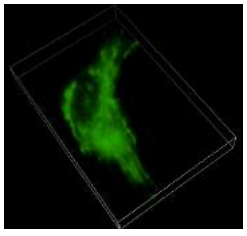


Deconvolution

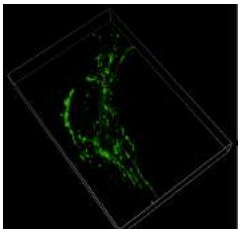
Option (Ar)

3D Deconvolution

Haze and blur of the acquired fluorescence image can be eliminated. By reassigning out-of-focus intensities back to the spatial locations to where they originated, the intensity of the image is kept and allows for quantitative analysis. Algorithms for wide-field fluorescence, point-scanning confocal and spinning-disk confocal images are available.



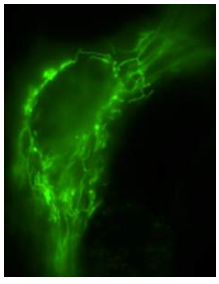
Before deconvolution



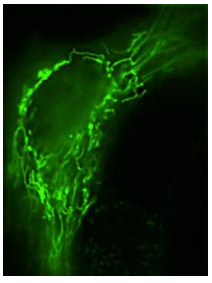
After deconvolution

2D Deconvolution

The 2D deconvolution module can be applied to a live image or an already acquired dataset. The module also allows the elimination of out-of-focus blur from live images and multidimensional images.



Before deconvolution



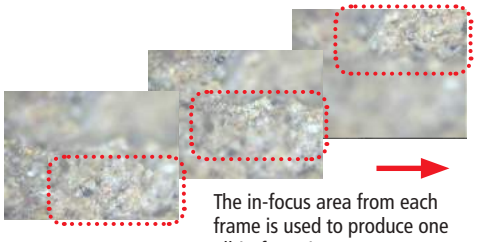
After deconvolution

Extended Depth of Focus (EDF)

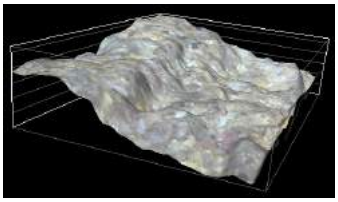
Option (Ar Br D)

With motorized focusing

The EDF function selects the in-focus area from multiple Z-stack images, and produces one all-in-focus image. The composite image can be viewed and rotated as a virtual 3D image, as it contains Z-axis information.

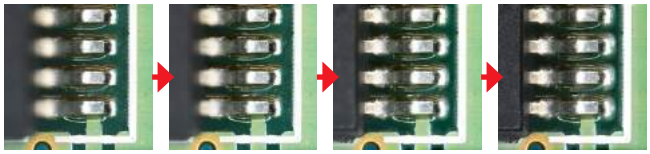


The in-focus area from each frame is used to produce one all-in-focus image.



With manual focusing

An all-in-focus image is created in real-time in synchronization with the rotation of the focus knob. While the focus is manually adjusted, the in-focus areas of the image at different depths are successively captured and combined for the EDF image.

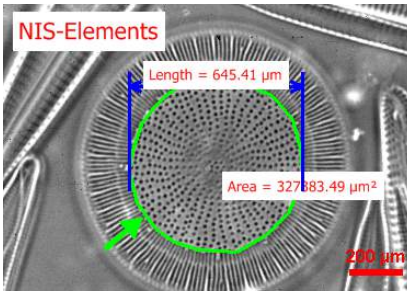


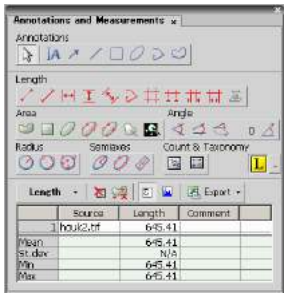
Measurement and Analysis

Manual Measurement (Interactive Measurement) and Image Annotation

Ar Br D

Interactive Measurement allows easy measurement of length and area by drawing lines or an object directly on the image. The results can be attached to the image, and also exported as text or to an Excel spreadsheet. Annotations such as arrows, circles, squares, text are also available display options.

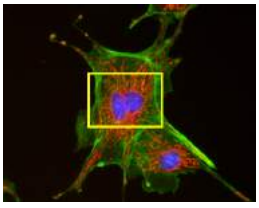


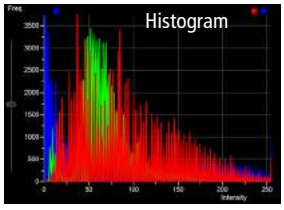


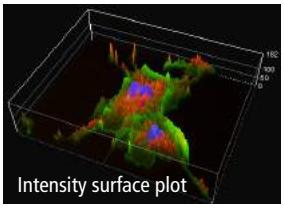
Histogram/Intensity Line Profile/Intensity Surface Plot

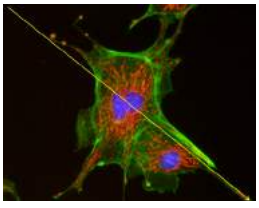
Ar Br D

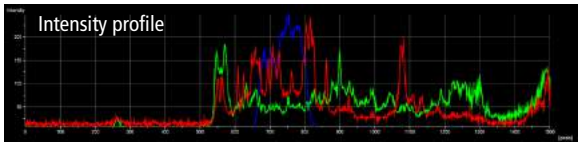
Histogram measurement measures the intensity distribution of pixels across the whole image or a defined region. An intensity line profile measurement shows the intensity distribution on a defined line. The Intensity Surface plot shows the intensity distribution of an image with the height of the z-axis line.







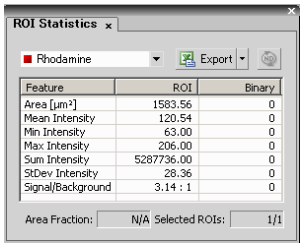




ROI Statistics

Ar Br

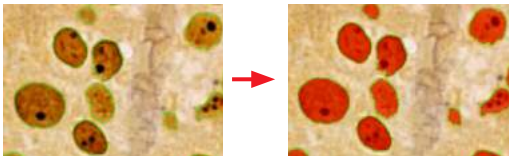
*Usable functions vary depending on the package.
Common pixel measurements such as area, maximum or minimum intensity are possible with the user defined ROI (Region Of Interest).
ROI or multiple ROIs statistic results for a single image or a multi-dimensional dataset are displayed and easily exported as text or an excel file.

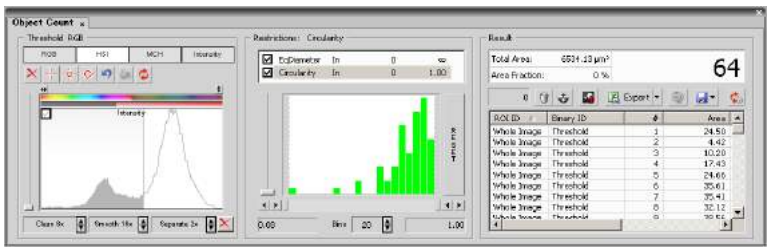


Auto Measurement (Object Counting)

Ar Br Option (D)

Auto measurement measures the number or area of objects which are extracted from images by the creation of a binary layer through thresholding using RGB/HIS or intensity values. The results can be listed or exported as text or an excel file. It is possible to save and reuse thresholding parameters.



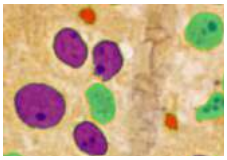


Classifier

Object Classifier

Option (Ar)

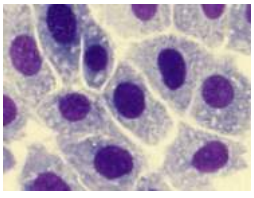
Object classifier uses objects identified by thresholding along with additional features such as shape factors, and other statistical methods including nearest neighbor and neural networks for classifying objects into multiple categories. It is also possible to teach the module based on interactive 'picking' of image pixels.

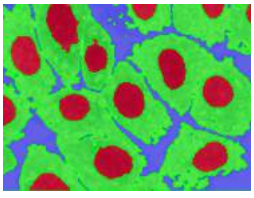


Pixel Classifier

Ar Br Option (D)

This function classifies each pixel in the image with RGB/HIS and intensity across the whole image. Results are reported in percentage and it possible to save and reuse parameters across a large sample of images. Multiple binary layers are also displayed with multiple colors on the image and are available with other analysis tools within the software package.

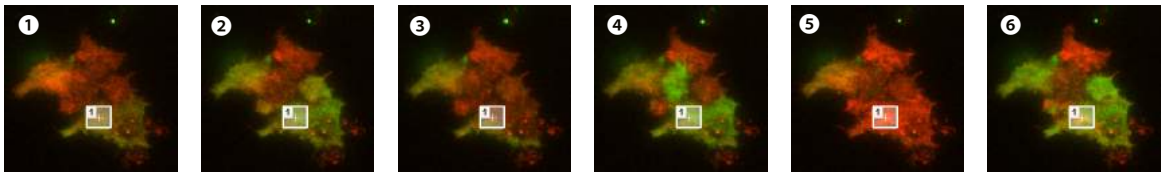


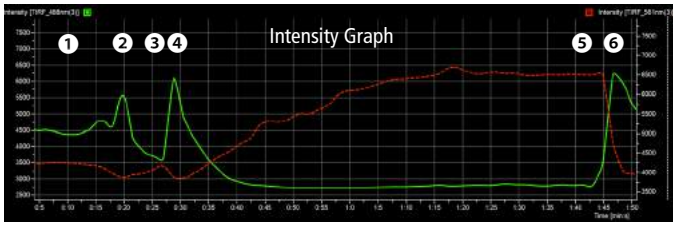


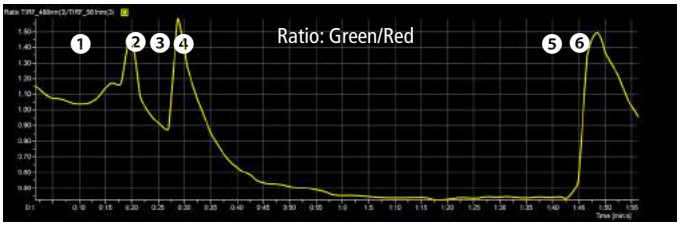
Time (Intensity) Measurement

Option (Ar / Br)

Time measurement creates a graph of sequential intensity changes while time-lapse imaging or from captured time-lapse images. Ratio view function* allows the measurement of the ratio of two wavelengths across multiple ROIs and shows the ratio value by pixel. Numeric data and graph images are exportable and the measurements on the graph are available as well. (* Only with AR)





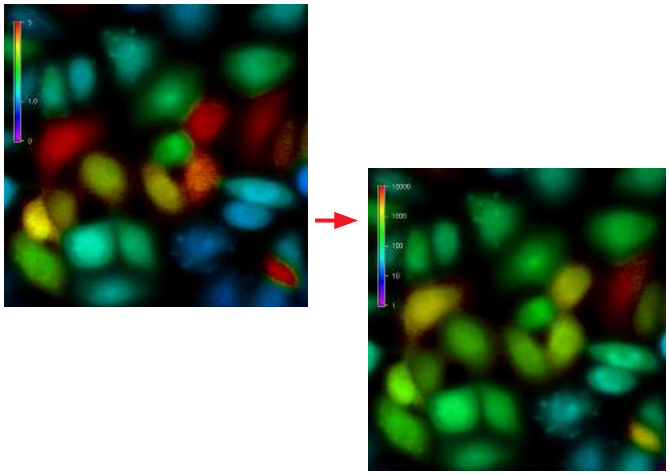


Calcium & FRET

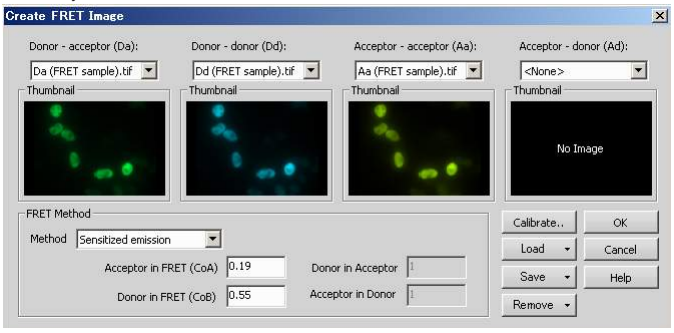
Option (Ar)

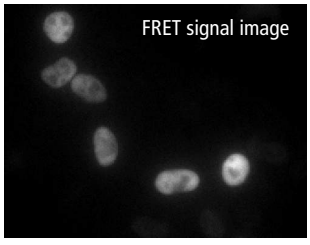
Ca^{2+} ion concentration calibration of the ratiometric fluorochrome Fura2, for example, is available using an easily configurable wizard. Corrected FRET image and FRET efficiency, reported in percentage is also available using three filter sets (three types of excitation–fluorescent combination: "Donor – Donor," "Acceptor – Acceptor" and "Donor – Acceptor") and two bleed-through factors.

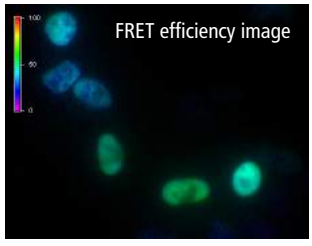
Ca^{2+} ion concentration calibration from ratiometric value



FRET analysis



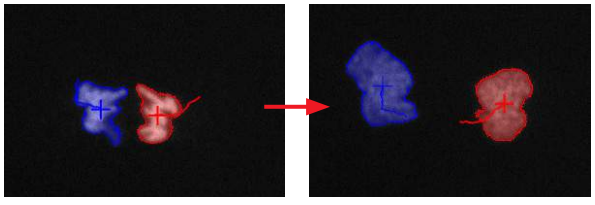




Object Tracking

Option (Ar)

2D tracking of an object utilizes the threshold of objects over time and produces measurements such as velocity, acceleration, and distance from a specified origin. The tracking module offers both automated tracking and manual tracking methods.



Index	Time [s]	Position X [µm]	Position Y [µm]	Position Z [µm]	Distance [µm]	Velocity [µm/s]	Acceleration [µm/s²]	Path Length [µm]
1	0.000000	32.980999	25.647466	0.000000	0.000000	N/A	N/A	0.000000
2	60.000000	33.054185	25.596928	0.000000	0.089940	0.001482	N/A	0.089940
3	120.000000	33.228145	25.628420	0.000000	0.176788	0.002946	0.000024	0.265728
4	180.000000	33.343192	25.686951	0.000000	0.129035	0.002151	-0.000013	0.394762
5	240.000000	33.578441	25.746873	0.000000	0.242785	0.004046	0.000032	0.637548
6	300.000000	33.593850	25.772921	0.000000	0.030265	0.000504	-0.000059	0.667813
7	360.000000	33.688604	25.827052	0.000000	0.109126	0.001819	0.000022	0.776939
8	420.000000	33.790295	25.769797	0.000000	0.116727	0.001945	0.000002	0.893666
9	480.000000	33.917277	25.762998	0.000000	0.127637	0.002127	0.000003	1.021303
10	540.000000	33.971434	25.746410	0.000000	0.065357	0.001089	-0.000017	1.086660
11	600.000000	33.983979	25.602417	0.000000	0.144538	0.002409	0.000022	1.231198
12	660.000000	34.190742	25.544193	0.000000	0.214804	0.003580	0.000020	1.446003
13	720.000000	34.409811	25.577152	0.000000	0.221635	0.003692	0.000002	1.667638
14	780.000000	34.521361	25.500699	0.000000	0.135235	0.002254	-0.000024	1.802773
15	840.000000	34.692465	25.524591	0.000000	0.211248	0.003521	0.000021	2.014021
16	900.000000	34.756459	25.641291	0.000000	0.066137	0.001102	-0.000040	2.080158

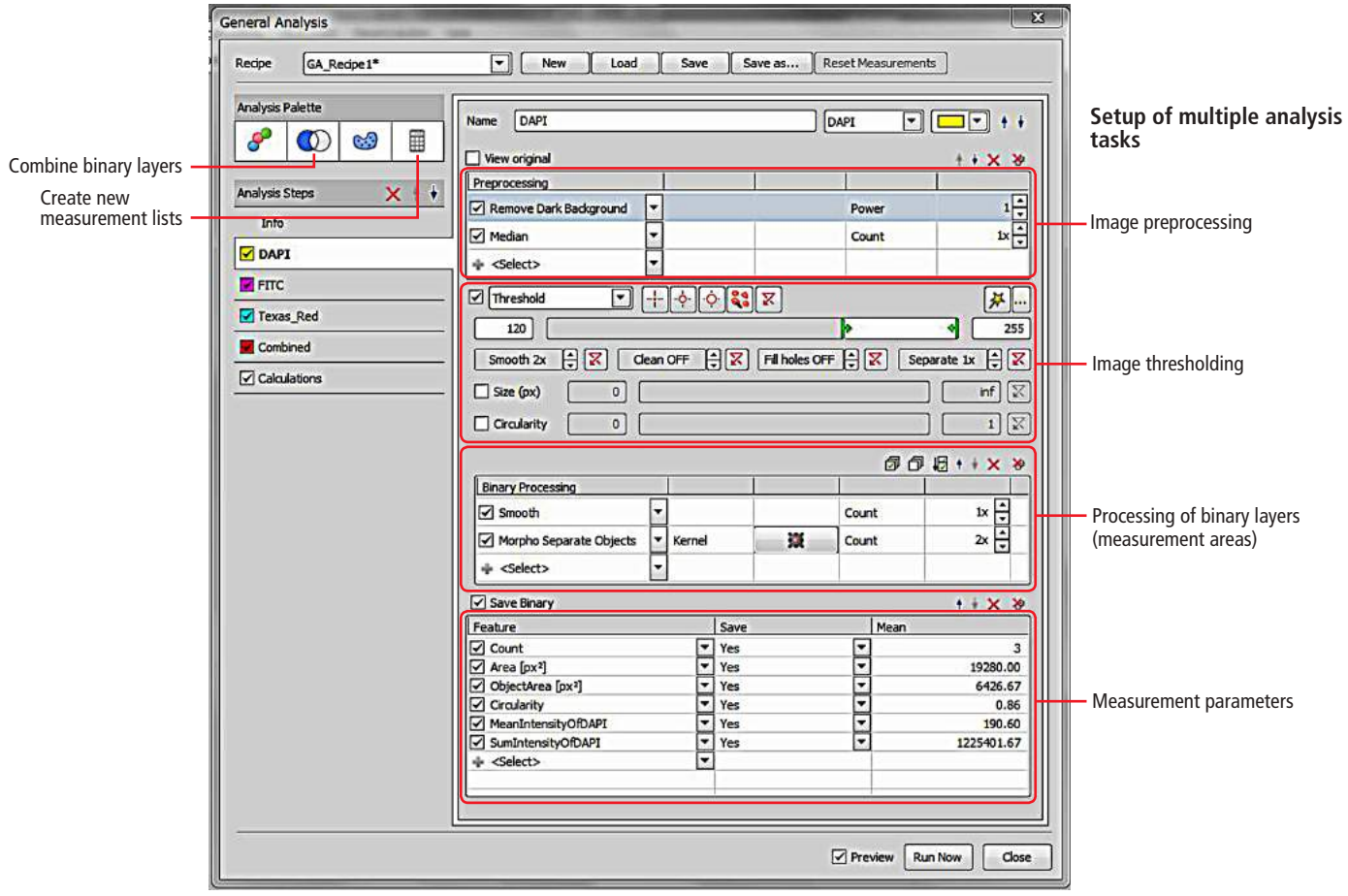
Graph | Data | Path Length 28.362714 [µm] | Avg Velocity 0.001818 [µm/s] | Avg Acceleration 0.000000 [µm/s²]

GA (General Analysis)

Option (Ar)

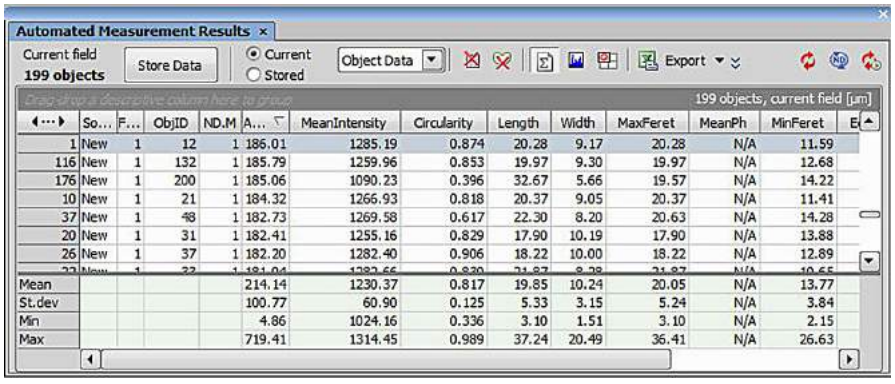
General Analysis streamlines the setup of image analysis combining functions, such as image preprocessing and thresholding, processing of binary images and features, and measurement settings.

- GA creates a new measurement area by combining multiple binary layers, and creates a new measurement parameter by applying these custom measurement settings.
- Each setting can be stored as a recipe that can be rerun for routine analysis under the same conditions across multiple datasets.

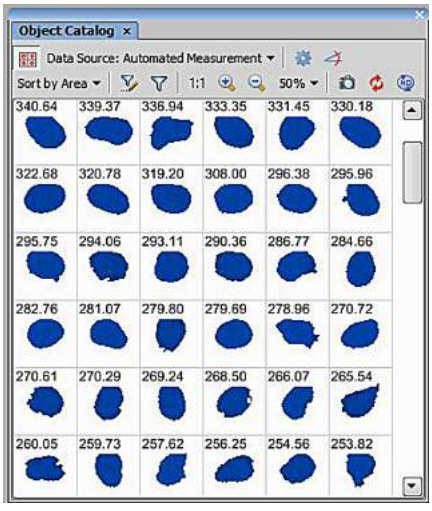


Output of analyzed results

Automated Measurement results



Object catalog



High-Content Acquisition and Analysis

HC Template for the High Content Analysis System

Option (Ar)

The HC Template is a dedicated software module within NIS-Elements.

- It allows fully automated acquisition and analysis of a large number of high-content, multi-dimensional images with integrated control of the high-speed motorized focus and stage of Ti-E motorized inverted microscope, camera and peripheral devices.
- HC Template within NIS-Elements allows for quick experimental setups with several autofocusing options and an immediate view of measurement data well by well during acquisition and via a heat map for trend observation and further analysis.

- The microscope-based High Content Analysis System combined with the Ti-E offers a wide range of interchangeable options, including a full range of camera models, such as high-speed and high-definition cameras, as well as a choice of magnifications and fluorescence filters.
- High-speed peripheral devices are optionally available to boost throughput of integrated devices. These include the high-speed piezo Z-objective positioner for fast autofocusing and the automatic plate loader for auto analysis of multiple well plates.

High Content Analysis System

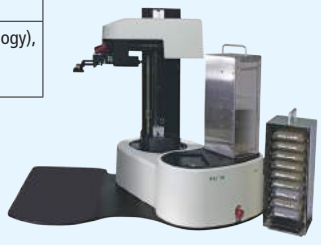
Microscope	Motorized inverted microscope ECLIPSE Ti-E
Compatible well plate types	6-, 12-, 24-, 48-, 96-well plates, 384-well plate (for fluorescence observation)
Multiple FOV experiments	Center, Covering, Random, Random+Center and Regular pattern in each well
Illumination methods	Fluorescence, Phase contrast, DIC
Image acquisition	Multichannel, Time lapse, Multidimensional imaging
Acquisition speed	2 min/96 well plate (1 point/well, 30 msec/shot, without Z stacking, PFS (Perfect Focus System))
Data visualization	Plate view, Sample labeling, Heat map, Graphing
Recommended objectives	S Fluor 4x, Plan Fluor 10x, S Plan Fluor ELWD 20xC/40xC (phase contrast objectives can also be used for image acquisition)
Recommended imaging devices	Camera : DS-Qi2 (Nikon), Zyla sCMOS (Andor technology), iXon3 DU-897 (Andor technology) Confocal microscope : A1+, A1R+, C2+ (Nikon)

High-speed Piezo Z-objective Positioner (Option)

For fast autofocusing

Z travel range	Up to 200 nm
Z travel speed	30 msec
Repeatability	±5 nm

(Physik Instrumente (PI) GmbH & Co. KG)



Automatic Plate Loader (Option)

For automatic imaging with multiple well plates

Number of well plates	Up to 20 plates
Loading speed	30 sec/plate
Barcode reader option	1D and 2D barcode

(Prior Scientific Instruments Ltd.)

Sequential HC Template workflow from acquisition to analysis

❶ Experimental setups

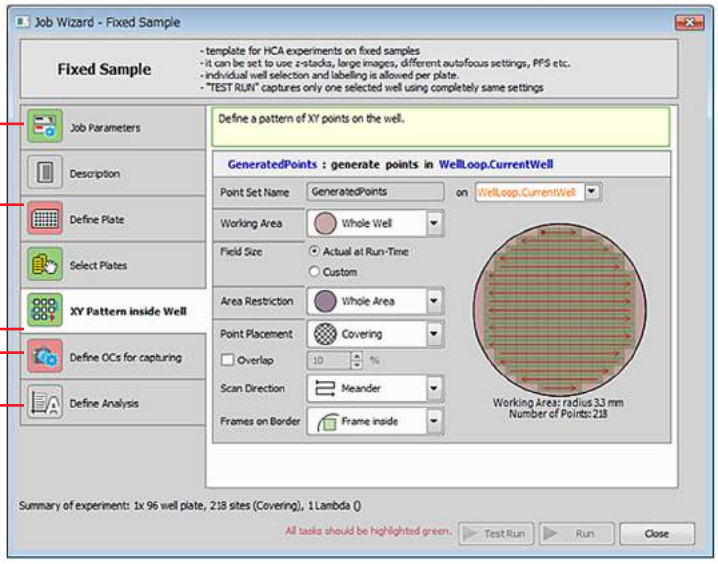
The wizard format simplifies settings for each experimental parameter. It also enables sequential operational settings, such as well plate definition, acquisition patterns in a well, wavelengths, autofocus and image analysis.

Define general job parameters
- Z-stack
- Sample labelling
- Autofocus
- Sending task completion by e-mail or SNS

Well plate setting
- Define well plate to use
- Select well plate for image capture
- Define XY image capture pattern inside a well

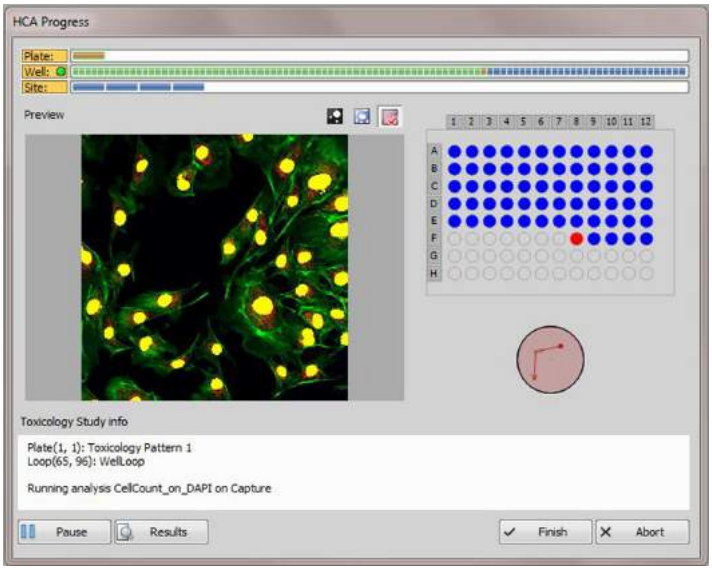
Define optical configurations for image capture

Define analysis
(Set the custom image analysis using General Analysis on page 11.)



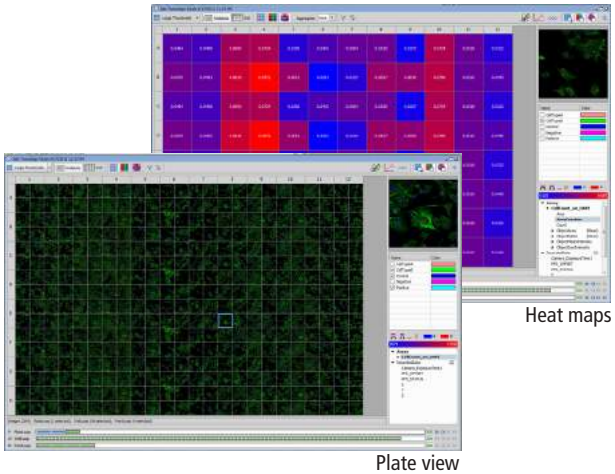
❷ Progress display

Current well-plate acquisition point is displayed in real time along with a live image. Image analysis is conducted during image acquisition, allowing for immediate observation of data collection and experimental status.



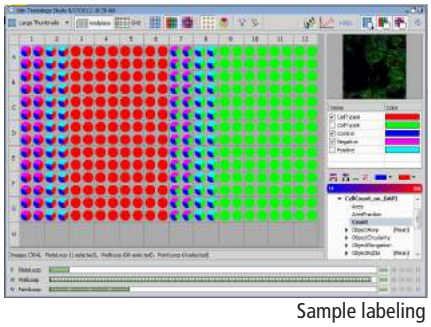
❸ Results display

Various formats are available for displaying results. Plate view is a centralized view that shows acquired images and all associated data. Sample labeling manages image data by linking cells by name, type and quantity of reagent. Heat maps visualize trends in measurement results and analytical values. Graphical displays of analytical values such as histograms, scatter plots and bar graphs are also available.

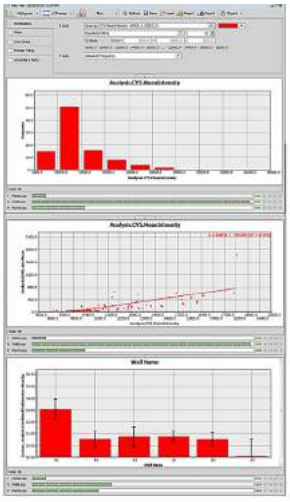


Heat maps

Plate view



Sample labeling

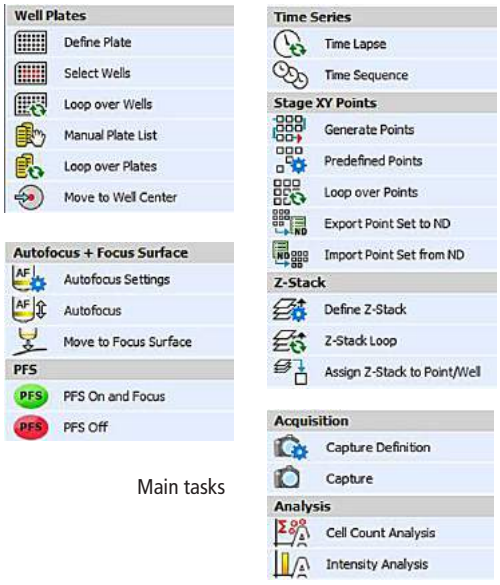


Visual programming tool that enables creation of highly flexible experimental templates

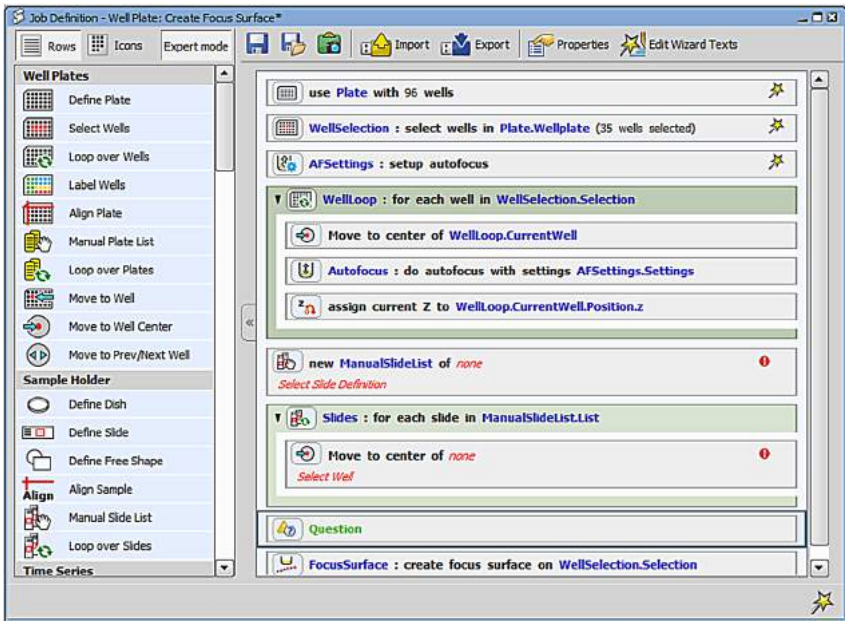
JOBS Editor

Option (Ar)

JOBS Editor is a visual programming tool that can create experimental templates (JOBS) simply by dragging and dropping the settings for "tasks" in the sequence of experimental procedures, such as sample definition, image acquisition settings and analysis settings, into the JOBS Editor window.
The HC Template offers streamlined operation of high-throughput imaging/analysis. However, JOBS Editor enables easy creation of more complex and custom experimental templates, from image acquisition to analysis, by providing a number of available tasks, without the need of advanced data programming knowledge and the need for creating a macro.



Main tasks



Task definition

For offline analysis of high-content data

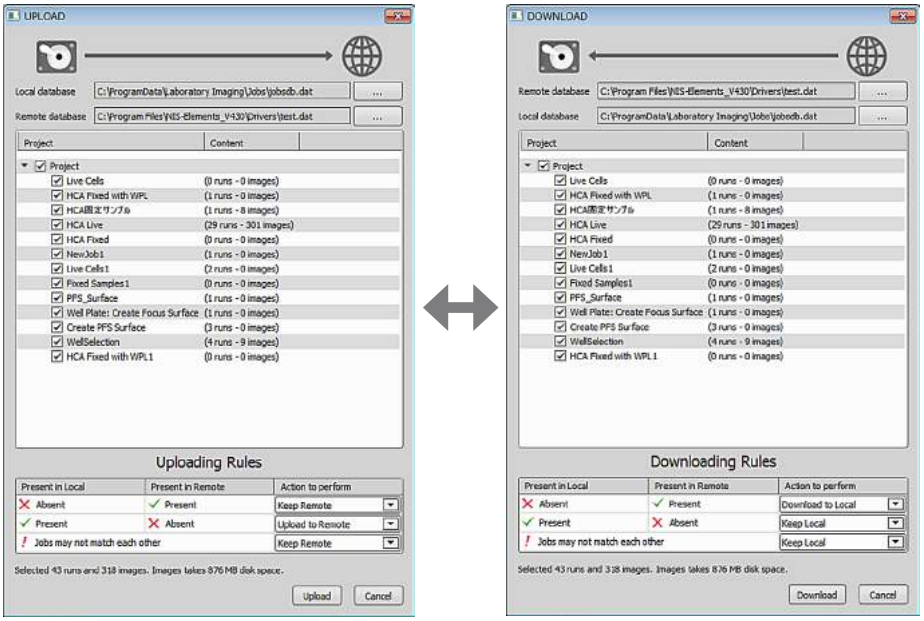
Remote Database/JOBS Viewer* (for HC Template and JOBS Editor)

Option (Ar)

Enables image analysis and management of a large volume of high-content imaging data on an offline PC.
Operating image acquisition and data analysis on separate computers boost total throughput.

General Analysis module is required for offline image analysis.
*JOBS Viewer is not available in some regions.

- Remote Database allows offline exchange of data between computers and network servers.
- Using JOBS Viewer and/or General Analysis, images acquired through HC Template or JOBS can be analyzed on a dedicated offline computer.



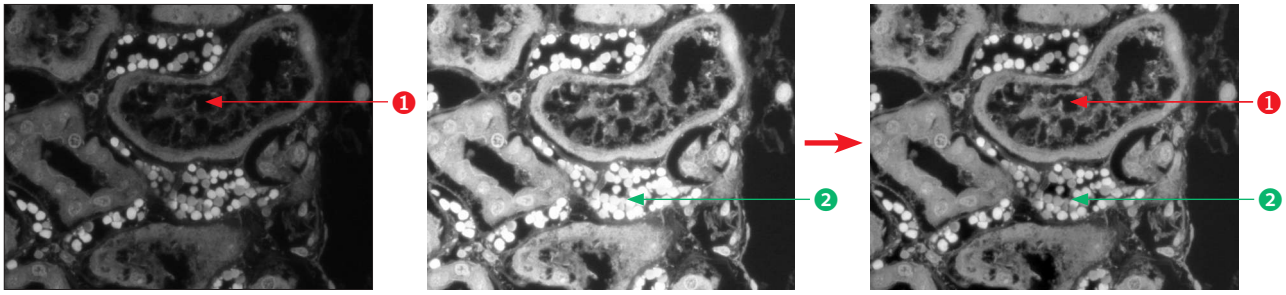
Data upload/download using Remote Database

Others

HDR (High Dynamic Range) Image Acquisition

Ar Option (Br D)

HDR creates an image with appropriate brightness in both the dark and bright regions in a sample by combining multiple images acquired with different exposure settings. It is also possible to create HDR image using multiple captured images.



300-msec exposure: 1 area is underexposed

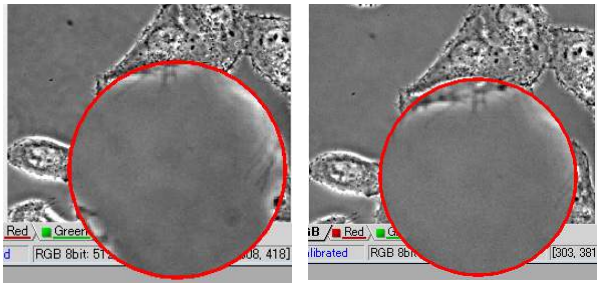
600-msec exposure: 2 area is overexposed

HDR image: captures both 1 and 2 areas with optimal exposure

Background Compensation

Ar Br D

Background correction uses previously captured images to correct uneven background brightness while imaging or of captured images.



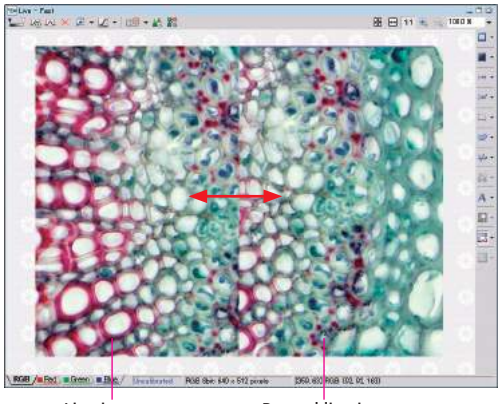
Before compensation

After compensation

Live Image Comparison

Ar Option (Br D)

Live Compare enables easy image comparison between a sample image and a live image. Live observation side by side with a paused live image is also available in split screen mode.



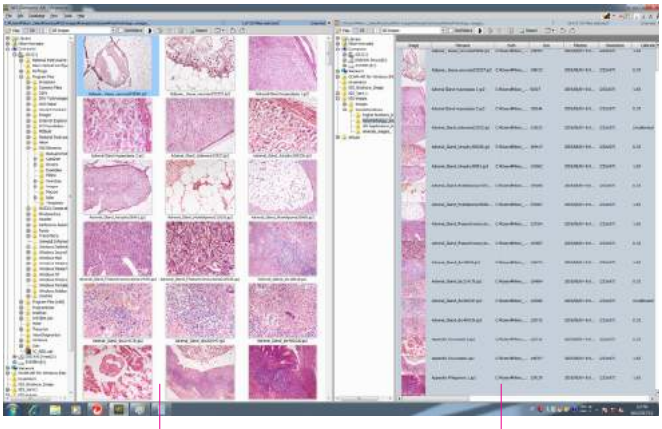
Live image

Paused live image

Database

Option (Ar Br D)

Using the organizer function, captured images are displayed in thumbnails for easy retrieval of the desired image. By simply clicking on the thumbnail image in this view, the image is easily opened. Sorting and filtering this database of images and datasets using acquisition details such as objective settings, date and author is an easy method for data management as well.



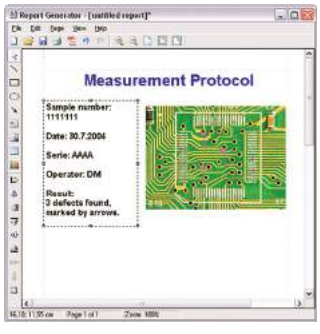
Organizer

Database

Report Generation

Ar Br D

Images captured with NIS-Elements have information such as acquisition details and analysis results, allowing export and PDF conversion of the image and the associated image header and data information.



User Rights/Control

Ar Br D

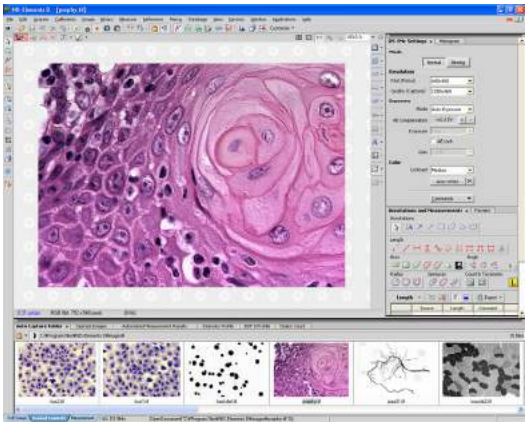
For safe system management, it is possible to individually limit each user authorization using the user account of Windows® (such as the Administrator or Guest) or the user account of NIS-Elements. It limits the authorization and modification of the device settings (microscopes, cameras or others), optical configuration and layout editing.

GUI Option

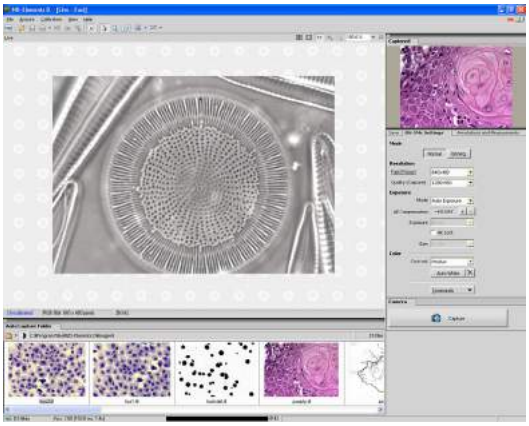
Industrial Simple GUI

D

With D package, the simple GUI mode provides controls for the most common operations such as image capture and simple measurement.



Standard GUI mode: Displays all functions of D package

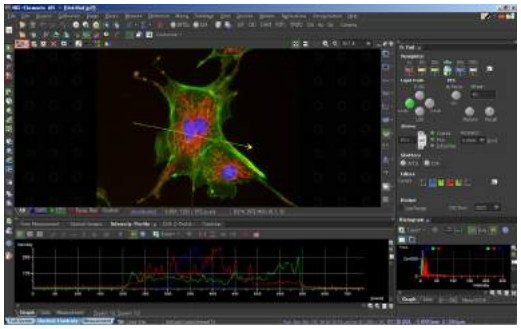


Simple GUI mode: Display only image capturing and measurement

Dark Color Scheme

Ar Br

This popular display option mode has a brightness level interface color palette suitable for use in a dark microscopy room.



Layout Manager

Ar Br D

Layout manager enables customizing layouts of controls, toolbars and menus and application (image acquisition or measurement). Saving custom layouts is possible and accessible through one-click tab access.

Compatibility with Third-party Products

NIS-Elements is compatible not only with Nikon products but also with third-party products such as high-sensitivity CCD cameras and peripheral devices. Third party devices and cameras are easy to integrate through the NIS-Elements intuitive install and device manager.

Off-line Package for Analysis

The NIS-Elements off-line software package offers analysis tools such as intensity measurements and object counting of tiff and multi-dimensional format images captured with Nikon's microscopes and third-party software.

Viewer Software

This is free software for image display of single images and datasets captured using NIS-Elements. Possible views include Tile View, Max/Min Projections and 3D Volume View. Saving multi-dimensional files into TIFF format is available as well. The viewer is downloadable from the Nikon website.

Software Upgrade Agreement (SUA) License

NIS-Elements can be upgraded for one year from the date of purchase. The Software Upgrade Agreement (SUA) License, which is purchasable in one-year license segments, extends the access to the latest version of NIS-Elements.

Supporting Broad Microscope Imaging

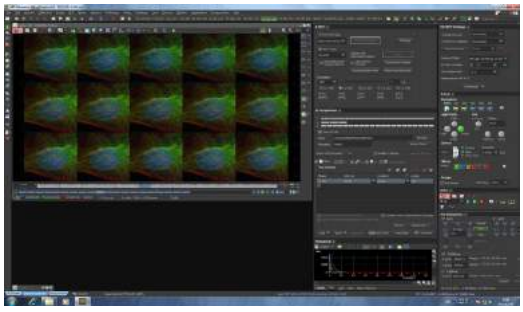
NIS-Elements is a common software platform for Nikon microscope systems, which allows the comprehensive control of wide range of functions for cameras, confocal imaging systems and super resolution microscopes.

NIS-Elements C

NIS-Elements C is an optimized software package for confocal imaging. It is compatible with high-speed/high-resolution confocal microscope A1$^+$/A1R$^+$, multiphoton confocal microscope A1 MP$^+$/A1R MP$^+$, confocal microscope C2$^+$ and spectral confocal imaging systems.

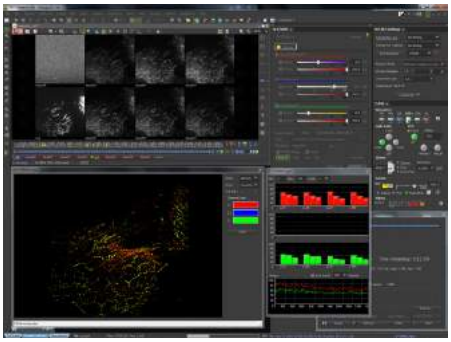
N-SIM Analysis option

N-SIM Analysis option allows control of Nikon Super-Resolution Microscope N-SIM, which can achieve an image resolution of 85nm and temporal resolution of up to 0.6 sec/frame using high frequency Structured Illumination.



N-STORM Analysis option

N-STORM Analysis option enables control of Nikon Super-Resolution Microscope N-STORM, which realizes an incredible image resolution of approx. 20nm by utilizing STochastic Optical Reconstruction Microscopy (STORM).



Features

	AR	BR	D
Window style	MDI (Multiple Document Interface)	MDI (Multiple Document Interface)	SDI (Single Document Interface)
Dark color scheme	○	○	—
Industrial simple GUI	—	—	○
Camera control	○	○	○
Microscope control	○	○	○
Nikon made peripheral control	○	○	○
Non-Nikon peripheral control	○	○	○
Live image capture	○	○	○
Time-lapse image capturing (T)	○	○	△
Z-series image capturing (Z)	○	○	○
Multichannel image capturing (λ)	○	○	—
Multipoint image capturing (MP)	○	○	○
Multidimensional image capturing	● Up to 6D	● Up to 4D	—
Stimulation experiment	●	—	—
RAM capture	○	—	—
HDR image capture	○	●	●
AVI live-stream capture	○	○	○
Objective calibration	○	○	○
Capturing data savings (Meta-data)	○	○	○
Image filtering	○	△	△
Binary	○	△	▲
LUT (look up table)	○	○	○
Histogram	○	○	○
Manual measurement	○	○	○
Auto measurement	○	○	●
Intensity line profile	○	○	○
Intensity surface plot	○	○	○
Time (intensity) measurement	○	●	—
3D measurement	●	▲	▲
Volume measurement	○	—	—
Database	●	●	●
Macro	○	△	△
Advanced interpreter	○	●	●
Report generator	○	○	○
Live compare	○	●	●
Volume view	○	△	△
EDF (Extended depth of focus)	●	●	●
3D surface view	●	●	●
Ratio view	○	—	—
SD deconvolution	●	—	—
AQ blind deconvolution	●	—	—
2D real time deconvolution	●	—	—
2D deconvolution	●	—	—
3D deconvolution	●	—	—
3D blind deconvolution	●	—	—
Wavelength switcher	●	●	●
TTL/analog IO	●	●	●
Object classifier	●	—	—
Object tracking	●	—	—
Calcium & FRET	●	—	—
General analysis	●	—	—
HC Template	●	—	—
JOBS Editor	●	—	—
N-SIM analysis	●	—	—
N-SIM offline analysis	●	—	—
N-STORM analysis	●	—	—
N-STORM offline analysis*	●	—	—
Metalogical analysis	—	—	●

○ : Full function △ : Limited function —: Not available ● / ▲ : Option

* N-STORM analysis is required.

NIS-Elements Supported Devices (ver. 4.30 or later)

Nikon Cameras

- DS-Ri2
- DS-Qi2
- CCU: DS-U2/L2 (for camera head DS-2Mv/Vi1/2MBW/2MBWc/5M/5Mc/Fi1/Fi1c/Qi1/Ri1)
- CCU: DS-U3/L3 (for camera head DS-Vi1/Fi1/Fi1c/Qi1/Ri1/Fi2)
- DQC-FS*2

Third-party Cameras

Photometrics
- Evolve
- QuantEM
- CoolSNAP HQ2
- CoolSNAP ES*2
- Cascade 128+*2
- Cascade II 512*2
- Cascade 1K*2

Andor Technology
- Luca S, Luca R
- iXon+ 897, 888, 885
- iXon X3
- iXon Ultra
- iKon-M
- Clara
- Neo sCMOS
- Neo 5.5 sCMOS
- Zyla 5.5 sCMOS (3-Tap, 10-Tap)
- Zyla 4.2 sCMOS

QImaging
- Retiga EXi Aqua/Blue
- Retiga 2000R - Mono/Color
- Retiga SRV + RGB-HM-S Slide
- Rolera EMC2
- QICLick
- QICAM

Hamamatsu
- ImagEM
- ImagEM 1K
- ImagEM X2
- ORCA-R2
- ORCA-Flash2.8
- ORCA-Flash4.0
- ORCA-Flash4.0 LT
- ORCA-D2
- ORCA
- C9100-02, C9100-12

Imaging Source
- DFK/DMK 31,41,51,72 series
- DFK/DMK 23U274
- DFK/DMK 23UP031
- DMK 23UM021
- DFK 23U445

Others
- TWAIN Device*2

Nikon Microscope Devices

- Biological Microscope Ti (HUBC/A, HUBC/A-U, Ti-LAPP System*4)
- Biological Microscope TE2000 (Perfect Focus System)
- Biological Microscope 90i (ND filter, Stage, DIH-E/M)
- Biological Microscope 80i (DIH-E/M, D-FL-E, C-Box/C-Box2)
- Biological Microscopes Ni-E, Ni-U, Ci-E
- Fixed-stage Microscope FN1 + D-DH-E-A1*1
- Stereo Microscope SMZ25/18/1270i/1270/800N
- Multizoom Microscope AZ100M
- Industrial Microscope LV-N Series*3
- Measuring Microscope MM-400/800*2
- Metallographic Microscope MA200
- Inspection Microscopes L200N/L300N
- C-HGFIE HG Fiber Illuminator Intensilight
- C-LEDFI Epi-FI LED Illuminator
- Laser Module LU-N Series
- LV-NCNT-N Nosepiece controller
- NI-SH-CON

Third-party Devices

Prior Scientific
- ProScan III
- ProScan II
- Prior PCI II
- OptiScan II ES10
- NZ100,200,400 NanoStageZ
- ES10ZE

Ludl Electronic Products
- MAC5000, MAC6000

Märzhäuser Wetzlar
- TANGO Desktop, Tango PCI
- LSTEP

Vincent Associates (Uniblitz)
- VCM-D1

Sutter Instrument
- Lambda 10-2, 10-3, SC, 10-B, XL

Physical Instrument
- PI E-662, 665 (RS232)

Photometrics
- Dual View

ASI (Applied Scientific Instrumentation)
- MS-2000
- FW-1000
- SC-2000

National Instruments
- TTL Input/Output (NI Card)

Tokai Hit
- WSKM

Mad City Labs
- Nano-Drive

Yokogawa
- CSU-W1*4
- CSU-X1*4

*1 Only compatible with 64-bit version OS
*2 Not compatible with 64 bit version OS
*3 Not compatible with LV-DAF Auto Focus Unit
*4 Only compatible with NIS-Elements AR

Supported Operation System

Windows 7 Professional SP1 (32/64-bit version)
* NIS-Elements Ar and C are only compatible with the 64-bit version.

NIS-Elements is compatible with all common file formats, such as JP2, JPG, TIFF, BMP, GIF, PNG, ND2, JFF, JTF, AVI, ICS/IDS. ND2 is a special format for NIS-Elements. ND2 allows storing sequences of images acquired during nD experiments. It contains information about the hardware settings and the experiment conditions and settings.

Specifications and equipment are subject to change without any notice or obligation on the part of the manufacturer. September 2014

⚠ WARNING	TO ENSURE CORRECT USAGE, READ THE CORRESPONDING MANUALS CAREFULLY BEFORE USING YOUR EQUIPMENT.

N.B. Export of the products* in this catalog is controlled under the Japanese Foreign Exchange and Foreign Trade Law. Appropriate export procedure shall be required in case of export from Japan.
*Products: Hardware and its technical information (including software)
Monitor images are simulated.

ISO 9001 BUREAU VERITAS Certification

ISO 9001 Certified for NIKON CORPORATION Microscope Solutions Business Unit Industrial Metrology Business Unit

ISO 14001 BUREAU VERITAS Certification

ISO 14001 Certified for NIKON CORPORATION

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