Nikon Imaging Software

NIS-Elements

Imaging Software

Elements D

Documentation

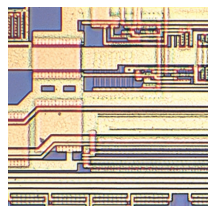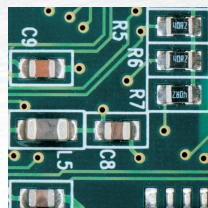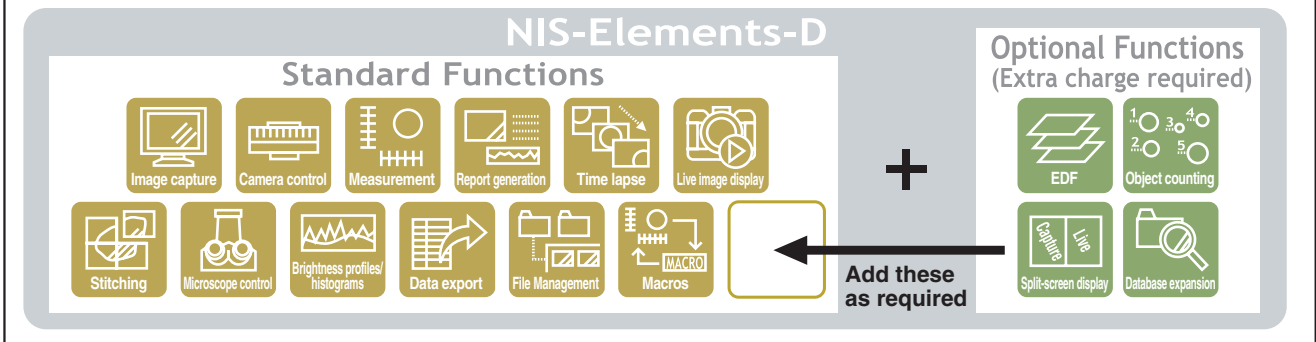# NIS-Elements D offers a total solution for capture, analysis and image file m anagement.

Ease of use and a range of powerful functions make NIS-Elements D an excellent tool for a wide range of microscope based inspection methods and protocols.

Imaging Software

NIS Elements D
Documentation

Flexiblity has been built into the design of the software's Standard Function and Optional Functions.

Standard Functions of NIS-Elements D were designed to faciliate efficient microscopic inspection in industrial production and quality control. Standard Fucntions include image capture, measurement, data export, file management and report generation.

NIS-Elements-D

Standard Functions

| Image capture | Camera control | Measurement | Report generation | Time lapse | Live image display |
| Stitching | Microscope control | Brightness profiles/histograms | Data export | File Management | Macros |

Add these as required

+

Optional Functions
(Extra charge required)

| EDF | Object counting |
| Live Capture | Split-screen display | Database expansion |

Automated Microscope control provide a streamlined workflow   `Standard Functions`

Integration of automated microscope control of motorized components such as illumination, Z position and nosepiece rotation allow for easy image capture and sample inspection.

Microscope control window (LV-PAD)
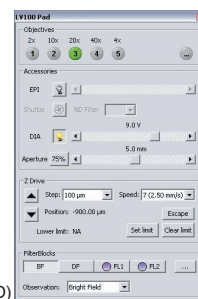
Powerful Nosepiece Control

Switch Maganifications and Configurations

Calibration and Scales are linked automatically with objectives. Changing magnifications is seamlessly linked to the appropriate spatial calibration. These setting can also be tied to camera parameters to ensure the correct measurements are applied to the captured images.

Objectives				
2x	10x	20x	40x	4x
1	2	3	4	5	...
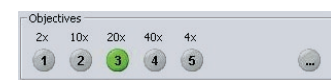
+AZ100M

AZ-NPI
Triple
Nosepiece I

+LV Series

LV-NU5AC
Motorized Nosepiece

LV-NU5A
Motorized Nosepiece

*The AZ-NPI Intelligent Triple (manual) nosepiece transmits objective magnification information to PC or CCU via the AZ-MC controller.

Control of illumination

Recording and replay of illumination conditions

Stored Illumination settings, which integrate shutter control, lamp voltage, illumination method (brighfield, darkfield, fluoresecence) are easily applied to image capture. Specific configurations can be saved and recalled at later times or with different operators to help provide consistent image capture.

+LV Series

LV-UEPI2A
Motorized Universal Epi-Illuminator 2
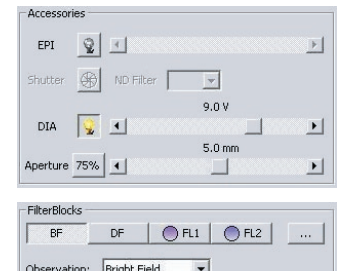
Control of Z positioning

Motorized focus control

Automated control of the Z motor and positioning is the core of 3D image capture and autofocusing. Linked with the EDF (extended depth of focus) module (optional- see P6), composite images that have been captured in a different Z-axis can be combined to create an all-in-focus image.

+AZ100M

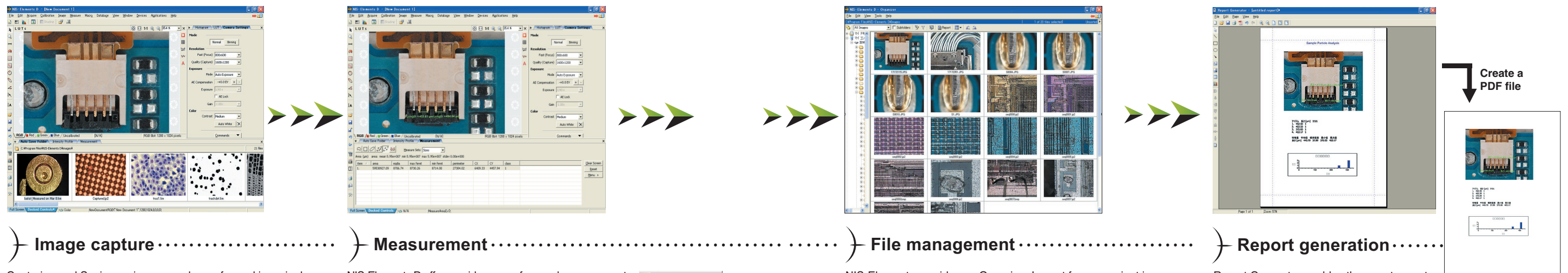AZ100M Motorized
Zooming Body

AZ-STDM
Diascopic
Stand M

+LV Series

LV-IMA
IM Module A

LV-FMA
FM Module A

# NIS-Elements D is the complete toolkit for image capture, measurement, image management and report generation.

Create a PDF file

⊢ Image capture

Capturing and Saving an image can be performed in a single mouse click. Typical saving parameters such as file name, automatic sequence numbering, storage location, and other image properties can be designated and stored for future image capture. This approach is time efficient as well as an organized method for capturing multiple images.
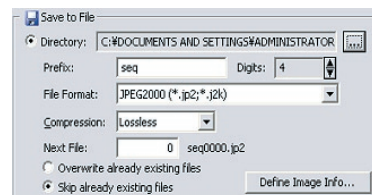
⊢ Measurement

NIS-Elements D offers a wide range of manual measurements, including distance between two points, area, auto detect area, radius, angle, counting. Measurement annotations are displayed on the image in a customizable display. Measurement results are also displayed in a data table that can be exported to Excel and other programs.

Export
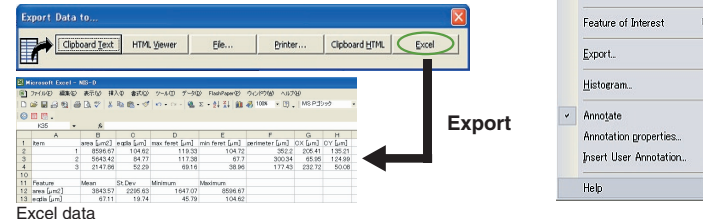
Excel data

⊢ File management

NIS-Elements provides an Organizer Layout for convenient image archiving and file management. Searching, sorting and multiple grouping of images and associated image information can be easily performed by drag and drop. Detail, thumbnail, icon and grid views are available on both the images on the file system as well as images in the optional Database Module.
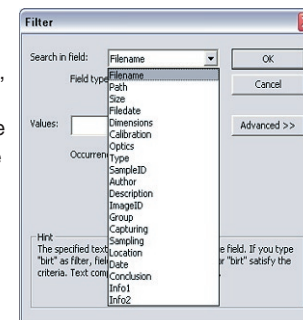
⊢ Report generation

Report Generator enables the user to create customized reports containing images, selected image information from the file or the database, measured data, user text and graphics. Reports can be saved, printed, converted to pdf or e-mailed.


Other Standard Functions

⊢ Large Image Stitching

NIS-Elements includes large image stitching capability allowing capture of images larger than the field of view as shown below. Capturing and stitching can be completed with or without an automated stage. Special algorithms ensure maximum accuracy, resulting in ultra high-resolution images.
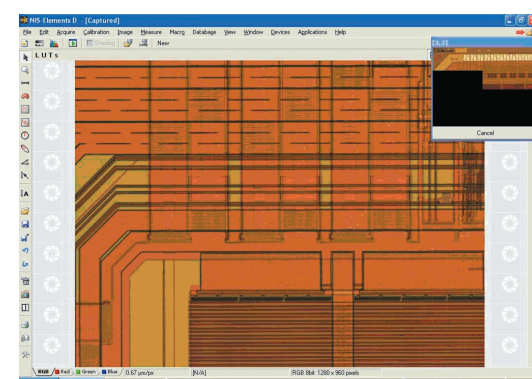
⊢ Display of profiles tools and histogram

Profile Tools: Profile tools are available for plotting intensity, brightness or density into an interactive graph. All output measurement statistics, histograms and profiles can be exported to MS Excel, HTML, or to a file.
Histogram: The histogram is a graph to indicate the brightness of your image to help ensure that the captured images are not over or under exposed.

Histogram

Profile tools
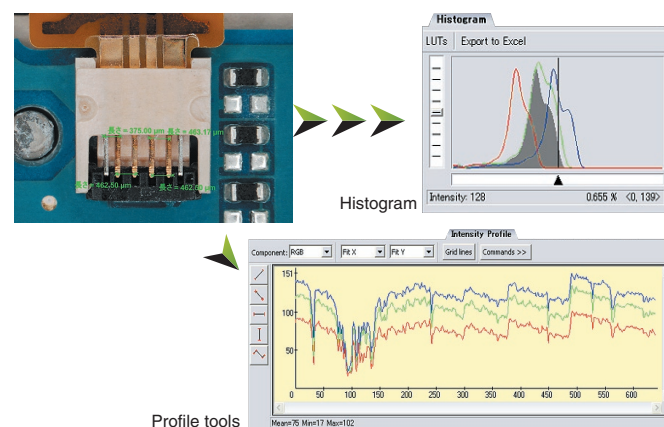
⊢ Time lapse

Time Lapse allows for capturing a sequence of images of events occurring over time, for example crystal formation or some structural change in a material. Interval and Duration are the only parameters that must be entered. Time Lapse images can be saved as AVIs movies so they can be replayed on any system.

⊢ Macros

A series of actions can be recorded as a macro and assigned to a toolbar button. This allows for automated execution of a variety of operations at a single touch. Once recorded, macros can be edited and enhanced.

⊢ Autofocus

NIS-Elements offer a number of Auto Focus routines to help keep your samples in focus for a single capture or during a time-lapse.

⊢ Display of grid overlays

Non-Destructive Overlays that can be displayed on the image include a simple cross hair, grid, concentric circles, horizontal, vertical rulers, etc. Properties such as color, width and density of these overlays can be adjusted.
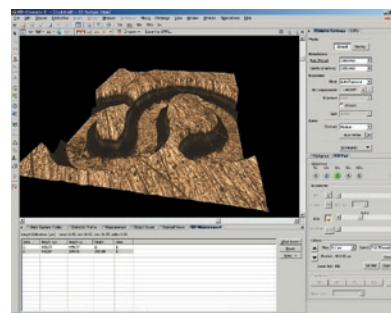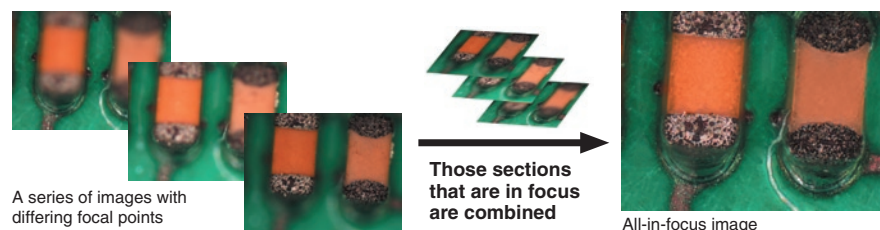
Grid   Concentric circles   Perpendicular ruler

Horizontal ruler   Crossed rulers   Crosshairs
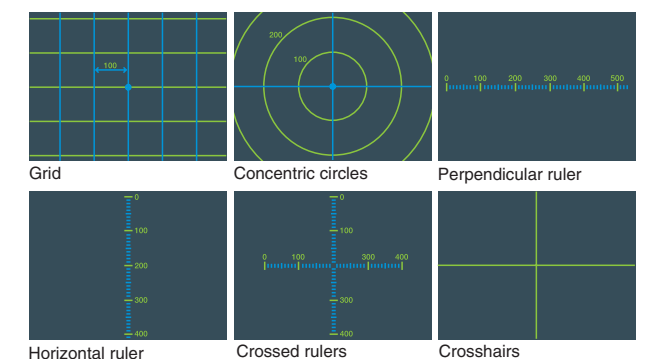
A comprehensive set of options to easily facilitate complex image capture, analysis and management.

## EDF (Extended depth of focus)

EDF allows Images that have been captured in a different Z-axis to be combined to create an all-in-focus image. Once the all in focus image has been created, it can be viewed and rotated as a Virtual 3D image as well as displayed as a stereovision image. Distances along the X,Y and Z axes can be measured in the all in focus image or the 3D image.

A series of images with differing focal points

Those sections that are in focus are combined

All-in-focus image

Three dimensional image (LV series only)

Automated Measurement

Using the RGB or HSI color spaces, NIS-Elements can segment the image and create binary images. Using the binary image, Automatic Measurement records features such as length, area, angle and density. There are about 90 different Object and Field that can be measured. The Object Count feature in Automated Measurement provides a consolidated power dialog for thresholding, counting and exporting measurement data.
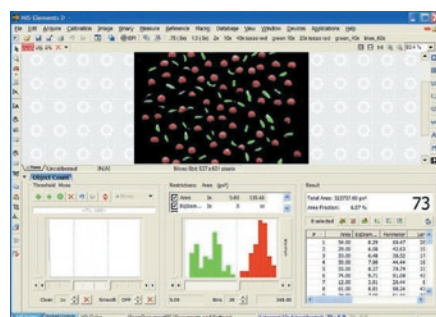
◆ Classifier

Images can be easily classified and displayed by pixel according to user-defined settings based on various characteristics of each pixel, such as brightness, RGB values, HSI values, HS values, etc.
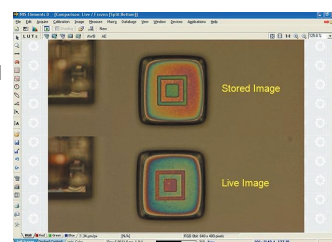
Classification of pixels
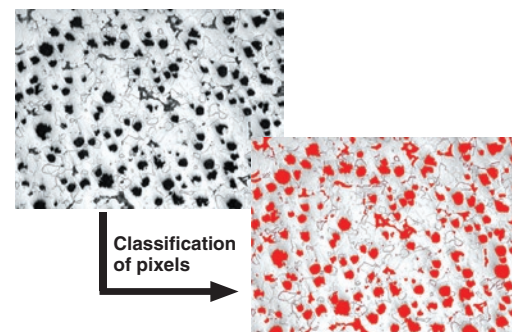
Database option

One of the key modules in NIS-Elements is the database capability. Various databases and tables can easily be created to help manage and keep track of your images. A one click option allows saving images directly into the database.
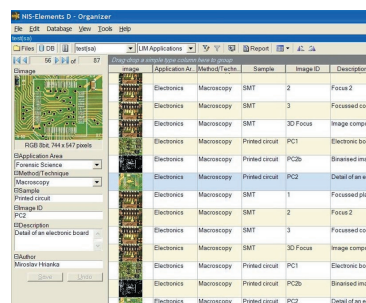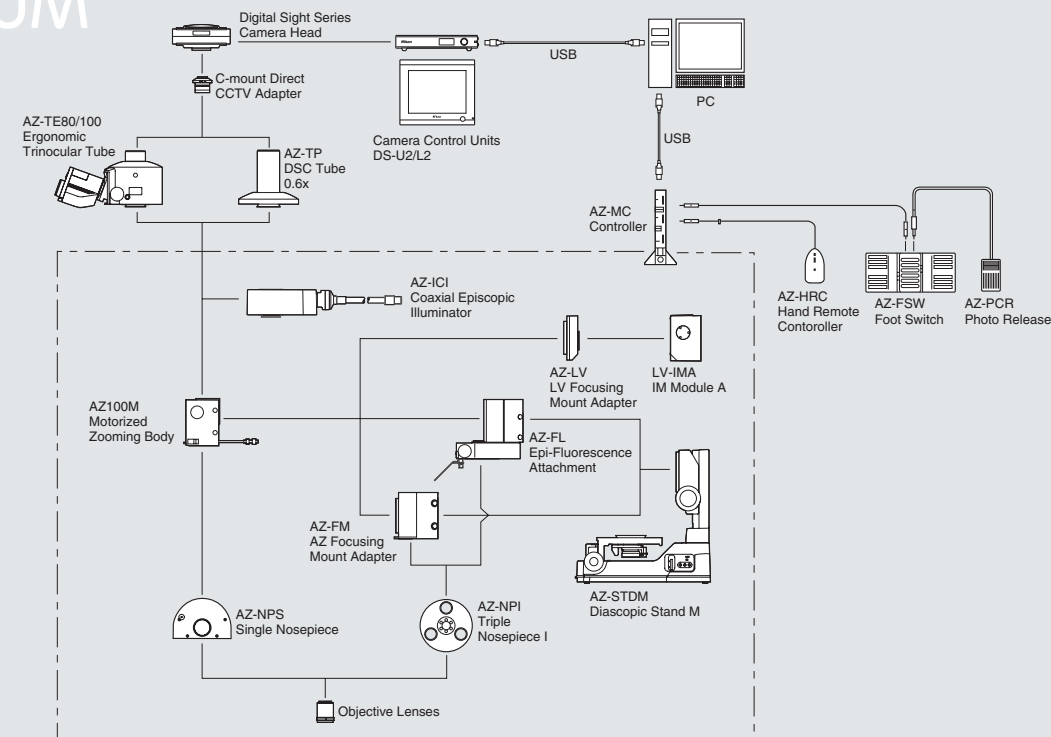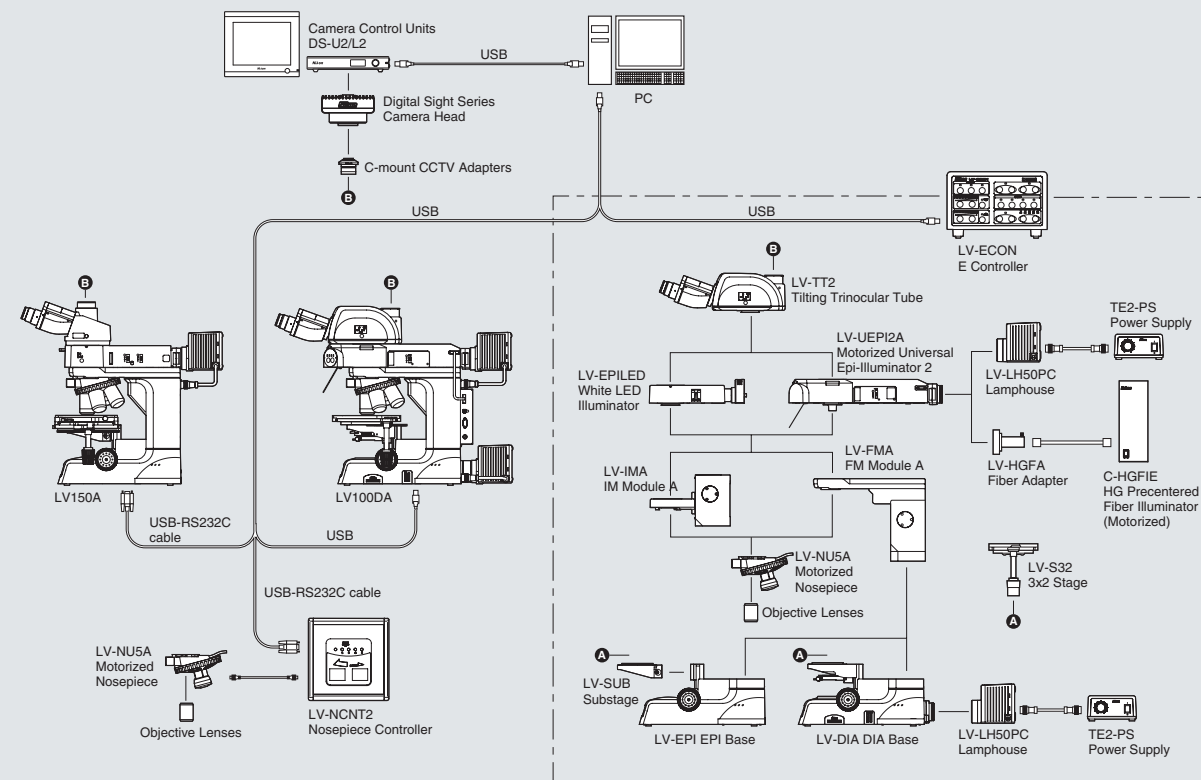
Live Compare

The Live Compare module is ideal for comparing a live image with a stored image for applications such as defect analysis, Go-NoGo assessment and more.
Viewing a stored image and a live image can be displayed in various formats such as side by side, transparent and alternating images.

Stored Image

Live Image

AZ100M

Digital Sight Series Camera Head
C-mount Direct CCTV Adapter
AZ-TE80/100 Ergonomic Trinocular Tube
AZ-TP DSC Tube 0.6x
Camera Control Units DS-U2/L2
USB
PC
USB
AZ-MC Controller
AZ-ICI Coaxial Episcopic Illuminator
AZ-HRC Hand Remote Controller
AZ-FSW Foot Switch
AZ-PCR Photo Release
AZ-LV LV Focusing Mount Adapter
LV-IMA IM Module A
AZ100M Motorized Zooming Body
AZ-FL Epi-Fluorescence Attachment
AZ-FM AZ Focusing Mount Adapter
AZ-NPS Single Nosepiece
AZ-NPI Triple Nosepiece I
AZ-STDM Diascopic Stand M
Objective Lenses

LV Series

Camera Control Units DS-U2/L2
USB
Digital Sight Series Camera Head
PC
C-mount CCTV Adapters
USB
USB
LV-ECON E Controller
LV-TT2 Tilting Trinocular Tube
TE2-PS Power Supply
LV-UEPI2A Motorized Universal Epi-Illuminator 2
LV-EPILED White LED Illuminator
LV-LH50PC Lamphouse
LV-IMA IM Module A
LV-FMA FM Module A
LV-HGFA Fiber Adapter
C-HGFIE HG Precentered Fiber Illuminator (Motorized)
LV150A
LV100DA
LV-NU5A Motorized Nosepiece
LV-S32 3x2 Stage
USB-RS232C cable
USB
Objective Lenses
USB-RS232C cable
LV-SUB Substage
LV-NU5A Motorized Nosepiece
LV-NCNT2 Nosepiece Controller
LV-EPI EPI Base
LV-DIA DIA Base
LV-LH50PC Lamphouse
TE2-PS Power Supply
Objective Lenses

⊱ NIS-Elements D Specifications

⊱ Main functions   S: Standard   O: Optional

Image display	Enlarge/reduce, full screen, and magnifying glass	S
	Capture thumbnail	S
	Scale, annotation, and profile	S
	Grid	S
	LUT, histogram, and sequence replay	S
	3D Surface Model (Part of EDF option) *LV Series Only	O
Image capture	Auto-capture	S
	Time lapse	S
	Z series and multi-point	S
	Stitching	S
	Live compare	O
Data formats	BMP, TIFF, JPEG, and JPEG2000	S
	GIF, PNG, ICS/IDS	S
Image processing	White balance and tone	S
	LUT and shading correction	S
	Contrast and hue/saturation correction	S
	Edge enhancement, averaging, and smoothing	S
	EDF and realtime EDF *LV Series Only	O
Image editing	Crop	S
	Image overlay	4 (RGB)
	Cut, copy, paste, rotate, invert, and resize	S
	Component extraction	S
	Pseudo-color	S
Image analysis	Calibration (length)	S
	Manual measurement (count, length, area, angle, circle, and ellipse)	S
	AutoMeasure (Object Count)	O
	3D measurement (EDF) *LV Series Only	O
Peripheral device control	Microscope control	S
	3rd Party Device Control	O
Screen control	Organizer layout	S
	Layout manager	S
Other	Printing, PDF output, mail transmission	S
	Optical Configurations	S
	Report generator	S
	Macros	S
	Advanced Macros	O
	Databases	O

⊱ Compatible devices

Microscopes and accessories	Eclipse LV series
	Universal Zoom Microscope AZ100M
	C-HGFIE HG Precenterd Fiber Illuminator (Motorized)
Cameras	Digital Sight series
	DXM1200 series
Accessories from other manufacturers	Stages: Prior, Marzhauser, LUDL, ASI *Note: For the detial, please contact your local agent or Nikon Corp.
	Prior Z-Focus Module
	EXFO XCite 120 series fiber illuminators

⊱ Operating environment

CPU	3.2GHz Intel® Pentium® IV processor or better
RAM	1GB or more
OS	Microsoft® Windows® XP SP2 (English version)
Hard disk space	600MB or more required for installation
Display	1280 x 1024 or better (TrueColor mode)

En