



INDUSTRIAL INSTRUMENTS



Industrial Instruments General Brochure





INDEX

Stereo Microscopes	3
Parallel Optics Type – SMZ25 / SMZ18 / SMZ1270 / SMZ1270i / SMZ800N Greenough Type – SMZ745 / SMZ745T / SMZ445 / SMZ460 / SMZ-2	
Industrial Microscopes	4-5
Upright Microscopes – LV100ND / LV100NDA / LV150N / LV150NA / L200N / L200ND / L300N / L300ND Inverted Metallurgical Microscopes – MA100N / MA200 Polarizing Microscopes – LV100NPOL / Ci POL	
Digital Cameras for Microscopes	6-7
Microscope Camera – Digital Sight 1000 Microscope Camera – Digital Sight 10	Microscope Camera – DS-Fi3 Imaging Software – NIS-Elements L/D/Ar/Br
Objective Lenses	8
Objective Lenses – CF160-2 / CF160	
For Incorporation into Microscopes / Wafer Loaders	9
Modular Focusing Units – IM-4 / LV-IM / LV-FM / LV-FMA Compact Reflected Microscopes – CM Series	Wafer Loaders – NWL200 Series
CNC Video Measuring Systems	10-11
CNC Video Measuring Systems – iNEXIV VMA Series / NEXIV VMZ-S Series / NEXIV VMZ-H3030 CNC Confocal Video Measuring Systems – NEXIV VMZ-K Series	
Measuring Microscopes	12
Measuring Microscopes – MM-400N / MM-800N	
Profile Projectors / Data Processing Systems	13
Profile Projectors – V-12B / V-20B Data Processing Software – E-MAX	Data Processor – DP-E1A
Autocollimators / DIGIMICRO	14
Autocollimators – 6B-LED / 6D-LED	DIGIMICRO – MF-1001 / MF-501 / MH-15M
Optical Flat / Optical Parallel / Standard 300 mm Scale	15




Stereo Microscopes

SMZ Series

The highly cost-effective SMZ series offer outstanding optical performance, flexible system expandability, and superb operability.

Parallel Optics Type				
				
	SMZ25	SMZ18	SMZ1270 SMZ1270i	SMZ800N
Zoom Ratio	25 : 1	18 : 1	12.7 : 1	8 : 1
Zoom Range	0.63–15.75x	0.75–13.5x	0.63–8x	1–8x
Total Magnification*1 (Standard combination*2)	3.15–945x (6.3–157.5x)	3.75–810x (7.5–135x)	3.15–480x (6.3–80x)	5–480x (10–80x)
WD *3	60 mm	60 mm	70 mm	78 mm
Camera	✓	✓	✓	✓

✓ : Available / — : Not available

Greenough Type				
				
	SMZ745 SMZ745T	SMZ445 SMZ460	SMZ-2	
Zoom Ratio	7.5 : 1	4.4 : 1	4.3 : 1	5 : 1
Zoom Range	0.67–5x	0.8–3.5x	0.7–3x	0.8–4x
Total Magnification*1 (Standard combination*2)	3.35–300x (6.7–50x)	4–70x (8–35x)	3.5–60x (7–30x)	4–120x (8–40x)
WD *3	115 mm	100 mm	77.5 mm	
Camera	✓ (SMZ745T only)	—	—	

✓ : Available / — : Not available

*1: Depending on combination of Eyepiece and Objective lens. *2: Combination of Eyepiece 10x and Objective lens 10x. *3: Objective lens 1x or no Auxiliary lens.

Nikon's Industrial Microscopes utilize the CFI60-2 optical system, highly evaluated for providing a high NA combined with long WD.

Upright Microscopes (General model)

**LV100ND
LV100NDA**

Model offers various observation methods with reflected/transmitted illumination.



**LV150N
LV150NA**

Stand and illumination units are selectable according to observation methods and purpose of use.



Observation Method	BF	DF	DIC	FL	POL	2-Beam	Ph-C
	EPI	✓	✓	✓	✓	✓	✓
EPI (LED)	✓	✓	✓	—	△	—	—
DIA	✓	✓	✓	—	✓	—	✓

✓ : Available / — : Not available / △ : Simple polarizing observation

Observation Method	BF	DF	DIC	FL	POL	2-Beam
	EPI	✓	✓	✓	✓	✓
EPI (LED)	✓	✓	✓	—	△	—

✓ : Available / — : Not available / △ : Simple polarizing observation

Observation Method	BF	DF	DIC	FL	POL	2-Beam
EPI	✓	—	✓	—	—	—

✓ : Available / — : Not available / △ : Simple polarizing observation

Illuminator

- Episcopic / Diascopic

Stage

- 3×2 Stage (stroke 75×50 mm)
- 6×4 Stage (stroke 150×100 mm)
- *See the "LV-N Series" brochure for other compatible stages.

BF: Brightfield DF: Darkfield DIC: Differential Interference Contrast FL: Fluorescence POL: Polarizing 2-Beam: Two-Beam Interferometry Ph-C: Phase-Contrast

Inverted Metallurgical Microscopes

MA100N

MA100N is compact, inverted microscopes designed for brightfield and simple polarizing observations.



MA200

With its unique, solid-box structure, the MA200 offers high stability, durability, and a smaller footprint than conventional models.



Observation Method	BF	DF	S-POL	DIC	FL
	EPI	✓	—	✓	—

✓ : Available / — : Not available
*Dedicated reflected illumination models.

Observation Method	BF	DF	S-POL	DIC	FL
	EPI	✓	✓	✓	✓

✓ : Available / — : Not available
△ : Only available with Halogen Lamp and Fiber Illumination
*DIA illuminator is available for transmitted light observation.

Illuminator

- Episcopic

Stage

- MA-SR-N Rectangular 3-plate Stage N (stroke 50×50 mm)
- MA-SP-N Plain Stage N
- TS2-S-SM Mechanical Stage CH (stroke 126×78 mm)
- *Please use in combination with MA-SP-N Plain stage N.

BF: Brightfield DF: Darkfield DIC: Differential Interference Contrast S-POL: Simple Polarizing FL: Fluorescence

Upright Microscopes (Large-sized stage model)

**L200N
L200ND**

Stage with stroke 200×200 mm is available. Suitable for ø200 mm wafer observation.



**L300N
L300ND**

Stage with stroke 350×300 mm is available. Suitable for ø300 mm wafer observation.



Observation Method	BF	DF	DIC	S-POL	FL
	EPI	✓	✓	✓	✓
DIA	✓*	—	—	—	—

*L200ND only ✓ : Available / — : Not available

Observation Method	BF	DF	DIC	S-POL	FL
	EPI	✓	✓	✓	✓
DIA	✓*	—	—	✓	—

*L300ND only ✓ : Available / — : Not available

Illuminator

- L200N : Episcopic
- L200ND : Episcopic / Diascopic

Stage

- 8×8 Stage (stroke: 200×200 mm)

Observation Method	BF	DF	DIC	S-POL	FL
	EPI	✓	✓	✓	✓
DIA	✓*	—	—	✓	—

*L300ND only ✓ : Available / — : Not available

Illuminator

- L300N : Episcopic
- L300ND : Episcopic / Diascopic

Stage

- 14×12 Stage (stroke: 350×300 mm)

BF: Brightfield DF: Darkfield DIC: Differential Interference Contrast S-POL: Simple Polarizing FL: Fluorescence

Polarizing Microscopes

LV100NPOL

Outstanding optical performance, perfect for a wide variety of imaging applications and polarizing techniques.



Ci POL

Compact polarizing microscope that balances optical performance and ease of use.



Observation Method	BF	POL
	EPI	✓
DIA	✓	✓

✓ : Available / — : Not available

Observation Method	BF	POL
	EPI	✓
DIA	✓	✓

✓ : Available / — : Not available

Illuminator

- Episcopic/ Diascopic

Stage

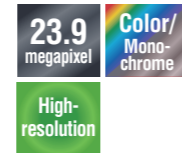
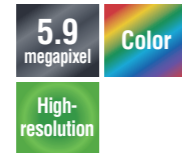
- High precision rotating stage for polarizing observation

BF: Brightfield POL: Polarizing DF: Darkfield DIC: Differential Interference Contrast S-POL: Simple Polarizing FL: Fluorescence

Microscope Camera

Digital Sight 1000

Equipped with a 2 megapixel CMOS image sensor, it can capture full HD microscope images. By connecting a microscope to this camera and HDMI monitor, movies and images can be captured and saved onto a pre-inserted SD card in the camera.



Frame Rate	30 fps (1920x1080)	30 fps (1440x1024)	66 fps (1920x1080)
Max Recordable Pixels	1920x1080	2880x2048	6000x3984

DS-Fi3

Three main features of the previous models, high-resolution, high sensitivity and low noise, and high-speed live display are offered in 1 camera.

Digital Sight 10

This high-resolution camera captures both color and monochromatic images at up to 6,000 x 3,984 pixels. This enables the wide range of images to be captured and then many of them to be stitched together making a single and large combined image.



Intuitive control of microscope cameras from tablet PCs

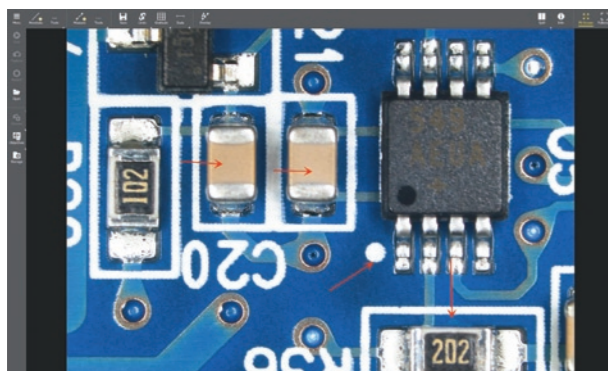
Easily view images and control image acquisition settings for the Digital Sight 1000/ DS-Fi3/Digital Sight 10 camera on a tablet PC using NIS-Elements L.

(Compatible OS: Windows® 10 Pro)

* Nikon provides confirmed compatible tablet PCs with up-to-date specifications. Contact Nikon for details.

User Interface for naturally simple operation

NIS-Elements L displays various menus for image capture, saving, display, measurement and annotations using intuitive icons. It also supports touch screen operation.



Scene mode

Ten camera setting patterns for optimal color reproduction and contrast for each microscope light source, observation method and type of sample, as well as custom settings, can be selected.

Industrial Scene Mode

- Wafer/IC
- Metal
- Circuit board
- Flat Panel Display

A wide variety of tools

NIS-Elements L enables the conducting of simple measurements on images, with input of lines and comments. These can also be written onto and saved with the image, and measurement data can be output.

Measurement function

- Line distance
- Area
- Circle
- Circle distance
- Pitch distance
- Angle

Annotate function

- Line
- Arrow
- Text
- Marker
- Polyline

Graticule/scale function

- Crosshairs
- Simple crosshairs
- Circle
- Grid
- Horizontal scale
- Vertical scale



Integration with Nikon's Software Imaging Platform

Nikon's universal software platform, NIS-Elements combines powerful image acquisition, analysis, visualization and data sharing tools. With fully customizable user interfaces and seamless integration of Nikon microscopes, cameras and a wide variety of peripheral devices, NIS-Elements can serve as a simple interface for photo-documentation or power complex, conditional workflows with automated imaging and analysis routines. The NIS-Elements platform features various packages and software modules to meet the needs of even the most challenging applications.

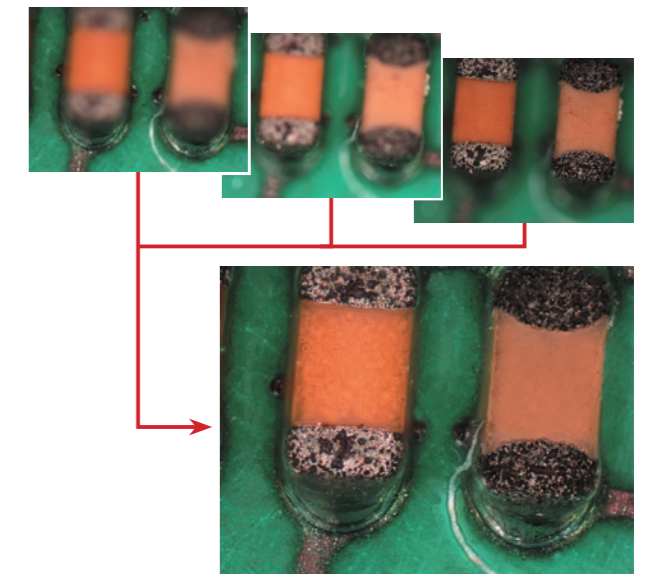
HDR (High Dynamic Range) image acquisition

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.



EDF (Extended Depth of Focus)

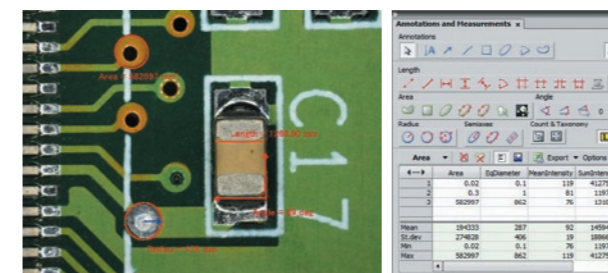
Creates a single, all-in-focus image from images of differing focus. Such images can now be created by simply turning the focus knob.



Selects the in-focus area and produces one all-in-focus image

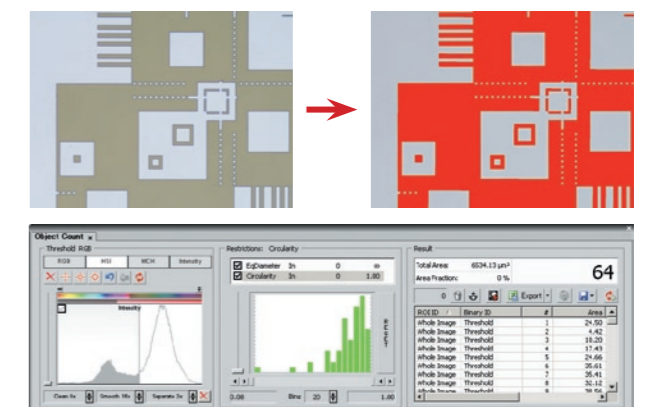
Manual measurement and image annotation

Manual 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.



Auto measurement (Object Counting)

Performs binarization on images using previously set thresholds to measure the number, area, brightness, etc. of identified objects.



Objective Lenses

CFI60-2 / CFI60

Nikon's CFI60-2/CFI60 optical systems are highly evaluated for their unique concept of high NA combined with a long working distance. These lenses have been developed further and evolved achieving the apex in long working distance specifications, correct chromatic aberration, and an optimized lens weight.



NA: Numerical Aperture BF: Brightfield DF: Darkfield POL: Polarizing S-POL: Simple Polarizing DIC: Differential Interference Contrast UV-FL: UV Fluorescence FL: EPI Fluorescence

	Model	Magnification	NA	WD (mm)	BF	DF	POL	S-POL	DIC	UV-FL	FL	
CFI60-2	T Plan EPI Plan (Achromat)	1x	0.03	3.8	✓	—	—	—	—	—	—	
		2.5x	0.075	6.5	✓	—	—	—	—	—	—	
	TU Plan Fluor EPI Universal Plan Fluor (Semi-apochromat)	5x	0.15	23.5	✓	—	—	✓	✓ A	✓	✓	
		10x	0.3	17.5	✓	—	—	✓	✓ A	✓	✓	
		20x	0.45	4.5	✓	—	—	✓	✓ A	✓	✓	
		50x	0.8	1.0	✓	—	—	✓	✓ A	✓	✓	
	TU Plan Apo EPI Universal Plan Apo (Apochromat)	50x	0.8	2.0	✓	—	—	✓	✓ A	—	✓	
		100x	0.9	2.0	✓	—	—	✓	✓ A	—	✓	
		150x	0.9	1.5	✓	—	—	✓	✓ A	—	✓	
		50x	0.15	23.5	✓	—	—	✓	✓ A	✓	✓	
	TU Plan Fluor EPI P Polarizing Universal Plan Fluor (Semi-apochromat)	10x	0.3	17.5	✓	—	—	✓	✓ A	✓	✓	
		20x	0.45	4.5	✓	—	—	✓	✓ A	✓	✓	
		50x	0.8	1.0	✓	—	—	✓	✓ A	✓	✓	
		100x	0.9	1.0	✓	—	—	✓	✓ A	✓	✓	
	TU Plan EPI ELWD Long Working Distance Universal Plan (Semi-apochromat)	20x	0.4	19.0	✓	—	—	✓	✓ B	—	✓	
		50x	0.6	11.0	✓	—	—	✓	✓ B	—	✓	
		100x	0.8	4.5	✓	—	—	✓	✓ B	—	✓	
	T Plan EPI SLWD Super Long Working Distance Plan (Semi-apochromat)	10x	0.2	37.0	✓	—	—	—	—	—	✓	
		20x	0.3	30.0	✓	—	—	—	—	—	✓	
		50x	0.4	22.0	✓	—	—	—	—	—	✓	
TU Plan Fluor BD Universal Plan Fluor (Semi-apochromat)	100x	0.6	10.0	✓	—	—	—	—	—	✓		
	5x	0.15	18.0	✓	✓	—	✓	✓ A	✓	✓		
	10x	0.3	15.0	✓	✓	—	✓	✓ A	✓	✓		
	20x	0.45	4.5	✓	✓	—	✓	✓ A	✓	✓		
TU Plan Apo BD Universal Plan Apo (Apochromat)	50x	0.8	1.0	✓	✓	—	✓	✓ A	—	✓		
	100x	0.9	2.0	✓	✓	—	✓	✓ A	—	✓		
	150x	0.9	1.5	✓	✓	—	✓	✓ A	—	✓		
	20x	0.4	19.0	✓	✓	—	✓	✓ B	—	✓		
TU Plan BD ELWD Long Working Distance Universal plan (Semi-apochromat)	50x	0.6	11.0	✓	✓	—	✓	✓ B	—	✓		
	100x	0.8	4.5	✓	✓	—	✓	✓ B	—	✓		
	100x	0.85	1.3-0.95	✓	—	—	—	—	—	✓		
CFI60	L Plan EPI (Achromat)	40x	0.65	1.0	✓	—	—	—	—	—	✓	
	LU Plan Apo EPI / Universal Plan Apo (Apochromat)	150x	0.95	0.3	✓	—	—	✓	✓ A	—	✓	
	L Plan EPI CR LCD Substrate Inspection Plan (Achromat) *Offers valid while supplies last	20x	0.45	10.9-10.0	✓	—	—	—	—	—	—	✓
		50x	0.7	3.9-3.0	✓	—	—	—	—	—	—	✓
		100x	0.85	1.2-0.85	✓	—	—	—	—	—	—	✓
		100x	0.85	1.3-0.95	✓	—	—	—	—	—	—	✓
	LE Plan EPI (Achromat)	5x	0.1	31	✓	—	—	—	—	—	—	✓
		10x	0.25	13	✓	—	—	—	—	—	—	✓
		20x	0.4	3.6	✓	—	—	—	—	—	—	✓
		50x	0.75	0.5	✓	—	—	—	—	—	—	✓
100x		0.9	0.31	✓	—	—	—	—	—	—	✓	

✓ : Available / — : Not available *A: Set prism position at A / B: Set prism position at B

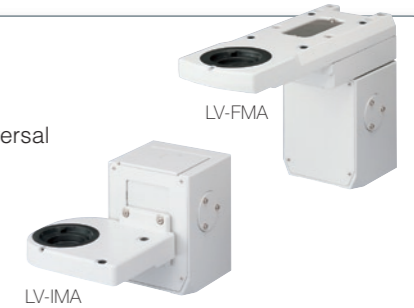
For Incorporation into Microscopes

Modular Focusing Units

IM-4, LV-IM/LV-IMA, LV-FM/LV-FMA

Suitable for incorporating into systems, these focusing units enable the mounting of a universal illuminator and a motorized nosepiece.

	IM-4	LV-IM/LV-IMA	LV-FM/LV-FMA
Type	Manual	Manual / Motorized	Manual / Motorized
Vertical stroke	30 mm	30/20 mm	30/20 mm



Compact Reflected Microscopes

CM Series

Ultra-compact reflected microscopes designed for integration into production lines to observe on monitors.



	CM-10A/CM-10L	CM-20A/CM-20L	CM-30A2/CM-30L2	CM-70L	CM-5A
Camera mount	C-mount				
Tube lens magnification	1x	0.5x	1x	0.4x/1x	—
Tube lens focal distance	200 mm	100 mm	200 mm	80/200 mm	—
Magnification on CCD surface	Same as objective magnification	Same as objective magnification ×0.5	Same as objective magnification	Same as objective magnification ×0.4 and Same as objective magnification	—
Compatible objectives	A series: CF IC EPI Plan objectives L series: CFI60-2 / CFI60 EPI Plan objectives				Objectives for Nikon MM series
Illumination optical system	Koehler illumination (high-quality telecentric illumination)				
Attached surfaces	3		4	3	
Dimensions (W×D×H)	40×40×224.5 mm	40×40×125.5 mm	40×40×107.3 mm	40×117×156.1 mm	40×40×186.5 mm
Weight (approx)	440 g	290 g	400 g	690 g	410 g

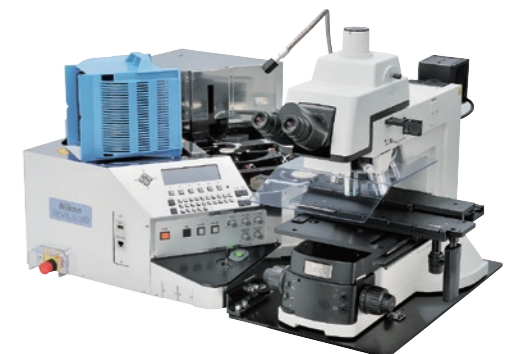
Wafer Loaders

Nikon's proprietary technology ensures reliable loading of ultra-thin 100 μm wafers. The NWL 200 series achieve highly reliable loading, suitable for inspection of next-generation semiconductors.

Wafer	Diameter	ø200 mm / ø150 mm
	Minimum thickness (standard)	300 μm
	Minimum thickness (option)	100 μm
Surface, back side macro inspection		✓

*Optional special wafer loader is also available. Please ask Nikon for detail.

NWL200 Series



Wide variety of stage strokes and magnifications are available for various customer requirements.

Simultaneous wide-area height measurements with confocal optics and 2D measurement with 15x brightfield zoom optics.

Main Body (Type / Stage Stroke)

Wide FOV Model

VMA

Model VMA-2520
VMA-4540
VMA-6555

Applications Electronic parts, resin molding parts, various mold parts, press parts, die cast parts, etc.



iNEXIV VMA-4540

Standard Model

VMZ-S

Model VMZ-S3020/VMZ-S4540/VMZ-S6555

Applications Semiconductor packages, high density PCB's, lead frames, MEMS, connectors, precision mechanical parts, etc.



NEXIV VMZ-S3020 NEXIV VMZ-S4540

High-precision Model

VMZ-H

Model VMZ-H3030

Applications Micro boards (line width, height), next-generation semiconductor packages (WLP, bump height), precision molds, rewiring masks, MEMS masks, etc.




NEXIV VMZ-H3030

Model	Wide FOV			Standard			High-precision
XY Stroke	250x200 mm	450x400 mm	650x550 mm	300x200 mm	450x400 mm	650x550 mm	300x300 mm
Wide FOV Head	✓	✓	✓	✓	✓	✓	✓
Standard Head				✓	✓	✓	✓
High-Magnification Head				✓	✓	✓	✓
Z-axis Stroke	200 mm	200 mm	200 mm	200 mm	200 mm	200 mm	150 mm
Max. guaranteed loading capacity	15 kg	20 kg	30 kg	20 kg	40 kg	50 kg	30 kg
Maximum permissible error (E _{UX} , MPE E _{UY} , MPE)	2+8L/1000 μm	2+6L/1000 μm		1.2+4L/1000 μm			0.6+2L/1000 μm
Maximum permissible error (E _{UZ} , MPE)	3+L/50 μm	3+L/100 μm		1.2+5L/1000 μm			0.9+L/150 μm


L = Length in mm

Main Body (Type / Stage Stroke)

VMZ-K3040



VMZ-K6555



XY Stroke	300x400 mm	650x550 mm
Magnification (Type S)	1.5x / 3x / 7.5x	1.5x / 3x / 7.5x
Magnification (Type H)	15x / 30x	15x / 30x
Z-axis Stroke	150 mm	150 mm
Max. guaranteed loading capacity	20 kg	30 kg
Maximum permissible error (E _{UX} , MPE E _{UY} , MPE)	1.5+4L/1000 μm	1.5+2.5L/1000 μm
Maximum permissible error (E _{UZ} , MPE)	1+L/1000 μm	1+L/1000 μm

Applications Micro wiring patterns (top and bottom), bonding wires, probe cards, WLP, PLP, etc.

Zoom Heads


FOV	W (mm) x D (mm)	8	4	2.0	1.6	1.26	1.00	0.8	0.63	0.53	0.4	0.27	0.20	0.11	0.100	0.05	0.04	WD
Type S	1.5x	8	4	2.0	1.6	1.26	1.00	0.8	0.63	0.53	0.4	0.27	0.20	0.11	0.100	0.05	0.04	24 mm
	3x	6	3	1.5	1.2	0.95	0.75	0.6	0.47	0.40	0.3	0.20	0.15	0.08	0.074	0.04	0.04	24 mm
	7.5x																	5 mm
Type H	15x																	20 mm
	30x																	5 mm

● Brightfield ● Confocal/Brightfield

Zoom Heads


Type A

Wide FOV and long working distance enables comfortable operation. Laser AF and Touch Probe can be attached as optional accessories.
*Touch Probe is an option only for VMA series.



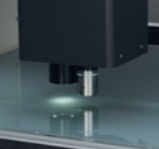
Type 1-4

Equipped with top, bottom, and oblique ring lights with adjustable angles. TTL (Through the Lens) Laser AF is a standard tool that can scan surfaces at 1000 points/second.



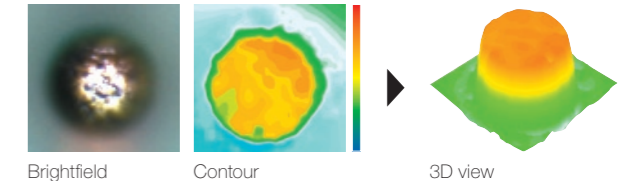
Type TZ

Equipped with 1-120x ultra high zoom ratio with 8 steps. Suitable for measurements of small targets up to several micrometers.



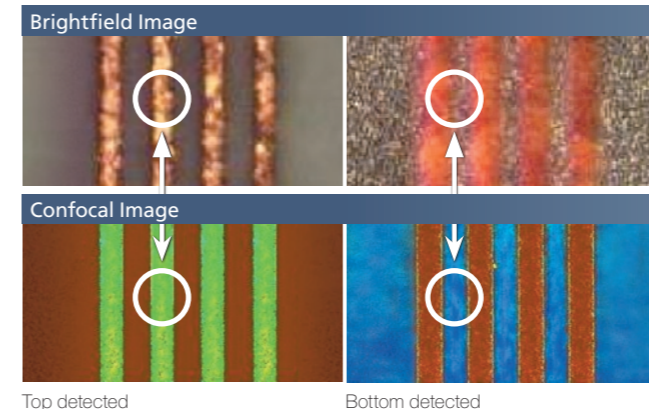
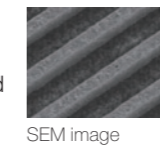
FOV	W(mm) x D(mm)	13.3	9.33	7.8	4.7	2.6	2.33	1.33	1.165	0.622	0.582	0.311	0.291	0.155	0.146	0.070	0.073	0.039	WD
Wide FOV Head	Type A	13.3	9.33	7.8	4.7	2.6	2.33	1.33	1.165	0.622	0.582	0.311	0.291	0.155	0.146	0.070	0.073	0.039	73.5 mm
Standard Head	Type 1																		50 mm
	Type 2																		50 mm
	Type 3																		50 mm
High-Magnification Head	Type 4																		30 mm
	Type TZ																		9.8 mm

Confocal NEXIV incorporates confocal optics for fast and accurate evaluation of fine three-dimensional geometries. Confocal Optics are designed for wide FOV height measurement.



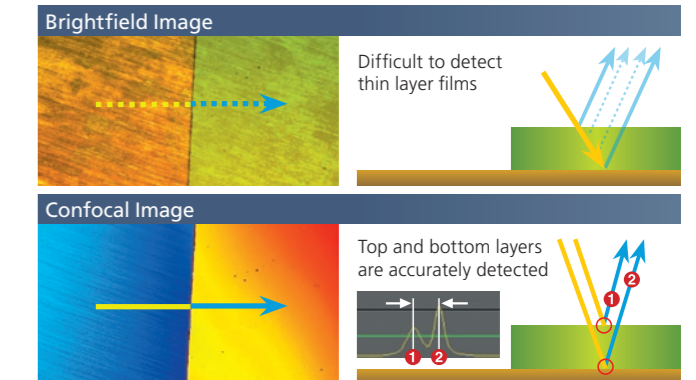
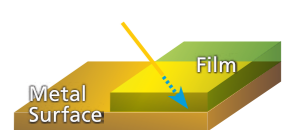
High Contrast and Multileveled Sample (PCBs)

Brightfield observation can sometimes be difficult due to blurred lines along sample structure. These lines can be clearly observed and measured using Confocal optics.



Thin Transparent Samples (Metal Surface Film / Semiconductor Resist)

Top layers of both thin transparent film and metal surface can be easily detected using Confocal optics.



Measuring Microscopes

Focused on high-precision and easy operability, a wide range of MM-products are available.

Basic Model MM-400N



Large-Stage Model MM-800N



Stage Size/ Loading Capacity	50x50 mm / 5 kg	✓	✓
	100x100 mm / 15 kg	✓	✓
	150x100 mm / 15 kg	✓	✓
	200x150 mm / 20 kg	—	✓
	250x150 mm / 20 kg	—	✓
	300x200 mm / 20 kg	—	✓
Max. Sample Height		150 mm	200 mm
Optical Head	Monocular	✓	—
	Binocular	✓	✓
X-Y-Z	2-axis	✓	✓
	3-axis	✓	✓
CCD		✓	✓
Obj. Magnification		1x/3x/5x/10x/20x/50x/100x	

✓ : Available / — : Not available

MM Type

With Nikon's optical technology and highly precise stages, high-precision measurement can be achieved.



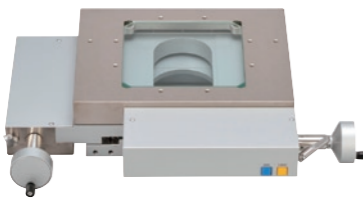
Universal Type

Offers a line-up compatible with dimensional measurement and various observation methods.



High-Precision Stages

The coarse/fine changeover lever and the RESET and SEND buttons are located near the X- and Y-axis knobs.



X-axis Knob

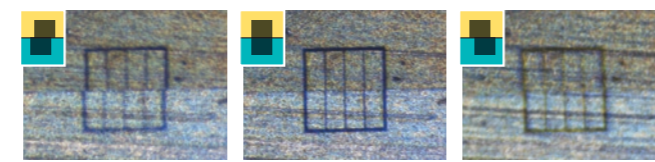
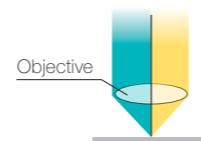


Y-axis Knob

Focusing Aid (FA)

The Split-Prism FA delivers sharp patterns to allow accurate focusing during Z-axis measurements.

FA patterns are clearly visible because they are split vertically.



Front Focus

Focused

Rear Focus



Profile Projectors

Nikon's profile projectors apply the principles of optics to the inspection of manufactured parts by projecting magnified silhouettes on a screen.

Desktop Model V-12B



Large-Screen Model V-20B



Stage Size/ Loading Capacity	50x50 mm / 5 kg	✓	✓
	100x100 mm / 15 kg	✓	✓
	150x100 mm / 15 kg	✓	✓
	200x150 mm / 20 kg	✓	✓
	250x150 mm / 20 kg	✓	✓
Max. Sample Height		100 mm*2	150 mm
Screen		305 mm	500 mm
Image		Erect	Inverted
Projection Lens	Magnification	5x/10x/20x/25x/50x/100x/200x	5x/10x/20x/50x/100x
	FOV (with 10x lens)*1	30.5 mm	50 mm
Digital Protractor		✓	✓
Digital Counter		✓	✓

*1: Actual FOV = Effective diameter of screen / Lens magnification

*2: Maximum sample height is 70 mm when 200x150 mm stage is installed.

✓ : Available / — : Not available

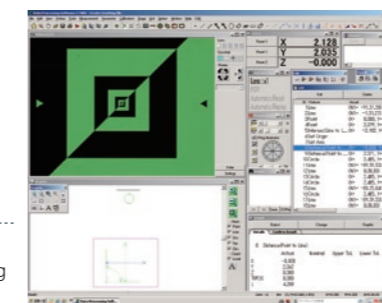
Data Processing Systems for Measuring Microscopes and Profile Projectors

Data Processing Software

E-MAX



Provides the user with various advanced measurements and processing functions. Automated edge detection with sub-pixel processing enables more precise and repeatable measurements.



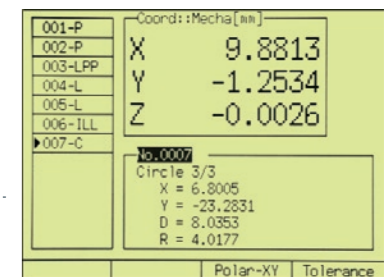
Connected with profile projector, data processing functions only

Data Processor

DP-E1A



Effectively used with a measuring microscope / profile projector, it quickly calculates and processes measurement data. Feature Oriented Operation of the DP-E1A allows the user to conduct measurements with the graphics, providing a seamless measuring environment.



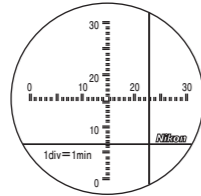
Connected with profile projector, retrofit counter and DP units are required.

Autocollimators

Autocollimator is an easy-to-use but precise metrology instrument for angularity, parallelism, perpendicularity, straightness of precision components machine guide-way and many other applications.

Brightfield Type

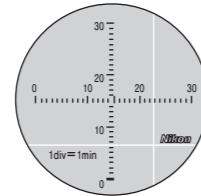
6B-LED



Utilizes hallmark Nikon optics to illuminate surface details.

Darkfield Type

6D-LED



Optimal for measuring small, flat mirrors.



Observation method	6B-LED: Brightfield, 6D-LED: Darkfield
Readout system	Adjustment in viewfield and reading on micrometer
Measuring range	30 minutes of arc (both vertical and horizontal axes)
Minimum range	0.5 seconds of arc

Plane Mirror C

Both sides are perfectly parallel, permitting its use as a reference for non-reflective surface. Also useful for measuring extremely small angles where a smaller mirror is desirable.



*Wooden case provided.

Outer diameter	30 mm
Thickness	12 mm
Parallelism	2 seconds of arc

LED Illuminator AC-L1

LED illumination unit for retrofitting onto Autocollimator 6B/6D illumination unit.



Power source	AA batteries×2, AC adaptor
--------------	----------------------------

DIGIMICRO

With built-in photoelectric digital length measuring systems, DIGIMICRO offers flawless contact measurements of dimension, thickness, and depth.



Main unit	MF-1001	MF-501	MH-15M
Measuring range	0–100 mm	0–50 mm	0–15 mm
Accuracy (20°C)	3 μm	1 μm	0.7 μm
Measuring force	Downward direction 1.225 to 1.813N (variable to about 0.441N), lateral 0.637 to 1.225N	Downward direction 1.127 to 1.617N (variable to about 0.294N), lateral 0.637 to 1.225N	Upward direction 0.245N, downward 0.637N, lateral 0.441N *With lifting release
Operating temperature	0 to 40°C		

Optical Flat / Optical Parallel / Standard 300 mm Scale

Optical Flat

The optical flat is used to check the flatness level of a surface provided with mirror-smooth finish. Flatness level can be measured by observing interference fringes by placing the optical flat in contact with the sample.



Diameter	Glass (ø60 mm)	Glass (ø130 mm)
Thickness	15 mm	27 mm
Flatness	0.1 μm	0.1 μm

Optical Parallel

Both planes of the optical parallel have been precisely finished flat and parallel. It is used to check the flatness and parallel levels of a sample by observing interference fringes by placing the optical parallel in contact with the sample.



Diameter	30 mm
Thickness	12 mm / 12.12 mm / 12.25 mm / 12.37 mm
Flatness	within 0.1 μm
Parallelism	within 0.2 μm

*Optical flats and parallels with greater precision are available by custom orders.

Standard 300mm Scale

Gauges stage travel accuracy up to 300 mm. Both 10 mm-interval sensor patterns and calibrations are provided. Made of the glass with low coefficient of thermal expansion, for minimizing thermal influence.

*Within 1 μm against compensation values.



Specifications and equipment are subject to change without any notice or obligation on the part of the manufacturer. January 2024 ©2014-2024 NIKON CORPORATION

Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and other countries. Company and product names listed in this brochure are trademarks or registered trademarks of each company.

N.B. Export of the products* in this brochure is controlled under the Japanese Foreign Exchange and Foreign Trade Law. Appropriate export procedures shall be required in case of export from Japan.

*Products: Hardware and its technical information (including software)



WARNING

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



NIKON CORPORATION

1-5-20, Nishiori, Shinagawa-ku, Tokyo 140-8601, Japan
phone: +81-3-6743-5742 fax: +81-3-6410-7252
<https://industry.nikon.com/>

ISO 14001 Certified
for NIKON CORPORATION

ISO 9001 Certified
for NIKON CORPORATION
Industrial Metrology Business Unit

NIKON METROLOGY EUROPE NV

Interleuvenlaan 86 B-3001 Leuven, Belgium
phone: +32-16-74-01-00 fax: +32-16-74-01-03
E-mail: Sales.Europe.NM@nikon.com
<https://industry.nikon.com/en-gb/>

NIKON METROLOGY UK LTD.

UNITED KINGDOM phone: +44-1332-811-349 fax: +44-1332-639-881
E-mail: Sales.UK.NM@nikon.com

NIKON METROLOGY SARL

FRANCE phone: +33-1-60-86-09-76 fax: +33-1-60-86-57-35
E-mail: Sales.France.NM@nikon.com

NIKON METROLOGY GMBH

GERMANY phone: +49-211-45-44-69-51
E-mail: Sales.Germany.NM@nikon.com

NIKON INSTRUMENTS S.p.A.

ITALY phone: +39-055-300-96-01 fax: +39-055-30-09-93

NIKON METROLOGY, INC.

12701 Grand River Road, Brighton, MI 48116 U.S.A.
phone: +1-810-220-4360 fax: +1-810-220-4300
E-mail: Sales.NM-US@nikon.com
<https://industry.nikon.com/en-us/>

NIKON METROLOGY - MÉXICO

E-mail: Sales.NM-MX@nikon.com

NIKON PRECISION (SHANGHAI) CO., LTD.

CHINA (Shanghai branch) phone: +86-21-6841-2050 fax: +86-21-6841-2060
(Beijing branch) phone: +86-10-5831-2028 fax: +86-10-5831-2026
(Guangzhou branch) phone: +86-20-3882-0551 fax: +86-20-3882-0580

NIKON INSTRUMENTS KOREA CO., LTD.

KOREA phone: +82-2-6288-1900 fax: +82-2-555-4415

NIKON SINGAPORE PTE. LTD.

SINGAPORE phone: +65-6559-3651 fax: +65-6559-3668

E-mail: NSG.Industrial-sales@nikon.com

PT. NIKON INDONESIA

INDONESIA phone: +62-213-873-5005 fax: +62-213-873-5006

E-mail: PTN.Instruments@nikon.com

NIKON SALES (THAILAND) CO., LTD.

THAILAND phone: +66-2633-5100 fax: 66-2633-5191