



# Industrial Instruments General Brochure

INDUSTRIAL INSTRUMENTS

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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	0.63–15.75×	0.75–13.5×	0.63–8×	1–8×
Total Magnification*1 (Standard combination*2)	3.15–945×	3.75–810×	3.15–480×	5–480×
	(6.3–157.5×	(7.5–135×	(6.3–80×	(10–80×
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
Zoom Range	0.67–5×	0.8–3.5×	0.7–3×
Total Magnification*1 (Standard combination*2)	3.35–300×	4–70×	3.5–60×
	(6.7–50×	(8–35×	(7–30×
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 10× and Objective lens 10×. \*3: Objective lens 1× 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



LV100ND

Model offers various observation methods with reflected/transmitted illumination.

LV150N  
LV150NA



LV150N

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								
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.							

Observation Method		BF	DF	DIC	FL	POL	2-Beam
	EPI	✓	✓	✓	✓	✓	✓
	EPI (LED)	✓	✓	✓	—	△	—
	DIA	✓	✓	✓	—	—	—
✓ : Available / — : Not available / △ : Simple polarizing observation							
Illuminator	• Episcopic						
Stage	• 3×2 Stage (stroke 75×50 mm) • 6×6 Stage (stroke 150×150 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.					
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.					

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 / Diascopic					
Stage	• MA2-SR Mechanical Stage (stroke 50×50 mm)					

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

Upright Microscopes (Large-sized stage model)

L200N  
L200ND



L200ND

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

L300N  
L300ND



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					
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		
Illuminator	• Episcopic/ Diascopic		
Stage	• High precision rotating stage for polarizing observation		

Observation Method		BF	POL
	EPI	✓	✓
	DIA	✓	✓
	✓ : Available / — : Not available		
Illuminator	• Episcopic/ Diascopic		
Stage	• Rotating stage with stage clamp		

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.



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.



Frame Rate	30 fps (1920×1080)	30 fps (1440×1024)	66 fps (1920×1080)
Max Recordable Pixels	1920×1080	2880×2048	6000×3984

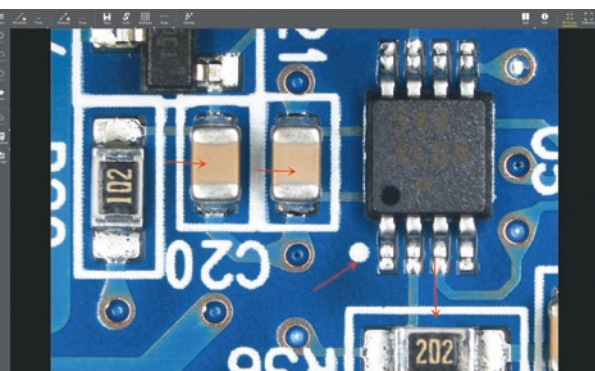


Intuitive control of microscope cameras from tablet PCs

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.



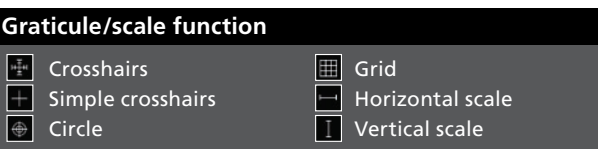
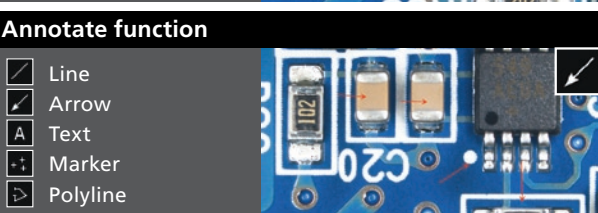
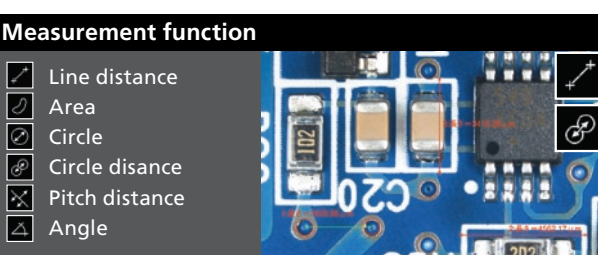
Scene mode

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.

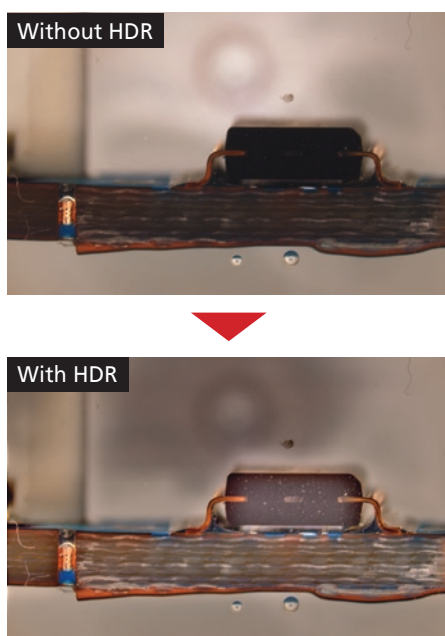


Integration with Nikon's Software Imaging Platform

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.

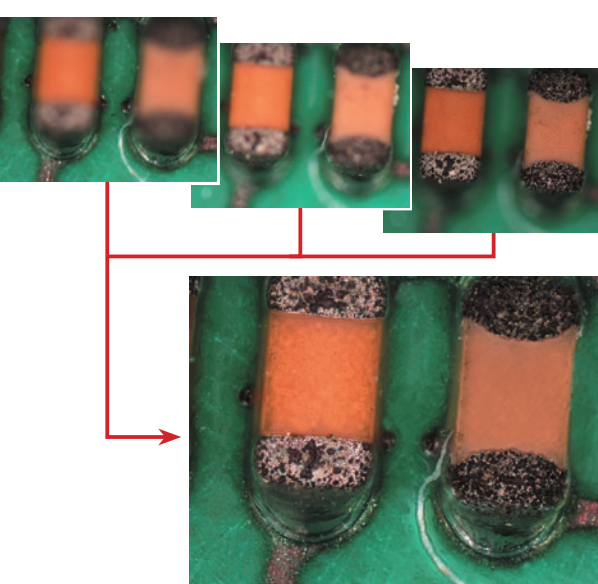
HDR (High Dynamic Range) image acquisition

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)

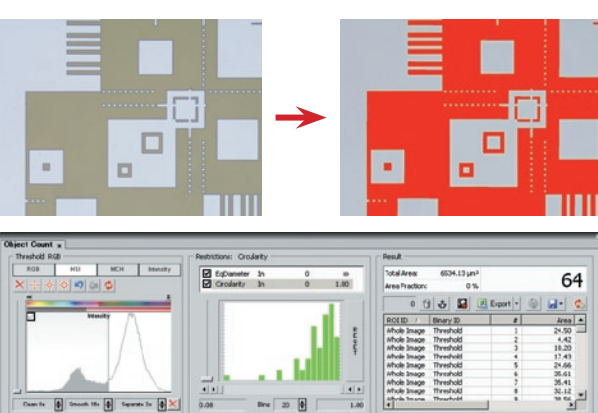
Creates a single, all-in-focus image from images of differing focus. Such images can now be created by simply turning the focus knob.



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

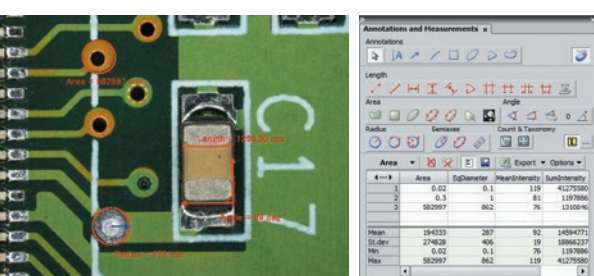
Auto measurement (Object Counting)

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



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.



Objective Lenses

Nikon's CFI<sub>60</sub>-2/CFI<sub>60</sub> 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
CFI <sub>60</sub> -2	T Plan EPI Plan (Semi-apochromat)	1×	0.03	3.8	✓	—	—	—	—	—	—
		2.5×	0.075	6.5	✓	—	—	—	—	—	—
	TU Plan Fluor EPI Universal Plan Fluor (Semi-apochromat)	5×	0.15	23.5	✓	—	—	✓	✓ A	✓	✓
		10×	0.3	17.5	✓	—	—	✓	✓ A	✓	✓
		20×	0.45	4.5	✓	—	—	✓	✓ A	✓	✓
		50×	0.8	1.0	✓	—	—	✓	✓ A	✓	✓
		100×	0.9	1.0	✓	—	—	✓	✓ A	✓	✓
	TU Plan Apo EPI Universal Plan Apo (Apochromat)	50×	0.8	2.0	✓	—	—	✓	✓ A	—	✓
		100×	0.9	2.0	✓	—	—	✓	✓ A	—	✓
		150×	0.9	1.5	✓	—	—	✓	✓ A	—	✓
	TU Plan Fluor EPI P Polarizing Universal Plan Fluor (Semi-apochromat)	5×	0.15	23.5	✓	—	✓	✓	✓ A	✓	✓
		10×	0.3	17.5	✓	—	✓	✓	✓ A	✓	✓
		20×	0.45	4.5	✓	—	✓	✓	✓ A	✓	✓
		50×	0.8	1.0	✓	—	✓	✓	✓ A	✓	✓
		100×	0.9	1.0	✓	—	✓	✓	✓ A	✓	✓
	TU Plan EPI ELWD Long Working Distance Universal Plan (Semi-apochromat)	20×	0.4	19.0	✓	—	—	✓	✓ B	—	✓
		50×	0.6	11.0	✓	—	—	✓	✓ B	—	✓
		100×	0.8	4.5	✓	—	—	✓	✓ B	—	✓
	T Plan EPI SLWD Super Long Working Distance Plan (Semi-apochromat)	10×	0.2	37.0	✓	—	—	—	—	—	✓
		20×	0.3	30.0	✓	—	—	—	—	—	✓
		50×	0.4	22.0	✓	—	—	—	—	—	✓
		100×	0.6	10.0	✓	—	—	—	—	—	✓
	TU Plan Fluor BD Universal Plan Fluor (Semi-apochromat)	5×	0.15	18.0	✓	✓	—	✓	✓ A	✓	✓
		10×	0.3	15.0	✓	✓	—	✓	✓ A	✓	✓
		20×	0.45	4.5	✓	✓	—	✓	✓ A	✓	✓
		50×	0.8	1.0	✓	✓	—	✓	✓ A	✓	✓
		100×	0.9	1.0	✓	✓	—	✓	✓ A	✓	✓
	TU Plan Apo BD Universal Plan Apo (Apochromat)	50×	0.8	2.0	✓	✓	—	✓	✓ A	—	✓
		100×	0.9	2.0	✓	✓	—	✓	✓ A	—	✓
		150×	0.9	1.5	✓	✓	—	✓	✓ A	—	✓
	TU Plan BD ELWD Long Working Distance Universal plan (Semi-apochromat)	20×	0.4	19.0	✓	✓	—	✓	✓ B	—	✓
		50×	0.6	11.0	✓	✓	—	✓	✓ B	—	✓
		100×	0.8	4.5	✓	✓	—	✓	✓ B	—	✓
CFI <sub>60</sub>	L Plan EPI (Achromat)	40×	0.65	1.0	✓	—	—	—	—	—	✓
	LU Plan Apo EPI / Universal Plan Apo (Apochromat)	150×	0.95	0.3	✓	—	—	✓	✓ A	—	✓
	L Plan EPI CR LCD Substrate Inspection Plan (Achromat) *Offers valid while supplies last	20×	0.45	10.9–10.0	✓	—	—	—	—	—	✓
		50×	0.7	3.9–3.0	✓	—	—	—	—	—	✓
		100×	0.85	1.2–0.85	✓	—	—	—	—	—	✓
		100×	0.85	1.3–0.95	✓	—	—	—	—	—	✓
	LE Plan EPI (Achromat)	5×	0.1	31	✓	—	—	—	—	—	✓
		10×	0.25	13	✓	—	—	—	—	—	✓
		20×	0.4	3.6	✓	—	—	—	—	—	✓
		50×	0.75	0.5	✓	—	—	—	—	—	✓
		100×	0.9	0.31	✓	—	—	—	—	—	✓

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

CFI<sub>60</sub>-2 / CFI<sub>60</sub>



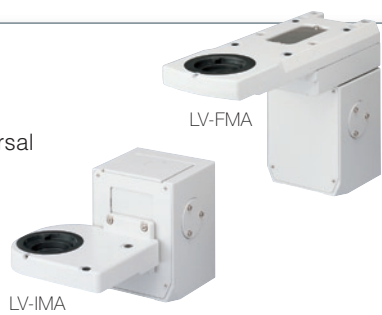
For Incorporation into Microscopes

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	1×	0.5×	1×	0.4×/1×	—
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: CFI <sub>60</sub> -2 / CFI <sub>60</sub> 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

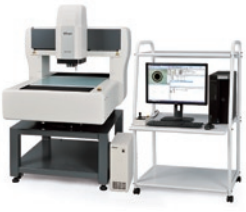




Wide variety of stage strokes and magnifications are available for various customer requirements.


**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 (Eux, MPE Euy, MPE)	2+8L/1000 µm	2+6L/1000 µm		1.2+4L/1000 µm			0.6+2L/1000 µm
Maximum permissible error (Euz, MPE)	3+L/50 µm	3+L/100 µm		1.2+5L/1000 µm			0.9+L/150 µm


L = Length in mm

**Zoom Heads**

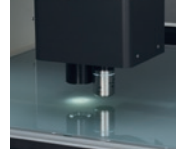
**Type A**  
Wide FOV and long working distance enables comfortable operation. Laser AF and Touch Probe can be attached as optional accessories.  
\*Touch Probe is an option only for VMA series.



**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)×D(mm)	13.3 10.0	9.33 7.01	7.8 5.8	4.7 3.5	2.6 1.9	2.33 1.75	1.33 1.00	1.165 0.875	0.622 0.467	0.582 0.437	0.311 0.233	0.291 0.218	0.155 0.117	0.146 0.109	0.070 0.068	0.073 0.055	0.039 0.029	WD
Wide FOV Head	Type A	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	73.5 mm
Standard Head	Type 1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	50 mm
	Type 2		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
	Type 3			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	
High-Magnification Head	Type 4				●	●	●	●	●	●	●	●	●	●	●	●	●	●	30 mm
	Type TZ					●	●	●	●	●	●	●	●	●	●	●	●	●	


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

**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 (Eux, MPE Euy, MPE)	1.5+4L/1000 µm	1.5+2.5L/1000 µm
Maximum permissible error (Euz, MPE)	1+L/1000 µm	1+L/1000 µm

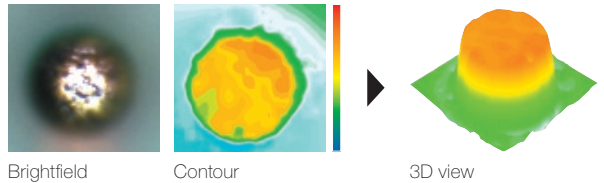
Applications Micro wiring patterns (top and bottom), bonding wires, probe cards, WLP, PLP, etc.

**Zoom Heads**

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


● Brightfield ● Confocal/Brightfield

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



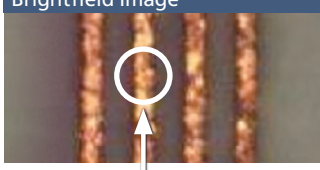
**High Contrast and Multileveled Sample (PCBs)**

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

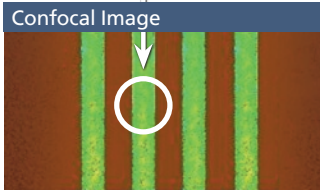


SEM image

**Brightfield Image**



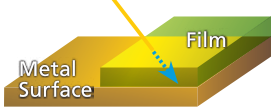
**Confocal Image**



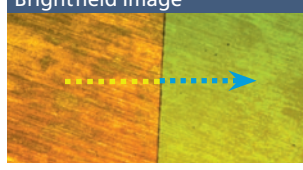
Top detected Bottom detected

**Thin Transparent Samples (Metal Surface Film / Semiconductor Resist)**

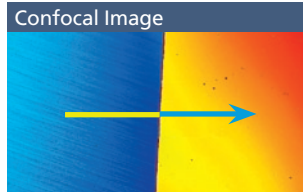
Top layers of both thin transparent film and metal surface can be easily detected using Confocal optics.



**Brightfield Image**



**Confocal Image**






Top and bottom layers are accurately detected

Measuring Microscopes

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

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

Compact Model		Basic Model		Large-Stage Model	
MM-200		MM-400N		MM-800N	
					
Stage Size/ Loading Capacity	50×50 mm / 5 kg	✓	✓	✓	✓
	100×100 mm / 15 kg	—	✓	✓	✓
	150×100 mm / 15 kg	—	✓	✓	✓
	200×150 mm / 20 kg	—	—	✓	✓
	250×150 mm / 20 kg	—	—	✓	✓
	300×200 mm / 20 kg	—	—	✓	✓
Max. Sample Height		110 mm	150 mm	200 mm	
Optical Head	Monocular	✓	✓	—	
	Binocular	—	✓	✓	
X-Y-Z	2-axis	✓	✓	✓	
	3-axis	—	✓	✓	
CCD		✓*	✓	✓	
Obj. Magnification		1×/3×/5×/10×	1×/3×/5×/10×/20×/50×/100×		

\*For simple video head only

✓ : 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

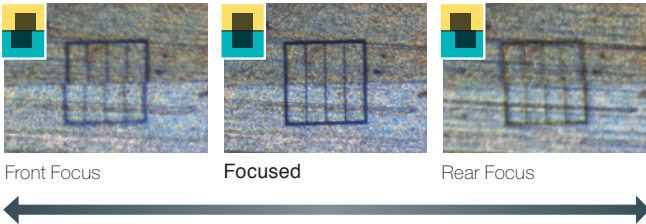
The coarse/fine changeover lever and the RESET and SEND buttons are located near the X- and Y-axis knobs.



X-axis Knob

Y-axis Knob

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.



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		Large-Screen Model	
V-12B		V-20B	
Stage Size/ Loading Capacity	50×50 mm / 5 kg	✓	✓
	100×100 mm / 15 kg	✓	✓
	150×100 mm / 15 kg	✓	✓
	200×150 mm / 20 kg	✓	✓
	250×150 mm / 20 kg	✓	✓
Max. Sample Height		100 mm*2	150 mm
Screen		305 mm	500 mm
Image		Erect	Inverted
Projection Lens	Magnification	5×/10×/20×/25×/50×/100×/200×	5×/10×/20×/50×/100×
	FOV (with 10× 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 200×150 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.



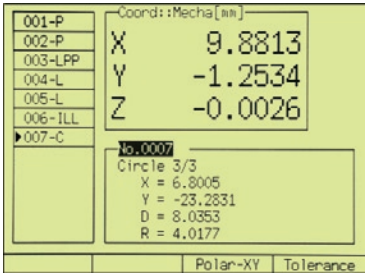
Connected with profile projector, data processing functions only

**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.

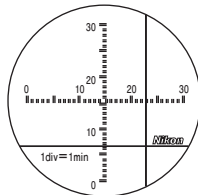


Autocollimators

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

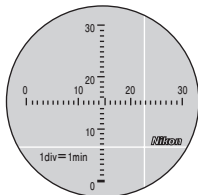
6B-LED



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
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DIGIMICRO

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

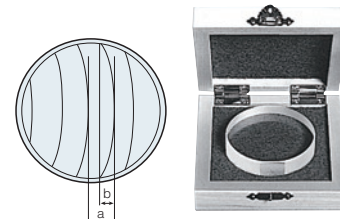


Main unit	MF-1001	MF-501	MH-15M
Measuring range	0–100 mm	0–50 mm	0–15 mm
Accuracy (20°C)	3 μm	1 μm	0.7 μm
Measuring force	Downward direction 1.225 to 1.813N (variable to about 0.441N), lateral 0.637 to 1.225N	Downward direction 1.127 to 1.617N (variable to about 0.294N), lateral 0.637 to 1.225N	Upward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





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



**WARNING**

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



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