INDUSTRIAL INSTRUMENTS

Industrial Instruments General Brochure

INDEX

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

	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× (6.3–157.5×)	3.75–810× (7.5–135×)	3.15–480× (6.3–80×)	5–480× (10–80×)
WD *3	60 mm	60 mm	70 mm	78 mm
Camera	✓	✓	✓	✓

✓ : Available / — : Not available

Greenough Type

SMZ745
SMZ745T

SMZ445
SMZ460

SMZ-2

	SMZ745 SMZ745T	SMZ445	SMZ460	SMZ-2
Zoom Ratio	7.5 : 1	4.4 : 1	4.3 : 1	5 : 1
Zoom Range	0.67–5×	0.8 –3.5×	0.7 –3×	0.8–4×
Total Magnification*1 (Standard combination*2)	3.35–300× (6.7–50×)	4–70× (8–35×)	3.5–60× (7–30×)	4–120× (8–40×)
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.

Please refer to individual product brochures for further details.

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 LED
LV100NDA LED

Model offers various observation methods with reflected/transmitted illumination.

LV100ND LED

LV150N
LV150NA

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

LV150N

		BF	DF	DIC	FL	POL	2-Beam	Ph-C
Observation Method	EPI	✓	✓	✓	✓	✓	✓	—
	DIA	✓	✓	✓	—	✓	—	✓
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.							

✓: Available / —: Not available

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

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

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

Upright Microscopes (Large-sized stage model)

L200N
L200ND

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

L200ND

L300N
L300ND

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

L300ND

		BF	DF	DIC	S-POL	FL
Observation Method	EPI	✓	✓	✓	✓	✓*
	DIA	✓*	—	—	—	—
Illuminator	• L200N : Episcopic • L200ND : Episcopic / Diascopic					
Stage	• 8×8 Stage (stroke: 200×200 mm)					

*L200ND only

✓: Available / —: Not available

		BF	DF	DIC	S-POL	FL
Observation Method	EPI	✓	✓	✓	✓	✓
	DIA	✓*	—	—	✓	—
Illuminator	• L300N : Episcopic • L300ND : Episcopic / Diascopic					
Stage	• 14×12 Stage (stroke: 350×300 mm)					

*L300ND only

✓: Available / —: Not available

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

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.

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

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

		BF	DF	S-POL	DIC	FL
Observation Method	EPI	✓	✓	✓	✓	—
Illuminator	• Episcopic / Diascopic					
Stage	• MA2-SR Mechanical Stage (stroke 50×50 mm)					

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

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

Polarizing Microscopes

LV100NPOL LED

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.

		BF	POL
Observation Method	EPI	✓	✓
	DIA	✓	✓
Illuminator	• Episcopic/ Diascopic		
Stage	• High precision rotating stage for polarizing observation		

✓: Available / —: Not available

		BF	POL
Observation Method	EPI	✓	✓
	DIA	✓	✓
Illuminator	• Episcopic/ Diascopic		
Stage	• Rotating stage with stage clamp		

✓: Available / —: Not available

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.

2.0 megapixel | Color | Full HD

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.

5.9 megapixel | Color | High-resolution

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.

23.9 megapixel | Color/Mono-chrome | High-resolution

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

Imaging software NIS-Elements Advanced Solutions for your Imaging World

for a tablet PC **L**

Intuitive control of microscope cameras from tablet PCs

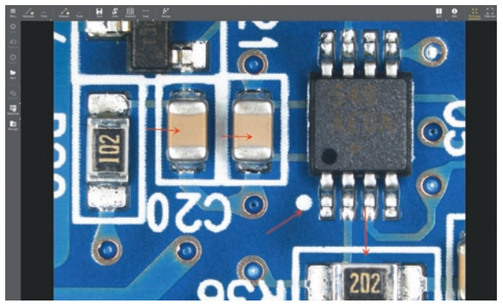
Easily view images and control image acquisition settings for the Digital Sight 1000/ DS-Fi3/Digital Sight 10 camera on a tablet PC using NIS-Elements L.

(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

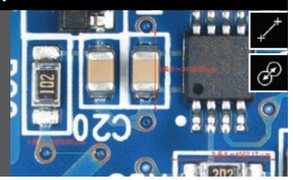
- Wafer/IC
- Circuit board
- Metal
- Flat Panel Display

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.

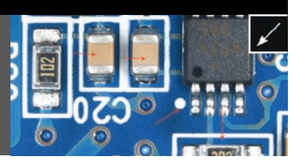
Measurement function

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



Annotate function

- Line
- Arrow
- Text
- Marker
- Polyline



Graticule/scale function

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

Imaging software NIS-Elements Advanced Solutions for your Imaging World

for a desktop PC **F** **D** **Br** **Ar**

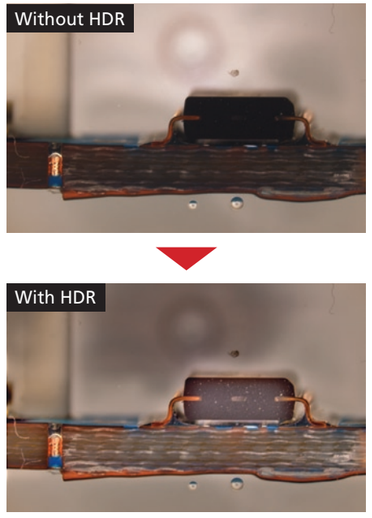
Integration with Nikon's Software Imaging Platform

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

Ar | Option Br D

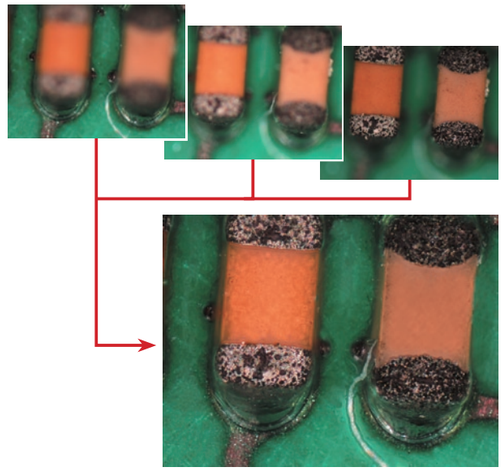
HDR creates an image with appropriate brightness in both the dark and bright regions in a sample by combining multiple images acquired with different exposure settings. It is also possible to create HDR image using multiple captured images.



EDF (Extended Depth of Focus)

Option Ar Br D

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

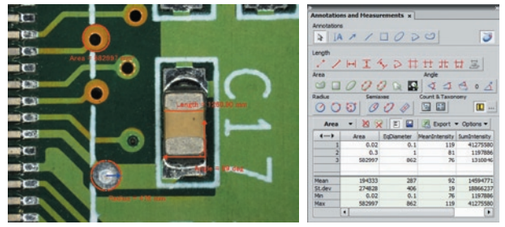


Selects the in-focus area and produces one all-in-focus image

Manual measurement and image annotation

Ar Br D

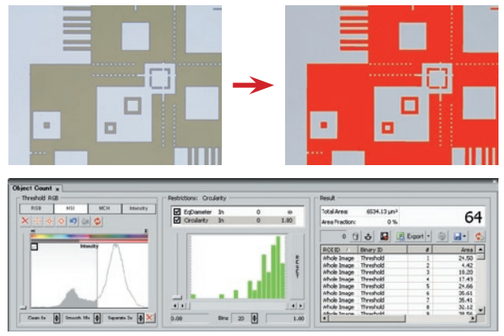
Manual Measurement allows easy measurement of length and area by drawing lines or an object directly on the image. The results can be attached to the image, and also exported as text or to an Excel spreadsheet.



Auto measurement (Object Counting)

Ar Br Option D

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)	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	—	✓
CFI60	L Plan EPI (Achromat)	40×	0.65	1.0	✓	—	—	—	—	—	✓
	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

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

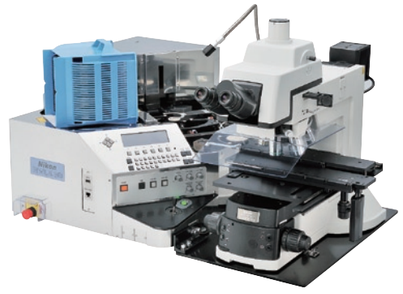
Ultra-compact reflected microscopes designed for integration into production lines to observe on monitors.

	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: 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

NWL200 Series

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 um
	Minimum thickness (option)	100 um
Surface, back side macro inspection		✓

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

Please refer to individual product brochures for further details.

Please refer to individual product brochures for further details.

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

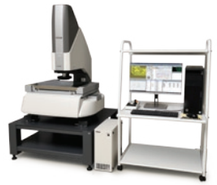
NEXIV VMZ-S4540

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	250×200 mm	450×400 mm	650×550 mm	300×200 mm	450×400 mm	650×550 mm	300×300 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

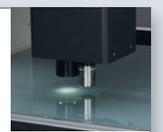
Wide FOV and long working distance enables comfortable operation. Laser AF and Touch Probe can be attached as optional accessories.

*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																		
	Type 2																		50 mm
	Type 3																		
High-Magnification Head	Type 4																		30 mm
	Type TZ																		9.8 mm

Please refer to individual product brochures for further details.

Equipped with brightfield and confocal optics, Confocal NEXIV series are capable of high-speed, high-resolution inspection of fine 3D shapes.

Main Body (Type /Stage Stroke)

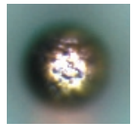
	VMF-K3040	VMF-K6555
		
XY Stroke	300×400 mm	650×550 mm
Standard head (Type-S)	1.5× / 3× / 7.5×	1.5× / 3× / 7.5×
High-Magnification head (Type-H)	15× / 30×	15× / 30×
45x High-magnification head	45×	45×
Z-axis Stroke	150 mm	150 mm
Accuracy guaranteed loading capacity	20 kg	30 kg
Maximum permissible error (EUX, MPE EUY, MPE)	1.2+4L/1000 µm	1.2+4L/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)	7.81 5.85	3.91 2.93	1.95 1.47	1.56 1.17	1.27 0.95	0.98 0.73	0.78 0.59	0.63 0.47	0.52 0.39	0.39 0.29	0.26 0.19	0.20 0.15	0.10 0.078	0.099 0.074	0.049 0.037	WD
Standard head (Type-S)	1.5×																24 mm
	3×																24 mm
	7.5×																5 mm
High-magnification head (Type-H)	15×																20 mm
	30×																5 mm
45x High-magnification head																	5 mm

Brightfield Confocal/Brightfield Confocal *The FOV of the bright field optics are indicated.

The NEXIV VMF-K series can perform full-field height measurement using confocal optics as well as 2D measurement with brightfield images. Special samples that are difficult to detect with brightfield can be clearly calculated with confocal measurement.



Brightfield image

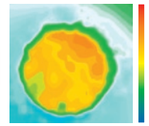
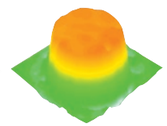


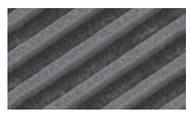
Image with height information



Bird's-eye view

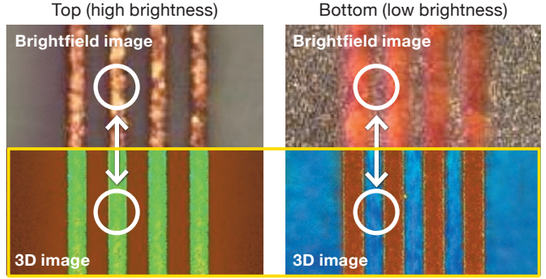
High contrast sample (copper wire on print board etc.)

Confocal observation accurately captures the shape, even for samples that are difficult to measure accurately in brightfield, due to effects such as halation.



Actual shape (SEM image)

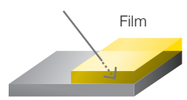
Top (high brightness) Bottom (low brightness)



Both top and bottom can be measured

Highly transparent and thin samples (metal surface films, semiconductor resists, etc.)

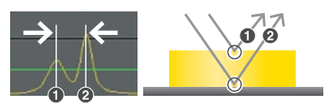
For transparent samples with unstable light reflection, confocal observation can accurately detect two points: the transparent surface and the metal surface.



Brightfield

Unstable reflection makes it difficult to detect the exact location

Confocal



Both the top and bottom heights can be detected accurately.

Please refer to individual product brochures for further details.

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	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		150 mm	200 mm
Optical Head	Monocular	✓	—
	Binocular	✓	✓
X-Y-Z	2-axis	✓	✓
	3-axis	✓	✓
CCD		✓	✓
Obj. Magnification		1×/3×/5×/10×/20×/50×/100×	

✓ : Available / — : Not available

MM Type

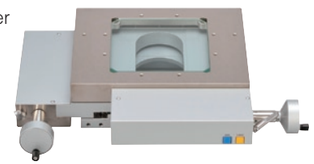
With Nikon's optical technology and highly precise stages, high-precision measurement can be achieved.

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.

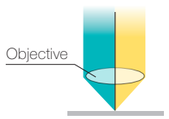


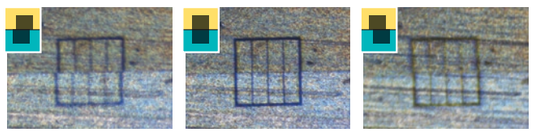
X-axis Knob

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

Please refer to individual product brochures for further details.

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	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.

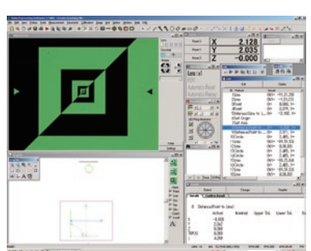
✓ : Available / — : Not available

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.

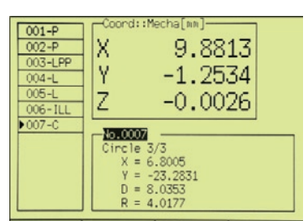


Connected with profile projector, data processing functions only

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.

Please refer to individual product brochures for further details.

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.

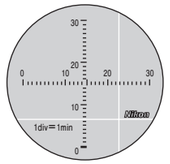
Brightfield Type

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

C-mount TV adapter for Autocollimators

C-mount TV camera can be used when adapter is attached to eyepiece tube.

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.

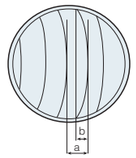
Main unit	MF-1001	MF-501	MH-15M
Measuring range	0–100 mm	0–50 mm	0–15 mm
Accuracy (20°C)	3 µm	1 µm	0.7 µm
Measuring force	Downward 1.13 to 1.62N (variable to about 0.29N) Lateral 0.64 to 1.23N	Downward 1.23 to 1.81N (variable to about 0.44N) Lateral 0.64 to 1.23N	Upward 0.25N Downward 0.64N Lateral 0.44N (lifting release included)
Operating temperature	0 to +40˚C		

Please refer to individual product brochures for further details.

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.

Please refer to individual product brochures for further details.

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

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