Nikon

TTL Laser AF (Universal Type) is a
Class 1 Laser Product

CLASS 1 LASER PRODUCT

LED Episcopic & Diascopic Illuminator
is a Class 1 LED Product

CLASS 1 LED PRODUCT

8-segment LED Ring Light CYN-E1 is a
Class 2 LED Product

**CAUTION – CLASS 2 LED RADIATION
DO NOT STARE INTO THE BEAM**

ISO/IEC 17025 Certified

Nikon Corporation Instruments Company has been certified as an ISO/IEC 17025
accredited calibration laboratory for measuring microscopes by the Japan Accreditation
Board for Conformity Assessment.
(ISO/IEC 17025: International standard, which specifies the general requirements to ensure
that a laboratory is competent to carry out specific tests and/or calibrations)

Date of accreditation: September 8, 2006
Scope of accreditation: X/Y-axis indication accuracy of measuring microscopes
Accredited section: Industrial Instruments CS 1st Engineering Section,
 Quality Assurance Department, Instruments Company
Calibration site: Customer's laboratory (On site calibration service)
An expanded uncertainty using a coverage factor, k=2 (CMC):
 X/Y-axis indication accuracy of measuring microscopes
 Linear scale up to 300mm: $(1.0 + 2.7 \times 10^{-3} \times L)$µm
 Micrometer up to 50mm: 2.0µm
 (L = Displacement : mm)

Nikon Measuring Microscopes

MM Series

Specifications and equipment are subject to change without any notice or obligation
on the part of the manufacturer. April 2013   ©2003-13 NIKON CORPORATION

⚠ **WARNING** TO ENSURE CORRECT USAGE, READ THE CORRESPONDING
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ISO 9001
BUREAU VERITAS
Certification
**ISO 9001 Certified
for NIKON CORPORATION
Instruments Company**

ISO 14001
BUREAU VERITAS
Certification
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Digital Imaging & Metrology

Next-Generation Measuring Microscopes

MM Series

Nikon is proud to present the MM series of Measuring Microscopes, which incorporate key performance features expected in an advanced next generation measuring microscope:

- Greater Accuracy
- Digital Imaging and Vision Processing Metrology
- Larger Stage for Increased Workpiece Handling
- Non Contact Z-height Measurements
- Coordination with Data Processing Systems

MM-400/LV

MM-800/LMU

- The new Nikon measuring microscope can be equipped with a TTL Laser AF (universal type) and a new Focusing Aid mechanism that provides sharper and more accurate focusing. High precision Z-axis measurement is simpler than ever.

- Digital image capture using a Nikon digital camera and E-Max metrology software allows rapid measurement with precise auto edge detection.

- A fully motorized high power microscopy model is also available for digital imaging.

- By offering many options in illuminators and light sources, an expanded observation range has been achieved. These include a high-intensity white LED illuminator for brightfield observation, a universal epi-illuminator to respond to various observation needs, and a 12V-50W halogen light source.

- A motorized Z-axis movement mechanism (LM models) simplifies accurate vertical motion through the use of a dedicated controller.

- Added body strength enables the use of larger stages, such as the newly developed PS 12x8C stage, allowing for larger workpieces.

- Ease of operation has been greatly improved by use of various motorized controls and ergonomic design. Even the PS 12x8C stage is easy to manipulate despite its large size.

- Stands with the integrated MM Controller interface and the newly developed DP-E1 Data Processor or SC counters and PC-based E-Max data processing software provide excellent geometric data processing and storage.

- The compact and lightweight MM-200 ensures precise and easy usage, and offers the basic functions of the MM-400/800 series.

MM-200 E-MAX set with 8-Segment LED Ring Light CYN-E1

Function Icons

AF — **Autofocus (Universal Type)**
TTL Laser AF (Autofocus) enables quick perfect focusing.

FA — **Focusing Aid**
The Focusing Aid (FA) ensures accurate Z-axis focusing.

UFA — **Universal Epi-illuminator Focusing Aid**
A universal epi-illuminator with Focusing Aid (FA) mechanism.

V — **Variable Magnification**
Two objective lenses can be attached, making magnification changeover easy.

Z-axis Motorized Motion
A dedicated controller provides easy and accurate up/down movements.

2 — **Dual Side Coarse/Fine Focus Knob**
Coarse/fine focus knobs are on both sides.

L — **Built-in Z-axis Linear Scale**
Z-axis reading is possible for noncontact height measurement.

T — **Trinocular Optical Head**
Ideal for configuration with photomicrography equipment.

M — **Monocular Optical Head**
For applications where cost performance is priority.

U-EPI — **Universal Epi-illuminator**
Supports a wide range of applications.

LED — **LED Illuminator**
A high-intensity white LED illuminator for brightfield use.

V — **Video Head**
Video head is available.

LED — **LED Ring Light**
8-segment LED ring lighting source.

DUAL — **Dual Knob**
Knob on both sides.

Stellar New Features Enhance Z-axis Measurement Accuracy

TTL Laser AF (Universal Type)
These are the first measuring microscopes to offer an optional TTL Laser Auto-Focus. This Laser AF system features a 0.5 second focusing speed with a repeatability as high as 0.5μm (2θ).

Focusing Aid (FA)
The newly developed split-prism Focusing Aid (FA) delivers sharp patterns to allow accurate focusing during Z-axis measurements. Measurement errors due to differences in the depth of focus of different objectives are minimized.

Laser AF Tracking on FPC

Split-prism Focusing Aid (FA) Mechanism

Objective FA patterns are clearly visible because they are split vertically.

Front focus Focused Rear focus

Front focus Focused Rear focus
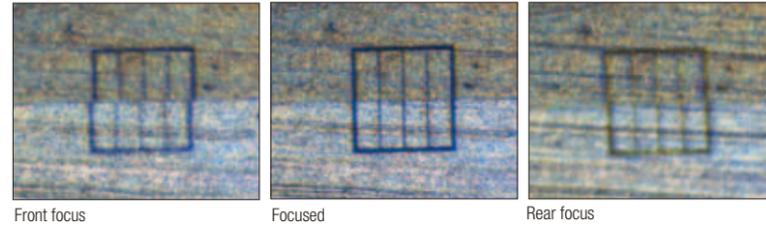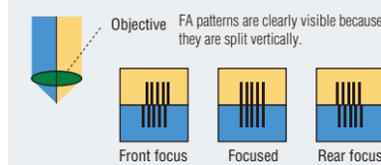
Low reflection surface can be precisely focused, too.
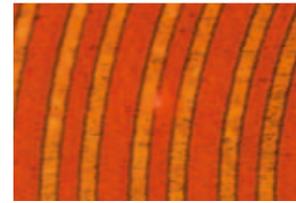
Motorized Z-Axis Movement (LM Model Stands)
A motorized vertical movement mechanism with a 10mm/sec. speed has been incorporated. Up/down control is accurately provided with a dedicated controller.

Improved Illuminators Broaden Observation Ranges

A high-intensity white LED illuminator is provided as standard for brightfield use. This illuminator features no bulb replacement and constant color temperature, enabling measurement with high-precision and efficiency. For the universal type (except FA), a newly designed 12V-50W halogen light is included. Brightness has been substantially improved, particularly at high magnifications.

Built-in Continuous Light Control
A continuous light control is built into the system, enabling light control from the PC without touching the dial on the main body. Measurements can now be made under the same conditions, assuring precise video edge detection for repeatable measurements.

LED Illuminator
This high-intensity illuminator uses white LED and comes with a quick light intensity control.

8-Segment LED Ring Light CYN-E1
This ring light enables illumination control from eight directions, eliminating the need to pull out and adjust the fiber illuminator each time a measurement is made.
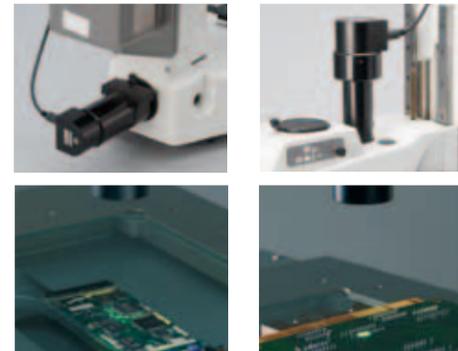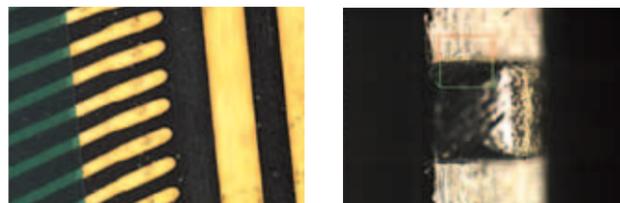
Digital Imaging & Vision Processing
The use of a Nikon microscope digital camera and E-Max software will streamline your workflow from observation and capture, to the storage of high-definition digital images of your workpieces.

MM Controller Backpack Interface
Illumination, X/Y stage and Z data can be connected to the MM Controller as an interface to an external computer running E-Max software for data processing and system control.

New PS 12x8C Stage for Large Workpieces (MM-800 only)
An enhanced body design using Computer Aided Engineering (CAE) for stress analysis enables the mounting of a larger stage to accommodate larger workpieces. A 300 x 200mm (12" x 8") stroke stage can be mounted to the MM-800.

Improved Interface with Data Processor and Software

Interfacing to data processors and PC software has been greatly improved to include comprehensive support throughout the entire measurement process, from image capture and measurements, to analysis and data storage.

Data Processor DP-E1
The DP-E1 Data Processor is compact, yet easy to use. For quick measurements and data processing you can place the read-out display near the eyepiece while the control pad is placed at your fingertips. The DP-E1's seamless interface to a PC platform makes it easy to perform computations and management of your measurement results.

- Twist roller drive allows smooth changeover of coarse/fine stage movement
- Swivel plate comes as standard for PS 12x8C, PS 10x6B and PS 8x6B.
- The coarse/fine changeover lever and the RESET and SEND buttons are located near the X- and Y-axis knobs
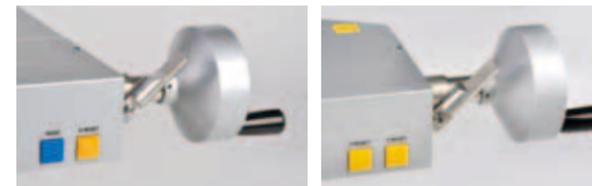
X-axis knob (near buttons) Y-axis knob (near buttons)

Data Processing Software E-MAX Series
Digital image measuring performance of the E-MAX software has been upgraded. Combined with Nikon's digital camera and measuring microscope, the system achieves digital image measurements with precision never before possible.

3rd-party DRO Connectable (S Models)
The MM-400S, SL and MM-800S, SL models were created for use with HEIDENHAIN QUADRA-CHEK and other 3rd-party digital read-outs. They offer an economical alternative if non-Nikon data processors are used.

* QUADRA-CHEK is a trademark of HEIDENHAIN.

MM-400/800 High-Precision Type (Factory Option)
The MM-400/800 high-precision type provides increased flexibility in choosing modules for system configurations. It enables optimum system configuration according to user needs, and provides excellent reliability during measurements with configurations consisting of a digital camera and/or other accessories.

- 1.5+L/100 μm (high-precision type 2)[1][2] for PS 8x6B, PS 10x6B, PS 12x8C
- 2.0+L/50 μm (high-precision type1)[2]
- 2.5+L/50 μm (standard type, calibration data included)

*1 When using MM400/800 for high precision type2, object lens 10x or higher, vibration isolation table and suitable temperature controlled room are required.
*2 Contact Nikon for details of system configuration.

Combination precision
- Standard precision: (2.5+L/50) μm
- High-precision type 1: (2.0+L/50) μm
- High-precision type 2: (1.5+L/100) μm

Error
Travel distance
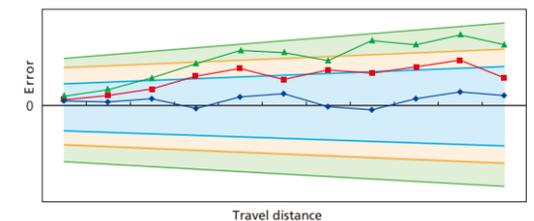
The LM models have a built-in motorized Z-axis scale, enabling accurate 3-axis measurements. In addition, the optional Focusing Aid uses a split prism to ensure Z-axis focusing accuracy and minimize measurement errors caused by the difference in the objective's depth of focus.

MM-800/LM

MM-400/LM

Applications:
Dies & molds, Finely machined parts, Stamped parts, Injection molded parts, Medical devices
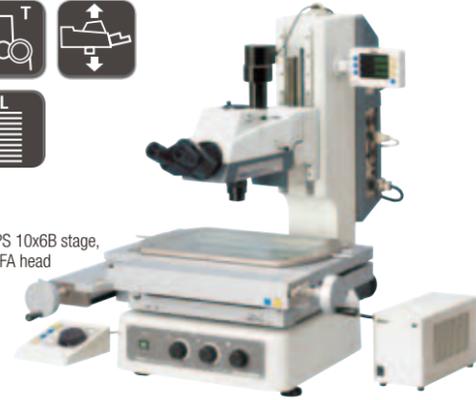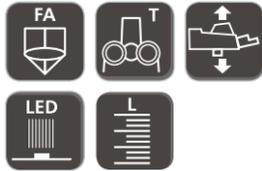
Configured with PS 10x6B stage, trinocular optical FA head

Configured with PS 6x4B stage, trinocular optical FA head

These models allow two objective lenses (low and high magnification) to be mounted simultaneously, thus making magnification changeover easy. Both low-magnification wide-field-of-view measurement and high-magnification high-precision-height measurement can be performed on a single microscope.
Please check specifications before purchasing a variable magnification model.
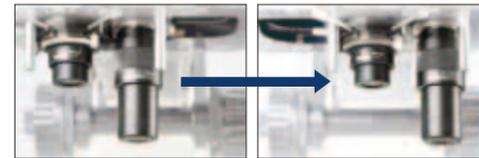
MM-800/LV
MM-400/LV

MM-800/LVFA
MM-400/LVFA
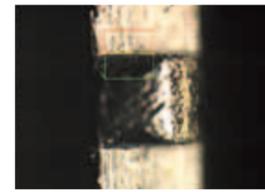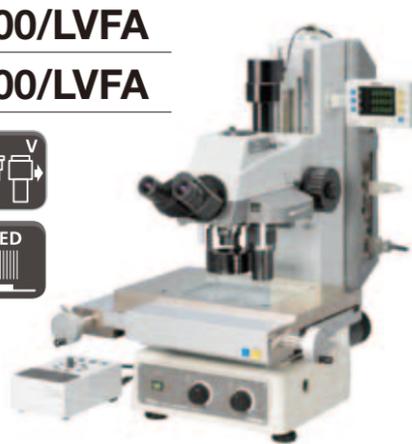
Specifications

Type	MM-800/LM	MM-400/LM	MM-800/LV, MM-800/LVFA	MM-400/LV, MM-400/LVFA
Z-axis movement	Motorized (max. speed: 10mm/sec)		Manual (dual side coarse/fine focus knob)	
MM controller backpack interface	Built-in		—	
Optical head	Monocular optical head, Trinocular optical head, Trinocular optical FA head		Variable magnification optical head, Variable magnification optical FA head	
Z-axis linear scale	Built-in		—	
Eyepiece inclination angle	—		25°	
Eyepiece	CFWN10x (Field No. 20)			
Objective	Measuring microscope objectives			
Objective lens magnification (working distance)	—		1x (79mm), 3x (75mm), 5x (64mm), 10x (48mm), 20x (20mm), 50x (15mm), 100x (4mm)	
Stage	PS 12x8C, PS 10x6B, PS 8x6B	PS 6x4B, PS 4x4B, PS 2x2B	PS 12x8C, PS 10x6B, PS 8x6B, PS 6x4B, PS 4x4B, PS 2x2B	PS 6x4B, PS 4x4B, PS 2x2B
Light source Diascopic	LED diascopic illuminator (standard), 12V-50W halogen light source (option)*			
Episcopic	LED episcopic illuminator			
Max. workpiece height	200mm	150mm	200mm	150mm
Dimensions (W x D x H)/weight	385 x 785 x 725mm/approx. 72kg	300 x 600 x 638mm/approx. 50kg	380 x 735 x 725mm/approx. 72kg	300 x 600 x 638mm/approx. 50kg

*TI-PS100W power supply is required

With a built-in Z-axis scale, this type is the basic standard for Nikon's measuring microscope series. Various models are available—with or without Focusing Aid, monocular or trinocular optical head. You can select the best one according to your measuring range, use and budget. The SL model is recommended for 3rd-party (non-Nikon) digital read-outs and therefore does not include the MM controller that interfaces with the Nikon DRO.

MM-800/L

MM-800/SL with 3rd-party DRO

Plastic Gear Teeth with Smaller Module

Configured with PS 8x6B stage, trinocular optical FA head

Applications:
Dies & molds, Finely machined parts, Stamped parts, Injection molded parts, Medical devices

Black Injection Molding Parts - Connector

MM-400/L

MM-400/SL with 3rd-party DRO

Configured with PS 4x4B stage, trinocular optical head

Specifications

Type		MM-800/L	MM-800/SL	MM-400/L	MM-400/SL
Z-axis movement		Manual (dual side coarse/fine focus knob)			
MM controller backpack interface		Built-in	—	Built-in	—
Optical head		Monocular optical head, Trinocular optical head, Trinocular optical FA head			
Z-axis linear scale		Built-in			
Eyepiece		CFWN10x (Field No. 20)			
Objective		Measuring microscope objectives			
Stage		PS 12x8C, PS 10x6B, PS 8x6B		PS 6x4B, PS 4x4B, PS 2x2B	
Light source	Diascopic	LED diascopic illuminator (standard), 12V-50W halogen light source (option)*			
	Episcopic	LED episcopic illuminator			
Max. workpiece height		200mm		150mm	
Dimensions (W x D x H)/weight		385 x 785 x 725mm/approx. 72kg		300 x 600 x 638mm/approx. 50kg	

*TI-PS100W power supply is required

These are the basic models in the MM-400/800 series. High in cost performance, these models are expressly designed for 2-axis (XY) applications. To meet your application and budget, various models are available—monocular or trinocular optical heads, plus 12x8 large stage or 2x2 small stage sizes are available. The 400S and 800S models are specifically for use with non-Nikon digital read-outs.

MM-800

Configured with PS 8x6B stage, trinocular optical head

Applications:
Dies & molds, Finely machined parts, Stamped parts, Injection molded parts, Medical devices

MM-400

Configured with PS 2x2B stage, monocular optical head

MM-400/S with 3rd-party DRO

Configured with PS 2x2B stage, trinocular optical head, ND 1200 QUADRA-CHEK

MM-800/S with 3rd-party DRO

Configured with PS 8x6B stage, trinocular optical head, ND 1200 QUADRA-CHEK

Applications:
Stamped parts, Injection molded parts, Medical devices, Drills, Micro tooling, Automotive Components

Specifications

Type		MM-800	MM-800/S	MM-400	MM-400/S
Z-axis movement		Manual (dual side coarse/fine focus knob)			
MM controller backpack interface		Built-in	—	Built-in	—
Optical head		Monocular optical head, Trinocular optical head			
Z-axis linear scale		—			
Eyepiece		Dedicated 10x (Field No. 20)	CFWN10x (Field No. 20)	Dedicated 10x (Field No. 20)	CFWN10x (Field No. 20)
Objective		Measuring microscope objectives			
Stage		PS 12x8C, PS 10x6B, PS 8x6B	PS 12x8C, PS 10x6B, PS 8x6B	PS 6x4B, PS 4x4B, PS 2x2B	PS 6x4B, PS 4x4B, PS 2x2B
Light source	Diascopic	LED diascopic illuminator (standard), 12V-50W halogen light source (option)*			
	Episcopic	LED episcopic illuminator			
Max. workpiece height		200mm	150mm	200mm	150mm
Dimensions (W x D x H)/weight		385 x 785 x 725mm/approx. 72kg	385 x 785 x 725mm/approx. 72kg	300 x 600 x 638mm/approx. 50kg	300 x 600 x 638mm/approx. 50kg

*TI-PS100W power supply is required

MM-200
Compact, light, precise and easy to use measuring microscope for dimensioning and tolerancing

The new Nikon Measuring Microscope MM-200—Uniquely designed for all machining engineers and inspectors

Compact, Space-saving, 40-kg Body

The MM-200 features a space-saving design with a footprint equivalent to an A3-size sheet, or 420 x 297 mm (main body with monocular eyepiece tube). The affordable measuring microscope is now available from Nikon.

Monocular Eyepiece Head / C-mount Video Head

The monocular eyepiece tube model is available for those who prefer to measure with their own eye, while the C-mount video head model provides easy video monitoring.

MM Controller Backpack Interface for Digital Readout and Data Processing

The MM-200 has a backpack control interface unit for XY stage scale readout, illumination control, communication ports to external devices such as PC, digital readout and so on. Simply apply the data processing unit, the DP-E1, to complicated GD & T measurements. The E-MAX DS-V system allows easy-to-use advanced video edge detection technologies. Popular digital readouts such as HEIDENHAIN ND 1200 QUADRA-CHEK are also available.

* QUADRA-CHEK is a trademark of HEIDENHAIN.

MM-200 with Monocular Eyepiece Tube and DP-E1

White LED Lighting Sources

The built-in episcopic and diascopic light sources are all long-life white LEDs. The optional LED ring lights enhance edge observation through the use of an oblique illumination angle.

Applications

- Small Size Die & Mold
- Drill Bits
- Inserts
- Fine Pitch Connector
- Medical Devices
- Watch Parts
- Gears

Drill Bits
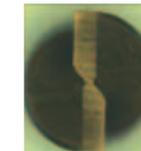
The image was generated by optional EDF/Stitching Express software
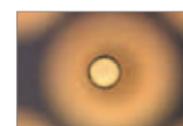
PGA - Insertion Pin | Connector - Housing Inside | Plastic Gear Teeth with Smaller Module

MM-200 with C-mount Video Head and E-MAX DS-V

Specifications

Type	Monocular Eyepiece Tube Type	C-mount Video Head Type
Optical head	MM-200 monocular optical head	C-mount video head for MM-200
XYZ stroke	50 mm x 50 mm x 110 mm	
Stage accuracy	2.5 + L/50 µm (with LEC), 3 + L/50 µm (L = measurement length in mm)	
Scale resolution	0.01/0.1(default)/1/10 µm	
Max. loading weight	2 kg for guaranteed accuracy, 5 kg for operation	
Magnification accuracy	0.1 %	
Objective lenses (W.D.)	Standard: 3x (75.5 mm), Optional: 1x (79 mm), 5x (64 mm), 10x (48 mm)	
Light sources	Standard: diascopic/episcopic (white LED), Optional: 8-segmented ring light (white LED)	
Dimensions & weight	316 x 455 x 533 (W x D x H), 40 kg	
Input voltage range	100 - 240 V (Max. 1.8 A)	

High Power Microscopic Model with Universal Epi-Illuminator
Motorized Z-axis & Microscopic Observation Mode Switchover

These "Universal" models combine a measuring stand with the best of Nikon's metallurgical microscope components for high resolution imaging and critical measurements. Featuring the full range of Nikon advanced LU objectives and microscopy techniques including: brightfield, darkfield, DIC contrast, polarizing and epi-fluorescence. Up to five objectives may be mounted on the nosepiece. Moreover, important controls in the microscope—e.g. Z-axis movement, focusing and illumination switchover—have been automated or motorized to streamline imaging operations such as digital image capture, digital field-of-view measurement and data storage.

Brightfield

Darkfield

Brightfield

Epi-fluorescence

DIC

Centralized Control for Different Microscopic Observations, Motorized Motions

Control of the motorized epi-illuminator and various light sources, universal motorized nosepiece and aperture diaphragm, DIC changeover, and other important operations can be performed at a single place via the illumination & AF controller.

TTL Laser AF (Auto-Focus)
The MM-400/800 LMU models are the measuring microscope series equipped with TTL Laser AF, these models accomplish focusing quickly with repeatability as high as 0.5µm (when a 20x objective is used).

Universal Motorized Nosepiece
The LV-NU5A universal nosepiece simplifies objective changeovers. Programmed magnification changeover is available via the illumination & FA controller.

A Wide Choice of Illuminators

A new lineup of motorized universal illuminators is available in addition to manual types. A white LED illuminator is available for brightfield use. Users can choose either a 12V-50W halogen or a white LED light source according to observation purpose and workpiece.

LV-U EPI Universal Epi-Illuminator
This universal epi-illuminator enables brightfield, darkfield, simple polarizing, and DIC observations. The illuminator automatically opens the field and aperture diaphragms when switching observation from brightfield to darkfield. When returning to brightfield, the previous field and aperture conditions are automatically restored.

LV-U EPI2 Universal Epi-Illuminator
In addition to brightfield, darkfield, simple polarizing, and DIC, this illuminator enables epi-fluorescence observation. The illuminator automatically sets optimum illumination through linkage to the shutter, field and aperture diaphragms.
This minimizes the complexity of operating a measuring microscope, allowing the user to concentrate on the observation.

LV-U EPI2A Motorized Epi-Illuminator
With the LV-U EPI2A, the illumination changeover turret, the aperture diaphragm and the illumination voltage control have been motorized, allowing optimum image capture conditions. The aperture diaphragm is automatically optimized through linkage with objective and observation. Also, illumination parameters can be arbitrarily changed according to observation purpose and workpiece. When loaded on the LM type measuring microscope, the illuminator can be controlled from the microscope operation panel or a connected PC. When the illumination & AF controller is used, the microscope can be controlled externally from a PC.

LV-U EPI FA Universal Epi-Illuminator Focusing Aid
This universal epi-illuminator is equipped with an optical split image prism Focusing Aid (FA) mechanism to provide greater accuracy in Z-axis measurements.

LV-EPI LED White LED Illuminator
The LV-EPI LED is a light, compact white LED illuminator exclusively designed for brightfield use. The white LED maintains constant color temperature to prevent any adverse effects on measurement. External control is possible either with the attached power supply controller or the illumination & AF controller.

Motorized Z-axis Movement

The MM-400/800LM models feature a motorized focusing module, enabling Z-axis movement with a dedicated controller.

High-Intensity White LED Illuminator or 12V-50W Halogen Light Source Selectable

LED illuminator can be used as an episcopic light source, eliminating the need for lamp replacement while providing quick response and very low heat emission. Also, thanks to new optical design, the 12V-50W MM-LH50PC precentered lamphouse provides images brighter than ever before. The low power-consumption halogen light source contributes to the compact design of the microscope while also being friendly to the environment. Defocus induced by heat drift is substantially reduced.

MM-LH50PC precentered lamphouse

LED illuminator for episcopic light source

The motorized system satisfies digital image capture and data storage requirements. In combination with the motorized universal epi-illuminator, it is possible to set and reproduce illumination optimized for a selected observation method and/or objective lens. Focusing and objective changeover can be electrically performed with the illumination & AF controller.

MM-800/LMU
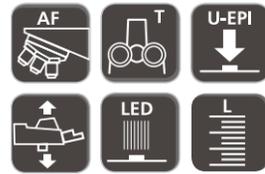
Configured with PS 12x8B stage, TTL Laser AF, LV-U EPI2A motorized universal epi-illuminator
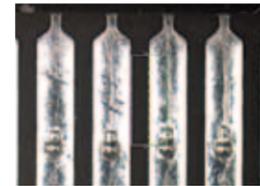
Metallized Patterns of FPC

CCD

Applications:
Semiconductor packages, Bonding placement, Loop height, FPD panel (LCM), MEMS, Wafer level CSP, HDD slider
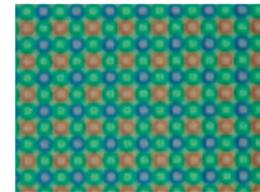
MM-400/LMU

Configured with PS 6x4B stage, TTL Laser AF, LV-U EPI2A motorized universal epi-illuminator

Specifications

Type		MM-800/LMU	MM-400/LMU
Z-axis movement		Motorized (max. speed: 10mm/sec)	
MM controller backpack interface		Built-in	
Optical head		C-TB binocular tube, LV-TI3 trinocular eyepiece tube, LV-TT2 tilting trinocular eyepiece tube (with built-in reticle)	
Z-axis linear scale		Built-in	
Eyepiece		CFI10x (Field No. 22), CFI10x CM (Field No. 22)	
Objective		CFI60-2 TU Plan Fluor EPI series, CFI60-2 TU Plan Fluor BD series, CFI60 L Plan EPI CR series	
Stage		PS 12x8C, PS 10x6B, PS 8x6B	PS 6x4B, PS 4x4B, PS 2x2B
Light source	Diascopic	LED diascopic illuminator (standard), 12V-50W halogen light source (option)*	
	Episcopic	White LED illuminator LV-EPI LED, Motorized universal epi-illuminator LV-U EPI2A*, Universal epi-illuminator LV-U EPI2*, Universal epi-illuminator U-EPI*, Universal epi-illuminator with Focusing Aid LV-U EPI FA	
Max. workpiece height		200mm	150mm
Dimensions (W x D x H)/weight		385 x 785 x 725mm/approx. 72kg	300 x 600 x 638mm/approx. 50kg

*TI-PS100W power supply is required

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The system is equipped with a universal epi-illuminator that responds to various observation needs such as brightfield, darkfield, simple polarizing and DIC, as well as epi-fluorescence. A bright 12V-50W halogen light source and a white LED light source are available depending on the workpiece or observation purpose. The 12V-50W halogen light source provides images brighter than ever. LSU models are is also available for connection to a 3rd-party DRO.

MM-800/LU
MM-800/SLU with 3rd-party DRO
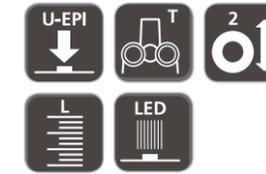
Configured with PS 12x8C stage, LV-U EPI2 universal epi-illuminator, tilting trinocular eyepiece tube with built-in reticle
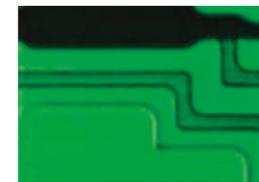
FPD-Cell Process

Color Filter
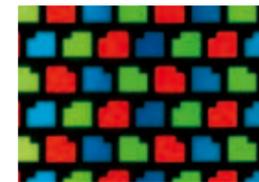
Applications:
Semiconductor packages, Bonding placement, Loop height, FPD panel (LCM), MEMS, Wafer level CSP, HDD slider

MM-400/LU
MM-400/SLU with 3rd-party DRO
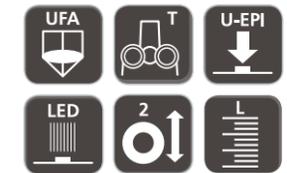
Configured with PS 6x4B stage, LV-U EPI FA universal epi-illuminator with Focusing Aid

Specifications

Type		MM-800/LU	MM-800/SLU	MM-400/LU	MM-400/SLU
Z-axis movement		Manual (dual side coarse/fine focus knob)			
MM controller backpack interface		Built-in	—	Built-in	—
Optical head		C-TB binocular tube, LV-TI3 trinocular eyepiece tube, LV-TT2 tilting trinocular eyepiece tube (with built-in reticle)			
Z-axis linear scale		Built-in			
Eyepiece		CFI10x (Field No. 22), CFI10x CM (Field No. 22)			
Objective		CFI60-2 TU Plan Fluor EPI series, CFI60-2 TU Plan Fluor BD series, CFI60 L Plan EPI CR series			
Stage		PS 12x8C, PS 10x6B, PS 8x6B		PS 6x4B, PS 4x4B, PS 2x2B	
Light source	Diascopic	LED diascopic illuminator (standard), 12V-50W halogen light source (option)*			
	Episcopic	White LED illuminator LV-EPI LED, Motorized universal epi-illuminator LV-U EPI2A*, Universal epi-illuminator LV-U EPI2*, Universal epi-illuminator U-EPI*, Universal epi-illuminator with Focusing Aid LV-U EPI FA			
Max. workpiece height		200mm		150mm	
Dimensions (W x D x H)/weight		385 x 785 x 725mm/approx. 72kg		300 x 600 x 638mm/approx. 50kg	

*TI-PS100W power supply is required

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This model is designed exclusively for 2-axis high magnification measurement of fine geometries. It is equipped with a universal epi-illuminator that allows observations such as brightfield, darkfield, simple polarizing and DIC. A bright 12V-50W halogen light source and a white LED light source are available depending on the workpiece or observation purpose. The 12V-50W halogen light source provides image brightness equivalent to or higher than that of 12V-100W.

MM-800/U

MM-800/SU with 3rd-party DRO

U-EPI	T	2	LED

Configured with PS 12x8C stage, LV-U EPI2 universal epi-illuminator, tilting trinocular eyepiece tube with built-in reticle

Applications:
Semiconductor packages, Bonding placement, FPD panel (LCM), MEMS, HDD slider

MM-400/U

MM-400/SU with 3rd-party DRO

U-EPI	LED	T	2

Configured with PS 6x4B stage, LV-U EPI universal epi-illuminator

Specifications

Type		MM-800/U	MM-800/SU	MM-400/U	MM-400/SU
Z-axis movement		Manual (dual side coarse/fine focus knob)			
MM controller backpack interface		Built-in	—	Built-in	—
Optical head		C-TB binocular tube, LV-TI3 trinocular eyepiece tube, LV-TT2 tilting trinocular eyepiece tube (with built-in reticle)			
Z-axis linear scale		—			
Eyepiece		CFI10x (Field No. 22), CFI10x CM (Field No. 22)			
Objective		CFI60-2 TU Plan Fluor EPI series, CFI60-2 TU Plan Fluor BD series, CFI60 L Plan EPI CR series			
Stage		PS 12x8C, PS 10x6B, PS 8x6B		PS 6x4B, PS 4x4B, PS 2x2B	
Light source	Diascopic	LED diascopic illuminator (standard), 12V-50W halogen light source (option)*			
	Episcopic	White LED illuminator LV-EPI LED, Motorized universal epi-illuminator LV-U EPI2A*, Universal epi-illuminator LV-U EPI2*, Universal epi-illuminator U-EPI*, Universal epi-illuminator with Focusing Aid LV-U EPI FA			
Max. workpiece height		200mm		150mm	
Dimensions (W x D x H)/weight		385 x 785 x 725mm/approx. 72kg		300 x 600 x 638mm/approx. 50kg	

*TI-PS100W power supply is required

Dimensional Diagram

Note: Dimensions will vary, depending on which stage and eyepiece tube are used.　　Unit: mm

MM-400/M
PS 2x2B Stage

MM-800/LM
PS 12x8C Stage
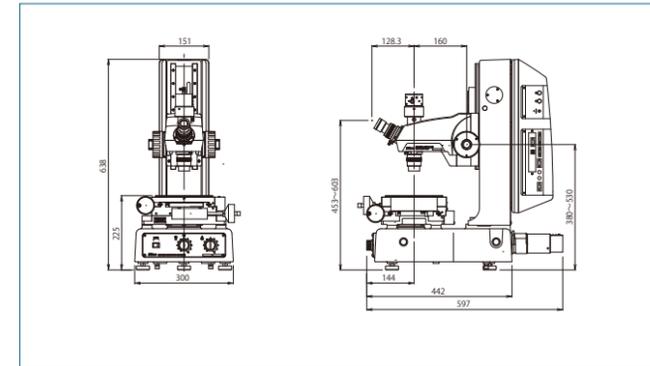
MM-400LV
PS 6x4B Stage
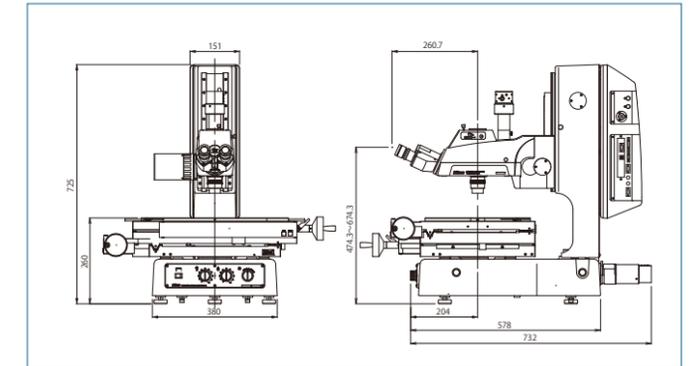
MM-400/LUFA
PS 6x4B Stage

MM-400/L
PS 4x4B Stage
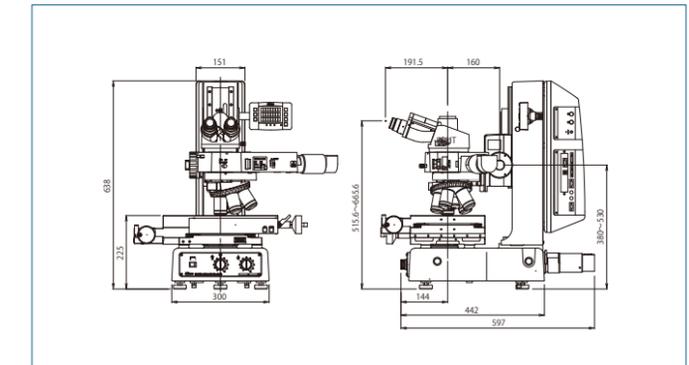
MM-800/LU
PS 8x6B Stage

MM-800/L
PS 10x6B Stage

MM-800/LMU
PS 12x8C Stage

New Series of High-performance Objective Lenses Enhances Optical Performance

Standard objective lens with improved transmission rate for UV wavelength
CFI60-2 TU Plan Fluor Series

The transmission rate in the UV wavelength range has been improved for the new CFI60-2 TU Plan Fluor series. These objective lenses are suitable for various research, analysis and examination needs, while maintaining Nikon's commitment to high NA and long working distance. Only one kind of objective lens is needed for brightfield, darkfield, simple polarizing, DIC and UV epi-fluorescence observations. These objective lenses offer high resolution and ease of use.

TU Plan Fluor EPI series

Objective lenses with correction ring
CFI60 L Plan EPI CR Series

The CFI60 series now includes the CFI60 L Plan EPI CR series objectives to cope with the thinner cover-glass used in liquid crystal displays and highly integrated, dense devices. Coverglass correction can be continuously made from 0 mm up to 1.2mm (0-0.7mm and 0.6-1.3mm for 100x) with the correction ring. The 100x objective lens offers 0.85 high NA, while enabling high-contrast imaging of cells and patterns without being affected by the coverglass.

L Plan EPI CR series of objective lenses with correction ring
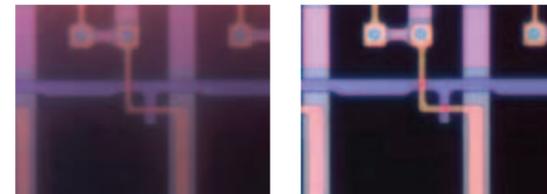
Without correction (50x)

With correction at 0.7mm (50x)

CFI60 Series Objectives

Brightfield

Type	Magnification	NA	W.D. (mm)
CFI L Plan EPI	2.5x	0.075	8.8
T Plan EPI	1x	0.03	4.0
	2.5x	0.075	6.5
TU Plan Fluor EPI	5x	0.15	23.5
	10x	0.30	17.5
	20x	0.45	4.5
	50x	0.80	1.0
	100x	0.90	1.0
TU Plan EPI ELWD	20x	0.40	19.0
	50x	0.60	11.0
	100x	0.80	4.5
T Plan EPI SLWD	10x	0.20	37.0
	20x	0.30	30.0
	50x	0.40	22.0
	100x	0.60	10.0
TU Plan Apo EPI	50x	0.80	2.0
	100x	0.90	2.0
	150x	0.90	1.5

Brightfield/Darkfield

Type	Magnification	NA	W.D. (mm)
TU Plan Fluor BD	5x	0.15	18.0
	10x	0.30	15.0
	20x	0.45	4.5
	50x	0.80	1.0
	100x	0.90	1.0
TU Plan BD ELWD	20x	0.40	19.0
	50x	0.60	11.0
	100x	0.80	4.5
TU Plan Apo BD	50x	0.80	2.0
	100x	0.90	2.0
	150x	0.90	1.5

With correction mechanism

Type	Magnification	NA	W.D. (mm)	Glass thickness correction range (mm)
CFI L Plan EPI CR	20x	0.45	10.9-10.0	0-1.2
CFI L Plan EPI CR	50x	0.7	3.9-3.0	0-1.2
CFI L Plan EPI CRA	100x	0.85	1.2-0.85	0-0.7
CFI L Plan EPI CRB	100x	0.85	1.3-0.95	0.6-1.3

Newly developed tilting trinocular eyepiece tube
LV-TT2 Tilting Trinocular Eyepiece Tube with Built-in Reticle

The newly developed LV-TT2 tilting trinocular eyepiece tube (erect image) with built-in reticle offers comfort to all users, regardless of their stature or viewing positions. The optical path changeover of 100:0/20:80 allows simultaneous use of a monitor.

Bracket for illuminators

The newly developed bracket enables the LV-UEPI illuminator to be attached to the left or right side of MM-400/800 series microscopes.

Compatible microscopes
• 2-axis and 3-axis MM-400/800 series

Compatible illuminators
• Epi-illuminator LV-U EPI
• White LED illuminator LV-EPI LED

Selectable nosepieces
Highly Durable Motorized Universal Nosepieces LV-NU5A*/LV-NU5AC*

Two types of motorized universal quintuple nosepieces are available. The LV-NU5A boasts greater durability thanks to a new click mechanism and control system. Programmed magnification change with a controller is possible.The LV-NU5AC comes with a centering mechanism that suppresses image drift during objective changeover.
* Not available for S and SL models

LV-NU5A nosepiece

LV-NU5AC nosepiece

Manual Nosepieces
A variety of manual control nosepieces are available to suit all needs.

C-N6 nosepiece (brightfield)　　L-NBD5 nosepiece (bright/darkfield)　　L-NU5 nosepiece (universal)

Motorized Observation Controller*

This controller makes it possible to control the light source, motorized illuminator, nosepiece, Z-movement and TTL Laser AF. When E-MAX software is used, control is also possible through the software's teaching program.
* Not available for S and SL models

Connectable units
• Motorized universal epi-illuminator LV-U EPI2A
• Halogen lamphouse MM-LH50PC (TI-PS100W power supply is required)
• PC-control type high-intensity mercury fiber light source
• White LED illuminator LV-EPI LED
• Motorized universal nosepiece LV-NU5A, LV-NU5AC (with centering mechanism)
• TTL Laser AF (U-AF)
• Diascopic/episcopic illumination

Stages

Nikon offers a broad range of stages to choose from including the new PS 12x8C stage.
All models boast an outstanding accuracy of 2.5+L/50μm (L=measurement length).
An optional high accuracy type (1.5+L/100μm) is also available.

Stages for MM-800 series

PS 12x8C
Stage
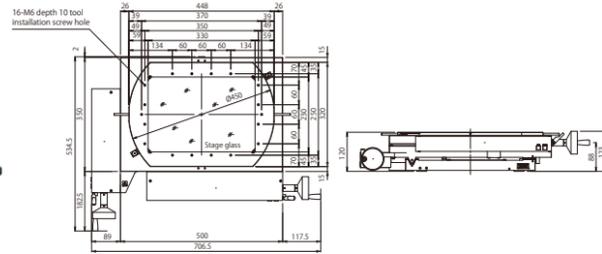
PS 10x6B
Stage
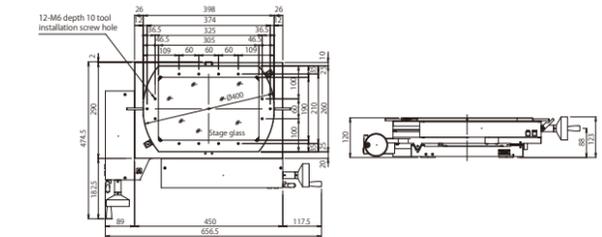
PS 8x6B
Stage
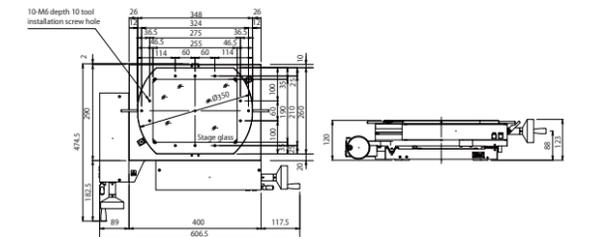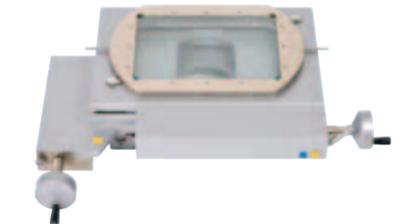
Stages for MM-400 series

PS 6x4B
Stage
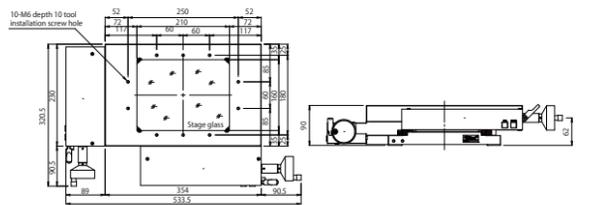
PS 4x4B
Stage
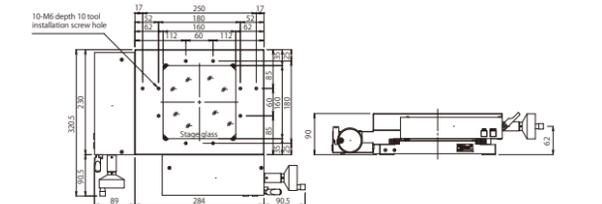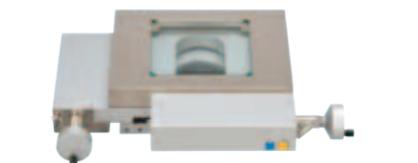
PS 2x2B
Stage
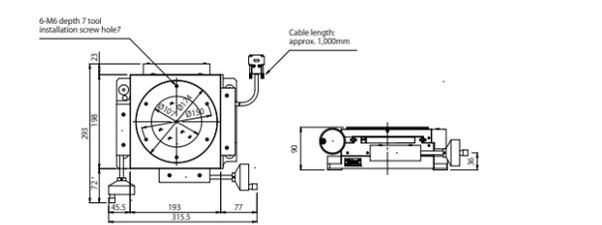
Stage specifications

Type	Surface area (mm)	Stage glass dimensions (mm)	Stroke (mm)	Reading method	Min. reading (mm)	Swivel plate rotation range	Tool installation screw hall	Loading capacity (kg)	Weight (kg)
PS 12x8C	448 x 320	330 x 230	300 x 200	Linear encoder	0.0001	±3°	16-M6 depth 10	20	Approx. 67
PS 10x6B	398 x 260	305 x 190	250 x 150				12-M6 depth 10		Approx. 52
PS 8x6B	348 x 260	255 x 190	200 x 150				10-M6 depth 10		Approx. 49
PS 6x4B	350 x 230	210 x 160	150 x 100			—	8-M6 depth 10	15	Approx. 27.5
PS 4x4B	284 x 230	160 x 160	100 x 100				8-M6 depth 10		Approx. 23.5
PS 2x2B	ø174	ø107	50 x 50			360°	6-M6 depth 7	5	Approx. 15.5

Stage Accessories

Stage Adapter
This adapter is used to mount PS 6x4B, PS 4x4B, or PS 2x2B stage to the MM-800.

For MM-800

Rotating Tables
Used to rotate the workpiece and align it in the direction to which the stage moves.

Rotating Table Type 4
For PS 12x8C*, PS 10x6B, PS 8x6B

Rotating Table Type 3
For PS 6x4B, PS 4x4B

Tool installation screw holes (6-M6 depth 9) are located at six equidistant positions around the circumference.
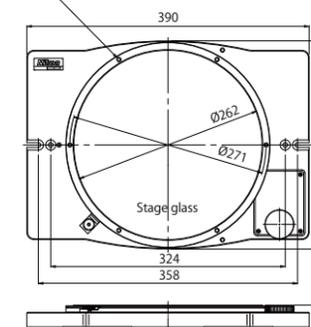
*When using rotating table type 4, stage stroke is limited in X and Y axis. Please ask Nikon for detail.

6-M6 depth 10 tool installation screw hole
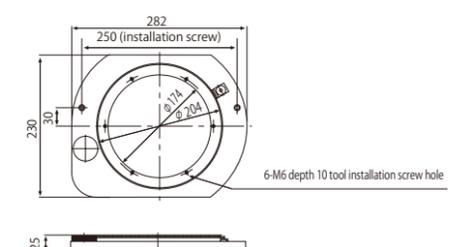
Rotating table specifications

	Table size	Glass insert size	Rotation range	Tool installation screw hole	Weight
Rotating table type 4	ø282mm	ø262mm	360° (uncalibrated)	6-M6 depth 9	Approx. 8kg
Rotating table type 3	ø204mm	ø165mm	360° (uncalibrated)	6-M6 depth 10	Approx. 5kg

Large Stage Adjustment Knob
Enables fine adjustment of swivel plate rotation for PS 12x8C, PS 10x6B and PS 8x6B.

Tilting Center Fixture A
Used to hold machined workpieces.
For MM-200, PS 6x4B*, PS 4x4B* and PS 2x2B

* Rotating Table Type 3 is required for PS 6x4B and PS 4x4B.

	Max. workpiece diameter and length when held level	Center height	Tilting angle	Weight
A	ø68 x 120mm	45mm	10° (in 1° increment)	Approx. 2.2kg

FOV Measurement with Advanced Digital Image Processing Technology

Data Processing Software E-Max Series

In combination with Nikon's industrial digital camera DS-Vi1, the new E-MAX series software provides state-of-the-art image processing technology. Automated edge detection with sub-pixel processing enables more precise and repeatable measurement. Effectively used in conjunction with a measuring microscope/profile projector, the new E-MAX series software provides the user with various advanced measurements and processing functions, ranging from two-dimensional data processing and image measurements, to data storage.

Larger icons support touch screen operation environment

Larger Icon Mode is selectable for a touch screen operation environment. The mouseless operation enables operators to concentrate on measurements.

Finer video images and fast image transfer with Nikon's innovative image processing technologies

The new E-MAX DS-V software provides FOV (field-of-view) measurements without a dedicated image processing board. This allows the software to be installed in high performance PCs. SVGA (800 x 600) images from the digital camera can be captured via IEEE1394b at very fast frame rates and can be processed and measured using Nikon's latest Automated Video Edge Detection and measuring algorithms.

Navigation function

The graphic window displays the next measurement position in brown, preventing errors and allowing speedy measurement (during replay). The current position is displayed in pink.

Chart measurement

A Chart with nominal shapes and tolerance lines can be generated from CAD data. It can be superimposed on the actual video image for easy and quick pass/fail judgments.

Illumination controls, motorized nosepiece, universal epi-illuminator, and TTL Laser AF controls

White LED illumination control is possible from E-MAX software. With motorized nosepiece, universal epi-illuminator and/or TTL Laser AF, E-MAX controls magnification switchover, microscopic methods, aperture setting, Laser AF, etc.
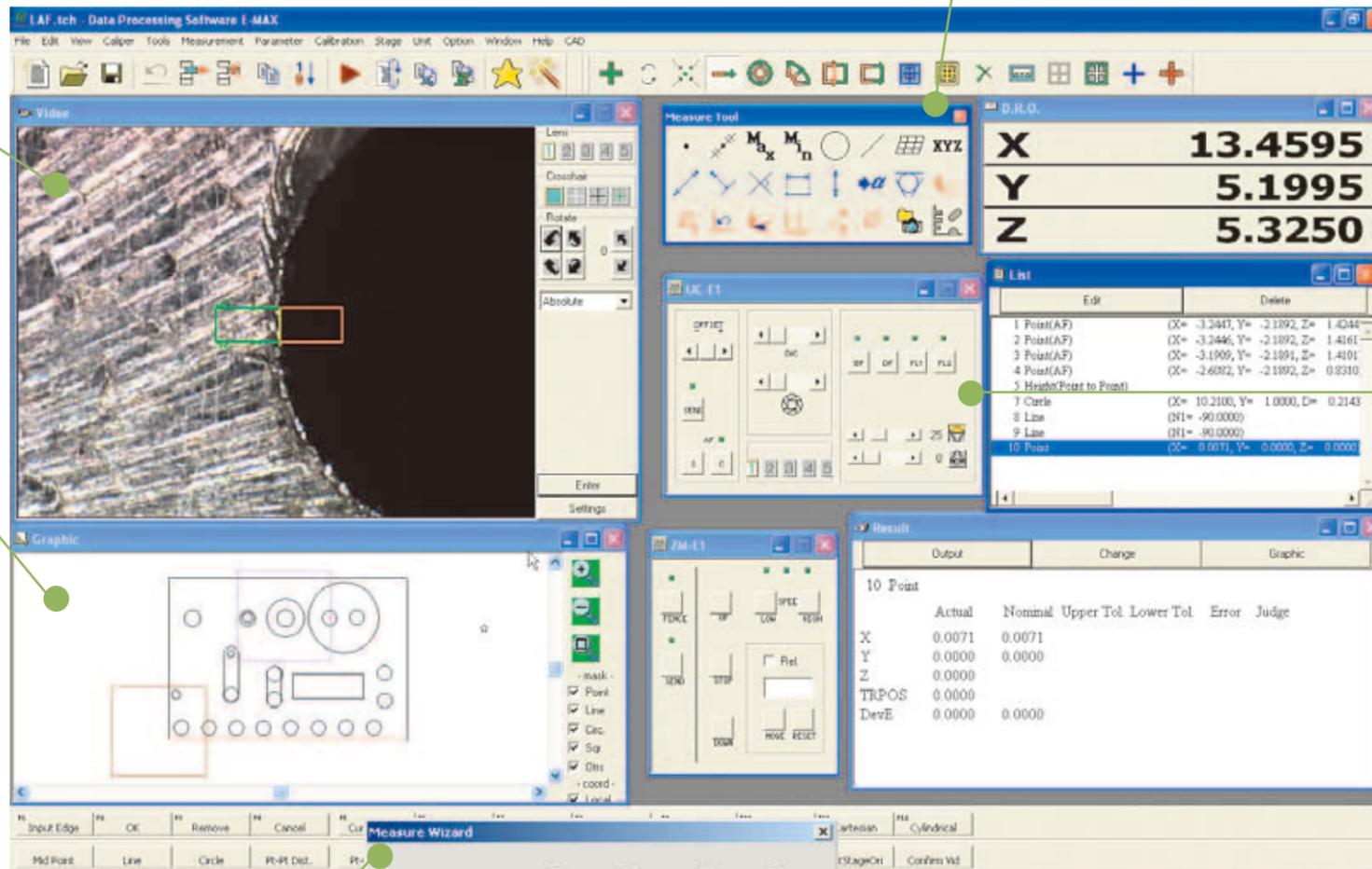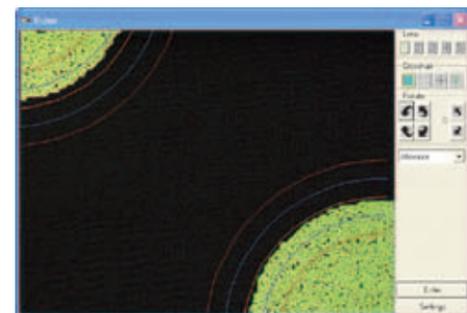
Interactive operation wizards

Depending on measurement requirements, operators can select "Quick Measure," "Teaching Measure" or "Run Teaching File" modes, with wizards.

Functions provided by each set

	DS-V set	D set
Data processing	✓	✓
Navigation during replay	✓	✓
Live video monitoring	✓	–
Chart measurement	✓	–
Automated video edge detection	✓	–

Real-time SPC via DDE (Dynamic Data Exchange)

Using a DDE Link function, measured data can be immediately transferred to spreadsheets such as Microsoft Excel®, SPC-PC IV Excel, and others, making real-time SPC analysis possible.

Note: SPC-PC IV Excel is a Quality America Inc. product.
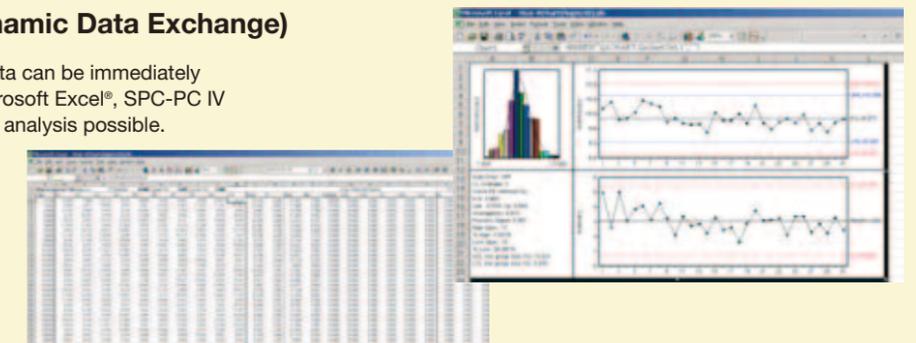
Data Processor with improved accuracy and ease of use

DP-E1

New DP-E1 data processor has been developed to improve accuracy and efficiency as a measuring system. A 0.1μm-reading counter display is built into the compact body. The 320 x 240-pixel LCD greatly improves ease of use. Effectively used in combination with a measuring microscope/profile projector, it quickly calculates and processes measurement data.

Simple & interactive operation

Feature Oriented Operation of the DP-E1 allows the user to conduct measurements by following the graphics, providing a seamless measuring environment when used in combination with the NEXIV VMR/E-MAX series software. Measurement results are automatically memorized as teaching steps and can be easily used as a measurement routine.

GD&T compliance

Geometric Dimensioning & Tolerancing defined by the ANSI Y 14.5M Specification is supported. In addition to Location Tolerancing such as True Position, MMC and LMC, determination of Form, Orientation and Runout can be conducted interactively.

Multi-language support

English, German, Japanese and various other Asian and European languages are supported.

Control panel

Labels: LCD, Coordinate reset keys, DRO display, List, Measurement prompts, results, Function keys, Measurement code keys, Macro keys, File control keys, Numeric keys, Data load key

Code

Measure code key

[Basic feature elements]

• Point
Calculates entered measurement point, or average point from multiple points.

• Line
Calculates line from two entered measurement points or from multiple points by least-square method.

• Circle/arc
Calculates circle from three entered measurement points or from multiple points by least-square method.

• Rectangle
Calculates square from entered five measurement points.

[Constructed elements]

• Mid-point
Calculates middle point from two measured points.

• Pitch
Calculates pitch between multiple measured points.

• Mid-line
Calculates middle line from two measured lines.

• Distance
Calculates distance between two measured points.

• Intersection
Calculates intersection point from two measured lines.
Calculates intersection point from measured point and line.
Calculates intersection point from two measured circles.

• Tangent
Calculates tangent point from measured point and circle.
Calculates circle to contact two measured lines.
Calculates circle to contact three measured lines.

[Coordinate systems]

• Set origin (datum)
Sets up origin of local coordinate system.

• Set axis (datum)
Sets up axis of local coordinate system.

• Displacement
Sets up move, rotation and reversion of local coordinate system.

Macro code key

M1 • Macro key

• Macro setup key
Registers combination of measurement codes for macro keys (M1 to M4).

MACRO

File key
[File run]
RUN • Run key
Runs teaching file.

• Repeat key
REPEAT Sets up repetition number of teaching file.

[File control]
• Print key
PRINT Conducts print output at discretionary timing during teaching.

• File key
FILE Shows menu to access file for file controls.

• Insert key
INSERT Inserts measurement codes between list items.

• Delete key
DELETE Deletes measurement code and entered measurement point. Deletes file during file control.

Display setting key

• Disp. key
DISP. Switches display settings.

Data input key
• Load key
LOAD Enters measurement points.

Accessory function key
• Ext1 key
EXT1 Sets up print out of standard deviation.

• Ext2 key
EXT2 Reserved

• Others key
OTHERS Reserved

Function key
• Function key
F1 Performance differs depending on displayed screen and item.

Retrofit Unit

To use the DP-E1 data processor with Measuring Microscope models MM-40/60 or Profile Projector models, V-24B, V-12B, or V-12BS, a Retrofit Unit is required as an interface.

Application Software for Measurement Support/Data Processing System

Metrology Software U-DP

Nikon Metrology Software U-DP is browser-based geometric dimensioning software. It can be effortlessly connected to desktop PCs, laptops or PDAs via Ethernet or even WiFi through a Web browser such as Safari, Internet Explorer or Firefox.
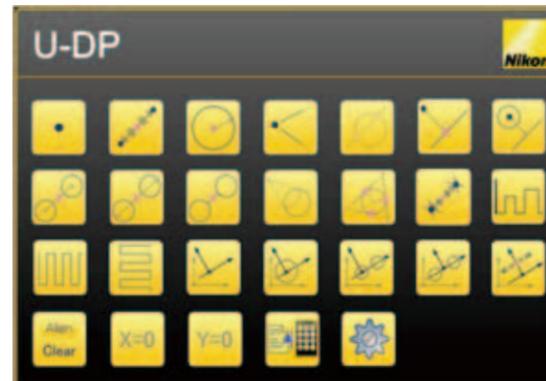
Interactive navigation enables immediate operation. Simple screen layout enables easy measurement result confirmation.
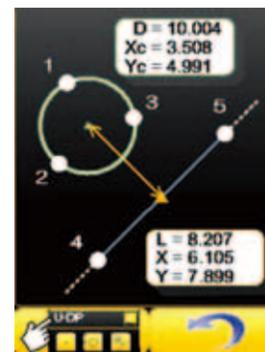
Measuring of circle center to line distance

Operating environment: Windows®XP, Windows®7
Required memory: 2GB (min)
Recommended browsers: Windows® Internet Explorer ver. 6.0.29 or later

Custom Fit QC: Report and chart generating program
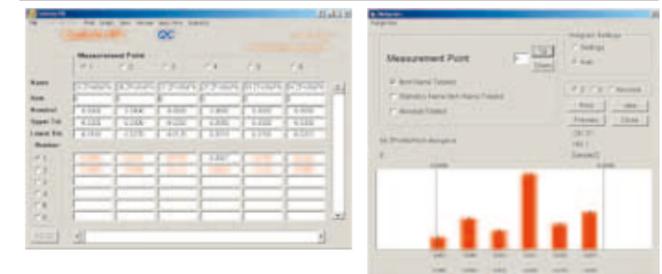
Suitable for lot control of inspection data such as maximum value, minimum value, range, standard deviation and process capability index.
• In addition to 10 standard inspection result sheet forms, it is possible to customize original forms.
• BMP and JPEG files can be pasted onto the inspection result sheet.
• Automatic generation of graph and changeable degree/minute/second display.
• Easy to generate histograms, $\bar{X}$-R control charts and scatter diagrams.

Operating environment: Windows®XP, Windows®7
Microsoft Excel 2003/2007/2010 or later
Required memory: 512MB (min)
Codevelopment: Aria Co., Ltd.

Custom Create: Direct link to Excel sheet programs

Measurement data from counters and/or data processors can be transferred directly to Excel sheets.
• Usable measuring instruments: MM-400/800 series, DP-E1, V-20B, V-12B
• Allows data transfer to customized inspection-result sheet form
• Three standard inspection-result sheet forms are available
• Transfer from multiple worksheets allows for more efficient measurements
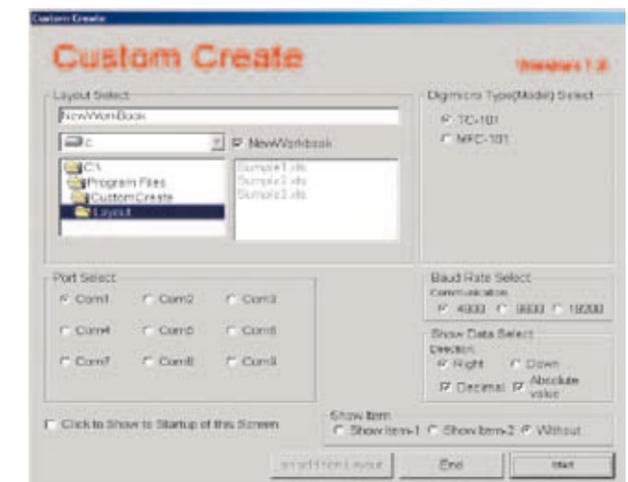
Operating environment: Windows®XP, Windows®7
Microsoft Excel 2003/2007/2010 or later
Required memory: 512MB (min)
Codevelopment: Aria Co., Ltd.

Digital Camera for Microscopes Digital Sight DS Vi1-L3

The all-in-one digital camera for microscopes enables display, measurement, image capture and storage with a simple touch of the finger or stylus. No PC connection is necessary.

Large, high-definition display for immediate microscopic observation
- Stand-alone camera control unit DS-L3 has 8.4-inch LCD monitor (XGA)
- DS-Vi1 camera head with 5.0-megapixel CCD provides high frame rate of 12fps and allows smooth focusing on monitor.

Scene mode provides optimal photography with ease
- Optimal imaging parameters are preset for different sample types. Up to seven custom modes can be set.

Wafer IC-chip   Metal Ceramic   Board   FPD
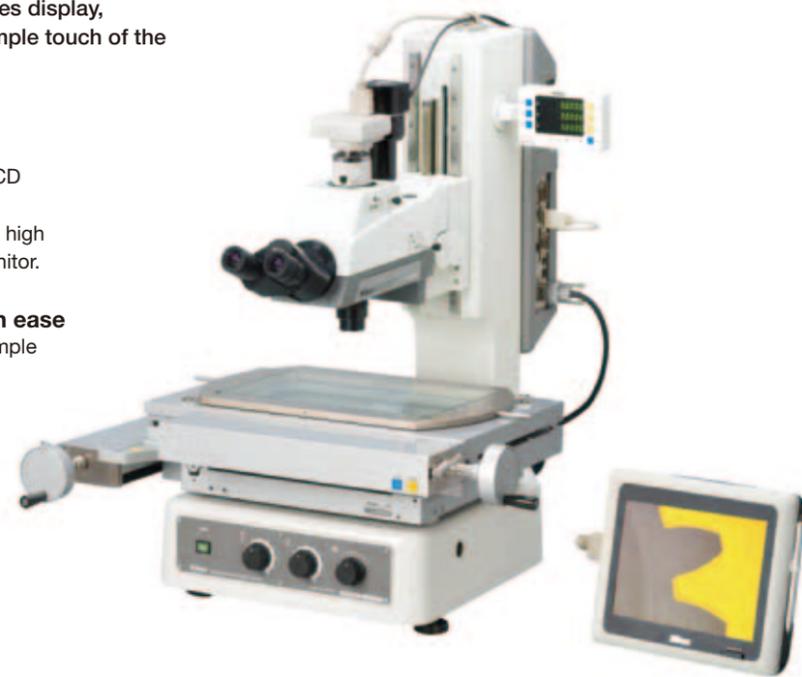
DS-Vi1-L3 configured with MM-800/LM

Various measuring tools are available
- Scale and grid line display, two-point distance measurement, and other measuring tools are available as standard.
- Convenient tools such as text input, line and graphic drawing, and super-impose are supported.
- Measurement results can be stored as CSV file for easy report generation with other PC software.

Objectives 1x, 3x, 5x, 10x, 20x, 50x, 100x

These compact objectives feature long working distances and excellent resolution. All have almost the same parfocal distances, come with lens adapter for quick and easy replacement.

The 3x objective is standard with the microscope.

Magnification	1x	3x	5x	10x	20x	50x	100x
W.D. (mm)	79	75	64	49	20	15	4

TV Reticle Adapter

To reduce user eyestrain, a Video CCTV camera can be used to make measurements on a monitor with the use of a TV reticle. The TV reticle will project sharp lines onto the monitor enabling measurements to be made. The accuracy of the reticles projected onto the monitor is the same as those seen through the eyepiece.

Direct C-mount Adapter

Used to install a C-mount NTSC CCTV camera on the microscope. To use, replace the straight tube in a trinocular tube with this adapter.

Note: LV-TV tube is required.

Protractor Eyepieces *(For all measuring microscopes except those with universal illumination.)*
Note: Monocular adapter (standard equipment) is required when using these eyepieces with trinocular tubes.

Digital Protractor Eyepiece*
Rotate the crosshairs in the viewfield to measure the angle.
Display unit: 1 minute, 10 minutes

* Not available for S and SL models

1-Minute Reading Eyepiece
The viewfield includes crosshairs and 60° lines, and angle indexes are read by appropriate microscopes. The measuring range is 360°.

10-Minute Reading Eyepiece
The viewfield includes crosshairs and angle indexes, and when the knurled ring at the lower section of the eyepiece tube is turned, the crosshairs and the vernier both rotate up to 180°.

Illuminators

8-Segment LED Ring Light CYN-E1
The CYN-E1 enables flexible illumination from eight directions. It is not necessary to adjust the position of illumination fibers by hand at each measurement and/or observation.

Can be used with measuring microscope MM-400/800.
Can be used with E-max series software.
The RS-232C cable is standard with the illuminator.
An E-BUS cable is required to control the illuminator with E-MAX.

Fluorescent Lamp Illuminator
The ring fluorescent tube provides smooth, uniform illumination without shadows over the entire field. The fluorescent tube has a service life of approximately 2,000 hours and is easy to replace.

Fluorescent lamp transformer: 120 (W) x 150 (D) x 70 (H)mm
Cannot be used with metallurgical microscope objectives.
Cannot be mounted when 20x, 50x and 100x measuring microscope objectives are used.

Fiber-optics Bifurcated and Ring Illuminators
As an LED illuminator with reflective mirror is used, a bright light source is obtained and the brightness is adjustable. The ring fiber illuminator produces cone-shaped illumination, minimizing shadows caused by any unevenness on the workpiece surface. The bifurcated fiber enables flexible illumination from two directions.

Cannot be used with metallurgical microscope objectives.
Cannot be mounted when 20x, 50x and 100x measuring microscope objectives are used.

LED Ring Illuminator
This illuminator uses 60 high output white LEDs with a variable intensity control and constant color temperature. The LEDs have a very long service life making them ideal for a production environment as there are no bulbs to change.

Cannot be used with metallurgical microscope objectives.
Cannot be mounted when 20x, 50x and 100x measuring microscope objectives are used.

MM Adapter for External Illuminator (except 8-Segment LED Ring Light CYN-E1)
This adapter mounts standard Stereo Microscope Ring Illuminators onto the MM-400/800 stands with TM objectives. May be used to mount Fiber Optic Ring, fluorescent lamp ring and LED ring illuminators.

Counters

3-Axis/2-Axis Counters

2-axis and 3-axis counters are available. The separate display unit can be mounted on the measuring microscope. Counters can be connected with data processors and digital printers via the RS-232C port.

3-axis counter

2-axis counter

Digital Thermal Printers DPU-414/TSP651-24

Print out counter values once connected to rear control box of measuring microscope MM-400/800.

DPU-414

TSP651-24

Standard 300mm Scale

This scale is used to calibrate measuring stage travel up to 300mm. Both 10mm-interval sensor patterns and calibrations are provided. It is made of low expansion glass to minimize thermal error.

Accuracy: Within 1μm against compensation values.

Vibration Isolation Table

Provides a stable, even surface by reducing floor vibrations. It is compatible with measuring microscopes, data processing systems, external light modulators and computers.

	MM-400/800
Installation part	450 (W) x 689 (D) mm
Dimensions	1058 (W) x 689 (D) x 751 (H) mm

XY Reset Switch

An XY reset switch can be attached to the microscope body so that coordinates can be easily reset while stage is in operation.

Y-axis

X-axis

Remote Switch

Enables reset and SEND remote control of counter.

Foot Switch

Used to send load command to DP-E1 and DPU-414. Frees both hands to enhance measurement efficiency.

Templates

The following dedicated templates are available to facilitate profile comparison and measurements.
• Standard angle templates (standard equipment)
• Concentric; diameter 0.2-4.6*

Note: Designed for 3x objectives.

*Cannot be attached to monocular type

MM-200 System Diagram

MBJ99000 Eye Guard for CFWN 10x Eyepiece

EDH20410 Concentric Circles (0.2-4.6 mm diameters in 0.2 mm increments)

EDD52000 Epi-illuminator for MM Monocular Optical Head

C-mount Camera

MQA25020 DS-U3 CCU
MQF11010 DS Camera I/F Cable
IEEE1394b Cable

EDG20100 Eyepiece 10x

EDG40100 MM Eyepiece Lens 10x for Monocular Head

MQA12010 DS-Vi1, etc.

PPL00200 XY Reset Switch

PPL00100 Counter Remote Switch

EDC50100 MM-200 C-mount Video Head

EDC50300 MM-200 Monocular Optical Head

EFE00202 Foot Switch 4

EDG20600 Protractor 10' Reading

EDG20701 Protractor 1' Reading A

EDG50700 Digital Protoractor for Monocular Head

PXA20224 Connection Cable for Simultaneous Use of Remote and Foot Switch

EFB50200 2-axis Digital Counter SC2-E1

EDF20010 TM Objective Lens 1x
EDF20031 TM Objective Lens 3x
EDF20052 TM Objective Lens 5x
EDF20102 TM Objective Lens 10x

EDF50001 Measuring Microscope Objective Adapter

PPG40000 Tilting Center Fixture A

EXA20409 MM Adapter for External Illuminator

MME39600 C-FID Bifurcated Fiber Light Guide

MNF52750 C-FLED LED Light Source for Fiber Illuminator

E-BUS Cable Port, USB Port, etc.

EXK30024 8-segment LED Ring Light CYN-E1

MXK21640 LED Ring Illuminator

MMF34910 C-FRL Fluorescent Ring Lamp 8 W

MME39610 C-FIR Ring Fiber Illuminator Guide

EXA20411 E-BUS Cable

MMF32920/MMF32940 C-FPS115/230 Fluorescent Ring Illuminator with Transformer

EDA52000 MM-200 Stand MM Controller Backpack Interface Z: Manual Motion

USB Cable
IEEE1394b Cable

Desktop PC

EDF11000 E-MAX DS-V/D Sytem

EFB51000 DP-E1 Data Processor Unit

PAE00101 MM AC Adapter

PAE08210 Power Cord (100-120V)
PAE08410 Power Cord (220-240V)

MQF52050 DS AC Adapter (100-240V)

MM-200 Dimensional Diagram

Monocular Eyepiece Head

C-mount Video Head

MM-400/800 System Diagram

MBJ99000
Eye Guard for
CFWN 10x Eyepiece

EDG40100
MM Eyepiece Lens 10x
for Monocular Head

EDG20100
Eyepiece 10x

EXA20340
Monocular Eyepiece
Tube Adapter

EDG20600
Protractor 10' Reading

EDG20701
Protractor 1' Reading A

EDG50700 Digital Protoractor
for Monocular Head

MBJ20100
ME CFWN 10x

EDB40200
Binocular Tube

C-mount Camera

Digital Sight Series

MQD42000
C-mount Adapter

MBB63435
LV-TV Tube

MBB92100
C-TB Binocular Tube

MBB63425
LV-TI3 Trinocular
Eyepiece Tube

EDB50300
LV-TT2 Tilting Trinocular Eyepiece Tube
with Built-in Reticle

PPG40000
Tilting Center
Fixture A

PXA20225
Large Sage Adjustment Knob

PPE50110
Rotating Table Type 4*

*When using rotating table type 4,
stage stroke is limited in X and Y axis.
Please ask Nikon for detail.

EDH40400
Concentric Circles
Reticle (0.2-4.6mm
diameters in 0.2mm
increments)

EDD50001
LED Epi-illuminator

EDD52001
Epi-illuminator for
MM400/800 Monocular
Optical Head

MBE60310
LV-U EPI2A

MBE60300
LV-U EPI2

MBE60201
LV-U EPI

EDC52200
LV-U EPI FA

MBE60500
LV-EPI LED

EDC55000
U-AF Unit

PPE42100
Rotating Table Type 3

PPB27700
PS 2x2B Stage

PPB57700
PS 8x6B Stage

PPB37700
PS 4x4B Stage

PPB67700
PS 10x6B Stage

PPB47700
PS 6x4B Stage

PPB77700
PS 12x8C Stage

EDC50000
Trinocular Optical Head

EDC50200
Trinocular Optical
FA Head

EDC51000
Variable Magnification
Optical Head

EDC51200 FA
Variable Magnification
Optical Head

EDC52000
Monocular Optical Head

EDC54000
U Bracket Mount LV

LV-NU5A Nosepiece
MBP60105, etc.

MXA23017
LU Nosepiece Adapter
M32-25

TU PLAN FLUOR EPI
Objective Lens
MUE12050, etc.

Objective Lens

EXK30083 8-divided LED
Ring Illuminator for Variable
Magnification Optical Head

Objective Lens

EXA20411
E-BUS
Cable

TU PLAN FLUOR BD
Objective Lens
MUE42050, etc.

EFH28000
MM Stage Adapter for MM800

EDF50001
Measuring Microscope
Objective Adapter

EDF20010
TM Objective Lens 1x

EDF20031
TM Objective Lens 3x

EDF20052
TM Objective Lens 5x

EDF20102
TM Objective Lens 10x

EDF20201
TM Objective Lens 20x

EDF20501
TM Objective Lens 50x

EDF21001
TM Objective Lens 100x

EDA54300 EDA54400
MM-400/S 400/SL Stand
Z: Manual Motion
SL: Z-axis Scale

EDA54000 EDA54100
MM-400 400/L Stand
MM Controller Backpack Interface
Z: Manual Motion
L: Z-axis Scale

EDA54200
MM-400/LM Stand
MM Controller Backpack Interface
Z Motorized Control with Linear Scale

EDA58300 EDA58400
MM-800/S 800/SL Stand
Z: Manual Motion
SL: Z-axis Scale

EDA58000 EDA58100
MM-800 800/L Stand
MM Controller Backpack Interface
Z: Manual Motion
L: Z-axis Scale

EDA58200
MM-800/LM Stand
MM Controller Backpack Interface
Z Motorized Control with Linear Scale

EXA20409
MM Adapter
for External Illuminator

MME39600
C-FID Bifurcated
Fiber Light Guide

MNF52750
C-FLED LED Light Source
for Fiber Illuminator

EXK30024
8-segment
LED Ring Light
CYN-E1

MXK60234
LED Ring
Illuminator

MMF34910
C-FRL Fluorescent
Ring Lamp 8W

MME39610
C-FIR Ring Fiber
Illuminator Guide

MMF32921/MMF32940
C-FPS115/230 Fluorescent
Ring Illuminator with
Transformer

EXA20411 E-BUS Cable

EDD51001
LED Dia-illuminator

EDD55805
MM-U Epi
Lamphouse LV

MXA23045
LV-HL50W
12V50W-LL
Halogen Lamp

MEF52251
TI-PS100W
Power Supply

MXA 20095
12V50W Lamp

EDD52200
Halogen Light
Intensity
Control Cable

EFB50200
2-axis Digital Counter
SC2-E1

Power Source Unit for
Motorized Z-axis

Motorized Z-axis Console

EDE51000
Motorized U EPI Driver

EDE52000
MM400/800 U-AF
Controller

EFB50300
3-axis Digital Counter
SC3-E1

EXA20364
SC213
Display Arm

EFB51000
Data Processor Console
DP-E1

PPL00200
XY Reset Switch

EFE00202
Foot Switch 4

PPL00100
Counter Remote
Switch

E-MAX
DS-V Type

Desktop PC

E-MAX
D Type

Desktop PC

PAE00101
MM AC Adapter

PAE08210/08410
Power Cord

MQF52055
AC Adapter Dsi (100-240V)

Identical with MPF52061
FA AC Adapter 2

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Measuring Microscope MM-400/800 Suggested Configuration Chart

Measuring microscope

	Order	Model	MM-400/S	MM-400	MM-400/L	MM-400/SL	MM-400/LM	MM-800/S	MM-800	MM-800/SL	MM-800/L	MM-800/LM
		Z-axis Motion	Manual	Manual	Manual	Manual	Motorized	Manual	Manual	Manual	Manual	Motorized
		Z-axis Scale	No	No	Yes	Yes	Yes	No	No	Yes	Yes	Yes
		MM Controller Backpack Interface	No	Yes	Yes	No	Yes	No	No	Yes	Yes	Yes
		Stage	PS 4x4B	PS 2x2B	PS 6x4B	PS 6x4B	PS 6x4B	PS 8x6B	PS 10x6B	PS 10x6B	PS 12x8C	PS 12x8C
		Head	Trinocular	Monocular	Trinocular	Trinocular	Trinocular	Trinocular	Trinocular	FA	Trinocular	FA
		Illuminator	-	-	Halogen Fiber Ring	-	8-seg. LED Ring	-	White LED Ring	-	8-seg. LED Ring	8-seg. LED Ring
	Order	Data Processor	3rd Party	-	DP-E1	3rd Party	E-MAX DS-V	3rd Party	DP-E1	3rd Party	E-MAX DS-V	E-MAX DS-V
Main Body Stand	EDA54000	MM-400 Stand		✓								
	EDA54100	MM-400/L Stand			✓							
	EDA54200	MM-400/LM Stand					✓					
	EDA54300	MM-400/S Stand	✓									
	EDA54400	MM-400/SL Stand				✓						
	EDA58000	MM-800 Stand							✓			
	EDA58100	MM-800/L Stand									✓	
	EDA58200	MM-800/LM Stand										✓
	EDA58400	MM-800/SL Stand								✓		
	EDA58300	MM-800/S Stand						✓				
	PAE00101	MM AC Adapter	✓	✓	✓ 2pcs			✓	✓ 2pcs	✓	✓	
	PAE08210/410	Power Cable	✓	✓	✓ 2pcs	✓	✓	✓	✓ 2pcs	✓	✓	✓
Optical Head & Eyepiece Tube/ Lenses	EDC52000	Monocular Optical Head		✓								
	EDG40100	MM Eyepiece Lens 10x for Monocular Head		✓								
	EDC50000	Trinocular Optical Head	✓		✓	✓	✓	✓	✓		✓	
	EDC50200	Trinocular Optical FA Head								✓		✓
	EDB40200	Binocular Tube	✓		✓	✓	✓	✓	✓	✓	✓	✓
	MBJ20100	ME CFWN 10x (2pcs)	✓		✓	✓	✓	✓	✓	✓	✓	✓
Illuminators	EDD51001	LED Dia-illuminator	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	EDD50001	LED Epi-illuminator	✓		✓	✓	✓	✓	✓	✓	✓	✓
	EDD52001	Epi-illuminator for MM400/800 Monocular Optical Head		✓								
	EXK30024	8-segment LED Ring Light CYN-E1 (100-240V)					✓				✓	✓
	EXA20411	E-BUS Cable			✓		✓		✓		✓	✓
	PAE08210/410	Power Cable					✓				✓	✓
	EXA20409	MM Adapter for External Illuminator			✓				✓			
	MME39610	C-FIR Ring Fiber Illuminator Guide			✓							
	MNF52750	C-FI115/230 Fiber Illuminator			✓							
	MXK60234	LED Ring Illuminator (100-240V) (ESD Type only)							✓			
Objective Lenses	EDF20031	TM Objective Lens 3x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	EDF20101	TM Objective Lens 10x								✓		✓
	EDF50001	Measuring Microscope Objective Adapter	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Stages & Rotating Tables	PPB27700	PS 2x2B Stage		✓								
	PPB37700	PS 4x4B Stage	✓							2pcs		2pcs
	PPB47700	PS 6x4B Stage			✓	✓	✓					
	PPB57700	PS 8x6B Stage						✓				
	PPB67700	PS 10x6B Stage							✓	✓		
	PPB77700	PS 12x8C Stage									✓	✓
	EFH28000	MM Stage Adapter for MM800 (PS 8x6B or smaller)						✓				
	PXA20225	Large Stage Adjustment Knob						✓	✓	✓	✓	✓
	PPE42100	Rotating Table Type 3			✓	✓	✓					
	PPE50110	Rotating Table Type 4							✓	✓	✓	
DRO/Data Processing Unit/ Printer	EFB50200	2-axis Digital Counter SC2-E1		✓								
	EFB50300	3-axis Digital Counter SC3-E1					✓				✓	(✓)*
	EFB51000	Data Processor Console DP-E1			✓				✓			
	PXA20218	SC-213 Z-signal Cable			✓							
	PPL00200	XY Reset Switch		✓								
	EFE00202	Foot Switch 4			✓		✓		✓		✓	✓
	EXK21072	Digital Thermal Printer Model DPU-414			✓				✓			
	EXK21073/74	DPU-414 AC Adapter			✓				✓			
	EXK21156	Printer Paper for SC-7P/DPU-414 (1 roll)			✓				✓			
	EXA20366	9-9 Pins RS-232C Normal Cable (2m)			✓				✓			
Data Processing System E-MAX DS-V Set	EDF11000	Data Processing Software E-MAX					✓				✓	✓
	EXA20371	E-MAX Calibration Plate					✓				✓	✓
	MQA12010	DS-Vi1 Color Camera Head					✓				✓	✓
	MQA25020	DS-U3 CCU					✓				✓	✓
	MQF11010	DS Camera I/F Cable 20/60					✓				✓	✓
	MQF52055	AC Adapter Dsi (100-240V)					(✓)**				(✓)**	(✓)**
	MBB63430	LV-TV Tube					✓				✓	✓
	MQD42000	C-mount Adapter					✓				✓	✓
	PAE08210/410	Power Cable					(✓)**				(✓)**	(✓)**
	MXK37363	USB A to B Cable					✓				✓	✓
	EXK30146	IEEE1394 Cable					✓				✓	✓

*With the combination of MM firmware Ver. 1.09.08 and E-MAX software Ver. 5.20 or later, 2-axis Digital Counter SC2-E1 and 3-axis Digital Counter SC2-E3 are not always required. E-MAX Software Ver. 5.20 or later supports DRO reset and MM settings.

** Some desktop PCs may be able to supply bus power to the DS-U3 via the IEEE1394b cable without the AC adapter Dsi. However, this should be verified beforehand.

High power measuring microscope

	Order	Model	MM-400/U	MM-400/LU	MM-400/LMU	MM-800/SU	MM-800/LU	MM-800/SLU	MM-800/LMU	MM-800/LMU	MM-800/SLU
		Z-axis Motion	Manual	Manual	Motorized	Manual	Manual	Manual	Motorized	Motorized	Manual
		Z-axis Scale	No	Yes	Yes	No	Yes	Yes	Yes	Yes	No
		MM Controller Backpack Interface	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No
		Stage	PS 4x4B	PS 4x4B	PS 6x4B	PS 8x6B	PS 12x8C	PS 10x6B	PS 12x8C	PS 12x8C	PS 10x6B
		Head	Y-TB	TT2 with Reticle	TI3	TT2 with Reticle	TT2 with Reticle	TI3	TT2 with Reticle	TT2 with Reticle	TI3
		Illuminator	LV-EPI LED	LV-U EPI FA	LV-U EPI2	LV-U EPI	LV-U EPI FA	LV-U EPI FA	LV-U EPI FA	LV-U EPI2A + LAF	LV-U EPI FA
	Order	Data Processor	-	E-MAX DS-V	E-MAX DS-V	3rd Party	E-MAX DS-V	3rd Party	E-MAX DS-V	E-MAX DS-V	3rd Party
		Microscopy	BF	BD-DIC	BD-DIC-FL	BF	BD-DIC	BD	BD-DIC	BD-DIC-FL	BF
Main Body Stand, U-bracket & Illuminator	EDA54000	MM-400 Stand	✓								
	EDA54100	MM-400/L Stand		✓							
	EDA54200	MM-400/LM Stand			✓						
	EDA54400	MM-400/SL Stand									
	EDA58000	MM-800 Stand									
	EDA58100	MM-800/L Stand					✓				
	EDA58200	MM-800/LM Stand							✓	✓	
	EDA58400	MM-800/SL Stand						✓			✓
	EDA58300	MM-800/S Stand				✓					
	PAE00101	MM AC Adapter	✓	✓	✓	✓	✓	✓	✓		✓
	PAE08210/410	Power Cable	✓	✓	✓	✓	✓	✓	✓		✓
	EDC54000	U Bracket Mount LV	✓	✓	✓	✓	✓	✓	✓	✓	✓
	EDD51001	LED Dia-illuminator (used for U-FA as Epi-illuminator)	✓	2pcs	✓	✓	2pcs	2pcs	2pcs	✓	2pcs
Stages & Rotating Tables	PPB37700	PS 4x4B Stage	✓	✓							
	PPB47700	PS 6x4B Stage			✓						
	PPB57700	PS 8x6B Stage				✓					
	PPB67700	PS 10x6B Stage						✓			✓
	PPB77700	PS 12x8C Stage					✓		✓	✓	
	EFH28000	MM Stage Adapter for MM800 (PS 8x6B or smaller)				✓					
	PXA20225	Large Stage Adjustment Knob				✓	✓				
	PPE42100	Rotating Table Type 3		✓							
	PPE50110	Rotating Table Type 4						✓			
DRO/Data Processing System	EFB50200	2-axis Digital Counter SC2-E1	✓								
	EFB50300	3-axis Digital Counter SC3-E1		(✓)*	(✓)*		(✓)*		(✓)*	(✓)*	
	PXA20218	SC-213 Z-signal Cable									
	EFE00202	Foot Switch 4		✓	✓		✓		✓	✓	
	EDF11000	Data Processing Software E-MAX		✓	✓		✓		✓	✓	
	EXA20371	E-MAX Calibration Plate		✓	✓		✓		✓	✓	
	MQA12010	DS-Vi1 Color Camera Head		✓	✓		✓		✓	✓	
	MQA25020	DS-U3 CCU		✓	✓		✓		✓	✓	
	MQF11010	DS Camera I/F Cable 20/60		✓	✓		✓		✓	✓	
	MQF52055	AC Adapter Dsi (100-240V)		(✓)**	(✓)**		(✓)**		(✓)**	(✓)**	
	MBB63430	LV-TV Tube		✓	✓		✓		✓	✓	
	MQD42000	C-mount Adapter		✓	✓		✓		✓	✓	
	PAE08210/410	Power Cable		(✓)**	(✓)**		(✓)**		(✓)**	(✓)**	
	MXK37363	USB A to B Cable		✓	✓		✓		✓	✓	
	EXK30146	IEEE1394 Cable		✓	✓		✓		✓	✓	
Manual, Motorized Control U-Epi Illuminator/LAF System	MBE60500	LV-EPI LED	✓								
	MPF52061	FA AC Adapter 2 (same as MQF52055)	✓								
	PAE08210/410	Power Cable	✓								
	MBE60200	LV-U EPI (BF DF DIC)				✓					
	EDC52200	LV-U EPI FA		✓			✓	✓	✓		✓
	MBE60300	LV-U EPI2 (BF DF DIC FL)			✓						
	EDE51000	Motorized U EPI Driver								✓	
	PAE00101	MM AC Adapter (For EDE51000)								✓	
	PAE08210/08410	Power Cable								✓	
	EDE52000	MM400/800 U-AF Controller								✓	
	MBE60310	LV-U EPI2A (BF DF DIC FL)								✓	
	EDC55000	U-AF Unit								✓	
Filters & Halogen Light Source	MBN66750	YM-NCB25 NCB11		✓	✓		✓		✓	✓	
	MBN66760	YM-ND25 ND4/ND16		✓	✓		✓		✓	✓	
	MXA23045	LV-HL50W 12V50W-LL Halogen Lamp		✓	✓		✓		✓	✓	
	MEF52251	TI-PS100W Power Supply (100-240V)		✓	✓		✓		✓	✓	
	PAE08210/08410	Power Cable		✓	✓		✓		✓	✓	
	EDD55805	MM-U Epi Lamphouse LV		✓	✓		✓		✓	✓	
	EDD52200	Halogen Light Intensity Control Cable (LV-EPI LED or MEF42252 Power Supply to MM Controller)	✓	✓	✓		✓		✓	✓	
Tubes & Eyepiece Lenses	MBB92100	C-TB Binocular Tube	✓								
	MBB63425	LV-TI3 Trinocular Eyepiece Tube		✓ 2pcs	✓		✓				✓
	EDB50300	LV-TT2 Trinocular Tube with Built-in Reticle		✓		✓	✓	✓	✓	✓	
	MAK10100	CFI 10x	✓	✓	✓						✓
	MAK30100	CFIUW 10x (2pcs)				✓	✓	✓			
	MAK12100	CFI 10x CM Crosshair Reticle with Diopter Adjustment	✓		✓	✓		✓			✓
Revolving Nosepiece	MBP60105	LV-NU5A U5A Nosepiece						✓			
	MBP60115	L-NU5 U5 Nosepiece ESD		✓	✓		✓				
	MBP60125	L-NBD5 BD5 Nosepiece									
	MBP71315	C-N6 Nosepiece (up to 5 objective lenses)	✓		✓						✓
BF Objectives	MUE12050	TU PLAN FLUOR EPI 5x	✓		✓						✓
	MUE12100	TU PLAN FLUOR EPI 10x	✓		✓						✓
	MUE21200	TU PLAN EPI ELWD 20xA	✓		✓						✓
	MUE21500	TU PLAN EPI ELWD 50xA	✓		✓						✓
BD/DIC/FL Objectives & Accessories	MUE42050	TU PLAN FLUOR BD 5x		✓	✓		✓		✓	✓	
	MUE42100	TU PLAN FLUOR BD 10x		✓	✓		✓		✓	✓	
	MUE61200	TU PLAN BD ELWD 20x		✓	✓		✓		✓	✓	
	MUE61500	TU PLAN BD ELWD 50x		✓	✓		✓		✓	✓	
	MUE61900	TU PLAN BD ELWD 100x		✓	✓		✓		✓	✓	
	MBP60170	L2-DIC DIC Prism for Eclipse Microscopes		✓	✓		✓		✓	✓	
	MBN66921	YM-PO Polarizer for LV-U EPI (MBE60200)		✓	✓		✓		✓	✓	
	MBN66922	L-AN Analyzer for LV-U EPI (MBE60200)		✓	✓		✓		✓	✓	
	MBE44500	C-FL Epi-Fl Filter Block N B-2A			✓					✓	