



DIGIMICRO

# MH-15M

User's Manual

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Thank you for purchasing the Nikon DIGIMICRO MH-15M.

Read thoroughly this user's manual before starting operation to be sure of getting optimum performance and longer service life from the unit.



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## About WARNING and CAUTION symbols used in the manual

Nikon products are designed with full consideration of safety. However, improper use or failure to observe precautions may result in injury or damage to property. Thoroughly read this user's manual before you use the product, and use the product appropriately. We recommend that you download or bookmark the manual so that you can refer to it whenever necessary.

This manual uses the following symbols to highlight what requires special attention for safety. Be sure to follow the instructions with those symbols.

<b>Symbol</b>	<b>Description</b>
 <b>WARNING</b>	Failure to follow the instructions may result in death or a serious injury.
 <b>CAUTION</b>	Failure to follow the instructions may result in injury or property damage.

 **WARNING****1. Purpose of Using the Product**

This product is precision measuring equipment. Do not use the product for any purposes other than its intended use.

**2. Do Not Disassemble or Modify**

Do not disassemble or modify the product. Such actions may cause a malfunction and/or electrical shock. If you notice an abnormality, contact your local Nikon representative.

**3. Do Not Splash Water or Allow Foreign Matter to Enter the Product**

To prevent the product from a failure or abnormal heat generated by a short circuit, never wet the product or any devices used with it or allow them to be contaminated by foreign matter. If they should get wet or foreign matter such as a piece of paper should get inside the product or peripheral devices, immediately turn off their power supplies, and then remove the AC power cord of the AC adapter. Avoid operating the product in this condition and contact your local Nikon representative.

**4. Do Not Excessively Bend or Twist the Cables**

Do not excessively bend or twist the cables. Such actions may damage the cables, causing an ignition or fire.

 **CAUTION****1. Turn the Power of the Peripheral Devices OFF before Installation or Cable Connection/ Disconnection**

To prevent any failure or malfunction, always turn off the power of the peripheral devices when installing the product or connecting or removing the cables.

**2. Precautions for Installation and Storage**

- Be careful not to get your fingers or hands pinched.
- This product is precision equipment. In order to prevent any failure and maintain accuracy, always handle the product with sufficient care and avoid applying a shock or strong vibrations.
- If the product is not to be used for a long time, turn off the power switches of the peripheral devices and remove the AC power cord of the AC adapter from the outlet.

# Notes on the use of the product

## Handle with care

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- This product is precision measuring equipment. Handle the product carefully to avoid applying excessive force or shock.
- To make a continuous measurement with the product connected to an automated machine, secure the tip of the spindle to the surface to be measured, where care should be taken not to allow radial load in excess of the specified value to apply to the spindle.
- Avoid tracing the surface to be measured with the use of only measuring force generated by the product.
- Contaminated spindle may cause a malfunction. Wipe the dirty spindle with a dry cloth. Furthermore, apply a small amount of lubricant (turbine oil equivalent to SAE#20) regularly.

## Installation

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Install the product in a stable, vibration-free place. Do not install the product near direct sunlight, in an excessively dusty environment, or in a place subject to extreme temperature change. Do not use the product in an environment that exceeds the operating temperature range (0°C to 40°C).

## Disposal

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When disposing of the product, follow the laws and regulations of your country or region.

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# 1 Names and Functions of Components

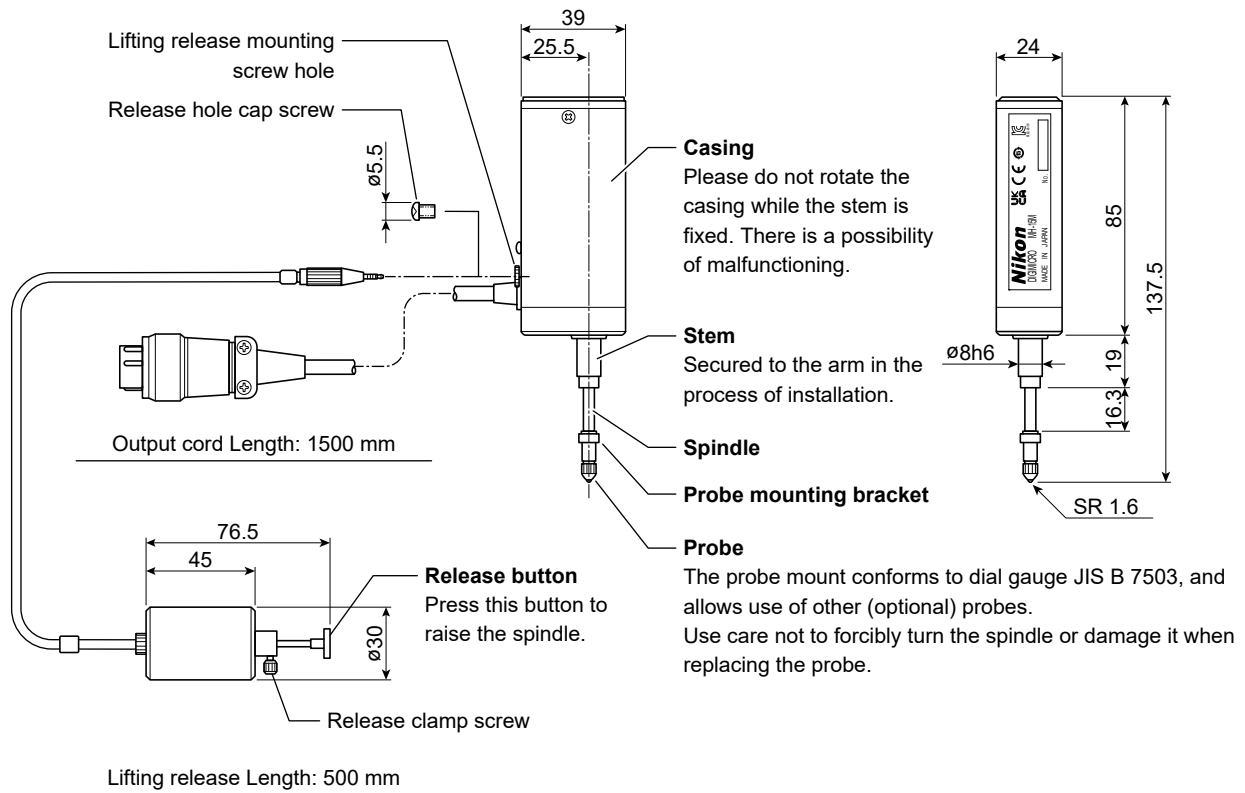
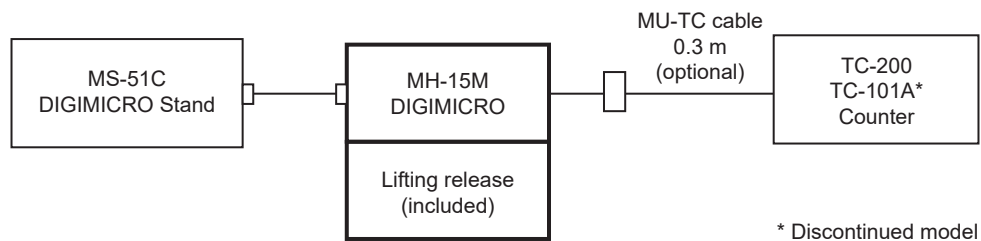


Figure 1 Component names

# 2 System Configuration



Note:

- Counters, DIGIMICRO Stands, probes, and cables other than the standard probe are optional. To purchase optional components, contact your local Nikon representative from which you purchased the DIGIMICRO.
- For details about connection with other devices, contact your local Nikon representative as well.

Figure 2

## 3 Methods of Use

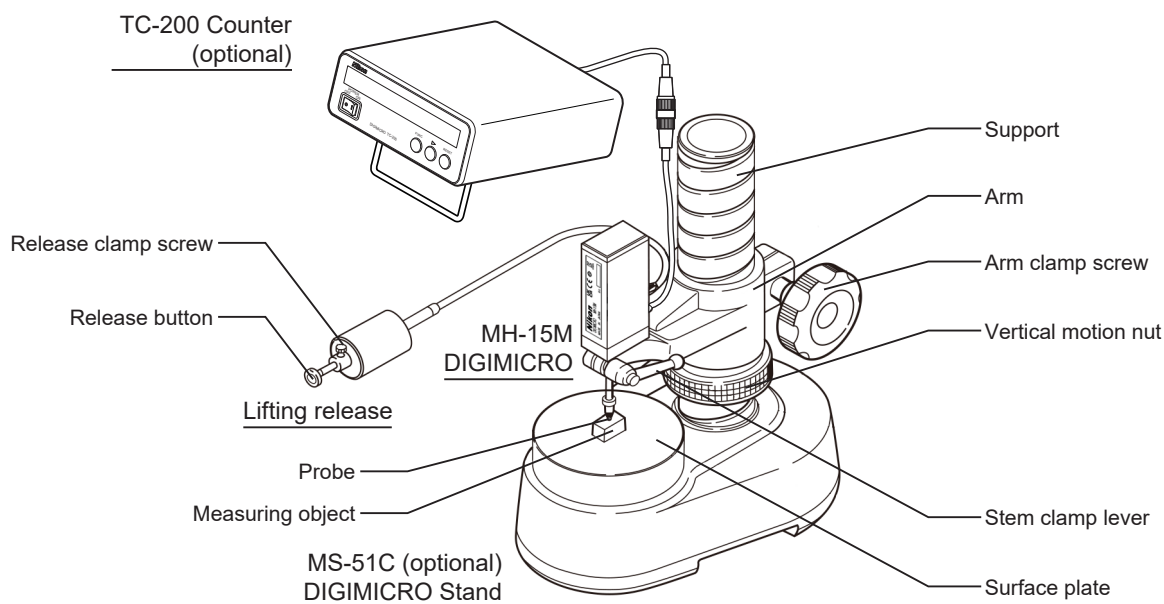


Figure 3

### 3.1 Securing the DIGIMICRO



#### CAUTION

- When securing the DIGIMICRO, see the DIGIMICRO Stand user's manual.
- Do not exert excessive force when tightening the stem. Overtightening might cause a failure such as impaired spindle operation.
- Do not tighten the arm clamp screw without the DIGIMICRO installed. Failure to follow this instruction might cause a failure in the DIGIMICRO Stand and the product.

Tighten the stem of the DIGIMICRO by using the stem clamp lever.

When using the MS-51C DIGIMICRO Stand, insert the stem in the arm's  $\varnothing 8$  mm hole after loosening the stem clamp lever, and then turn the stem clamp lever right to secure it.

The brake of the stem clamp lever is disengaged when pulled in the direction of the axis of rotation, so the lever can be stopped at your favored position.

### 3.2 Connecting the lifting release

**Note: Attach the release hole cap screw when you are not using the lifting release.**

Remove the release hole cap screw (M3 pan head screw, head diameter: 5.5 mm) attached to the lifting release mounting screw hole at the back of the DIGIMICRO. Screw the tip of the lifting release into the same screw hole.



### 3.3 Connecting with a Counter

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**Note:**

- **Be sure to turn off the Counter's power before connecting to or disconnecting from the TC-200 Counter.**
- **Be sure to connect to ground the earth terminal of the Counter's AC power cord to prevent the main unit from malfunctioning due to noise.**

Connect the MU-TC connection cable (optional) and the Counter's AC power cord in accordance with the user's manual of the Counter.

### 3.4 Turning off the power supply

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Turn off the power supply of the connected devices.

The product does not have a power supply. For details about how to operate the power supply of the connected devices, see the relevant user's manual.

### 3.5 Moving the spindle

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The included lifting release is used to manually operate the spindle. Take care because operating it too rapidly may result in an error due to overspeed.

### 3.6 Release clamp

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Gently tightening the release clamp screw when the spindle has been raised with the lifting release will keep the spindle in this raised state.

This is convenient at times such as placing measuring objects.

### 3.7 Turning on the power supply

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Turn on the power supply of the connected devices.

The product does not have a power supply. For details about how to operate the power supply of the connected devices, see the relevant instruction manual.

## 3.8 Measuring examples

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Simple measuring examples using basic combinations are shown below (see Figure 3).

### (1) DIGIMICRO travel

**Note:**

- Use the probe after it has been sent at least 0.2 mm. If the probe has been sent less than 0.2 mm, a measurement error might occur.
- Not taking into consideration factors such as temperature and dust in the air may lead to unforeseen measurement errors.
- When conducting a high-precision measurement of a mirrored plane surface like a block gauge, prepare a reference plane made from the same materials and with the same surface state. Thoroughly clean this reference plane and the measuring object surface and then bring them into close contact (linking) to carry out measurement.

Confirm that the vertical motion nut is adjacent to the arm and loosen the arm clamp screw while supporting the arm. Turn the vertical motion nut to move the arm up and down.

Apply the DIGIMICRO probe to the surface plate, send the probe at least 0.2 mm, and then tighten the arm clamp screw securely.

When the vertical motion nut and arm are distanced, carelessly loosening the arm clamp screw will cause the whole arm and the DIGIMICRO to fall down and damage the device.

### (2) Zero reset

Press the lifting release button, raise the spindle and lower it again. Then apply the probe to the surface place.

Press the Counter reset switch to reset the Counter to zero.

### (3) Measuring

Press the lifting release button, raise the spindle and place the measuring object under the spindle. (If the release clamp screw is used at this time, the spindle will be held at a raised position.)

Next, release the release button and apply the probe to the surface you want to measure. (Spindle speed is suited to the measurement by the lifting releases' own damper function.)

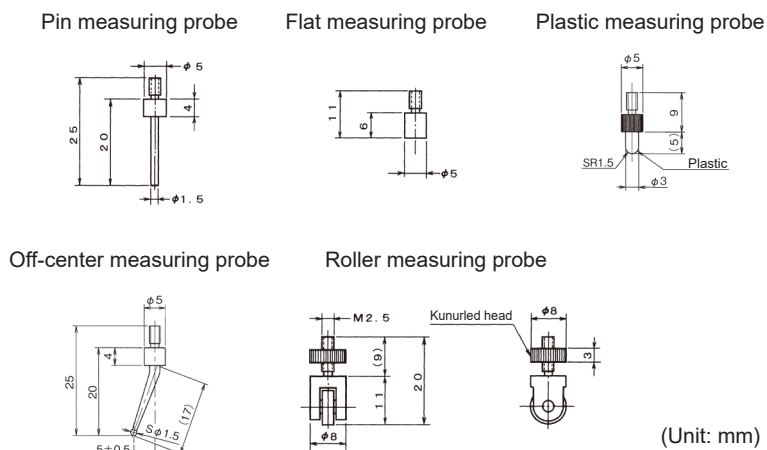
The value displayed then will be the height from the surface plate.

## 4 Options

Options shown in Figure 2 are available.

- Probes (optional)

Probes shown in Figure 4 are available in addition to the standard probe.



**Figure 4**

- DIGIMICRO Stand (optional)

	Maximum measuring height	Size of surface plate
MS-51C	Approx. 110 mm	Ø100 mm

- Counter (optional)  
TC-200
- Extension cable (optional)  
MU-TC cable (0.3 m)

## 5 Troubleshooting

Should the product fail to operate properly, locate a possible cause of the trouble by referring to the table below.

**Table 1**

Trouble	Check to see if:
<ul style="list-style-type: none"> <li>• Spindle binds.</li> <li>• The motion of spindle suddenly becomes stiff.</li> </ul>	<ul style="list-style-type: none"> <li>• Spindle is not dirty.</li> <li>• Excessive radial load is not applied to the spindle.</li> <li>• The stem has not been overtightened.</li> </ul>
<ul style="list-style-type: none"> <li>• Measurement error</li> <li>• Bad repeatability</li> </ul>	<ul style="list-style-type: none"> <li>• The measuring probe is securely installed.</li> <li>• The stem is securely installed.</li> <li>• The DIGIMICRO, DIGIMICRO Stand, and other components are installed properly.</li> <li>• Excessive load is not applied to the DIGIMICRO.</li> </ul>
<ul style="list-style-type: none"> <li>• Faulty counting</li> <li>• A message. "Error X", appears frequently.</li> </ul>	<ul style="list-style-type: none"> <li>• Power switch of the Counter is turned on.</li> <li>• The DIGIMICRO and Counter are properly connected.</li> <li>• Travel speed is appropriate.</li> <li>• There are no sources generating noise in the vicinity of the product.</li> <li>• The cable is not defective.</li> <li>• The dedicated AC adapter for the DIGIMICRO Counter in use is used.</li> </ul>

## 6 Performance and Specifications

Recommended minimum reading	: 0.1 $\mu\text{m}$
Measuring range	: 15 mm
Accuracy	: 0.7 $\mu\text{m}$ at 20°C
Response speed (at 0.1 $\mu\text{m}$ resolution)	: 100 mm/s
Direction of measurement	: Any direction
Measuring force	: Downward Approx. 0.64 N Lateral Approx. 0.44 N Upward Approx. 0.25 N
Standard measuring speed	: When using the included lifting release in a downward direction Approx. 15 mm/s
Weight	: Approximately 0.22 kg (excluding the release)
Permitted spindle load	: Radial 0.98 N
Probe	: Probe conforming to dial gauge JIS B 7503
Temperature	: 0 to 40°C in use -20 to 60°C in storage
Conforming standards	: CE



EMC Directive  
RoHS Directive

This product conforms to EN standards and shows the CE Marking.

This product has been tested and found to comply with the limits for a Class A device, pursuant to EMC DIRECTIVE. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This product must not be used in residential areas.

KC



사용자안내문

이 기기는 업무용 환경에서 사용할 목적으로 적합성평가를 받은 기기로서 가정용 환경에서 사용하는 경우 전파간섭의 우려가 있습니다.

WEEE



This symbol indicates that this product is to be collected separately.

The following apply only to users in European countries.

- This product is designated for separate collection at an appropriate collection point. Do not dispose of as household waste.
- For more information, contact the retailer or the local authorities in charge of waste management.

UKCA



FCC



This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

CAN ICES-3 (A)/NMB-3 (A)

## 7 Output Connectors

- Model: SRCN6A16-7P (Japan Aviation Electronics Industry, Ltd.)  
7-pin circular connector (plug)
- Matching connector: SRCN1A16-7S (Japan Aviation Electronics Industry, Ltd.) (receptacle)

**Table 2 Pin assignment and signal names**

Pin No.	Signal name	Description	Pin No.	Signal name	Description
1	A	Signal phase A	5	LED	LED power supply
2	B	Signal phase B	6	0V	0V power supply
3	Vcc	+12V power supply	7	N.C.	OPEN
4	N.C.	OPEN	Housing	FG	Frame ground

## 8 Accessories

- Standard probe x 1
- Lifting release x 1
- Safety Precautions x 1
- Product warranty x 1

## 9 Repair

If you need repair, contact your local Nikon representative.

Repairs covered by the warranty

- A natural failure occurred within the warranty period (one year after the date of purchase), and the product warranty is present.
- After repair, the same part failed in normal handling conditions within six months after the date of return from the previous repair, and the relevant documentation for the previous repair is present.

Any other cases constitute out-of-warranty repairs. Store the product warranty so that it is not lost.

For details, contact your local Nikon representative.

## 10 Contact information

**Table 3 Contact information**

Region	Company name	Address	Phone
Japan	NIKON CORPORATION	Shinagawa Intercity Tower C, 2-15-3, Konan, Minato-ku, Tokyo 108-6290, Japan	+81-3-6433-3726
China	NIKON INSTRUMENTS (SHANGHAI) CO., LTD.	1103-1104, Tower 5, Crystal Plaza No. 36, Ping Jia Qiao Road, Pudong New District, Shanghai 200126, China	+86-21-6841-2050
Korea	NIKON INSTRUMENTS KOREA CO., LTD.	21F, City Air Tower, 36, Teheran-ro 87gil, Gangnam-gu, Seoul, 06164, South Korea	+82-2-6288-1900
Europe (Belgium)	NIKON METROLOGY EUROPE NV	Interleuvenlaan 86 3001 Leuven Belgium	+32-16-74-01-01
Europe (UK)	NIKON METROLOGY UK LTD.	Nottingham EMA, Argosy Road Castle Donington Derby DE74 2SA United Kingdom	+44-1332-811-349
USA	NIKON METROLOGY, INC.	12701 Grand River, Brighton Avenue, MI 48116 U.S.A.	+1-810-220-4360



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