

Nikon

DS-L4

Microscope Camera Control Unit

< Instructions >

—— Microscope Operation ——

Introduction

Thank you for purchasing a Nikon product.

This instruction manual is written for users of the Nikon DS-L4 Microscope Camera Control Unit. To ensure correct usage, read this manual carefully before operating this product.

- No part of this manual may be reproduced or transmitted in any form without prior written permission from Nikon.
- The contents of this manual are subject to change without notice.
- The equipment described in this manual may differ from the actual product in its appearance.
- Although every effort has been made to ensure the accuracy of this manual, errors or inconsistencies may remain. If you note any points that are unclear or incorrect, please contact your nearest Nikon representative.
- Some of the equipment described in this manual may not be included in the set you have purchased.
- If you intend to use any other equipment with this product, read the manual for that equipment too.
- If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Contents of the Manual

The instruction manual for the DS-L4 Microscope Camera Control Unit is provided in two volumes.

◆ **Camera Operation** (Describes the operation of the camera connected to the DS-L4.)

◆ **Microscope Operation** (Describes how to check the status of and operate the microscope connected with the DS-L4 via USB.)

To use the Ti2Control application on a DS-L4 tablet to check the status of or control a Ti2-E or Ti2-A microscope system that is connected with DS-L4 via LAN, refer to "Application for Inverted Research Microscope ECLIPSE Ti2 series Ti2Control Instruction Manual (for Windows)".

Symbols Used in This Manual

The following symbols are used in this manual.



Indicates information you should note or comply with to prevent defects or malfunction of this product.



Indicates information you should be aware of in using this product, as well as other useful information.

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Part 1

Biological Microscope

Composition of Part 1

Part 1 describes how to operate the microscope or change the microscope's settings from a DS-L4 Microscope Camera Control Unit connected to a biological microscope Ni-E, Ni-U, or Ci-E.

Introduction

Contents of the Manual

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Chapter 1 Motorized Units Operable from DS-L4

Chapter 2 Basics of Microscope Operation with DS-L4

Chapter 3 Preparation for Microscopy

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Motorized Units
Operable from DS-L4

Basics of Microscope
Operation with DS-L4

Preparation for
Microscopy

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with DS-L4

Individual
Operations

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Troubleshooting

⚠ WARNING

Before using this product, thoroughly read the “Safety Precautions” at the beginning of the “Camera Operation” separately provided and be sure to follow the warnings and precautions indicated therein.

In addition, thoroughly read the instruction manuals for the products used with this system (such as microscope main body or motorized accessory devices) and be sure to follow the warnings and precautions indicated therein.

✔ Procedure for Connecting Each Device

For details on the procedure for connecting the microscope main body, DS-L4, and motorized accessories, refer to the instruction manual of your microscope and also the “Camera Operation” instruction manual of DS-L4.

By connecting the DS-L4 Microscope Camera Control Unit to a Ni/Ci series microscope, you can use the touch panel on the DS-L4 to control and monitor the microscope and accompanying motorized devices attached to the microscope. DS-L4 also allows you to use useful features such as the MODE function, as well as to modify various microscope settings.

This chapter provides information on ECLIPSE Ni/Ci series microscopes and accessories that can be controlled using DS-L4.

1

Devices Operable From DS-L4 Connected to Ni-E

When the DS-L4 is connected to Ni-E, it can be used to perform the following operations.

The required settings will differ depending on the motorized accessory used. Refer to the following table to perform the required configuration.

Device	Operation Available on DS-L4	Required Configuration
ECLIPSE Ni-E Main Body	ON/OFF and brightness control of dia-illumination Adjustment of DIA field diaphragm Retraction and restoration ^{*2} of elevating section ^{*1}	None
	Parfocal correction	Focal position (See Chapter 6, “5.1.4 Configuring the Parfocal Correction Function (Auto Link Focus)”)
	Output of capture trigger signal from DSC connector	Information on camera connected to DSC connector (See Chapter 6, “3.1 Configuring the Connection of Digital Camera”)
NI-TT-E Motorized Quadrocular Tilting Tube	Switching of optical path	None
NI-RPZ-E Motorized DSC Zooming Port for Quadrocular Tube	Adjustment of zoom magnification	None
NI-N7-E Motorized Septuple Nosepiece	Switching of objective Address detection for nosepiece in optical path	Information on attached objectives (See Chapter 6, “2.1 Configuring the Objective Information”)
NI-ND6-E Motorized DIC Sextuple Nosepiece		
NI-N7-I Intelligent Septuple Nosepiece		
NI-ND6-I Intelligent DIC Sextuple Nosepiece		

Device	Operation Available on DS-L4	Required Configuration
NI-FLT6-E Motorized Epi-fluorescence Cube Turret ^{*3}	Switching of filter cube (including the analyzer cube), opening/closing the built-in shutter	Information about the attached filter cube (see Chapter 6, "2.3 Configuring the Filter Cube Information")
NI-FLT6-I Intelligent Epi-fluorescence Cube Turret ^{*3}	Address detection for turret in optical path	
NI-EXW-E Motorized Excitation Filter Wheel	Switching of excitation filter	Information of attached filters (See Chapter 6, "2.4 Configuring the Excitation Filter/Barrier Filter Information")
NI-BAW-E Motorized Barrier Filter Wheel	Switching of barrier filter	
C-HGFIE HG Precentered Fiber Illuminator (motorized)	Switching built-in ND, opening/closing the built-in shutter	None
NI-ND-E Motorized ND Filter	Adjustment of ND filter transmittance	None
NI-SH-E Motorized Shutter ^{*4}	Opening/closing EPI/DIA/AUX motorized shutter	None ^{*5}
NI-CUD-E Motorized Universal Condenser Dry	Switching of module Adjustment of DIA aperture diaphragm	Information of attached condenser modules (See Chapter 6, "2.2 Configuring the Condenser Module Information")
NI-S-E Motorized XY Stage	Stage movement control by swiping	Enable the function (See Chapter 5, "5.1 Enabling the XY Movement with the Position Specified on the Monitor")
	Movement to specimen replacement position	None

*1: With the focusing stage system, the stage is elevated, and with the focusing nosepiece system, the objective is elevated.

*2: DS-L4 cannot be used to move the elevating section to an arbitrary position.

*3: Motorized/intelligent epi-fluorescence cube turrets may be used in a single layer, or in two overlapping layers.

*4: Up to two motorized shutters can be operated.

*5: Refer to Chapter 6, "3.2 Configuring the Connection of Motorized Shutter" when changing the usage of the motorized shutter to AUX (other than EPI/DIA).

2

Devices Operable From DS-L4 Connected to Ni-U

Device	Operation Available on DS-L4	Required Configuration
ECLIPSE Ni-U Main Body	ON/OFF and brightness control of dia-illumination	None
	Output of capture trigger signal from DSC connector	Information on camera connected to DSC connector (See Chapter 6, "3.1 Configuring the Connection of Digital Camera")
NI-N7-E Motorized Septuple Nosepiece	Switching of objective	Information on attached objectives (See Chapter 6, "2.1 Configuring the Objective Information")
NI-ND6-E Motorized DIC Sextuple nosepiece		
NI-N7-I Intelligent Septuple Nosepiece	Address detection for nosepiece in optical path	
NI-ND6-I Intelligent DIC Sextuple Nosepiece		
NI-FLT6-E Motorized Epi-fluorescence Cube Turret ^{*1}	Switching of filter cube, opening/closing the built-in shutter	Information about the attached filter cube (see Chapter 6, "2.3 Configuring the Filter Cube Information")
NI-FLT6-I Intelligent Epi-fluorescence Cube turret ^{*1}	Address detection for turret in optical path	
C-HGFIE HG Precentered Fiber Illuminator (motorized)	Switching built-in ND, opening/closing the built-in shutter	None
NI-SH-E Motorized Shutter ^{*2}	Opening/closing EPI/DIA/AUX motorized shutter	None ^{*3}

*1: Motorized (or intelligent) epi-fluorescence cube turret cannot be used in two layers. When using in two layers with the manual epi-fluorescence cube turret, place the motorized (or intelligent) epi-fluorescence cube turret at the bottom.

*2: Up to two motorized shutters can be operated.

*3: Refer to Chapter 6, "3.2 Configuring the Connection of Motorized Shutter" when changing the usage of the motorized shutter to AUX (other than EPI/DIA).

3

Devices Operable From DS-L4 Connected to Ci-E

Device	Operation Available on DS-L4	Required Configuration
ECLIPSE Ci-E Main Body	ON/OFF and brightness control of dia-illumination Switching of objective	Information on attached objectives (See Chapter 6, "2.1 Configuring the Objective Information")
	Output of capture trigger signal from DSC connector	Information on camera connected to DSC connector (See Chapter 6, "3.1 Configuring the Connection of Digital Camera")
CI-C-E Motorized Swing-out Condenser	Swing-out of condenser top lens	Address of nosepiece requiring swing-out (See Chapter 6, "5.6 Configuring Top Lens Swing-out of the Motorized Swing-out Condenser")

Basics of Microscope Operation with DS-L4

This chapter describes the startup and shutdown procedures for the DS-L4, as well as the composition of the screens used for microscope operation.

1

Powering On/Off the Devices

Powering ON the devices and displaying the MICROSCOPE CONTROL screen

1

Turn on the power on the microscope main body and the motorized parts.

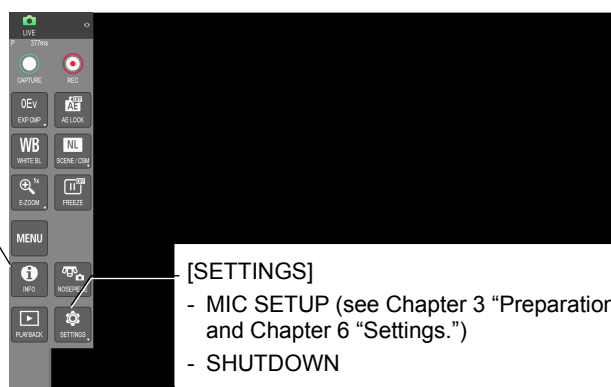
The motorized devices are initialized. For details on turning on the power, refer to the instruction manual provided with your microscope.

2

Turn on the power of DS-L4, and then the camera.

The startup screen appears, and the system configuration data and settings are acquired from the main body. If the DS-L4 user has already been registered, log in to DS-L4 according to the instruction on the screen. The completion of the initial operations takes about 30 seconds, depending on the configuration of the microscope system.

Shows or hides the INFO window.



3

Tap [MENU], and tap [MIC CNTRL] button on the menu tab.

The [MICROSCOPE CONTROL] screen appears.



✓ Displaying the [MIC CNTRL] button

If the [MIC CONTROL] button is not shown, change the settings.

1. Go [SETTINGS] > [DS SETUP] > [MAIN] > [OTHERS], and select [MIC CNTRL] with the MENU TAB.
2. Tap [SAVE].
3. Close the DS SETUP screen.

Shutdown

- 1** Tap [SETTINGS] on the LIVE or VIEW menu.
- 2** Tap [SHUT DOWN].
- 3** Press the power switch of the camera to turn it off.
- 4** Turn off the powers to the microscope main unit and motorized parts.

2

Screens for Ni-E

✔ The displayed content will differ depending on the configuration and settings of your microscope.

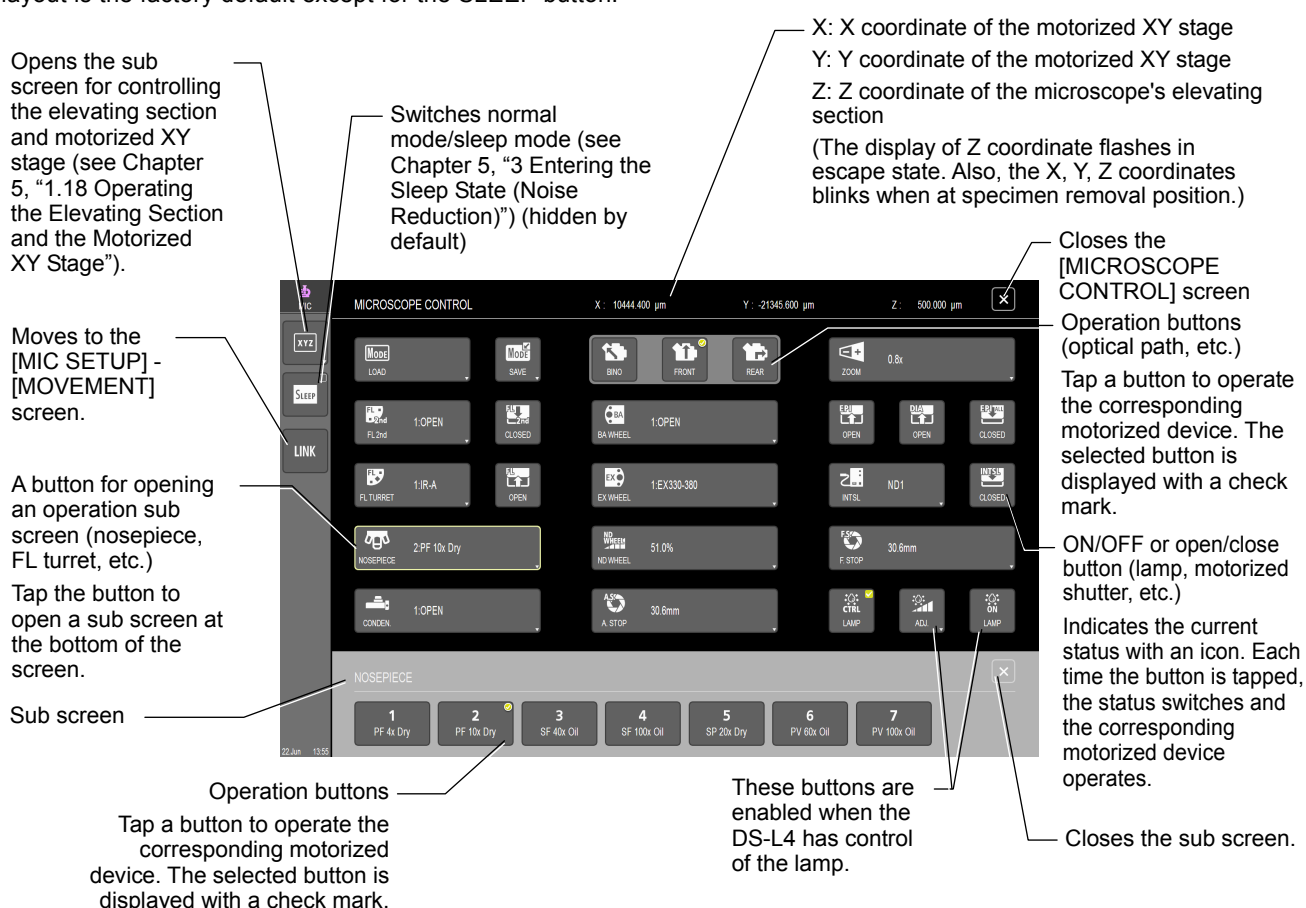
The screen will only show devices that are connected to the microscope and recognized by DS-L4. For this reason, the composition of the screen will differ depending on the configuration of the microscope. For information on microscopes and devices that can be recognized by DS-L4, refer to Chapter 1, "Motorized Units Operable from DS-L4".

The button layout on the [MICROSCOPE CONTROL] and [MIC EASY] screens can be customized. For details on changing the button layout or displaying/hiding the buttons, refer to Chapter 6, "4.1.1 Selecting the Buttons to be Displayed".

2.1

MICROSCOPE CONTROL Screen (Ni-E)

The [MICROSCOPE CONTROL] screen is used to operate the motorized parts of the microscope. The following button layout is the factory default except for the SLEEP button.



Example of a sub screen with a slider (Lamp adjustment)



Slider

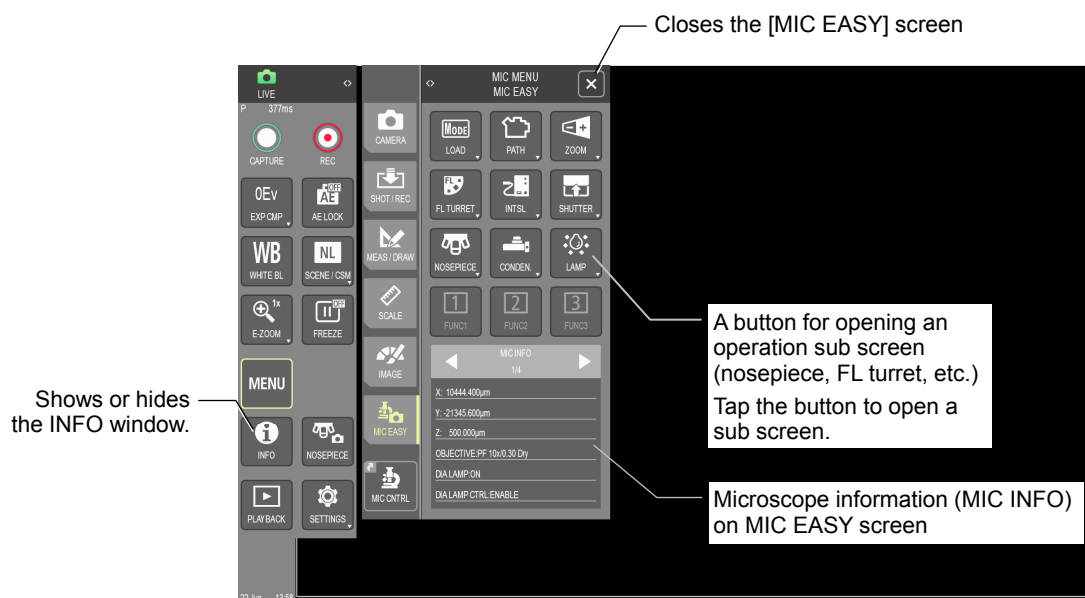
Available operations:

- Dragging the round marker right and left
- Tapping the [◀] or [▶] button
- Tapping the area to the right or left of the round marker (for greater movement than when using the [◀] or [▶] button)

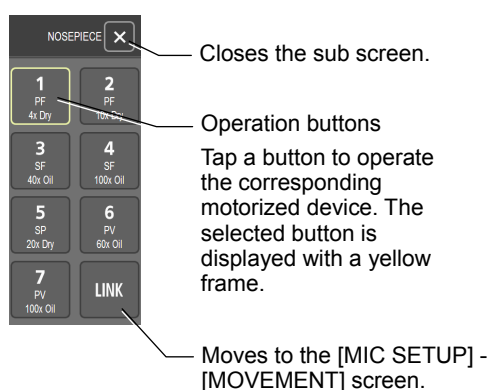
2.2

MIC EASY Screen (Ni-E)

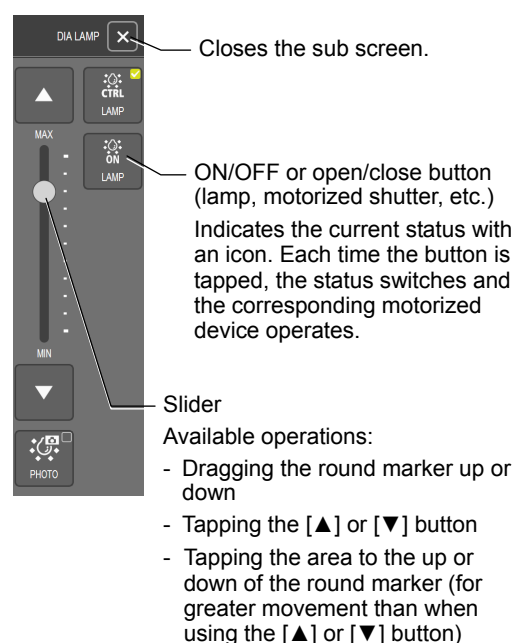
The [MIC EASY] screen provides buttons to control the microscope while observing images. The default button layout is shown below.



Example of a Nosepiece sub screen



Example of a sub screen with a slider (Lamp adjustment)



Microscope information (MIC INFO) on MIC EASY screen

Tap the [◀] or [▶] button or swipe the microscope information area to move to a different page of information.

(In the figure below, all displayable information is shown. If there is any motorized device unattached, that motorized device state is not displayed.)

Page 1/4:

- X (X coordinate of the motorized XY stage): 10444.400μm
- Y (Y coordinate of the motorized XY stage): -21345.600μm
- Z (Z coordinate of the microscope's elevating section): 500.000μm
- Nosepiece: OBJECTIVE:PF 4x/0.13 Dry
- Dia-illumination lamp: ON/OFF: DIA LAMP:ON
- Dia-illumination lamp control: DIA LAMP CTRL:ENABLE

Page 2/4:

- DSC zooming port: Zoom magnification: ZOOM:0.8x
- Second epi-fluorescence cube turret: FL 2nd:OPEN,CLOSED
- Filter cube name: OPEN /CLOSE
- First epi-fluorescence cube turret: FL TURRET:IR-A ,OPEN
- Filter cube name, OPEN /CLOSE: BA WHEEL:OPEN
- HG precentered fiber illuminator: ND, OPEN /CLOSE: EX WHEEL:EX330-380
- INTSL:ND1 ,CLOSED
- Motorized barrier filter wheel: Filter wavelength
- Motorized excitation filter wheel: Filter wavelength

Page 3/4:

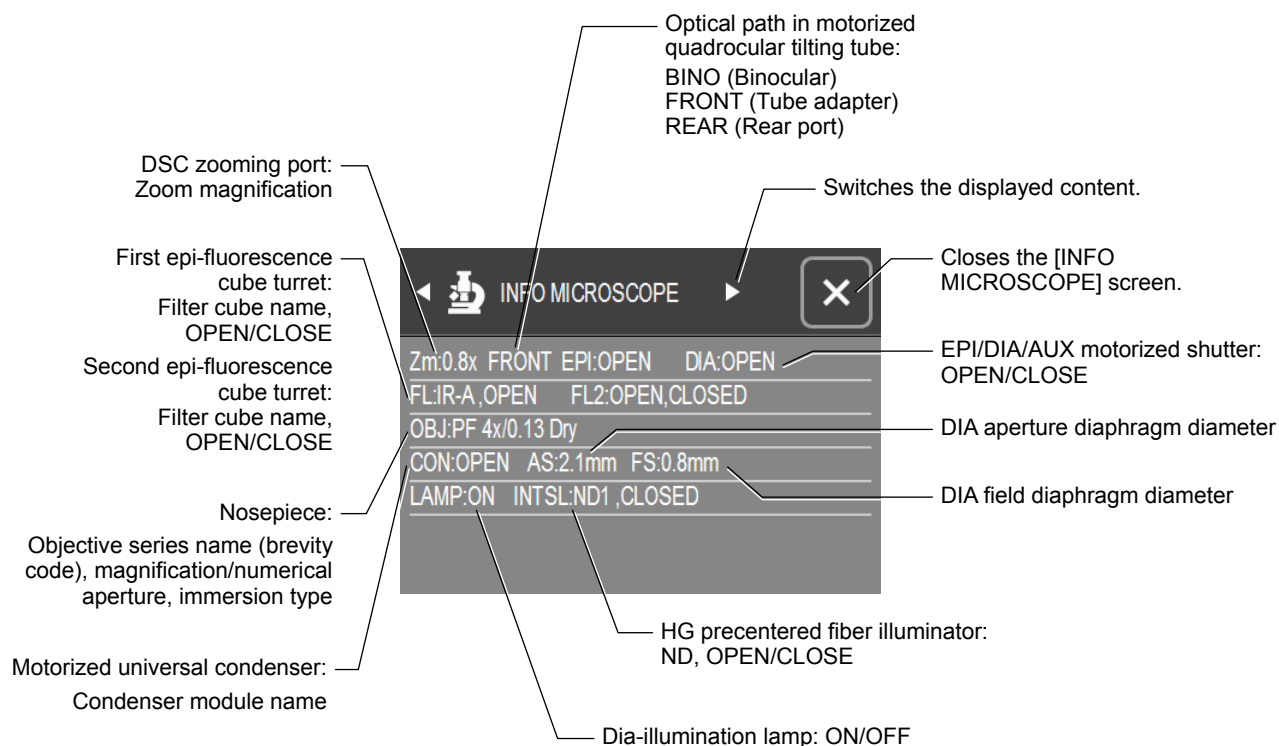
- Motorized universal condenser: Condenser module name: CONDENSER:OPEN
- DIA aperture diaphragm diameter: A.STOP:2.1mm
- DIA field diaphragm diameter: F.STOP:0.8mm
- Motorized ND filter wheel: Transmittance: ND WHEEL:51.0%
- PATH:FRONT
- Optical path in motorized quadocular tilting tube: BINO (Binocular), FRONT (Tube adapter), REAR (Rear port)

Page 4/4:

- EPI/DIA/AUX motorized shutter: OPEN /CLOSE: EPI:OPEN
- SLEEP: DS-L4 is in sleep mode: DIA:OPEN
- AWAKE: DS-L4 is awake: SLEEPMODE:AWAKE

2.3

INFO Window

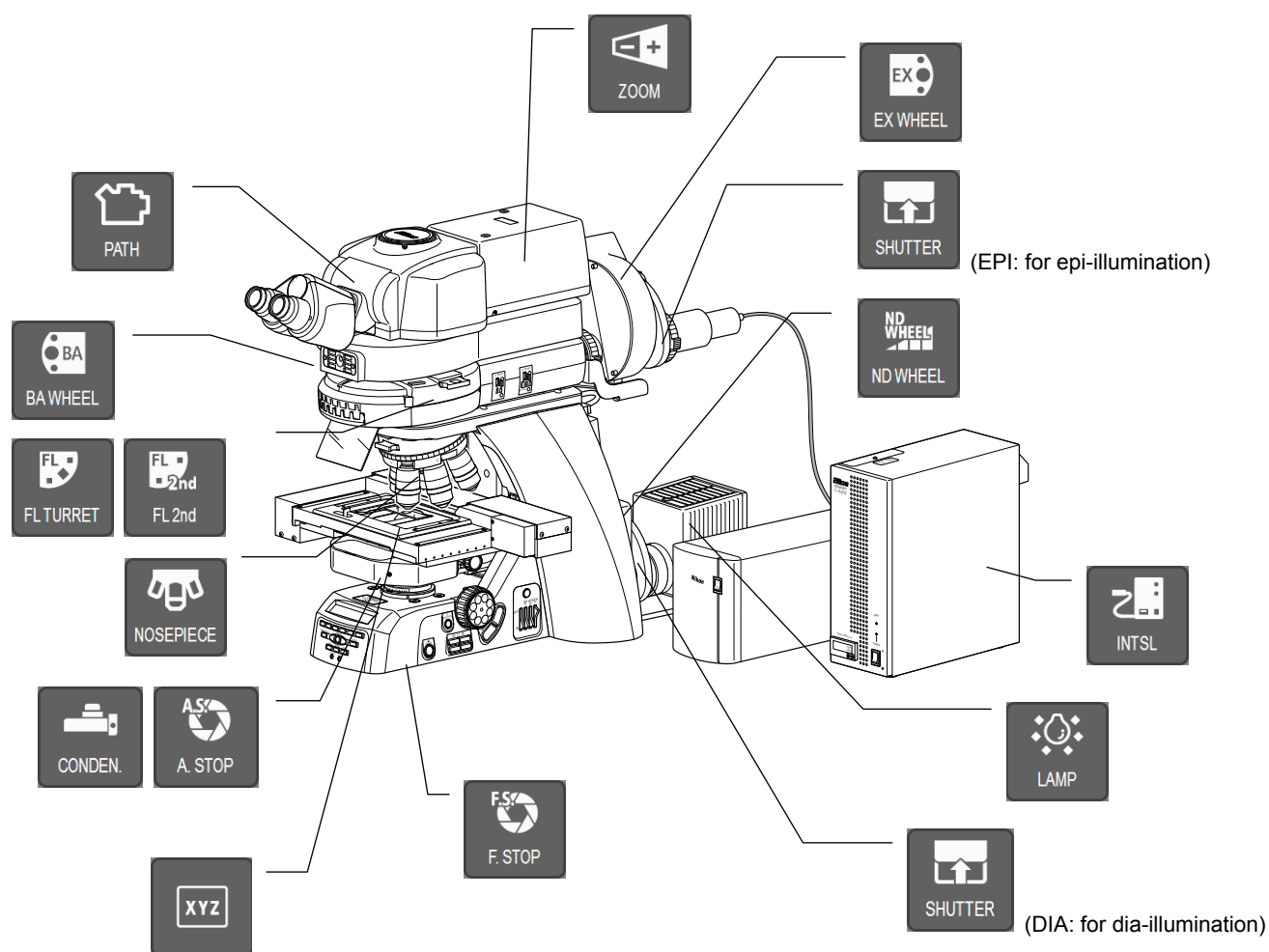





















2.4 Microscope Operation Buttons (Ni-E)












The buttons displayed on the [MICROSCOPE CONTROL] and [MIC EASY] screens have the following functions.















[MICROSCOPE CONTROL] and [MIC EASY] screens only show buttons for devices operable from the DS-L4. For this reason, the screen composition differs depending on the configuration of your microscope. For information on microscopes and devices that can be operated from DS-L4, refer to Chapter 1, "Motorized Units Operable from DS-L4".








Some buttons are not displayed by default, even if the corresponding device is operable from DS-L4. For details on showing/hiding the buttons, refer to Chapter 6, "4.1.1 Selecting the Buttons to be Displayed".



Operation Button (Ni-E)		Function	Description
 [NOSEPIECE]	 [Objective (Address)]	Switches the objective.	Chapter 5, “1.1 Switching the Objective (Motorized Nosepiece)”
 [PATH]	 [BINO]	Directs the optical path in the motorized quadocular tilting tube to the binocular section.	Chapter 5, “1.2 Switching the Optical Path (Motorized Quadocular Tilting Tube)”
	 [FRONT]	Directs the optical path in the motorized quadocular tilting tube to the tube adapter.	
	 [REAR]	Directs the optical path in the motorized quadocular tilting tube to the rear port.	
 [ZOOM]		Switches the zoom magnification of the DSC zooming port.	Chapter 5, “1.3 Adjusting the Zoom Magnification (Motorized DSC Zooming Port)”
 [FL TURRET]	 [Filter Cube (Address)]	Switches the filter cube in the first motorized epi-fluorescence cube turret.	Chapter 5, “1.4 Switching the Filter Cube (Motorized Epi-fluorescence Cube Turret)”
	 [SHUTTER FL]	Opens/closes the first motorized epi-fluorescence cube turret’s built-in shutter.	Chapter 5, “1.5 Opening/Closing the Motorized Epi-fluorescence Cube Turret’s Built-in Shutter”
 [FL 2nd]	 [Filter Cube 2nd (Address)]	Switches the filter cube in the second motorized epi-fluorescence cube turret.	Chapter 5, “1.4 Switching the Filter Cube (Motorized Epi-fluorescence Cube Turret)”
	 [SHUTTER FL 2nd]	Opens/closes the second motorized epi-fluorescence cube turret’s built-in shutter.	Chapter 5, “1.5 Opening/Closing the Motorized Epi-fluorescence Cube Turret’s Built-in Shutter”
 [EX WHEEL]	 [Excitation Filter (Address)]	Switches the excitation filter.	Chapter 5, “1.7 Switching the Excitation Filter (Motorized Excitation Filter Wheel)”
 [BA WHEEL]	 [Barrier Filter (Address)]	Switches the barrier filter.	Chapter 5, “1.8 Switching the Barrier Filter (Motorized Barrier Filter Wheel)”
 [CONDEN.]	 [Condenser Module (Address)]	Switches the condenser module.	Chapter 5, “1.9 Switching the Condenser Module (Motorized Universal Condenser)”

Operation Button (Ni-E)		Function	Description
 [A. STOP]		Adjusts the diameter of the aperture diaphragm in the motorized universal condenser.	Chapter 5, "1.10 Adjusting the DIA Aperture Diaphragm (Motorized Universal Condenser)"
 [INTSL]	 [Intensilight (ND number)]	Switches the ND for the HG precentered fiber illuminator.	Chapter 5, "1.12 Operating the Motorized HG Precentered Fiber Illuminator (Intensilight)"
	 [SHUTTER INTSL]	Opens/closes the HG precentered fiber illuminator's built-in shutter.	
 [ND WHEEL]		Adjusts the ND filter transmittance of the motorized ND filter wheel.	Chapter 5, "1.13 Adjusting the ND Filter for Dia-illumination (Motorized ND Filter Wheel)"
 [LAMP]	 [LAMP CTRL]	Transfers the control of the dia-illumination lamp between the microscope and DS-L4.	Chapter 5, "1.14.1 Transferring the Control of the Dia-illumination Lamp/LED"
	 [ADJ.]	Adjusts the brightness of the dia-illumination lamp.	Chapter 5, "1.14.3 Adjusting the Brightness of the Dia-illumination Lamp/LED"
	 [PHOTO]	Adjusts the dia-illumination lamp to the brightness that offers optimal color reproduction.	
	 [LAMP ON/OFF]	Turns the dia-illumination lamp ON/OFF.	Chapter 5, "1.14.2 Turning the Dia-illumination Lamp/LED ON/OFF"
 [F. STOP]		Adjust the diameter of the DIA field diaphragm.	Chapter 5, "1.15 Adjusting the DIA Field Diaphragm"

Operation Button (Ni-E)	Function	Description
 [SHUTTER]	 [SHUTTER EPI ALL]	Opens/closes all HG precentered fiber illuminator's built-in shutter, EPI motorized shutter, epi-fluorescence cube turret's built-in shutter.
	 [SHUTTER FL]	Opens/closes the first motorized epi-fluorescence cube turret's built-in shutter. (Equivalent to the [SHUTTER FL] button on the [FL TURRET] sub screen.)
	 [SHUTTER FL 2nd]	Opens/closes the second motorized epi-fluorescence cube turret's built-in shutter. (Equivalent to the [SHUTTER FL 2nd] button on the [FL 2nd] sub screen.)
	 [SHUTTER INTSL]	Opens/closes the HG precentered fiber illuminator's built-in shutter. (Equivalent to the [SHUTTER INTSL] button on the [INTSL] sub screen.)
	 [SHUTTER EPI]	Opens/closes the EPI motorized shutter.
	 [SHUTTER DIA]	Opens/closes the DIA motorized shutter.
	 [SHUTTER AUX]	Opens/closes the AUX motorized shutter.
 [CAPTURE]	 [CAPTURE FRONT]	Outputs the capture trigger signal to the digital camera connected to the tube adapter.
	 [CAPTURE LEFT]	Outputs the capture trigger signal to the digital camera connected to the DSC zooming port.
	 [CAPTURE RIGHT]	Outputs the capture trigger signal to the digital camera connected to the back port unit.
	 [CAPTURE AUX]	Outputs the capture trigger signal to the digital camera connected to the position other than the above mentioned.
 [SAVE]	Saves the current microscopy state as a mode.	Chapter 5, "2.2 Saving/Updating a Mode (State of Motorized Devices)"

Operation Button (Ni-E)		Function	Description
 [LOAD]	 [LOAD (MODE number)]	Loads a saved mode.	Chapter 5, “2.3 Loading a Mode”
 [XYZ]	 [Z-axis RESET]	Resets the Z-axis coordinate displayed on DS-L4 to zero (0.000um).	Chapter 5, “1.18.1 Zero-resetting the Z-axis Coordinate”
	 [ESCAPE]	Moves the microscope’s elevating section to the retracting position. Tapping the button again restores it to the original position.	Chapter 5, “1.18.2 Retracting the Elevating Section”
	 [Specimen Removal Position]	Moves the microscope’s elevating section to the retracting position, and the motorized XY stage to the sample removal position (front). Tapping the button again restores only the motorized XY stage to the original position.	Chapter 5, “1.18.3 Retracting the Elevating Section and Moving the Stage to the Specimen Removal Position”
	 [SLEEP]	Enters the sleep state to reduce noise.	Chapter 5, “3 Entering the Sleep State (Noise Reduction)”

3

Screens for Ni-U

✓ **The displayed content will differ depending on the configuration and settings of your microscope.**

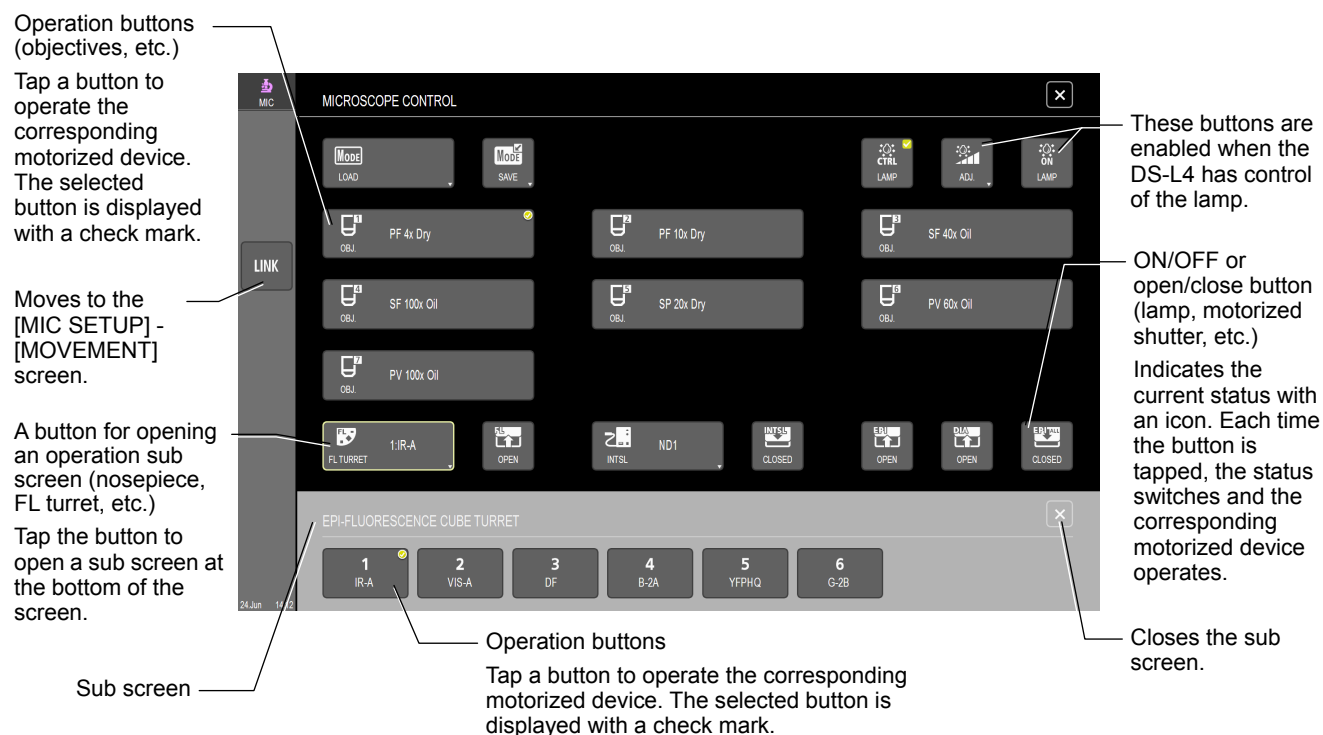
The screen only shows devices that are connected to the microscope and recognized by DS-L4. For this reason, the composition of the screen differs depending on the configuration of the microscope. For information on microscopes and devices that can be recognized by DS-L4, refer to Chapter 1, "Motorized Units Operable from DS-L4".

The button layout on the [MICROSCOPE CONTROL] and [MIC EASY] screens can be customized. For details on changing the button layout or displaying/hiding the buttons, refer to Chapter 6, "4.1.1 Selecting the Buttons to be Displayed".

3.1

MICROSCOPE CONTROL Screen (Ni-U)

The [MICROSCOPE CONTROL] screen is used to operate the motorized parts of the microscope. The default (factory setting) button layout is shown below.



Example of a sub screen with a slider (Lamp adjustment)



Slider

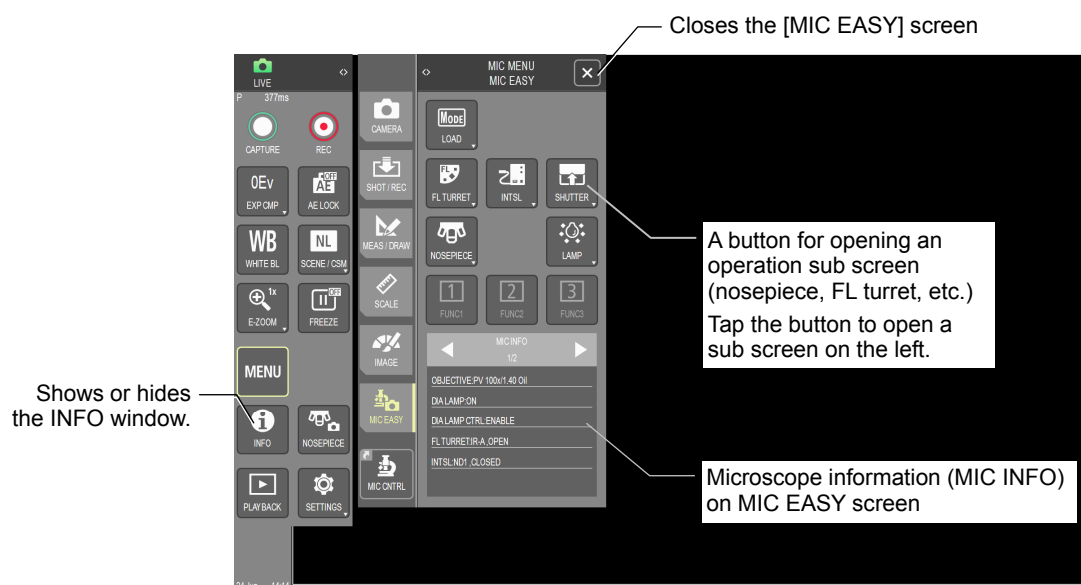
Available operations:

- Dragging the round marker right and left
- Tapping the [◀] or [▶] button
- Tapping the area to the right or left of the round marker (for greater movement than when using the [◀] or [▶] button)

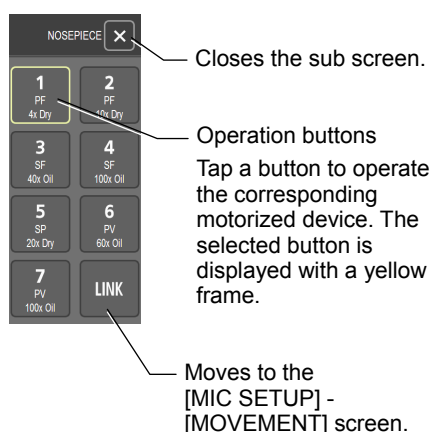
3.2

MIC EASY Screen (Ni-U)

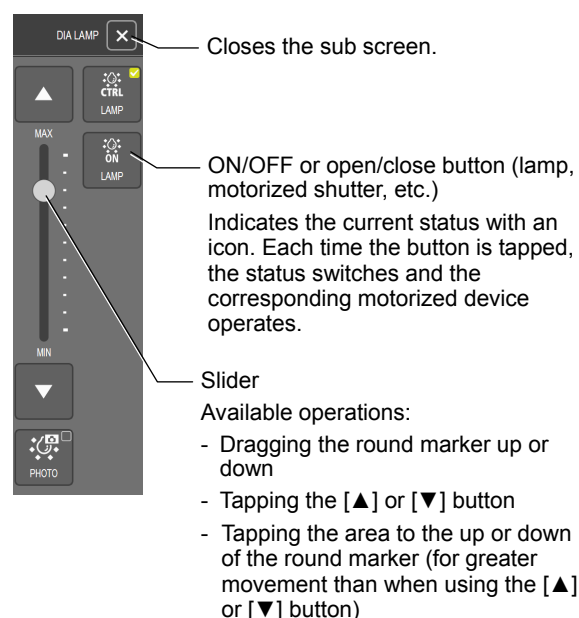
The [MIC EASY] screen provides buttons to control the microscope while observing images. The default button layout is shown below.



Example of a Nosepiece sub screen



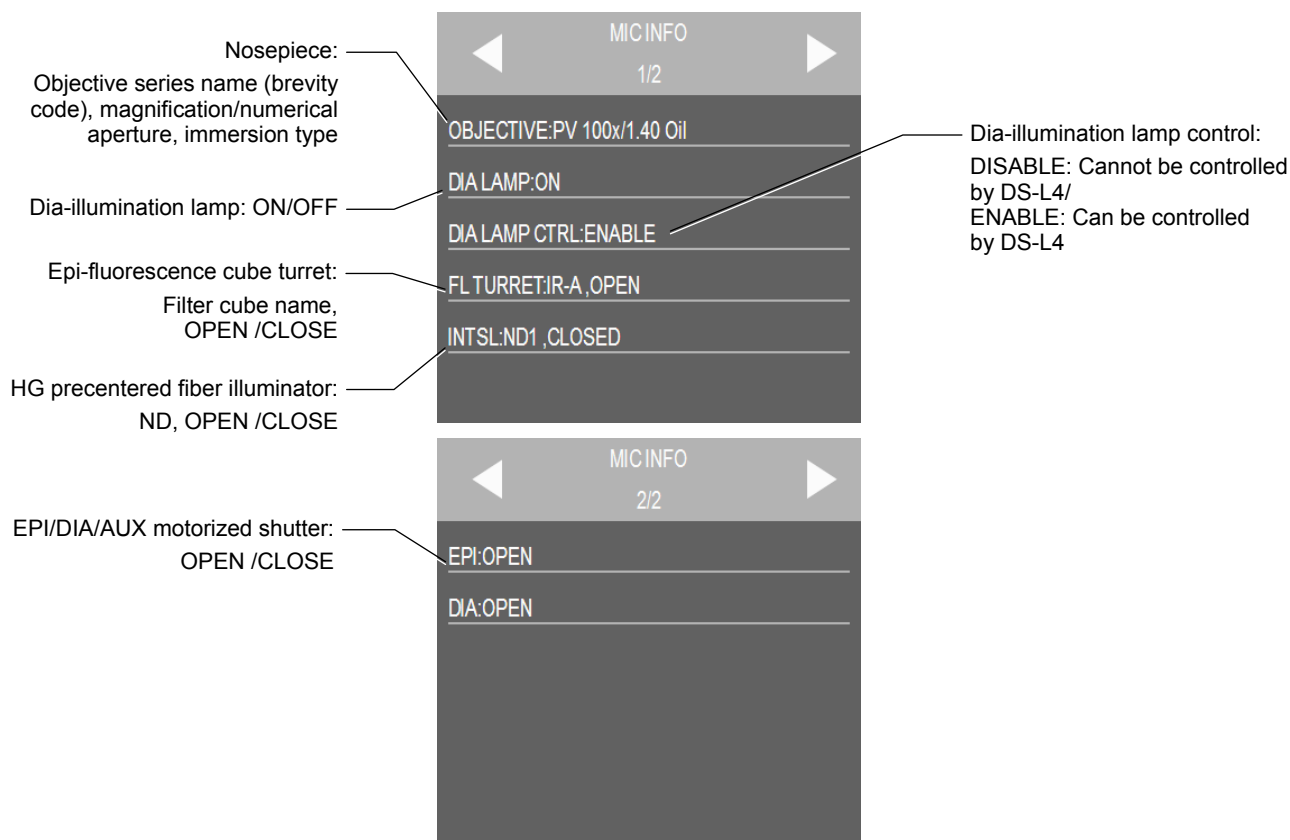
Example of a sub screen with a slider (Lamp adjustment)



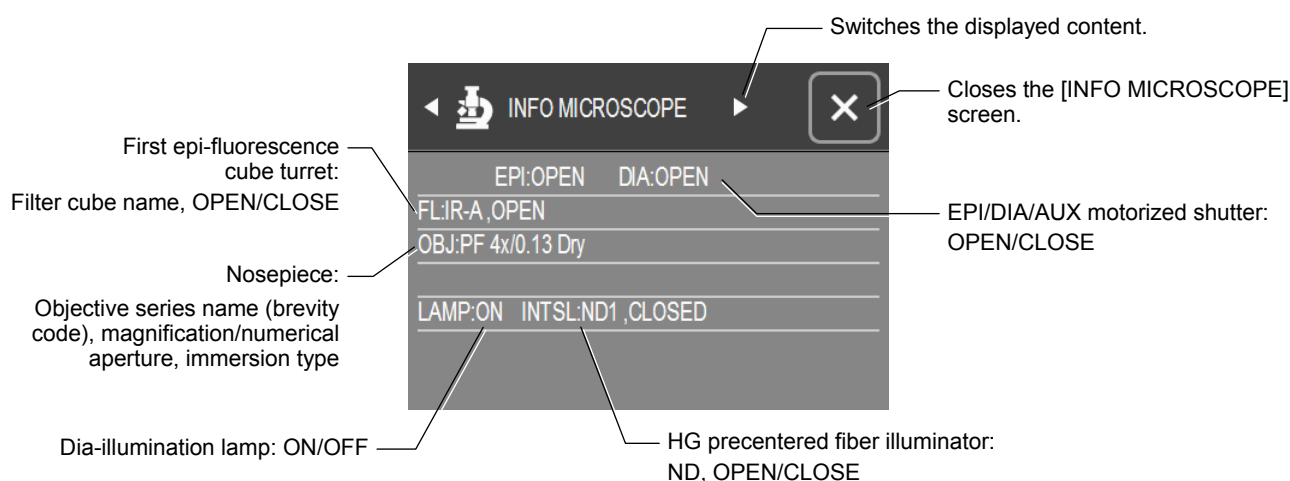
Microscope information (MIC INFO) on MIC EASY screen

Tap the [◀] or [▶] button or swipe the microscope information area to move to a different page of information.

(In the figure below, all displayable information is shown. If there is any motorized device unattached, that motorized device state is not displayed.)



3.3 INFO Window

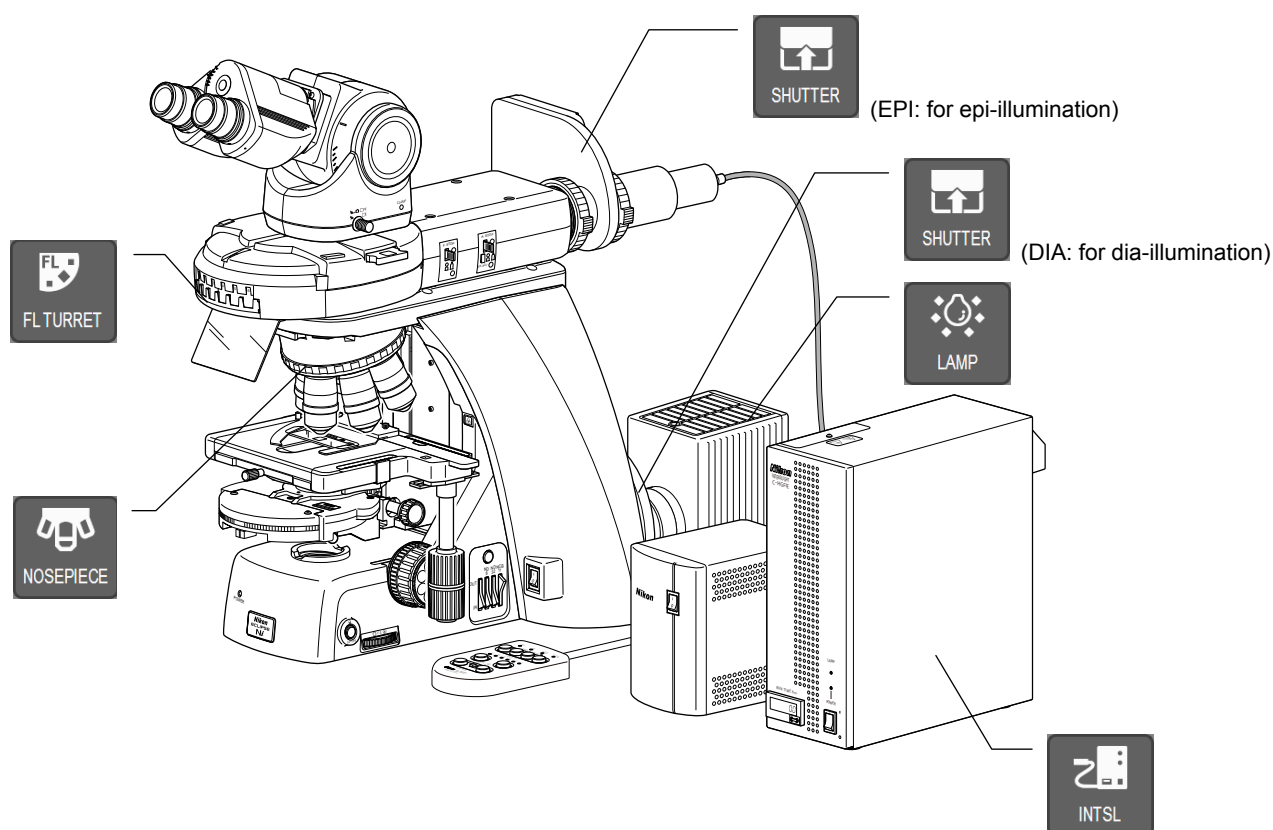







3.4 Microscope Operation Buttons (Ni-U)
















The buttons displayed on the [MICROSCOPE CONTROL] and [MIC EASY] screens have the following functions.









[MICROSCOPE CONTROL] and [MIC EASY] screens only show buttons for devices operable from the DS-L4. For this reason, the screen composition differs depending on the configuration of your microscope. For information on microscopes and devices that can be operated from DS-L4, refer to Chapter 1, "Motorized Units Operable from DS-L4".

Some buttons are not displayed by default, even if the corresponding device is operable from DS-L4. For details on showing/hiding the buttons, refer to Chapter 6, "4.1.1 Selecting the Buttons to be Displayed".



Operation Button (Ni-U)		Function	Description
 [NOSEPIECE]	 [Objective (Address)]	Switches the objective.	Chapter 5, "1.1 Switching the Objective (Motorized Nosepiece)"
 [FL TURRET]	 [Filter Cube (Address)]	Switches the filter cube in the motorized epi-fluorescence cube turret.	Chapter 5, "1.4 Switching the Filter Cube (Motorized Epi-fluorescence Cube Turret)"
	 [SHUTTER FL]	Opens/closes the motorized epi-fluorescence cube turret's built-in shutter.	Chapter 5, "1.5 Opening/Closing the Motorized Epi-fluorescence Cube Turret's Built-in Shutter"

Operation Button (Ni-U)		Function	Description
 [INTSL]	 [Intensilight (ND number)]	Switches the ND for the HG precentered fiber illuminator.	Chapter 5, "1.12 Operating the Motorized HG Precentered Fiber Illuminator (Intensilight)"
	 [SHUTTER INTSL]	Opens/closes the HG precentered fiber illuminator's built-in shutter.	
 [LAMP]	 [LAMP CTRL]	Transfers the control of the dia-illumination lamp between the microscope and DS-L4.	Chapter 5, "1.14.1 Transferring the Control of the Dia-illumination Lamp/LED"
	 [ADJ.]	Adjusts the brightness of the dia-illumination lamp.	Chapter 5, "1.14.3 Adjusting the Brightness of the Dia-illumination Lamp/LED"
	 [PHOTO]	Adjusts the dia-illumination lamp to the brightness that offers optimal color reproduction.	
	 [LAMP ON/OFF]	Turns the dia-illumination lamp ON/OFF.	Chapter 5, "1.14.2 Turning the Dia-illumination Lamp/LED ON/OFF"
 [SHUTTER]	 [SHUTTER EPI ALL]	Opens/closes all HG precentered fiber illuminator's built-in shutter, EPI motorized shutter, epi-fluorescence cube turret's built-in shutter.	Chapter 5, "1.6 Opening/Closing All Shutters for Epi-illumination"
	 [SHUTTER FL]	Opens/closes the motorized epi-fluorescence cube turret's built-in shutter. (Equivalent to the [SHUTTER FL] button on the [FL TURRET] sub screen.)	Chapter 5, "1.5 Opening/Closing the Motorized Epi-fluorescence Cube Turret's Built-in Shutter"
	 [SHUTTER INTSL]	Opens/closes the HG precentered fiber illuminator's built-in shutter. (Equivalent to the [SHUTTER INTSL] button on the [INTSL] sub screen.)	Chapter 5, "1.12.1 Opening/Closing the Motorized HG Precentered Fiber Illuminator's Built-in Shutter"
	 [SHUTTER EPI]	Opens/closes the EPI motorized shutter.	Chapter 5, "1.16 Opening/Closing the EPI/DIA/AUX Motorized Shutter"
	 [SHUTTER DIA]	Opens/closes the DIA motorized shutter.	
	 [SHUTTER AUX]	Opens/closes the AUX motorized shutter.	

Operation Button (Ni-U)		Function	Description
 [CAPTURE]	 [CAPTURE FRONT]	Outputs the capture trigger signal to the digital camera connected to the tube adapter.	Chapter 5, "1.17 Outputting Capture Trigger Signals from the Microscope"
	 [CAPTURE LEFT]	Outputs the capture trigger signal to the digital camera connected to the DSC zooming port.	
	 [CAPTURE RIGHT]	Outputs the capture trigger signal to the digital camera connected to the back port unit.	
	 [CAPTURE AUX]	Outputs the capture trigger signal to the digital camera connected to the position other than the above mentioned.	
	 [SAVE]	Saves the current microscopy state as a mode.	Chapter 5, "2.2 Saving/Updating a Mode (State of Motorized Devices)"
 [LOAD]	 [LOAD (MODE number)]	Loads a saved mode.	Chapter 5, "2.3 Loading a Mode"

4

Screens for Ci-E

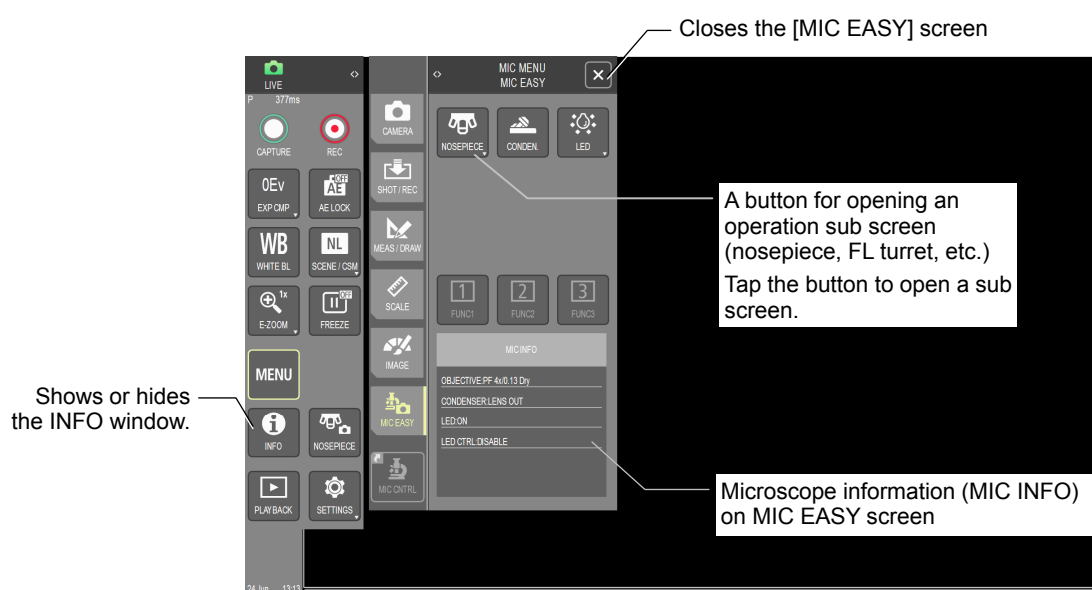
✓ The displayed content will differ depending on the configuration and settings of your microscope.

When the motorized swing-out condenser is not attached, the status display and operation of the condenser are disabled.

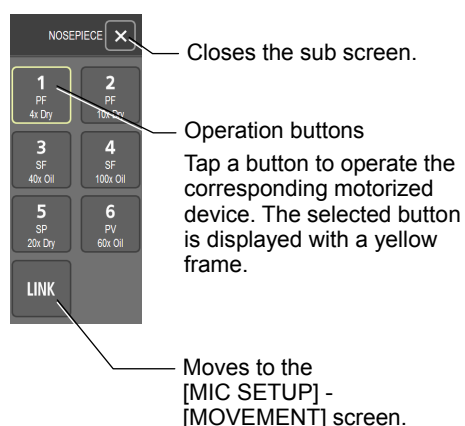
4.1

MIC EASY Screen (Ci-E)

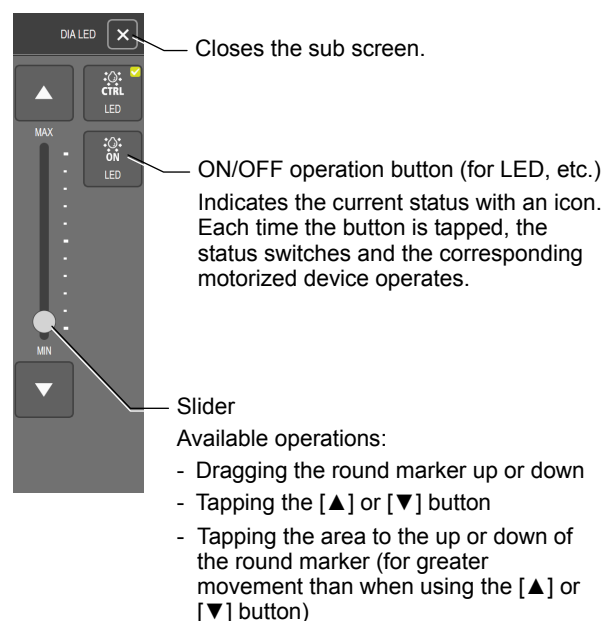
The [MIC EASY] screen provides buttons to control the microscope while observing images.



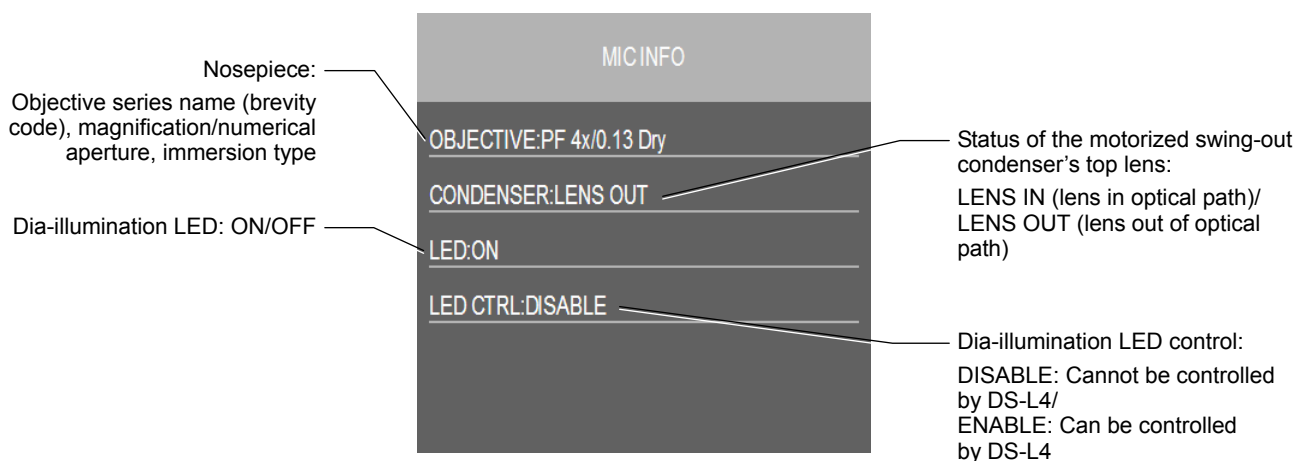
Example of a Nosepiece sub screen



Example of a sub screen with a slider (LED adjustment)

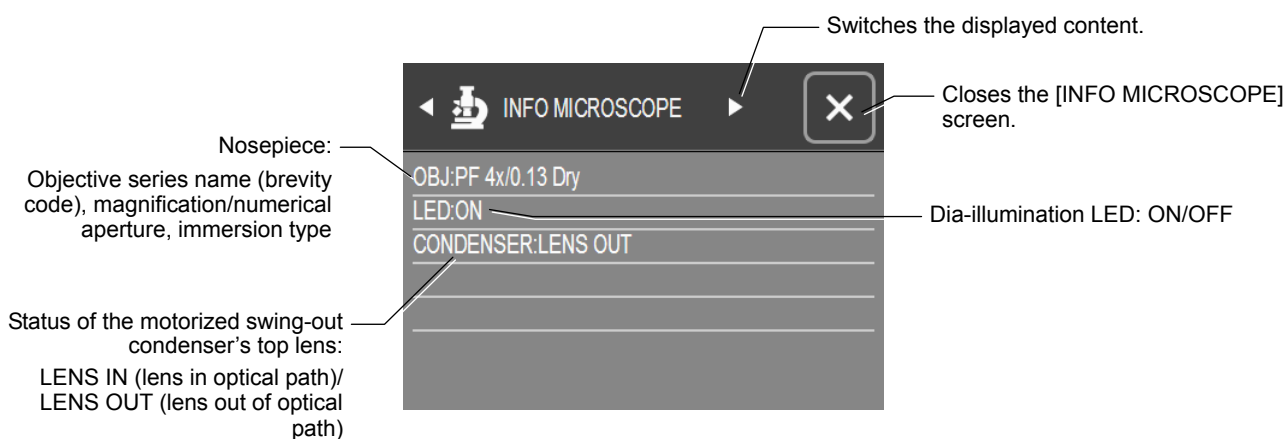


Microscope information (MIC INFO) on MIC EASY screen



4.2

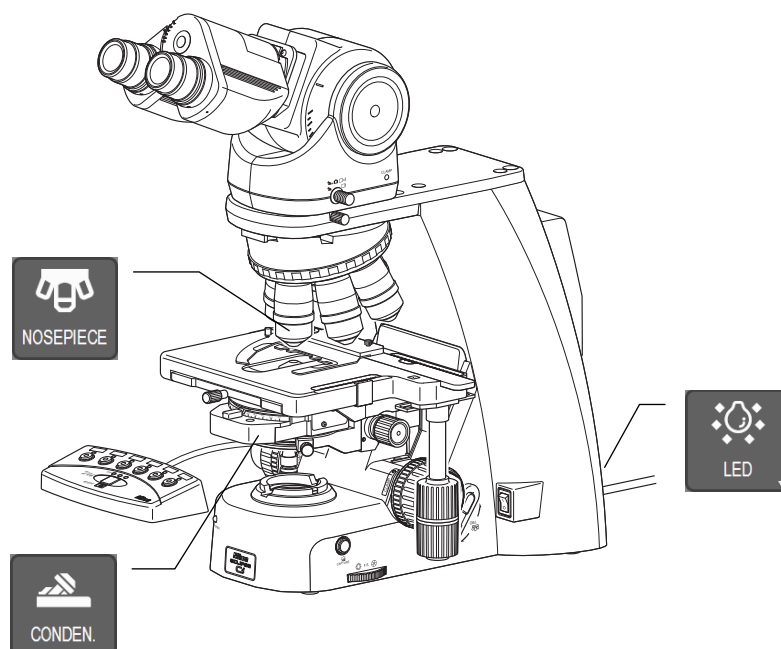
INFO Window








4.3 Microscope Operation Buttons (Ci-E)

The buttons displayed on the [MIC EASY] screen have the following functions.

When the motorized swing-out condenser is not attached, the operation button for the condenser is not displayed.



Operation Button (Ci-E)	Function	Description
 [NOSEPIECE]	Switches the objective.	Chapter 5, "1.1 Switching the Objective (Motorized Nosepiece)"
 [CONDEN.]	Moves condenser top lens in/out of optical path.	Chapter 5, "1.11 Swinging Out the Condenser Top Lens (Motorized Swing-out Condenser)"
 [LED]	 [LED CTRL]	Transfers the control of the dia-illumination LED between the microscope and DS-L4.
	-	Adjusts the brightness of the dia-illumination LED.
	 [LED ON/OFF]	Turns the dia-illumination LED ON/OFF.

This chapter describes various settings required for using DS-L4 to control your microscope.

1

Configuring Optical Elements Information

In this chapter, you configure the information on the optical elements attached to the microscope. The information of the optical elements you entered here is displayed on the DS-L4 screen.

! Tap the [SAVE] button after changing the settings.

After making changes to the settings, be sure to tap the [SAVE] button on the [MIC SETUP] - [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information, see "3 Saving the Settings" in this chapter.

1.1

Configuring the Objective Information

Ni-E

Ni-U

Ci-E

In this section, you configure the information of the objectives attached to the motorized or intelligent nosepiece.

✓ Prerequisite for configuration

A motorized/intelligent nosepiece must be attached to the microscope in order to perform this configuration.

[Procedure]

The configuration method is outlined below. For further details, refer to Chapter 6, "2.1 Configuring the Objective Information".

[MIC SETUP] → [COMPONENTS]

- (1) Select the [NOSEPIECE] tab.
- (2) Tap the nosepiece address button to be configured.
- (3) Select the [SERIES], [MAG.], and [DETAIL] for the attached objective, then tap the [OK] button.
When an appropriate objective is not on the list, you can register any objective by tapping the [CUSTOM] button.
- (4) Repeat steps (2) and (3) for each address to be configured.

1.2

Configuring the Condenser Module Information

Ni-E

In this section, you configure the information on the condenser module attached to the motorized universal condenser.

✓ Prerequisite for configuration

A motorized universal condenser must be attached to the microscope in order to perform this configuration.

[Procedure]

The configuration method is outlined below. For further details, refer to Chapter 6, "2.2 Configuring the Condenser Module Information".

[MIC SETUP] → [COMPONENTS]

- (1) Select the [CONDENSER] tab.
- (2) Tap the turret address button to be configured.
- (3) Select the attached condenser module, and tap the [OK] button.
When an appropriate condenser module is not on the list, you can register any module by tapping the [CUSTOM] button.
- (4) Repeat steps (2) and (3) for each address to be configured.

1.3

Configuring the Filter Cube Information

Ni-E

Ni-U

In this section, you configure the information for filter cubes attached to the motorized or intelligent epi-fluorescence cube turret. When using Ni-E with motorized (or intelligent) epi-fluorescence cube turrets in two layers, be sure to configure the filter cube information for the second (upper) turret also.

✓ **Prerequisite for configuration**

- A motorized (or an intelligent) epi-fluorescence cube turret must be attached to the microscope in order to perform this configuration.
- A second (upper) epi-fluorescence cube turret must be attached in order to configure the information for the second cube turret.

[Procedure]

The configuration method is outlined below. For further details, refer to Chapter 6, “2.3 Configuring the Filter Cube Information”.

[MIC SETUP] → [COMPONENTS]

(1) Select the **[FL TURRET]** tab (or the **[FL 2nd]** tab for the second turret).

(2) Tap the turret address button to be configured.

(3) Select the attached filter cube, and tap the **[OK]** button.

When an appropriate filter cube is not on the list, you can register any filter cube by tapping the **[CUSTOM]** button.

(4) Repeat steps (2) and (3) for each address to be configured.

1.4

Configuring the Excitation Filter/Barrier Filter Information

Ni-E

In this section, you configure the information on the excitation filters attached to the motorized excitation filter wheel, and for barrier filters attached to the motorized barrier filter wheel.

✓ **Prerequisite for configuration**

- A motorized excitation filter wheel must be attached to the microscope in order to configure the excitation filters.
- A motorized barrier filter wheel must be attached to the microscope in order to configure the barrier filters.

[Procedure]

The configuration method is outlined below. For further details, refer to Chapter 6, “2.4 Configuring the Excitation Filter/Barrier Filter Information”.

[MIC SETUP] → [COMPONENTS]

(1) Select the **[EX WHEEL]** or **[BA WHEEL]** tab.

(2) Tap the wheel address button to be configured.

(3) Select the attached excitation/barrier filter, and tap the **[OK]** button.

When an appropriate filter is not on the list, you can register any filter by tapping the **[CUSTOM]** button.

(4) Repeat steps (2) and (3) for each address to be configured.

2

Configuring the Digital Camera Connection

Ni-E

Ni-U

Ci-E

Configure the digital camera connection as follows when connecting the microscope and the camera with a trigger cable and capturing by outputting a trigger signal from the DSC connector on the microscope.

This configuration is unnecessary if you are capturing with a camera directly connected to this DS-L4 by tapping the [CAPTURE] button on the camera control screen.

For details, refer to Chapter 6, “3.1 Configuring the Connection of Digital Camera”.

[Procedure]

[MIC SETUP] → [CONNECTION]

- (1) Tap the button for the position setting (on the left) for DSC1 or DSC2.
- (2) Select [NOT-CONNECTED] if no camera is connected, otherwise select the position.
- (3) Tap the camera manufacturer setting button (on the right) for DSC1 or DSC2.
- (4) Select a camera manufacturer name.
- (5) Repeat steps (1) through (4) when you use two DSC connectors on Ni-E.

❗ Tap the [SAVE] button after changing the settings.

After making changes to the settings, be sure to tap the [SAVE] button on the [MIC SETUP] - [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For details on saving the settings, refer to “3 Saving the Settings” in this chapter.

3

Saving the Settings

Ni-E

Ni-U

Ci-E

After making changes on the [MIC SETUP], be sure to tap the [SAVE] button on the [MIC SETUP] - [MENU] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored.

- (1) After changing a setting, tap the [MAIN] button to go back to the [MIC SETUP] - [MAIN] screen.
- (2) Tap the [SAVE] button.
A confirmation dialog box appears.
If there is no setting data to be saved, the [SAVE] button is disabled.
- (3) Tap the [OK] button.
The settings are saved.

To cancel saving, tap the [CANCEL] button.

Tapping the [X] button on the upper-right of the screen closes the [MIC SETUP].

✔ Settings to be saved

Tapping the [SAVE] button will save all changes that have been made since the settings were last saved.

To save the settings individually, perform the above save procedure after each configuration operation.

You do not need to save the settings if you only wish to apply the settings temporarily (i.e. only until the microscope is turned off).

This chapter describes the microscopy operation procedures for DS-L4, using bright-field microscopy with Ni-E (Focusing Nosepiece System) microscope as an example.

The following example assumes that the following devices are attached to the Ni-E microscope.

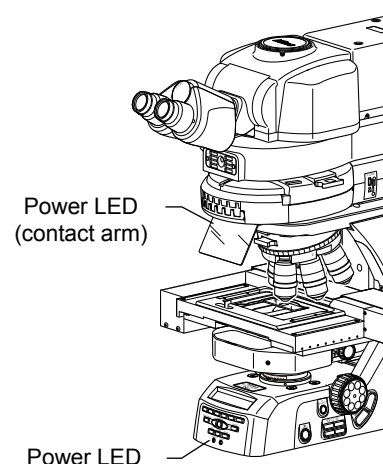
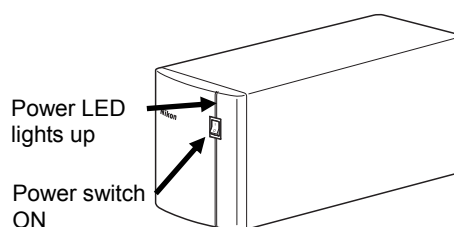
- DS-L4 Microscope Camera Control Unit (with camera connected)
- NI-TT-E Motorized Quadrocular Tilting Tube
- NI-RPZ-E Motorized DSC Zooming Port for Quadrocular Tube (with the above camera connected to the camera port)
- NI-N7-E Motorized Septuple Nosepiece
(with configuration completed for the attached objectives)
- NI-ND-E Motorized ND Filter
- NI-CUD-E Motorized Universal Condenser Dry
(with configuration completed for the attached condenser cassette)
- NI-S-E Motorized XY Stage
- NI-ERG NI Ergo Controller, or NI-SJ Joystick for Motorized Stage

Preparation

1 Turn on the power on the microscope main unit and the motorized parts.

- (1) Turn on each connected motorized part (except DS-L4) by pressing the power switch to the “I” position.
(The power LED will light up on each device. There is no specific order for turning on the motorized accessory devices.)
- (2) Turn on control box A by pressing its power switch to the “I” position.
(The power LED on the front of the main body, control box A, and contact arm will light up.)

Initialization is performed on the microscope main body and the motorized parts.

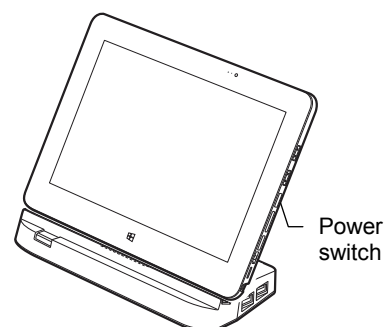


For details on initialization indicators for motorized devices, refer to the Instruction Manual (Operation) for Ni-E.

Top: Model name, firmware version
Bottom: Program startup progress

Top: Model name, firmware version
Bottom: Motorized device initialization progress


The startup screen appears, and the system configuration, settings, and other data are acquired from the microscope main body.



Tap the [MENU] button on the DS-L4 screen, then tap the [MICROSCOPE CONTROL] button to switch to the [MICROSCOPE CONTROL] screen.

- (1) Tap the [LAMP CTRL] button on the DS-L4 screen to control the dia-illumination lamp from DS-L4.

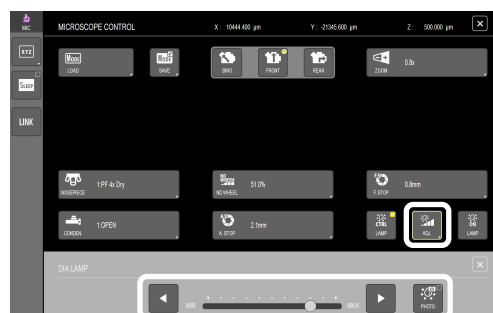




- (2) Tap the [LAMP ON/OFF] button to turn on the lamp.

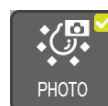


- (3) Tap the [ADJ.] button to open the sub screen, and move the slider to adjust the brightness.



✓ For improved color reproduction

Tap the [PHOTO] button on the sub screen to adjust the lamp brightness to the voltage appropriate for capturing images. To adjust the brightness further without changing color, bring the NCB11 filter in the filter cassette of the microscope main body into the optical path, and adjust the brightness using ND filters.

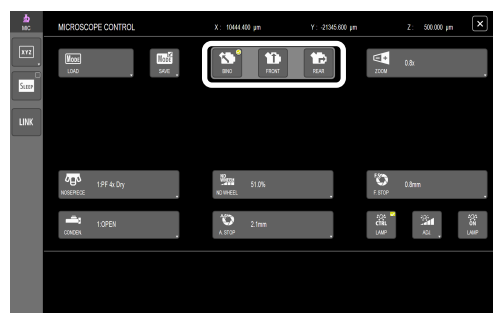


5 Set the optical path of the tube to 100% light distribution to the binocular section.

Tap the [BINO] button on the DS-L4 screen.

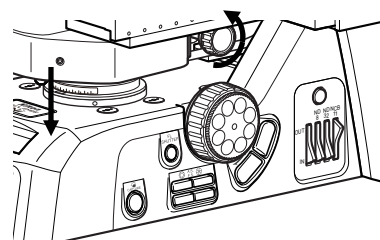
Three buttons are provided for switching the optical path in the tube. The button for the currently selected optical path is shown with a check mark.

- [BINO] button: 100% to binocular
- [FRONT] button: 100% to tube adapter
- [REAR] button: 100% rear port



6 Lower the condenser slightly from the uppermost position.

Turn the condenser focus knob until the condenser is positioned at the upper limit (where it clicks to a stop), and then lower it a little.

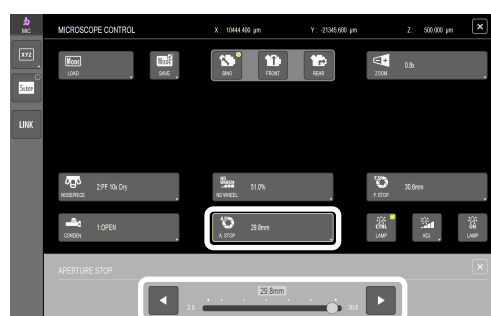


7 Fully open the DIA field diaphragm and the DIA aperture diaphragm.

- (1) Tap the [F. STOP] button on the DS-L4 screen to open the sub screen. Move the slider to the right end.

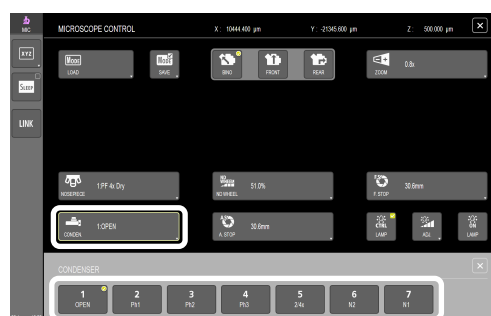


- (2) Tap the [A. STOP] button on the DS-L4 screen to open the sub screen. Move the slider to the right end.



8 Set the condenser turret to the [OPEN] position (empty: bright-field).

Tap the [CONDEN.] button on the DS-L4 screen to open the sub screen. Select [OPEN].



9 Bring the 10x objective into the optical path.

Tap the [NOSEPIECE] button on the DS-L4 screen to open the sub screen. Select a 10x objective.

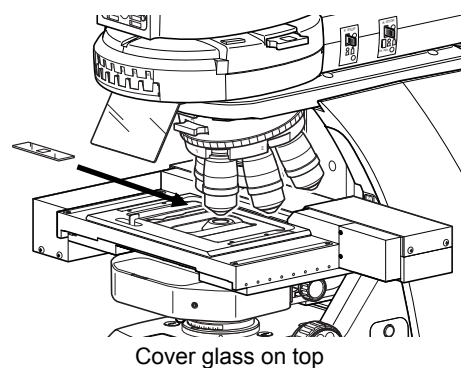


10 Place a specimen on the stage, and move the stage to bring the target into view.

- (1) Tap the [XYZ] button on the DS-L4 screen to open the sub screen. Tap the [Specimen Removal Position] button to move the stage.



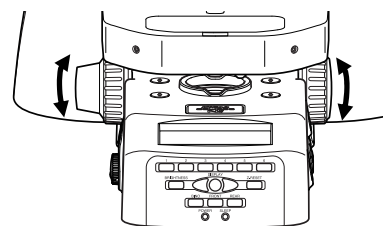
- (2) Open the claw of the specimen holder's moving part and place the specimen onto the stage, gently stowing the claw back to fix the specimen.



- (3) Tap the [Specimen Removal Position] button once again to restore the stage to the original position.
- (4) Using the ergo controller or the joystick, bring the target area of the specimen into the optical path.
(So that the sample sealed under the cover glass will be lighted.)

11 Focus on the sample.

Rotate the focus knob on the microscope main body, ergo controller, or joystick to operate the elevating section of the microscope main body.

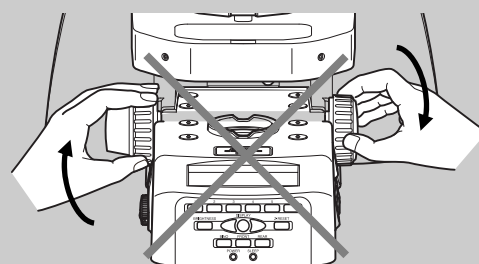


Z-axis coordinate



! Notes on controlling the focus knobs

- Avoid the following action, which can cause equipment malfunction: rotating the right and left focus knobs on the microscope in opposite directions.



Don't rotate the knobs in opposite directions.

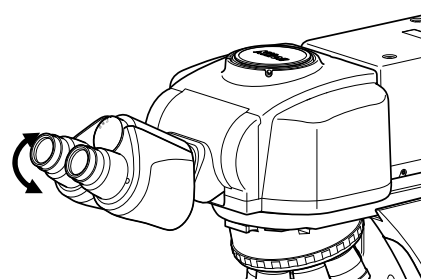
✓ Zero resetting the Z-axis coordinate

Tap the [Z-axis RESET] button to reset the Z-axis coordinate to zero. This is useful when you wish to use the current position as the reference position in adjusting the focus.

Z-axis
RESET

12 Adjust the diopter.

Look into the right eyepiece with your right eye and the left eyepiece with your left eye. Turn the diopter adjustment ring of each eyepiece to focus on the specimen. At this point no focus knobs are used.

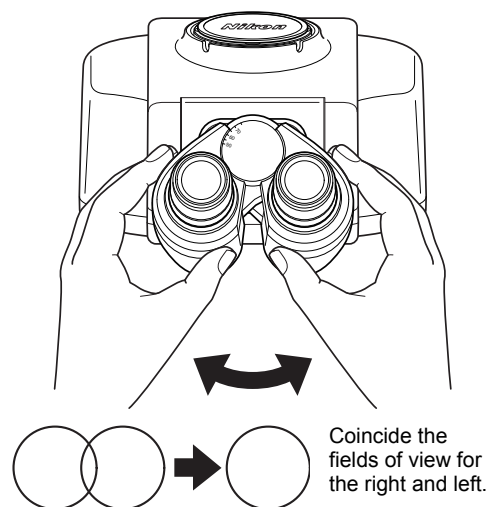


13 Adjust the interpupillary distance.

Look into both eyepieces and rotate the binocular part to adjust the binocular part's opening until the fields of view for the right and left eyes coincide.

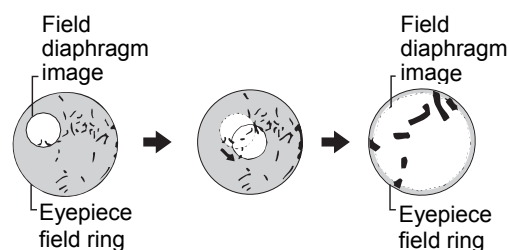
✓ Tip on adjusting the interpupillary distance

For easy adjustment, look into the eyepiece as if you were looking at a distant object.



14 Focus and center the condenser.

- (1) Tap the [F. STOP] button on the DS-L4 screen to stop down the DIA field diaphragm to the minimum, and look into the eyepiece. Focus on the field diaphragm image using the condenser focus knob, then adjust the condenser centering screws to center the diaphragm image within the field of view.
- (2) Tap the [NOSEPIECE] button to bring a 40x objective into the optical path, and check the focus and centering of the field diaphragm image. Make adjustments as necessary.
- (3) Adjust the field diaphragm so that the size of its image almost matches the field of view.



Motorized bright-field microscopy operation

15 Bring an arbitrary objective into the optical path.

Tap the [NOSEPIECE] button on the DS-L4 screen to open the sub screen. Select the desired objective.

When using an oil immersion type objective, apply immersion oil between the specimen and the objective.

✓ Configuring the rotation of the motorized nosepiece

The following settings can be configured for the rotation of the nosepiece.

- Disabling nosepiece rotation when the elevating section is positioned higher than the specified position (See Chapter 6, “5.3 Disabling the Rotation of the Motorized Nosepiece Depending on the Position of the Elevating Section”)
- Disabling the switching to higher magnification objective (nosepiece address 1→6 or 1→7) (See Chapter 6, “5.4 Disabling the Reverse Rotation of the Nosepiece”)

✓ Interlocking operations with the switching of objectives

The following operations can be configured to be automatically performed when the nosepiece is rotated to switch the objective.

- Retraction of the Ni-E microscope's elevating section and its restoration after switching of the objective that follows
- Aperture diaphragm adjustment on the motorized universal condenser
- DIA field diaphragm adjustment on the Ni-E microscope main body
- ND filter transmittance adjustment on the motorized ND filter wheel
- Switching of the module in the motorized universal condenser
- Switching of Ni-E microscope's elevating section movement speed
- Switching of motorized XY stage movement speed
- Correction of the focal position

For details, refer to Chapter 6, “5.1.1 Configuring the Interlocked Operation with Switching of Objectives”, “5.1.3 Automatically Switching the Movement Speed of the Microscope's Elevating Section and Motorized Stage”, and “5.1.4 Configuring the Parfocal Correction Function (Auto Link Focus)”.

When the aperture diaphragm, field diaphragm, and ND filter configurations are made to [75%], [100%], and [NORMAL], relevant adjustment steps described in the following procedure can be omitted.

✓ Toggle function

Use the toggle function for easy switching between two objectives. For details, refer to Chapter 6, “5.5 Configuring the Toggle Function (Alternating between Two Objectives)”.



16 Adjust the DIA aperture diaphragm.

Tap the [A. STOP] button on the DS-L4 screen to adjust the diameter of the aperture diaphragm.

The aperture should be adjusted to about 70 to 80% of the numerical aperture of the objective.

✓ Proper size of the aperture diaphragm

Normally, the appropriate size of the aperture diaphragm is 70 to 80% of the numerical aperture of the objective. Since an excessively small aperture diaphragm opening will degrade the image resolution, it is not recommended to set the aperture diaphragm to less than 60% of the numerical aperture of the objective.

✓ Adjustment timing for the aperture diaphragm

Be sure to adjust the aperture diaphragm each time you change the objective.

✓ Calculating the aperture diaphragm diameter

Use the following formula to determine the suitable size of the aperture diaphragm.

34 x NA x ratio

NA: Numerical aperture of the objective
(Indicated on the side of the objective.)

Ratio: 0.70 for 70%, 0.80 for 80%

<Example>

- Using Plan 40x objective.....Numerical aperture: 0.75

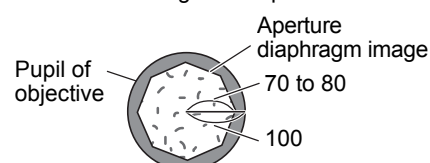
In this case, the diaphragm diameter to set the aperture diaphragm of the condenser to 70% can be determined as follows:

$$34 \times 0.75 \times 0.70 = 17.85$$

Rounded to one decimal place, 17.9 (mm) is calculated.



Aperture diaphragm viewed with a centering telescope



Plan 40X

40x / 0.75

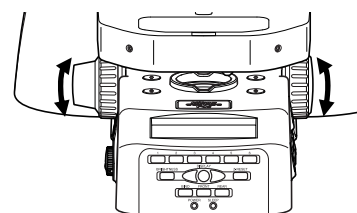
∞ / -WD



Indication for 40x magnification/
numerical aperture 0.75

17 Focus on the sample.

Rotate the focus knob on the microscope main body, ergo controller, or joystick to operate the elevating section of the microscope main body.



Z-axis coordinate



18 Adjust the DIA field diaphragm.

Tap the [F. STOP] button on the DS-L4 screen to adjust the field diaphragm so that it almost circumscribes the field of view.

✓ Size of the field diaphragm

Normally, the field diaphragm should be adjusted so that it almost circumscribes the field of view. Excessively opening the field diaphragm will result in stray light entering the field of view, generating flare and reducing the image contrast. It will also cause the sample to become decolorized over a wider area.

✓ Adjustment timing for the field diaphragm

Be sure to adjust the field diaphragm each time you change the objective.



Appropriate size of the field diaphragm

Field diaphragm Field of view



Circumscribe around the field of view

19 Adjusting the brightness

Tap the [ND WHEEL] button on the DS-L4 screen to open the sub screen, and then move the slider to adjust the transmittance of the ND filter.



20 View the sample.

To observe another part of the sample, operate the ergo controller or the joystick to move the stage. If the sample is not in focus, turn the focus knob to focus on it.

To observe under a different magnification, repeat steps 15 and later with another objective.

✓ Glare when switching microscopy method

When switching from dark-field to bright-field microscopy, you may feel the field of view is dazzling. To avoid this, close your eyes or look away from the eyepiece during the switchover.

✓ Presetting the microscopy state

The MODE function can be used to record the current state of the motorized devices for later use. For details, refer to Chapter 5, "2 Using the MODE Function".

21 Capture images.

- (1) Tap the [REAR] button on the DS-L4 screen to direct the optical path of the quadrocular tilting tube to the rear port (motorized DSC zooming port), to which the digital camera is connected.

✓ Interlocking operations with the switching of the optical path

The DIA field diaphragm diameter can be configured to be automatically adjusted when the optical path is switched. For details, refer to Chapter 6, “5.1.6 Configuring the Interlocked Operation with Switching of Optical Path”.

- (2) Tap the [MIC EASY] button on the [MAIN] menu to switch to the [MIC EASY] screen, which allows the microscope to be operated while viewing images captured by the camera.
- (3) Tap the [ZOOM] button to open the sub screen, and move the slider to adjust the zoom magnification of the motorized DSC zooming port.

✓ Interlocking operations with the switching of the motorized DSC zooming port's zoom magnification

The following operations can be configured to be automatically performed when the zoom magnification is changed.

- DIA field diaphragm adjustment on the Ni-E microscope main body
- ND filter transmittance adjustment on the motorized ND filter wheel

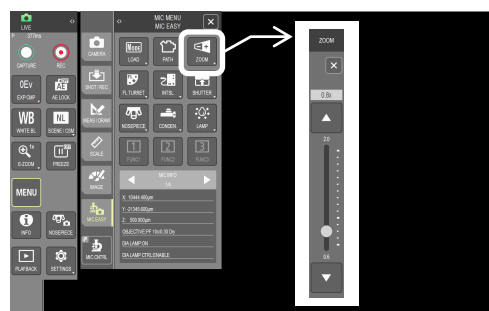
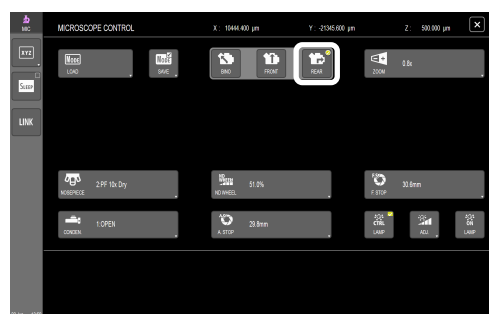
For details, refer to Chapter 6, “5.1.5 Configuring the Interlocked Operation with Switching of Zoom Magnification”.

- (4) Tap the [CAPTURE] button to capture an image. Configure the camera settings as necessary before starting capturing.

✓ Capture operation available on DS-L4

DS-L4 offers three capturing operations, each with differing operation methods.

- Capture operation using the [CAPTURE] button in the LIVE menu (operation in this procedure)
- Capture operation by clicking with the mouse
- Output of capture trigger signal from microscope (For details, refer to Chapter 5, “1.17 Outputting Capture Trigger Signals from the Microscope”.)



22 Turn off DS-L4 by tapping [SETTINGS] on the LIVE or VIEW menu and selecting [SHUT DOWN], and then turn off the camera by pressing the power switch.

23 Turn off the power on the microscope main unit and the motorized parts.

Turn off control box A and the connected motorized devices by pressing their power switches to the “O” position. (Each power LED turns off.)

This chapter individually describes the procedures for using DS-L4 to operate the motorized devices of your microscope.

✓ **The screen contents will differ depending on the configuration and settings of your microscope.**

The screen will only show devices that are connected to the microscope and recognized by DS-L4. For this reason, the composition of the screen will differ depending on the configuration of your microscope. For information on microscopes and devices that can be recognized by DS-L4, refer to Chapter 1, “Motorized Units Operable from DS-L4”.

The button layout on the [MICROSCOPE CONTROL] and [MIC EASY] screens can be customized. For details on changing the button layout or displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”.

1

Operating Motorized Devices

Motorized devices can be operated from the [MICROSCOPE CONTROL] screen or the [MIC EASY] screen.

[MICROSCOPE CONTROL] Screen

(Displayed with the [MIC CNTRL] button on the menu tab)



Operation with the [NOSEPIECE] Button

Display Status of the [NOSEPIECE] Button

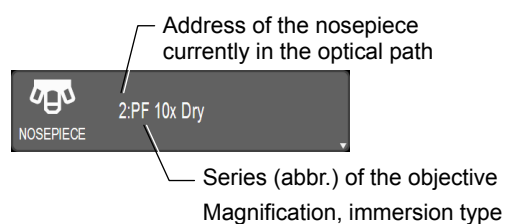
	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Displayed by default	Displayed by default
Ni-U	Can be displayed by setting	Displayed by default
Ci-E	-	Displayed (cannot be changed)

(For details on displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”.)

[Procedure]

(1) Tap the [NOSEPIECE] button.

[MICROSCOPE CONTROL] Screen



[MIC EASY] Screen



(2) Tap the button for the objective to be used.

The objective is switched. The button for the currently selected objective is highlighted (with a check mark on the [MICROSCOPE CONTROL] screen, or with a yellow frame on the [MIC EASY] screen).

Direct Operation with [Objective (Address)] Buttons

Display Status of [Objective (Address)] Buttons

	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Can be displayed by setting	Can be displayed by setting
Ni-U	Displayed by default	Can be displayed by setting
Ci-E	-	Cannot be displayed

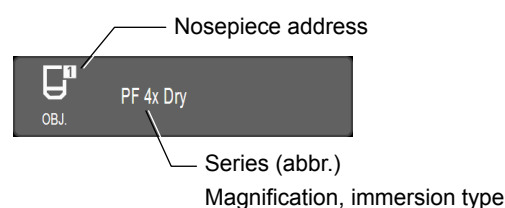
(For details on displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”).

[Procedure]

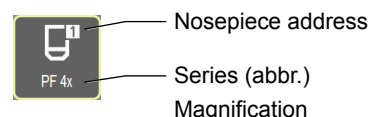
Tap an [Objective (Address)] button.

The objective is switched. The button for the currently selected objective is highlighted (with a check mark on the [MICROSCOPE CONTROL] screen, or with a yellow frame on the [MIC EASY] screen).

[MICROSCOPE CONTROL] Screen



[MIC EASY] Screen



✔ Interlocking other motorized devices with the switching of objective (Ni-E only)

The following operations can be configured to be automatically performed when the nosepiece is rotated to switch the objective.

- Retraction of the microscope's elevating section and its restoration after switching of the objective that follows^{*1}
- Aperture diaphragm adjustment on the motorized universal condenser
- DIA field diaphragm adjustment on the Ni-E microscope main unit
- ND filter transmittance adjustment on the motorized ND filter wheel
- Switching of the module in the motorized universal condenser
- Switching of Ni-E microscope's elevating section movement speed
- Switching of motorized XY stage movement speed
- Correction of the focal position^{*1}

^{*1} Disabled when the intelligent nosepiece is turned manually.

For details, refer to Chapter 6, “5.1.1 Configuring the Interlocked Operation with Switching of Objectives”, “5.1.3 Automatically Switching the Movement Speed of the Microscope's Elevating Section and Motorized Stage”, and “5.1.4 Configuring the Parfocal Correction Function (Auto Link Focus)”.

Tap the [LINK] button to go directly to the setting screen.

LINK

1.2

Switching the Optical Path (Motorized Quadrocular Tilting Tube)

Ni-E

Use the [BINO], [FRONT], or [REAR] button to redirect the optical path in the motorized quadrocular tilting tube to the binocular section, tube adapter, or rear port.

✔ **Prerequisite for motorized operation**

A motorized quadrocular tilting tube must be attached to the microscope in order to perform the following operation.

Display Status of [BINO], [FRONT], [REAR] Buttons

	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Displayed by default	Displayed on [PATH] button sub screen by default

(For details on displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”.)

[Procedure]

- (1) Tap the [PATH] button.
(This operation is not necessary on [MICROSCOPE CONTROL] screen. Go to the next step.)

[MIC EASY] Screen



- (2) Tap the button for the optical path ([BINO]: binocular section/[FRONT]: tube adapter/[REAR]: rear port) to be used.

[MICROSCOPE CONTROL] Screen



The optical path is switched. The button for the currently selected optical path is highlighted (with a check mark on the [MICROSCOPE CONTROL] screen, or with a yellow frame on the [MIC EASY] screen).

✔ **Interlocking other motorized devices with the switching of the optical path**

The DIA field diaphragm diameter can be configured to be automatically adjusted when the optical path is switched.

For further details and the configuration method, refer to Chapter 6, “5.1.6 Configuring the Interlocked Operation with Switching of Optical Path”. Tap the [LINK] button at the top of the [MICROSCOPE CONTROL] screen to jump directly to the configuration screen.

1.3

Adjusting the Zoom Magnification (Motorized DSC Zooming Port)

Ni-E

Use the [ZOOM] button to adjust the zoom magnification of the motorized DSC zooming port.

✔ **Prerequisite for motorized operation**

A motorized DSC zooming port must be attached to the microscope in order to perform the following operation.

Display Status of the [ZOOM] Button

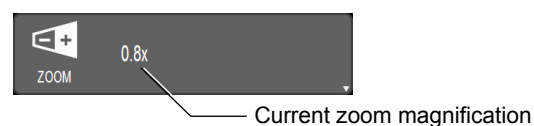
	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Displayed by default	Displayed by default

(For details on displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”.)

[Procedure]

(1) Tap the [ZOOM] button.

[MICROSCOPE CONTROL] Screen



[MIC EASY] Screen



(2) Move the slider to adjust the zoom magnification.

✔ **Interlocking other motorized devices when changing zoom magnification**

The following operations can be configured to be automatically performed when the zoom magnification is changed.

- DIA field diaphragm adjustment on the Ni-E microscope main body
- ND filter transmittance adjustment on the motorized ND filter wheel

For further details and the configuration method, refer to Chapter 6, “5.1.5 Configuring the Interlocked Operation with Switching of Zoom Magnification”. Tap the [LINK] button at the top of the [MICROSCOPE CONTROL] screen to jump directly to the configuration screen.

1.4

Switching the Filter Cube (Motorized Epi-fluorescence Cube Turret)

Ni-E

Ni-U

To switch the filter cube in the motorized epi-fluorescence cube turret, use the [FL TURRET] button or the [Filter Cube (Address)] buttons.

✓ **Prerequisite for motorized operation**

In order to switch the filter cube from DS-L4, a motorized epi-fluorescence cube turret must be attached to the microscope. When an intelligent epi-fluorescence cube turret is attached, the filter cube information is displayed, but the operation is disabled. The following operations cannot be performed if neither a motorized epi-fluorescence cube turret nor an intelligent epi-fluorescence cube turret is attached.

✓ **Using two motorized epi-fluorescence cube turrets (Ni-E only)**

The following procedure describes the operation of the first epi-fluorescence cube turret. To operate the second epi-fluorescence cube turret attached to Ni-E, follow the procedure below using buttons labeled with “2nd”.

Operation with the [FL TURRET] Button

Display Status of the [FL TURRET] Button (For the First Epi-fluorescence Cube Turret)

	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Displayed by default	Displayed by default
Ni-U	Displayed by default	Displayed by default

Display Status of the [FL 2nd] Button (For the Second Epi-fluorescence Cube Turret)

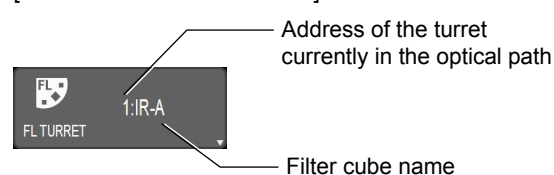
	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Displayed by default	Can be displayed by setting

(For details on displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”.)

[Procedure]

(1) Tap the [FL TURRET] button.

[MICROSCOPE CONTROL] Screen



[MIC EASY] Screen



(2) Tap the button for the filter cube to be used.

The filter cube is switched. The button for the currently selected filter cube is highlighted (with a check mark on the [MICROSCOPE CONTROL] screen, or with a yellow frame on the [MIC EASY] screen).

Direct Operation with [Filter Cube (Address)] Buttons

Display Status of the [Filter Cube (Address)] Buttons (For the First Epi-fluorescence Cube Turret)

	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Can be displayed by setting	Can be displayed by setting
Ni-U	Can be displayed by setting	Can be displayed by setting

Display Status of the [Filter Cube 2nd (Address)] Buttons (For the Second Epi-fluorescence Cube Turret)

	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Can be displayed by setting	Can be displayed by setting

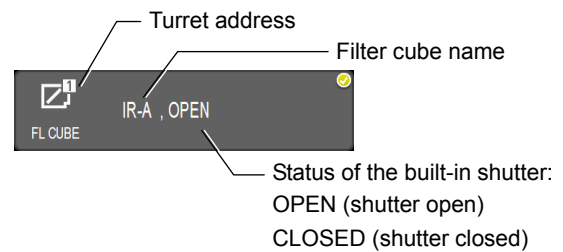
(For details on displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”.)

[Procedure]

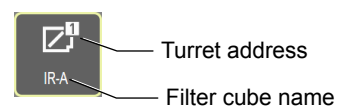
Tap a [Filter Cube (Address)] button.

The filter cube is switched. The button for the currently selected objective is highlighted (with a check mark on the [MICROSCOPE CONTROL] screen, or with a yellow frame on the [MIC EASY] screen).

[MICROSCOPE CONTROL] Screen



[MIC EASY] Screen



1.5

Opening/Closing the Motorized Epi-fluorescence Cube Turret's Built-in Shutter

Ni-E

Ni-U

Use the [SHUTTER FL] button to open/close the motorized epi-fluorescence cube turret's built-in shutter.

✓ **Prerequisite for motorized operation**

In order to open/close the turret's built-in shutter from DS-L4, a motorized epi-fluorescence cube turret must be attached to the microscope. When an intelligent epi-fluorescence cube turret is attached, the status of the built-in shutter is not displayed.

✓ **Using two motorized epi-fluorescence cube turrets (Ni-E only)**

The following procedure describes the operation of the first epi-fluorescence cube turret. To operate the second epi-fluorescence cube turret attached to Ni-E, follow the procedure below using buttons labeled with "2nd".

Display Status of [SHUTTER FL] Button (For the First Epi-fluorescence Cube Turret)

	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Displayed by default	<ul style="list-style-type: none"> Displayed on [FL TURRET] sub screen and [SHUTTER] sub screen by default Can be displayed individually by setting
Ni-U	Displayed by default	<ul style="list-style-type: none"> Displayed on [FL TURRET] sub screen and [SHUTTER] sub screen by default Can be displayed individually by setting

Display Status of [SHUTTER FL2] Button (For the Second Epi- fluorescence Cube Turret)

	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Displayed by default	<ul style="list-style-type: none"> Displayed on [FL TURRET] sub screen and [SHUTTER] sub screen by default Can be displayed individually by setting

(For details on displaying/hiding the buttons, refer to Chapter 6, "4.1.1 Selecting the Buttons to be Displayed".)

[Procedure]

- (1) Tap the **[FL TURRET]** or **[SHUTTER]** button.
(This operation is not required if the **[SHUTTER FL]** button is already displayed. Go to the next step.)

[MIC EASY] Screen



- (2) Tap the **[SHUTTER FL]** button.

The shutter opens or closes each time the button is tapped.

[MICROSCOPE CONTROL] Screen



When the shutter is open



When the shutter is closed



1.6

Opening/Closing All Shutters for Epi-illumination

Ni-E

Ni-U

The following epi-illumination shutters are opened/closed at once.

- Motorized HG precentered fiber illuminator's built-in shutter
- EPI motorized shutter
- Motorized epi-fluorescence cube turret's built-in shutter (in both turrets, if two are used in layers)

The [SHUTTER EPI ALL] button is used for this operation.

✓ **Prerequisite for motorized operation**

At least one of the shutters to be operated must be attached to the microscope.

Display Status of [SHUTTER EPI ALL] Button

	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Displayed by default	<ul style="list-style-type: none"> • Displayed on [SHUTTER] button sub screen by default • Can be displayed individually by setting
Ni-U	Displayed by default	<ul style="list-style-type: none"> • Displayed on [SHUTTER] button sub screen by default • Can be displayed individually by setting

(For details on displaying/hiding the buttons, refer to Chapter 6, "4.1.1 Selecting the Buttons to be Displayed".)

[Procedure]

- (1) Tap the [SHUTTER] button.

This operation is not necessary if the [SHUTTER EPI ALL] button is displayed. Go to the next step.)

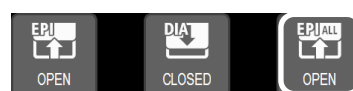
[MIC EASY] Screen



- (2) Tap the [SHUTTER EPI ALL] button to open/close the shutter.

All epi-illumination shutters open or close each time the [SHUTTER EPI ALL] button is tapped.

[MICROSCOPE CONTROL] Screen



When an epi-illumination shutter is individually opened/closed, the display on the [SHUTTER EPI ALL] button will indicate shutter closed state if any of the shutters is closed.

When the shutter is open



When the shutter is closed



To switch the excitation filter by rotating the motorized excitation filter wheel, use the [EX WHEEL] button or the [Excitation Filter (Address)] buttons.

✓ Prerequisite for motorized operation

A motorized excitation filter wheel must be attached to the microscope in order to perform the following operation.

✓ Cautions on switching the excitation filter

When switching the excitation filter, depending on the positioning of the optical parts, passing an empty address (that has no filter) may result in strong light entering the observation section and into your eyes. For this reason, as well as to avoid unnecessarily irradiating the specimen, it is recommended that the epi-illumination shutters be closed when switching the excitation filter.

Operation with the [EX WHEEL] Button

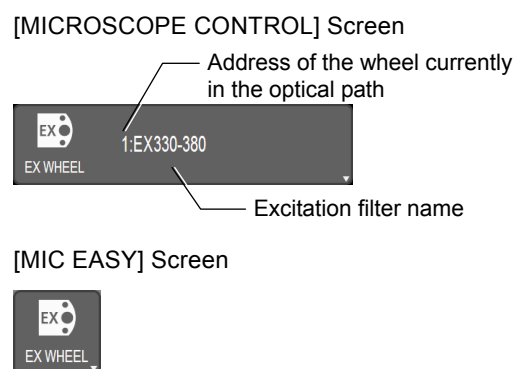
Display Status of the [EX WHEEL] Button

	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Displayed by default	Can be displayed by setting

(For details on displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”.)

[Procedure]

(1) Tap the [EX WHEEL] button.



(2) Tap the button for the excitation filter to be used.

The excitation filter is switched. The button for the currently selected excitation filter is highlighted (with a check mark on the [MICROSCOPE CONTROL] screen, or with a yellow frame on the [MIC EASY] screen).

Direct Operation with [Excitation Filter (Address)] Buttons

Display Status of [Excitation Filter (Address)] Buttons

	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Can be displayed by setting	Can be displayed by setting

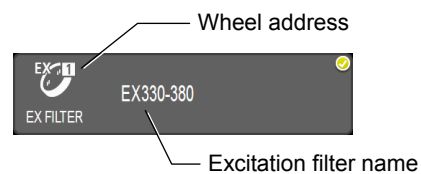
(For details on displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”).

[Procedure]

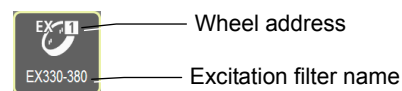
Tap an [Excitation Filter (Address)] button.

The excitation filter is switched. The button for the currently selected excitation filter is highlighted (with a check mark on the [MICROSCOPE CONTROL] screen, or with a yellow frame on the [MIC EASY] screen).

[MICROSCOPE CONTROL] Screen



[MIC EASY] Screen



To switch the barrier filter by rotating the motorized barrier filter wheel, use the [BA WHEEL] button or the [Barrier Filter (Address)] buttons.

✔ **Prerequisite for motorized operation**

A motorized barrier filter wheel must be attached to the microscope in order to perform the following operation.

Operation with the [BA WHEEL] Button

Display Status of the [BA WHEEL] Button

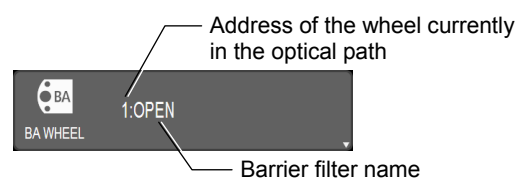
	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Displayed by default	Can be displayed by setting

(For details on displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”.)

[Procedure]

(1) Tap the [BA WHEEL] button.

[MICROSCOPE CONTROL] Screen



[MIC EASY] Screen



(2) Tap the button for the barrier filter to be used.

The barrier filter is switched. The button for the currently selected barrier filter is highlighted (with a check mark on the [MICROSCOPE CONTROL] screen, or with a yellow frame on the [MIC EASY] screen).

Direct Operation with [Barrier Filter (Address)] Buttons

Display Status of [Barrier Filter (Address)] Buttons

	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Can be displayed by setting	Can be displayed by setting

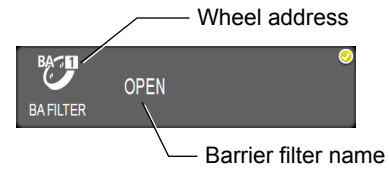
(For details on displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”.)

[Procedure]

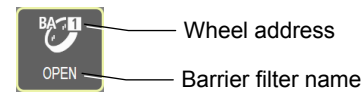
Tap a [Barrier Filter (Address)] button.

The barrier filter is switched. The button for the currently selected barrier filter is highlighted (with a check mark on the [MICROSCOPE CONTROL] screen, or with a yellow frame on the [MIC EASY] screen).

[MICROSCOPE CONTROL] Screen



[MIC EASY] Screen



To switch the condenser module in the motorized universal condenser, tap the [CONDEN.] button or a [Condenser Module (Address)] button.

✓ **Prerequisite for motorized operation**

A motorized universal condenser must be attached to the microscope in order to perform the following operation.

Operation with the [CONDEN.] Button

Display Status of the [CONDEN.] Button

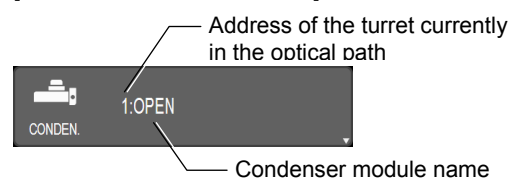
	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Displayed by default	Displayed by default

(For details on displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”.)

[Procedure]

(1) Tap the [CONDEN.] button.

[MICROSCOPE CONTROL] Screen



[MIC EASY] Screen



(2) Tap the button for the condenser module to be used.

The condenser module is switched. The button for the currently selected condenser module is highlighted (with a check mark on the [MICROSCOPE CONTROL] screen, or with a yellow frame on the [MIC EASY] screen).

Direct Operation with [Condenser Module (Address)] Buttons

Display Status of [Condenser Module (Address)] Buttons

	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Can be displayed by setting	Can be displayed by setting

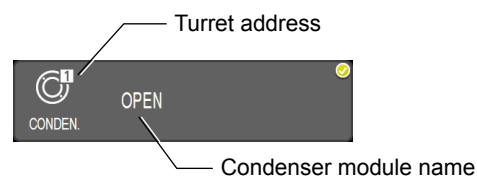
(For details on displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”).

[Procedure]

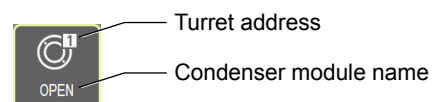
Tap the [Condenser Module (Address)] button.

The condenser module is switched. The button for the currently selected condenser module is highlighted (with a check mark on the [MICROSCOPE CONTROL] screen, or with a yellow frame on the [MIC EASY] screen).

[MICROSCOPE CONTROL] Screen



[MIC EASY] Screen



1.10

Adjusting the DIA Aperture Diaphragm (Motorized Universal Condenser)

Ni-E

To adjust the aperture diaphragm in the motorized universal condenser, use the [A. STOP] button.

✔ **Prerequisite for motorized operation**

A motorized universal condenser must be attached to the microscope in order to perform the following operation.

Display Status of the [A. STOP] Button

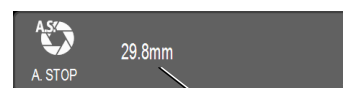
	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Displayed by default	Can be displayed by setting

(For details on displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”.)

[Procedure]

- (1) Tap the [A. STOP] button.

[MICROSCOPE CONTROL] Screen



Current diameter of the aperture diaphragm

[MIC EASY] Screen



- (2) Move the slider to adjust the diameter of the aperture diaphragm.

1.11

Swinging Out the Condenser Top Lens (Motorized Swing-out Condenser)

Ci-E

To swing out the top lens of a motorized swing-out condenser, use the [CONDEN.] button.

✓ **Prerequisite for motorized operation**

A motorized swing-out condenser must be attached to the microscope in order to perform the following operation.

Display Status of the [CONDEN.] Button

	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ci-E	-	Displayed (cannot be changed)

[Procedure]

Tap the [CONDEN.] button to switch the status of the top lens.

The top lens status changes each time the button is tapped.

[MICROSCOPE CONTROL] Screen

When the top lens is in the optical path



When the top lens is out of the optical path



1.12

Operating the Motorized HG Precentered Fiber Illuminator (Intensilight)

Ni-E

Ni-U

To open/close the shutter built into the motorized HG precentered fiber illuminator (Intensilight), use the [SHUTTER INTSL] button.

To switch the ND built into the motorized HG precentered fiber illuminator, use the [INTSL] button or the [Intensilight (ND number)] buttons.

✔ **Prerequisite for motorized operation**

A motorized HG precentered fiber illuminator must be attached to the microscope in order to perform the following operation.

1.12.1

Opening/Closing the Motorized HG Precentered Fiber Illuminator's Built-in Shutter

Display Status of the [SHUTTER INTSL] Button

	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Displayed by default	<ul style="list-style-type: none"> Displayed on [INTSL] sub screen and [SHUTTER] sub screen by default Can be displayed individually by setting
Ni-U	Displayed by default	<ul style="list-style-type: none"> Displayed on [INTSL] sub screen and [SHUTTER] sub screen by default Can be displayed individually by setting

(For details on displaying/hiding the buttons, refer to Chapter 6, "4.1.1 Selecting the Buttons to be Displayed".)

[Procedure]

- (1) Tap the [INTSL] or [SHUTTER] button.
(This operation is not required if the [SHUTTER INTSL] button is already displayed. Go to the next step.)

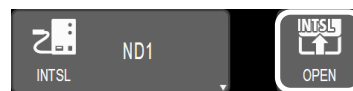
[MIC EASY] Screen



- (2) Tap the [SHUTTER INTSL] button.

The shutter opens or closes each time the button is tapped.

[MICROSCOPE CONTROL] Screen



When the shutter is open



When the shutter is closed



1.12.2 Switching the ND for the Motorized HG Precentered Fiber Illuminator

Operation with the [INTSL] Button

Display Status of the [INTSL] Button

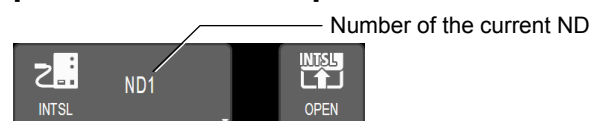
	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Displayed by default	Displayed by default
Ni-U	Displayed by default	Displayed by default

(For details on displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”.)

[Procedure]

(1) Tap the [INTSL] button.

[MICROSCOPE CONTROL] Screen



[MIC EASY] Screen



(2) Tap the button for the ND to be used.

The ND is switched. The button for the currently selected ND is highlighted (with a check mark on the [MICROSCOPE CONTROL] screen, or with a yellow frame on the [MIC EASY] screen).

Direct Operation with [Intensilight (ND number)] Buttons

Display Status of [Intensilight (ND number)] Buttons

	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Can be displayed by setting	Can be displayed by setting
Ni-U	Can be displayed by setting	Can be displayed by setting

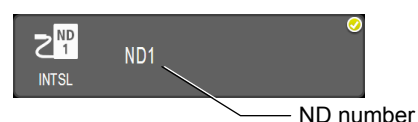
(For details on displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”.)

[Procedure]

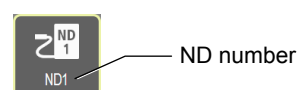
Tap an [Intensilight (ND number)] button.

The ND is switched. The button for the currently selected ND is highlighted (with a check mark on the [MICROSCOPE CONTROL] screen, or with a yellow frame on the [MIC EASY] screen)..

[MICROSCOPE CONTROL] Screen



[MIC EASY] Screen



1.13

Adjusting the ND Filter for Dia-illumination (Motorized ND Filter Wheel)

Ni-E

To adjust the transmittance of the ND filter in the motorized ND filter wheel, use the [ND WHEEL] button.

✓ **Prerequisite for motorized operation**

A motorized ND filter wheel must be attached to the microscope in order to perform the following operation.

Display Status of the [ND WHEEL] Button

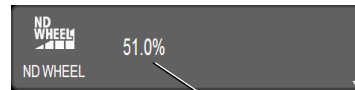
	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Displayed by default	Can be displayed by setting

(For details on displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”.)

[Procedure]

(1) Tap the [ND WHEEL] button.

[MICROSCOPE CONTROL] Screen



Current ND filter transmittance

[MIC EASY] Screen



(2) Move the slider to adjust the transmittance.

1.14 Adjusting the Dia-illumination Lamp/LED

Ni-E Ni-U Ci-E

To switch over the control of the dia-illumination lamp/LED to turn the lamp ON/OFF, or adjust the brightness of the lamp, use the [LAMP]/[LED] button.

✔ **Control of the dia-illumination lamp/LED**

To control the dia-illumination lamp/LED from DS-L4, you must first transfer the control from the microscope to DS-L4. If DS-L4 does not have control, the button will be grayed out and disabled. When DS-L4 has control, the dia-illumination lamp/LED can also be controlled from the PC. Control of the dia-illumination lamp/LED is returned to the microscope main body when the microscope is turned off.

Display Status of the [LAMP]/[LED] Button

	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Displayed by default (Displayed by expanding [LAMP CTRL], [ADJ.], [LAMP ON/OFF] button)	Displayed by default
Ni-U	Displayed by default (Displayed by expanding [LAMP CTRL], [ADJ.], [LAMP ON/OFF] button)	Displayed by default
Ci-E	-	Displayed (cannot be changed)

(For details on displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”.)

1.14.1 Transferring the Control of the Dia-illumination Lamp/LED

[Procedure]

- (1) Tap the [LAMP]/[LED] button.
(This operation is not required on the [MICROSCOPE CONTROL] screen. Go to the next step.)

Following screens are for Ni-E/Ni-U. For Ci-E, it is displayed as [LED] instead of [LAMP].

- (2) Tap the [LAMP CTRL]/[LED CTRL] button to transfer the control.

The control is transferred between DS-L4 and the microscope each time the [LAMP CTRL]/[LED CTRL] button is tapped.

[MIC EASY] Screen



[MICROSCOPE CONTROL] Screen



When DS-L4 does not have control



When DS-L4 has control



1.14.2 Turning the Dia-illumination Lamp/LED ON/OFF

[Procedure]

- (1) Tap the [LAMP]/[LED] button.

(This operation is not required on the [MICROSCOPE CONTROL] screen. Go to the next step.)

Following screens are for Ni-E/Ni-U. For Ci-E, it is displayed as [LED] instead of [LAMP].

[MIC EASY] Screen



- (2) Tap the [LAMP ON/OFF]/[LED ON/OFF] button to turn ON/OFF.

The lamp/LED turns ON/OFF each time the [LAMP ON/OFF]/[LED ON/OFF] button is tapped.

(DS-L4 must have control of the lamp/LED. For details on the control, refer to “1.14.1 Transferring the Control of the Dia-illumination Lamp/LED”.)

[MICROSCOPE CONTROL] Screen



1.14.3 Adjusting the Brightness of the Dia-illumination Lamp/LED

[Procedure]

- (1) (For [MICROSCOPE CONTROL] screen)

Tap the [ADJ.] button.

(For [MIC EASY] screen)

Tap the [LAMP]/[LED] button.

[MICROSCOPE CONTROL] Screen



Following screens are for Ni-E/Ni-U. For Ci-E, it is displayed as [LED] instead of [LAMP].

[MIC EASY] Screen



- (2) Move the slider to adjust the brightness.

(DS-L4 must have control of the lamp/LED. For details on the control, refer to “1.14.1 Transferring the Control of the Dia-illumination Lamp/LED”.)

✓ For improved color reproduction (Ni-E, Ni-U only)

On Ni-E and Ni-U, change in lamp voltage will affect the color of the illumination. Where color reproduction is of significance, tap the [PHOTO] button to adjust the lamp voltage to the voltage that offers optimal color reproduction. (The [PHOTO] button turns yellow. The yellow indicator on the slider will not move.) Use ND filters for brightness adjustment.

[PHOTO] button



1.15

Adjusting the DIA Field Diaphragm

Ni-E

To adjust the DIA field diaphragm in the microscope main body, use the [F. STOP] button.

Display Status of [F. STOP] Button

	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Displayed by default	Displayed by default

(For details on displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”.)

[Procedure]

- (1) Tap the [F. STOP] button.

[MICROSCOPE CONTROL] Screen



Current diameter of the field diaphragm

[MIC EASY] Screen



- (2) Move the slider to adjust the diameter of the field diaphragm.

To open or close the motorized shutter attached to the microscope, use the [SHUTTER EPI/DIA/AUX] button.

✓ Prerequisite for motorized operation

A motorized shutter must be attached to the microscope in order to perform the following operation.

Display Status of [SHUTTER EPI/DIA/AUX] Button

	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Displayed by default	<ul style="list-style-type: none"> Displayed on [SHUTTER] sub screen by default Can be displayed individually by setting
Ni-U	Displayed by default	<ul style="list-style-type: none"> Displayed on [SHUTTER] sub screen by default Can be displayed individually by setting

(The EPI, DIA, and AUX buttons for which connection is configured are displayed. For connection information of motorized shutter, see Chapter 6, “3.2 Configuring the Connection of Motorized Shutter”.

For details on displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”.)

[Procedure]

- (1) Tap the [SHUTTER] button.

This operation is unnecessary if the [SHUTTER EPI/DIA/AUX] button is displayed. Go to the next step.)

[MIC EASY] Screen



- (2) Tap the [SHUTTER EPI/DIA/AUX] button to open/close the shutter.

The shutter opens or closes each time the [SHUTTER EPI/DIA/AUX] button is tapped.

When the shutter is open



When the shutter is closed



1.17

Outputting Capture Trigger Signals from the Microscope

Ni-E

Ni-U

The DSC connector on the microscope can be used to output capture trigger signals.

The following procedure requires configuration of the digital camera connected to the DSC connector. Refer to Chapter 6, “3.1 Configuring the Connection of Digital Camera”.

Exposure time and other capture settings must be configured separately via the digital camera controller.

✓ Three capture operations possible from the DS-L4

Three different capture operations are possible from the DS-L4.

- Sending capture trigger signal from the microscope (only for Ni-E and Ni-U) (described in this section)
Use the [CAPTURE FRONT/LEFT/RIGHT/AUX] button on the [MICROSCOPE CONTROL] or [MIC EASY] screen. Tapping these buttons outputs the capture trigger signal via the DSC connector (DSC1 or DSC2 connector on Ni-E), instructing the connected camera to capture an image. This operation requires configuration on the [CONNECTION] screen.
- Capture operation using the [CAPTURE] button in the LIVE menu (For details, refer to the “Camera Operation” instruction manual)
- Capture operation by clicking with the mouse (For details, refer to the “Camera Operation” instruction manual)



Display Status of [CAPTURE FRONT/LEFT/RIGHT/AUX] Button

	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Can be displayed by setting	Can be displayed by setting (Sub screen of [CAPTURE] button displayed at the bottom of screen)
Ni-U	Can be displayed by setting	Can be displayed by setting (Sub screen of [CAPTURE] button displayed at the bottom of screen)

(For details on displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”.)

[Procedure]

- (1) Tap the [CAPTURE] button.
(This operation is not necessary on [MICROSCOPE CONTROL] screen. Go to the next step.)

[MIC EASY] Screen



- (2) Tap the [CAPTURE FRONT/LEFT/RIGHT/AUX] button.
The capture trigger signal is output via the DSC connector on the microscope.



✔ Interlocking other motorized devices with the outputting of capture trigger signals (Ni-E only)

When using Ni-E, the following operations can be configured to be automatically performed when a capture trigger signal is output by pressing the [CAPTURE] button on the microscope main body or tapping the [CAPTURE FRONT/LEFT/RIGHT/AUX] button on the DS-L4 screen.

- Optical path switching of the motorized quadocular tilting tube
- Switching of the filter cube in the motorized epi-fluorescence cube turret

For further details and the configuration method, refer to Chapter 6, “5.1.7 Configuring the Interlocked Operation with Capture Command Sending or Trigger Signal Output”. Tap the [LINK] button at the top of the [MICROSCOPE CONTROL] screen to jump directly to the configuration screen.

1.18

Operating the Elevating Section and the Motorized XY Stage

Ni-E

This section describes procedures for zero-resetting the displayed position of the elevating section, retracting the elevating section, and moving the motorized XY stage to the sample removal position. DS-L4 cannot be used to move the elevating section or the motorized XY stage to an arbitrary position.

Display Status of [Z-axis RESET], [ESCAPE], [Specimen Removal Position] Buttons

	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Displayed on [XYZ] button sub screen (cannot be changed)	<ul style="list-style-type: none"> Displayed on [XYZ] button sub screen by setting Can be displayed individually by setting

(For details on displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”.)

1.18.1

Zero-resetting the Z-axis Coordinate

The coordinate of the elevating section displayed on the DS-L4 screen can be reset to zero (0.000 μm) as a current position. The value on the display panel of the microscope main body is also reset to zero.

[Procedure]

- Move the elevating section to the position that you wish to set as the zero position of the Z-axis coordinate.
- Tap the [XYZ] button.
(This operation is not required if the [Z-axis RESET] button is already displayed on the [MIC EASY] screen. Go to the next step.)



- Tap the [Z-axis RESET] button.

The current position of the elevating section is displayed as 0.000 μm .

[MICROSCOPE CONTROL] Screen



[MIC EASY] Screen



1.18.2 Retracting the Elevating Section

[Procedure]

- (1) Tap the [XYZ] button.
(This operation is not required if the [ESCAPE] button is already displayed on the [MIC EASY] screen. Go to the next step.)
- (2) Tap the [ESCAPE] button.

The elevating section is moved to the position specified for the [ESCAPE DISTANCE] and enters the escape state.

For details on the escape distance, refer to Chapter 6, “5.2 Setting the Retracting Amount of the Elevating Section”.

The following are disabled in retracted state:

- Focus knob of the microscope, ergo controller, and joystick
- [Specimen Removal Position] button

Also, the display of Z coordinate on the [MICROSCOPE CONTROL] screen flashes.

Tap the button again to return to the original position.

The retracted state is reset and the focus knob and [Specimen Removal Position] button are enabled.



[MICROSCOPE CONTROL] Screen



[MIC EASY] Screen



1.18.3

Retracting the Elevating Section and Moving the Stage to the Specimen Removal Position

✓ **Prerequisite for motorized operation**

A motorized XY stage must be attached to the microscope in order to perform the following operation.

[Procedure]**(1) Tap the [XYZ] button.**

(This operation is not required if the [ESCAPE] button is already displayed on the [MIC EASY] screen. Go to the next step.)

**(2) Tap the [Specimen Removal Position] button.**

The elevating section is moved by the amount specified for the [ESCAPE DISTANCE]. The motorized XY stage is also moved to the software limit position at the front of the microscope.

[MICROSCOPE CONTROL] Screen



[MIC EASY] Screen



For details on the escape distance, refer to Chapter 6, “5.2 Setting the Retracting Amount of the Elevating Section”. For details on the software limit, refer to Chapter 6, “6.4 Setting the Software Limits”.

The following operations are disabled when moved to specimen removal position.

- Focus knob of the microscope, ergo controller, and joystick
- XY direction movement with the ergo controller or joystick
- [ESCAPE] button

Also, the display of X, Y, Z coordinates on the [MICROSCOPE CONTROL] screen blinks.

Tap the button again to return the motorized XY stage to the original position and enable XY direction movement with the ergo controller and joystick.

The elevating section is not returned to the original position, but escape state is canceled and the focus knob is enabled.

In addition, the [ESCAPE] button is enabled.

2

Using the MODE Function

Ni-E

Ni-U

The MODE function allows the microscopy state (position and status of motorized devices) to be stored in microscope's memory and restored at a push of a button. A single microscopy state is stored as a single mode. Up to eight modes can be stored and named with up to 4 characters. The motorized devices for which the state is restored can be selected for each mode. The MODE button on the Ni-E microscope main body can also be used to restore a state registered as a mode.

2.1

Registering/Changing Target Motorized Devices

Before using the MODE function, specify the motorized devices for which the status is restored.

The following motorized devices can be selected.

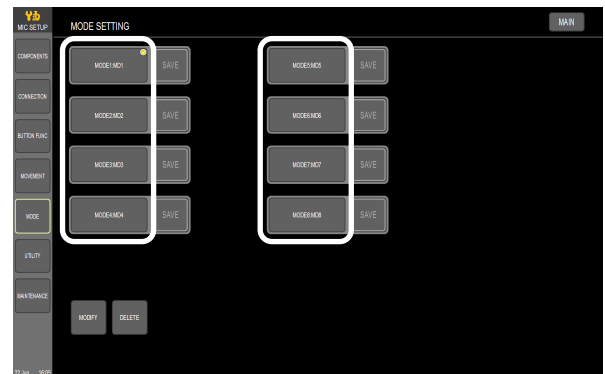
Setting Item	Stored Information
[CONDEN.] (Ni-E only)	Motorized universal condenser's condenser module currently in the optical path
[FL TURRET]	Motorized epi-fluorescence cube turret's epi-fluorescence filter cube currently in the optical path
[FL [SHUTTER]]	Open/close state of the motorized epi-fluorescence cube turret's built-in shutter
[FL 2nd] (Ni-E only)	Second motorized epi-fluorescence cube turret's epi-fluorescence cube currently in the optical path
[FL2 [SHUTTER]](Ni-E only)	Open/close state of the second motorized epi-fluorescence cube turret's built-in shutter
[EX WHEEL] (Ni-E only)	Motorized excitation filter wheel's excitation filter currently in the optical path
[BA WHEEL] (Ni-E only)	Motorized barrier filter wheel's barrier filter currently in the optical path
[PATH] (Ni-E only)	Optical path in the motorized quadrocular tilting tube
[Z] (Ni-E only)	Position of the elevating section ^{*1}
[EPI/DIA/AUX shutter]	Open/close state of EPI/DIA/AUX motorized shutter
[LAMP]	Turns the dia-illumination lamp on or off.
[INTSL [SHUTTER]]	Open/close state of the motorized HG precentered fiber illuminator's built-in shutter
[LAMP ADJ.]	Dia-illumination lamp voltage
[INTSL]	ND in the motorized HG precentered fiber illuminator
[A. STOP]	DIA aperture diaphragm diameter of motorized universal condenser
[F. STOP] (Ni-E only)	DIA field diaphragm diameter
[ZOOM] (Ni-E only)	Zoom magnification of the motorized DSC zooming port
[ND WHEEL] (Ni-E only)	ND filter transmittance of the motorized ND filter

*1: When using the Ni-E microscope, the elevating section is automatically unselected by turning the power of the microscope main unit off and then on again, so as to avoid contact between the specimen and the objective.

[Procedure]

[MIC SETUP]→[MODE]

(1) Tap the mode button to be used.



(2) Tap the [MODIFY] button, then the [OK] button.
To cancel adding or saving, tap the [CANCEL] button.



(3) Tap the [INPUT] button to enter a name for the mode, and then tap the [ENTER] button.

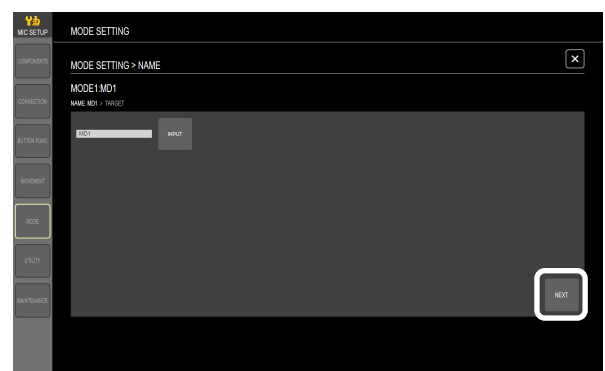
Up to 4 characters can be used for the mode name. The default name is [MD1] - [MD8].

Tapping the button removes a character at the end of the data you entered.

Tap the button to switch between upper and lower case alphabets.

To quit setting, tap the [X] button.

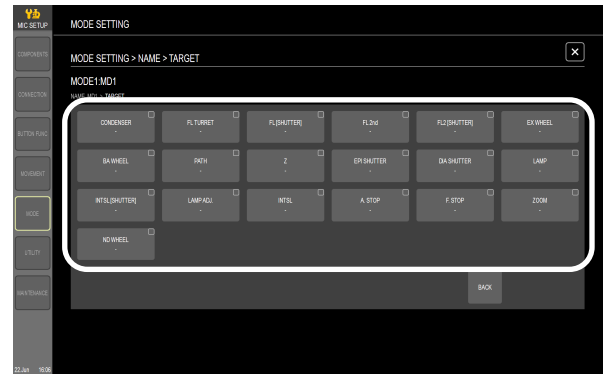
(4) Tap the [NEXT] button.



- (5) **Select the motorized devices for which the state is to be restored.**

The device is selected or unselected each time the button is tapped.

To return to the previous screen, tap the [BACK] button.



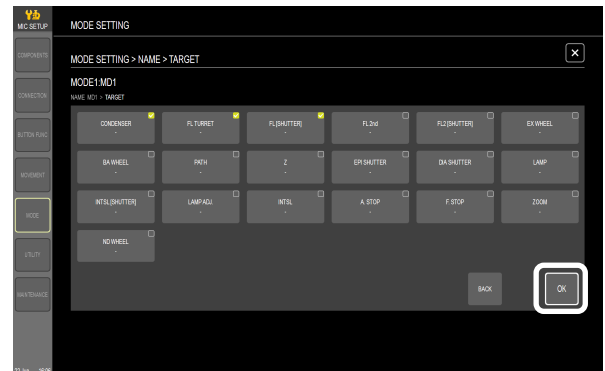
- (6) **Tap the [OK] button.**

You will be taken back to the [MODE] screen.

✓ When the target device is changed

After changing the target devices subjected to loading, adjust the states of all target devices and then tap the [SAVE] button to save the current position of the devices. (For details on saving the current position, refer to “2.2 Saving/Updating a Mode (State of Motorized Devices)”.)

When a motorized device selected as the target of loading is unselected and then selected again, or when a mode is once deleted and then re-registered to the same number, neglecting the above procedure will result in the previously saved position being restored.



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see “1 Bulk Saving of Settings ([MAIN] Screen)” in Chapter 6.

2.2

Saving/Updating a Mode (State of Motorized Devices)

To store the current state of the microscope as a mode, or to overwrite the previously stored state of motorized devices with the current state, use the [SAVE] button.

✓ **Register the target devices in advance**

Before storing the state of motorized devices as a mode, you must specify the devices for which the state is restored. For setup details, refer to “2.1 Registering/Changing Target Motorized Devices” in this chapter.

Display Status of the [SAVE] Button

	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Displayed by default	Can be displayed by setting
Ni-U	Displayed by default	Can be displayed by setting

(For details on displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”.)

[Procedure]

(1) Tap the [SAVE] button.



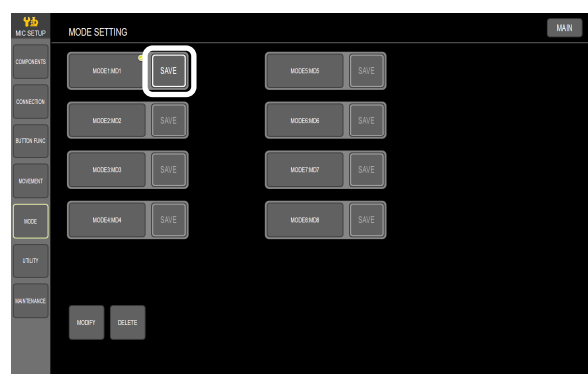
(2) Tap the button for the mode to be saved.

The state of the motorized devices selected as target devices is saved as a mode.

If a motorized device is placed at an inappropriate position, it will automatically be excluded.

✓ **[SAVE] button on the [MODE] screen**

Once the target devices have been specified for a mode, a [SAVE] button becomes active on the [MIC SETUP] - [MODE] screen. This button can also be used to save a mode.

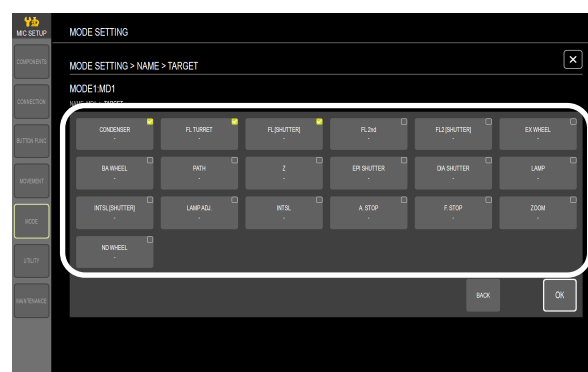


✓ **Checking the saved mode**

To check the state saved to a mode for a motorized device, open the selection screen of the target motorized device (Tap the mode no. button on the [MODE] screen of the [MIC SETUP], tap the [MODIFY] button, and then go to the screen to select the target motorized device). The saved state is displayed on the button for each motorized device. For lamp brightness control, [Set] is displayed if the state is saved.

[-] is displayed on the button for factory default and for unattached motorized devices.

Tap the [X] button to return to the [MODE] screen.



2.3 Loading a Mode

To restore the microscopy state stored as a mode, use the [LOAD] button or the [LOAD (MODE number)] buttons. (For details on saving a mode, refer to “2.2 Saving/Updating a Mode (State of Motorized Devices)”.)

Operation with the [LOAD] Button

Display Status of the [LOAD] Button

	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Displayed by default	Displayed by default
Ni-U	Displayed by default	Displayed by default

(For details on displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”.)

[Procedure]

- (1) Tap the [LOAD] button.



- (2) Tap the button for the mode to be restored.

The stored microscopy state is restored.

Direct Operation with [LOAD (MODE number)] Buttons

Display Status of [LOAD (MODE number)] Buttons

	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Can be displayed by setting	Can be displayed by setting
Ni-U	Can be displayed by setting	Can be displayed by setting

(For details on displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”.)

[Procedure]

- Tap the [LOAD] button.

The stored microscopy state is restored.



2.4 Deleting a Mode

An unused mode can be deleted. When you delete a mode, the name of that mode returns to the default [MD (1 to 8)] and no motorized device is subject to LOAD.

✔ Deleting a mode does not delete the stored state of the motorized devices

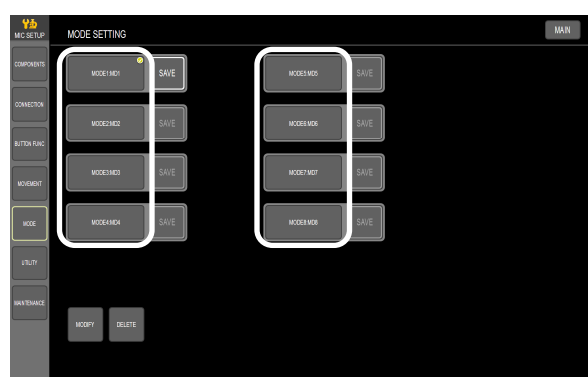
Once a mode is deleted, the device states can no longer be restored for the target devices of that mode. However, the device state data remains intact within the microscope's internal memory. For this reason, when reusing the same mode number, the mode must be overwritten by tapping the [SAVE] button after adjusting the states of all target devices. Neglecting this procedure results in the previously stored state being restored.

For details on saving the current position, refer to "2.2 Saving/Updating a Mode (State of Motorized Devices)".

[Procedure]

[MIC SETUP] → [MODE]

(1) Tap the button for the mode to be deleted.



(2) Tap the [DELETE] button, then the [OK] button.

Mode settings are removed.

To cancel deleting, tap the [CANCEL] button.



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, refer to Chapter 6, "1 Bulk Saving of Settings ([MAIN] Screen)".

3

Entering the Sleep State (Noise Reduction)

Ni-E

To reduce the generation of noise by shutting off the supply of power to the motorized devices, use the [SLEEP] button. For operations that are disabled in sleep state, refer to the Ni-E instruction manual “Operation”.)

Display Status of the [SLEEP] Button

	[MICROSCOPE CONTROL] Screen	[MIC EASY] Screen
Ni-E	Can be displayed at the top of the screen by setting	Can be displayed by setting

(The [SLEEP] button can be configured to be hidden or shown. If the [SLEEP] button is not displayed on the [MICROSCOPE CONTROL] screen, refer to Chapter 6, “4.1.2 Showing/Hiding the [SLEEP] Button”. To display the [SLEEP] button on [MIC EASY] screen, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed” to position the [SLEEP] button and refer to Chapter 6, “4.1.2 Showing/Hiding the [SLEEP] Button” to turn its display on.)

[Procedure]**Tap the [SLEEP] button.**

The motorized devices switch between the sleep state and the normal state each time the button is tapped.

When in the normal state



When in the sleep state



4

Operating the Motorized XY Stage with the Position Specified on the Monitor

Ni-E

Swipe (or drag with a mouse) the live image on the DS-L4 monitor to move the motorized XY stage.

To use the function, the function must be enabled on the [UTILITY] screen on the [MIC SETUP].

4.1

Enabling the XY Movement with the Position Specified on the Monitor

✓ Prerequisite for configuration

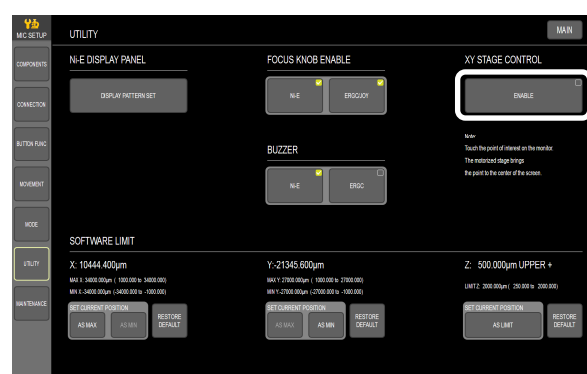
To use this function, a motorized (or intelligent) nosepiece and a motorized XY stage must be attached to the microscope.

Setting item	Setting value	Description
[ENABLE]	ON	Swiping (or dragging with the mouse) on the screen moves the motorized XY stage.
	OFF (Default)	Does not allow the motorized XY stage to move according to the position specification.

[Procedure]

[MIC SETUP]→[UTILITY]

Tap the [ENABLE] button under [XY STAGE CONTROL] to switch between ON and OFF.



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to DS-L4's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see Chapter 6 "1 Bulk Saving of Settings ([MAIN] Screen)".

4.2

Operating the Motorized XY Stage

Swipe (or drag with the mouse) the live image to operate the motorized XY stage.

Conditions as shown below must be met to move the XY stage with this operation:

- **Zoom magnification must be set at 1x.**
- **A live image must be displayed on the screen.**
This function is not available when:
 - An error or confirmation message is displayed,
 - The DS-L4 is in FREEZE mode, or
 - A drawing mode is selected from [TOOL MENU: MEAS/DRAW] > [LINE], [ARROW], or [PEN].
- **The optical path should be set to [FRONT] or [REAR] when a motorized tilting quadocular tube is mounted.**

This function is not available when the optical path is set to [BINO].

Swiping (or dragging with a mouse) the screen with the optical path set to [BINO] shows the message “XY STAGE CONTROL - SELECT [FRONT] OR [REAR] OPTICAL PATH.”

This function is available whichever direction the optical path is set to when a manual tube is mounted.

Even if the [MIC EASY] screen is displayed, you can operate the XY stage by swiping where the live image is displayed.

✔ Conditions for proper operation

For proper XY stage operation, calibration must be configured correctly, and the camera must be facing the correct direction. If the stage does not work correctly, check the following:

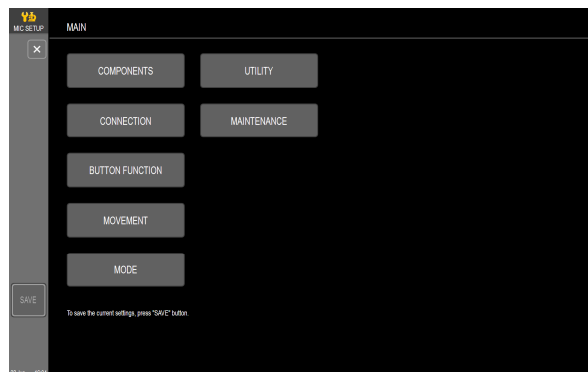
- **Information on the objective has been set.**
See Chapter 6, “2.1 Configuring the Objective Information” for details.
- **The camera faces the correct direction.**
- **If the manual DSC zooming port has been attached, the zoom has been set to 1.0x.**
The travel distance is calculated assuming that the 1.0x zoom is used, except when the motorized DSC zooming port is attached.
- **If you are using a microscope camera by mounting it on the DSC zooming port, make sure that the Nikon logo on the camera faces upward.**

✔ XY stage operation in continuous shot mode

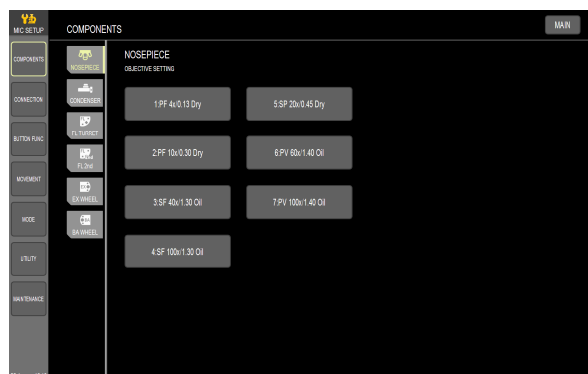
Swiping (or clicking with a mouse) a portion on which a live image is displayed in continuous shot mode moves the XY stage.

This chapter describes the procedure to change the various settings of the microscope and DS-L4 from the screen on DS-L4. These configurations are performed on [MIC SETUP].

**[MAIN] screen of [MIC SETUP]
(LIVE/VIEW menu → [SETTINGS] → [MIC SETUP])**



On each screen of the [MIC SETUP] except the [MAIN] screen, you can go to other setting screens by tapping the button at top left of the screen.



! Tap the [SAVE] button after changing the settings.

After making changes to the settings, be sure to tap the [SAVE] button on the [MIC SETUP] - [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information, see "1 Bulk Saving of Settings ([MAIN] Screen)" in this chapter.

✓ Some settings are not configurable depending on the configuration of the microscope.

Configurable settings vary depending on the configuration of the microscope; the settings not configurable are grayed out. Therefore, actual screens on your system may differ from those shown in the following explanations.

1

Bulk Saving of Settings ([MAIN] Screen)

Ni-E Ni-U Ci-E

After making changes on the [MIC SETUP], be sure to tap the [SAVE] button on the [MIC SETUP] - [MAIN] to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored.

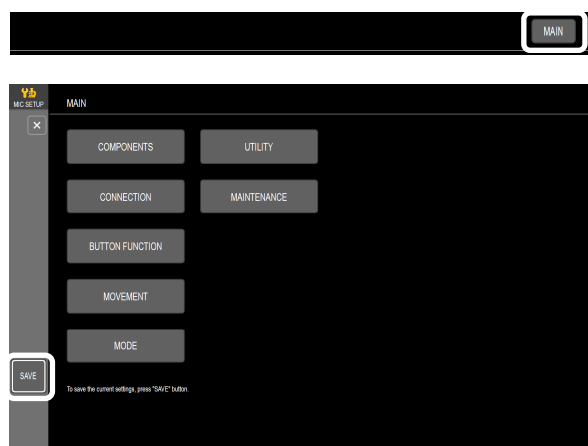
[Procedure]

- (1) After changing the settings, tap the [MAIN] button to go back to the [MIC SETUP] - [MAIN] screen.

- (2) Tap the [SAVE] button.

A confirmation dialog box appears.

If there is no data to be saved, the [SAVE] button is disabled.

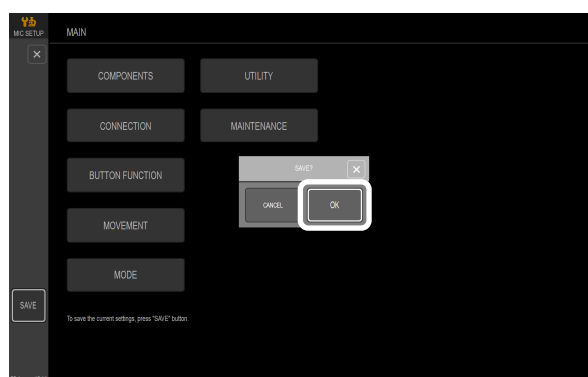


- (3) Tap the [OK] button.

Settings are saved.

To cancel saving, tap the [CANCEL] button.

Tapping the [X] button on the upper-left of the screen closes the [MIC SETUP].



✔ Settings to be saved

Tapping the [SAVE] button saves the setting changes made since last save at one time. (Including the information of the attached optical elements, microscope setting saved as a mode, and initial value of the interlock setting [INTELLIGENT].)

If you want to save each setting individually, perform the above procedure each time you change the setting.

If you want the settings to be temporal (only while the microscope is turned on), you do not have to save the settings.

2 Configuring Optical Elements Information ([COMPONENTS] Screen)

In the [COMPONENTS] screen, you can configure information for optical elements attached to the microscope such as objectives or condenser modules.

2.1 Configuring the Objective Information

Ni-E Ni-U Ci-E

In this section, you configure the information of the objectives attached to the motorized nosepiece or the intelligent nosepiece. The configured objective information is shown on a screen on the DS-L4 (for Ni-E, also on the display panel of the microscope). In addition, it is used for various interlocked operations. If you have replaced or added objectives, you need to reconfigure the settings.

✓ Prerequisite for configuration

A motorized or intelligent nosepiece must be attached to the microscope in order to perform this configuration.

2.1.1 Selecting and Configuring the Objective from the List

✓ When appropriate objective is not on the list

When an appropriate objective is not on the list, you can register any objective by tapping the [CUSTOM] button. For more information, see “2.1.2 Arbitrarily Configuring the Data of Objective” in this chapter.

[Procedure]

[MIC SETUP] → [COMPONENTS]

(1) Select the [NOSEPIECE] tab.

(2) Tap the nosepiece address button to be configured.

If the objective is displayed as [----], information for the objective is not configured. For Ni-E and Ni-U, all addresses are displayed as [----] by default.

✓ Default settings of Ci-E

The default settings of Ci-E are as follows:

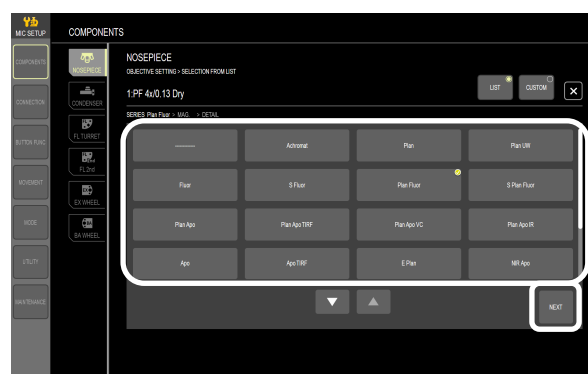
1:P 4x/0.10 Dry
 2:P 10x/0.25 Dry
 3:P 20x/0.40 Dry
 4:P 40x/0.65 Dry
 5:----x/----
 6:----x/----



(3) Select the name of the series of the objective attached to the microscope and tap the [NEXT] button.

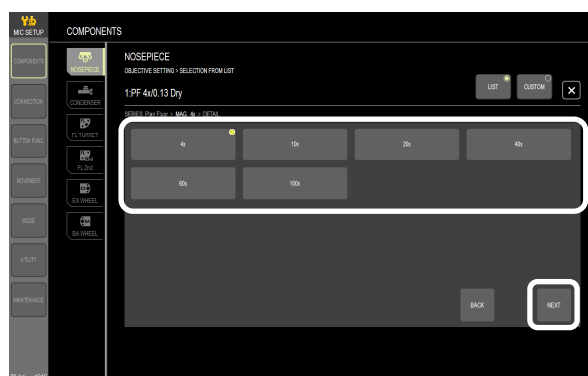
When [▲] and [▼] buttons are shown under the list, you can tap [▲] or [▼] button to go to other pages.

To quit setting, tap the [X] button.



- (4) Select the magnification of the objective attached to the microscope and tap the [NEXT] button.

To return to the previous screen, tap the [BACK] button.

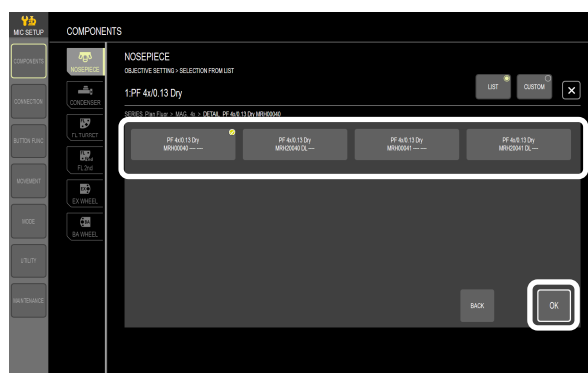


- (5) Select the product code of the objective attached to the microscope and tap the [OK] button.

The selected objective is set to the nosepiece address.

✓ **If multiple objectives with the same specification are shown**

If multiple objectives with the same specification (such as magnification/NA/support of immersion/microscopy method) are shown, select the one whose first digit of the product code is the biggest.



- (6) Repeat steps (2) to (5) for all nosepiece addresses to be configured.

After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see "1 Bulk Saving of Settings ([MAIN] Screen)" in this chapter.

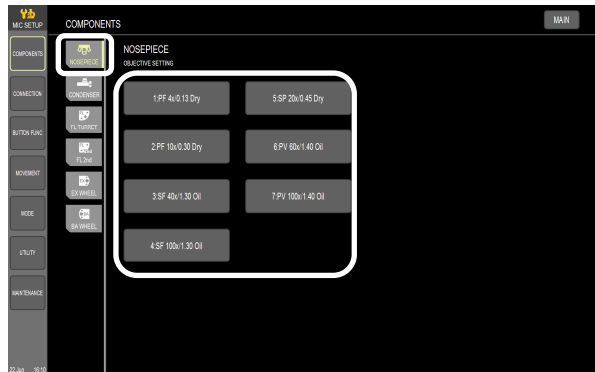
2.1.2 Arbitrarily Configuring the Data of Objective

When the objective attached to the microscope is not on the list, you can arbitrarily configure the objective's data. The objective's data arbitrarily configured is registered to the memory (memory address 1 through 10).

[Procedure]

[MIC SETUP] → [COMPONENTS]

- (1) Select the [NOSEPIECE] tab.
- (2) Tap the nosepiece address button to be configured.

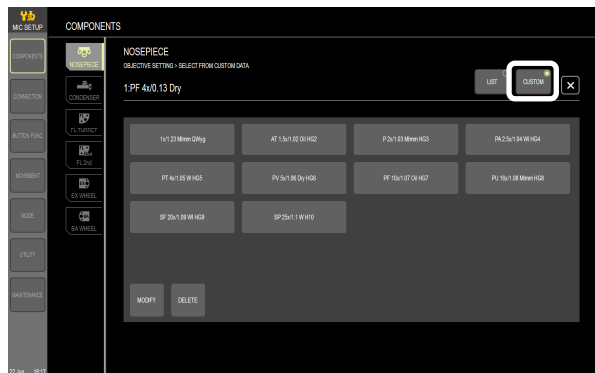


- (3) Tap the [CUSTOM] button on the objective configuration screen.
The objectives registered to the memory are displayed.

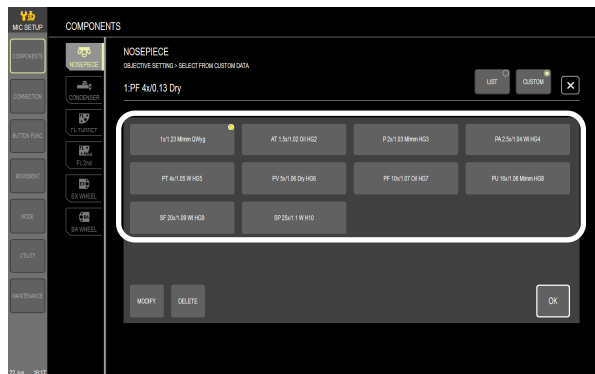
To quit setting, tap the [X] button.

✓ When the data is already registered to the memory

If the data for the objective to be used is already registered to the memory, you can complete the configuration by selecting the objective from the list and tapping the [OK] button.



- (4) Select the memory address (1 - 10) to which you want to register (or modify) the data.

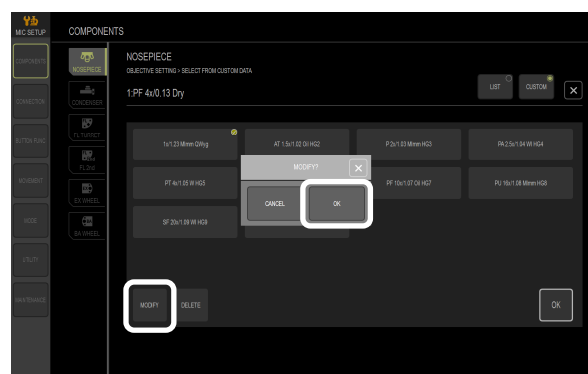


- (5) Tap the [MODIFY] button and then [OK] button.

To cancel adding or saving, tap the [CANCEL] button.

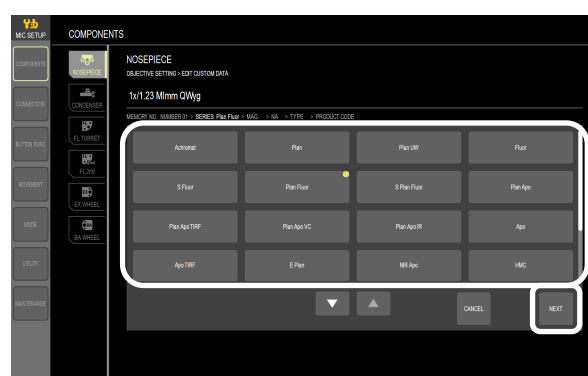
✓ **Removing the data registered to the memory**

To remove the data of the objective registered to the memory address, tap the [DELETE] button. If the objective data registered for a nosepiece address is the same as that deleted here, settings in the nosepiece address will also be removed.



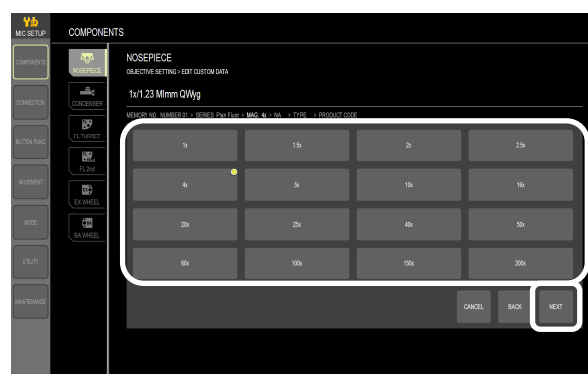
- (6) Select the name of the series of the objective attached to the microscope and tap the [NEXT] button.

When [▲] and [▼] buttons are shown under the list, you can tap [▲] or [▼] button to go to other pages.




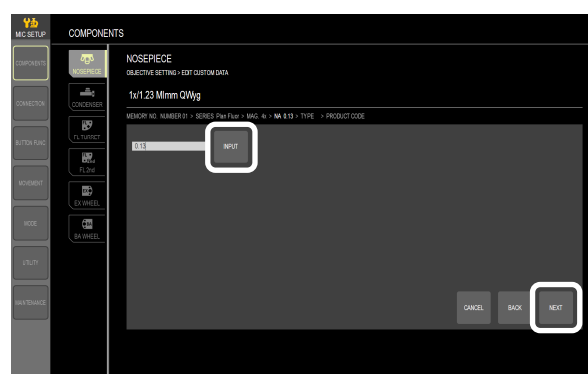
- (7) Select the magnification of the objective attached to the microscope and tap the [NEXT] button.

To return to the previous screen, tap the [BACK] button.

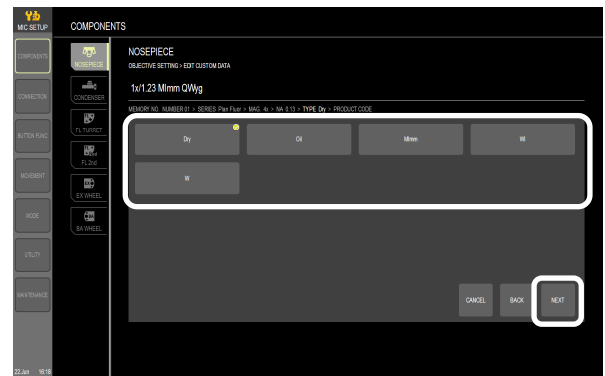


- (8) Tap the [INPUT] button, enter the numerical aperture of the attached objective, tap the [ENTER] button, and then the [NEXT] button.


Tapping the  button removes a character at the end of the data you entered.




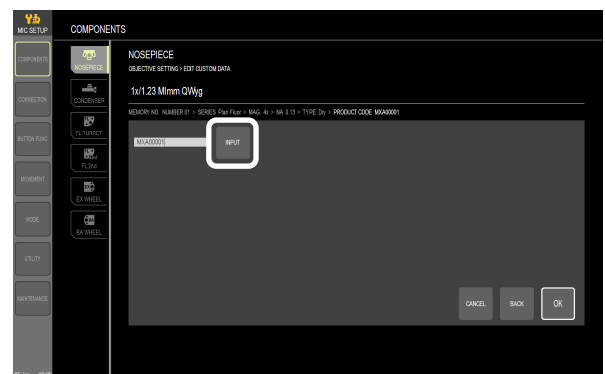
- (9) Select the immersion type of the objective attached to the microscope and tap the [NEXT] button.



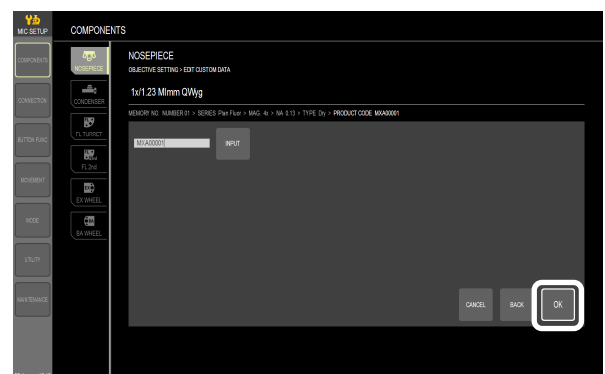
- (10) Tap the [INPUT] button, enter the product code of the attached objective, and then tap the [ENTER] button.

Tapping the  button removes a character at the end of the data you entered.

Tapping the  button toggles between upper and lower cases for alphabet letters.

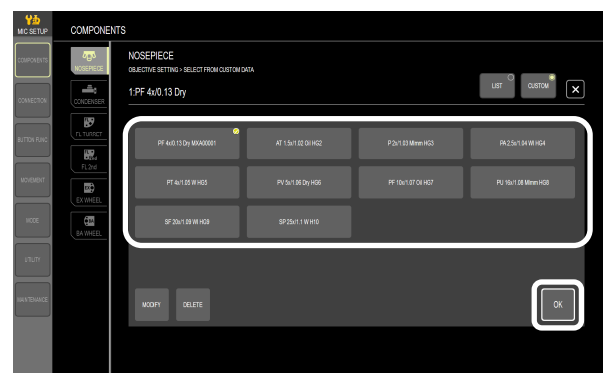


- (11) Tap the [OK] button.



- (12) Select the objective registered to the memory address and tap the [OK] button.

The selected objective is set to the nosepiece address.



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see "1 Bulk Saving of Settings ([MAIN] Screen)" in this chapter.

2.2

Configuring the Condenser Module Information

Ni-E

In this section, you configure the information on the condenser module attached to the motorized universal condenser. The configured condenser module information is shown in a screen on the DS-L4 and the display panel of the microscope. If you have replaced or added condenser modules, you need to reconfigure the settings.

✓ **Prerequisite for configuration**

A motorized universal condenser must be attached to the microscope in order to perform this configuration.

2.2.1

Selecting and Configuring the Condenser Module from the List

✓ **When appropriate condenser module is not on the list**

When an appropriate condenser module is not on the list, you can register any name by tapping the [CUSTOM] button. For more information, see “2.2.2 Arbitrarily Configuring the Name of Condenser Module” in this chapter.

[Procedure]

[MIC SETUP] → [COMPONENTS]

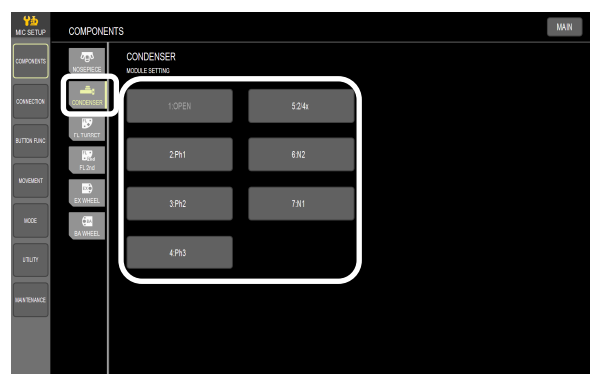
(1) **Select the [CONDENSER] tab.**

(2) **Tap the turret address button to be configured.**

If the condenser module is displayed as [-----], information for the module is not configured. By default, all modifiable addresses are displayed as [-----].

✓ **Turret address 1**

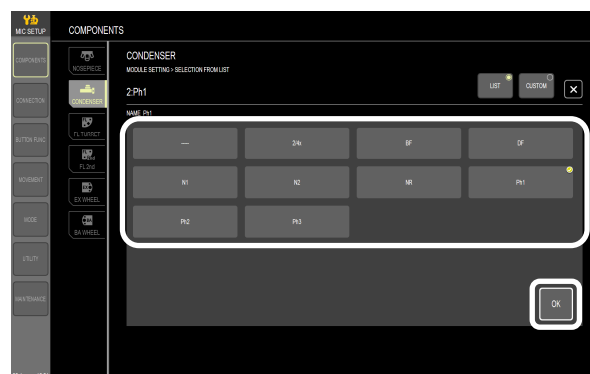
Turret address 1 is fixed to [OPEN].



(3) **Select the condenser module attached to the microscope and tap the [OK] button.**

The selected condenser module is set to the turret address.

To quit setting, tap the [X] button.



(4) **Repeat steps (2) and (3) for all turret addresses to be configured.**

After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see “1 Bulk Saving of Settings ([MAIN] Screen)” in this chapter.

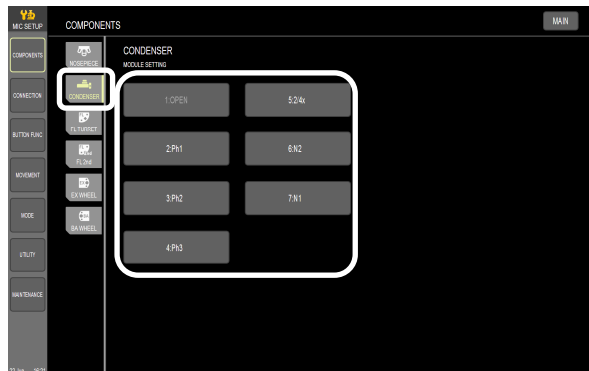
2.2.2 Arbitrarily Configuring the Name of Condenser Module

When the condenser module attached to the microscope is not on the list, you can configure any name. The name arbitrarily configured is registered to the memory (memory address 1 through 10).

[Procedure]

[MIC SETUP] → [COMPONENTS]

- (1) Select the [CONDENSER] tab.
- (2) Tap the turret address button to be configured.

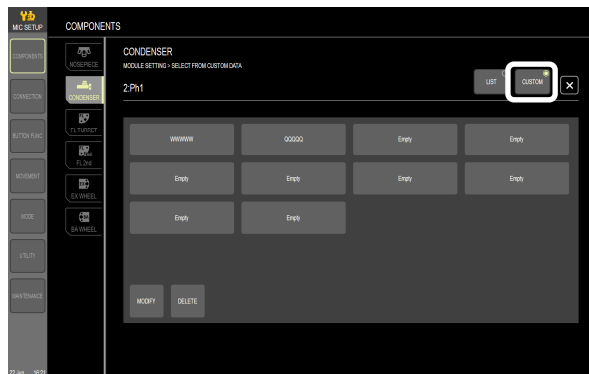


- (3) Tap the [CUSTOM] button on the condenser module configuration screen.
The condenser modules registered to the memory are displayed.

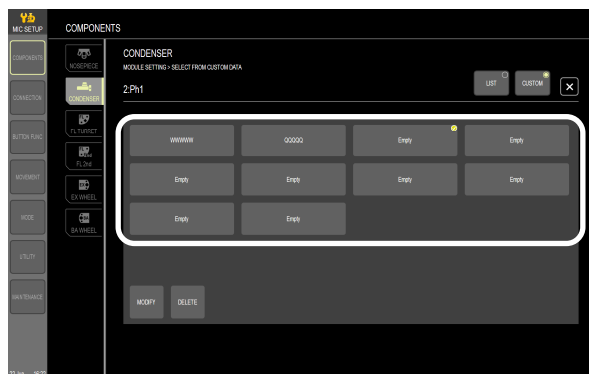
To quit setting, tap the [X] button.

✓ When the module name is already registered to the memory

If the name of the module to be used is already registered to the memory, you can complete the configuration by selecting the condenser module from the list and tapping the [OK] button.



- (4) Select the memory address (1 - 10) to which you want to register (or modify) the data.

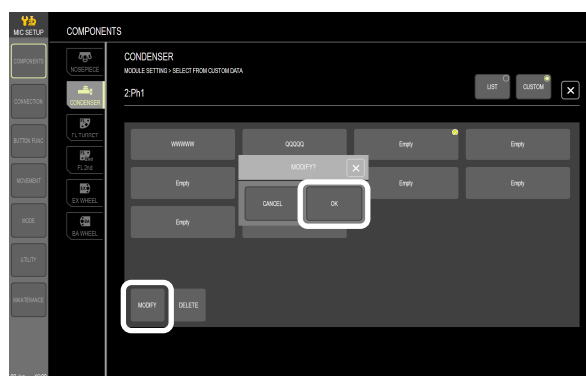


- (5) Tap the [MODIFY] button and then [OK] button.


To cancel adding or saving, tap the [CANCEL] button.


✓ **Removing the module name registered to the memory**

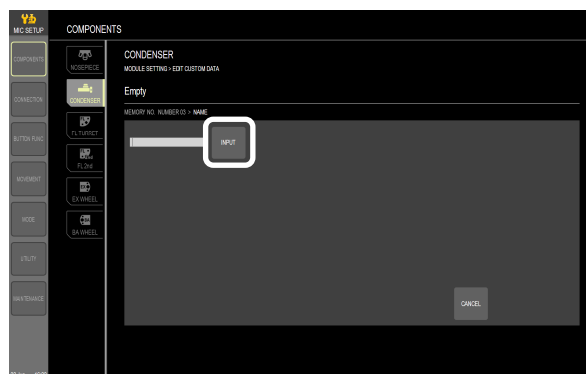
To remove the module name registered to a memory address, tap the [DELETE] button. If the module name to be removed has been registered to a turret address, settings in the turret address will also be removed.



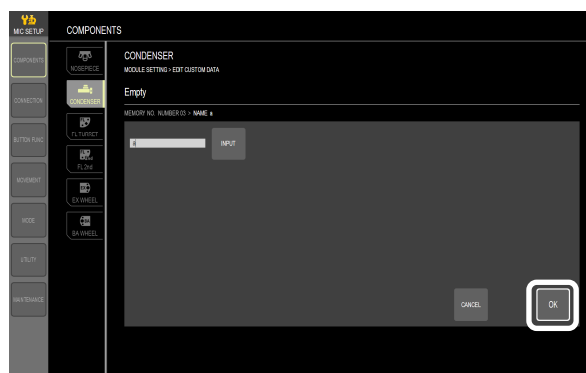
- (6) Tap the [INPUT] button, enter the name of the attached condenser module (up to five characters), and then tap the [ENTER] button.

Tapping the  button removes a character at the end of the data you entered.

Tapping the  button toggles between upper and lower cases for alphabet letters.

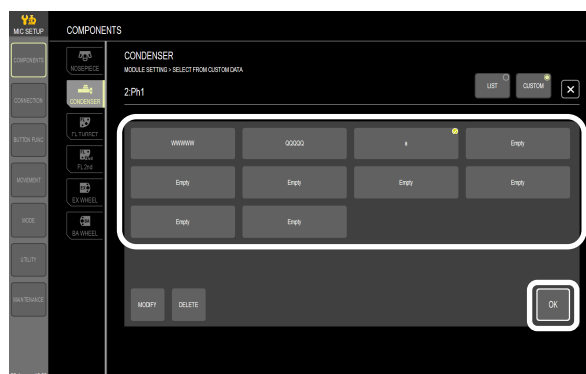


- (7) Tap the [OK] button.



- (8) Select the condenser module registered to the memory address and tap the [OK] button.

The selected condenser module is set to the turret address.



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see "1 Bulk Saving of Settings ([MAIN] Screen)" in this chapter.

2.3 Configuring the Filter Cube Information

Ni-E Ni-U

In this section, you configure information for the filter cube attached to the motorized or intelligent epi-fluorescence cube turret. The configured filter cube information is shown in a screen on the DS-L4 and the display panel of the microscope (only in Ni-E). If you have replaced or added filter cubes, you need to reconfigure the settings.

If you are using two motorized or intelligent epi-fluorescence cube turrets by layering them on top of each other, be sure to configure information for the second (upper) filter cube as well.

✓ **Prerequisite for configuration**

- A motorized or intelligent epi-fluorescence cube turret must be attached to the microscope in order to perform this configuration.
- A second (upper) motorized or intelligent epi-fluorescence cube turret must be attached in order to configure the information for the second cube turret.

2.3.1 Selecting and Configuring the Filter Cube from the List

✓ **When appropriate filter cube is not on the list**

When an appropriate filter cube is not on the list, you can register any name by tapping the [CUSTOM] button. For more information, see “2.3.2 Arbitrarily Configuring the Name of Filter Cube” in this chapter.

[Procedure]

[MIC SETUP] → [COMPONENTS]

(1) Select the [FL TURRET] tab.

When you want to configure settings for the second epi-fluorescence cube turret, select the [FL 2nd] tab.

(2) Tap the turret address button to be configured.

If the filter cube is displayed as [-----], information for the filter cube is not configured. By default, all addresses are displayed as [-----].

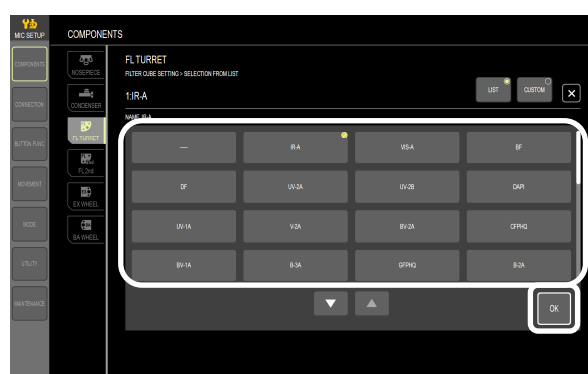


(3) Select the filter cube attached to the microscope and tap the [OK] button.

The selected filter cube is set to the turret address.

Only turret address 1 can select [OPEN].

To quit setting, tap the [X] button.



(4) Repeat steps (2) and (3) for all turret addresses to be configured.

After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see “1 Bulk Saving of Settings ([MAIN] Screen)” in this chapter.

2.3.2

Arbitrarily Configuring the Name of Filter Cube

When the filter cube attached to the microscope is not on the list, you can configure any name. The name arbitrarily configured is registered to the memory (memory address 1 through 10). If you are using two epi-fluorescence cube turrets (motorized or intelligent) by layering them on top of each other, you use a single list of registered names for both layers.

[Procedure]

[MIC SETUP] → [COMPONENTS]

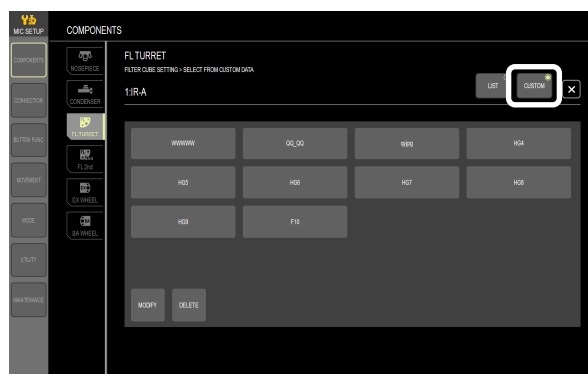
(1) Select the [FL TURRET] tab.

When you want to configure settings for the second epi-fluorescence cube turret, select the [FL 2nd] tab.

(2) Tap the turret address button to be configured.**(3) Tap the [CUSTOM] button on the filter cube configuration screen.**

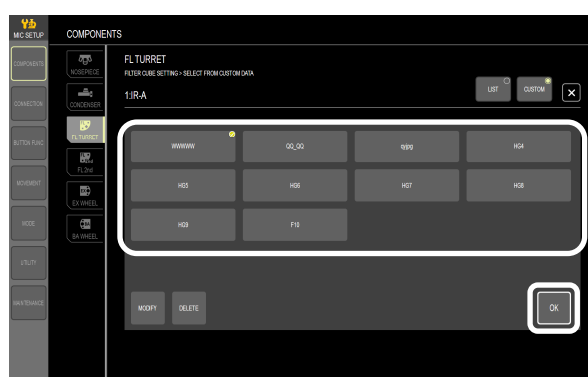
The condenser modules registered to the memory are displayed.

To quit setting, tap the [X] button.



✓ **When the filter cube name is already registered to the memory**

If the name of the filter cube to be used is already registered to the memory, you can complete the configuration by selecting the filter cube from the list and tapping the [OK] button.

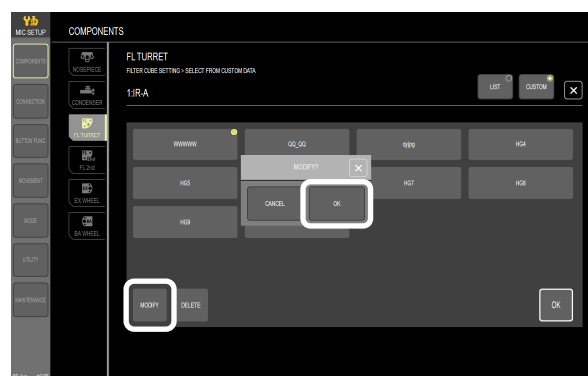
(4) Select the memory address (1 - 10) to which you want to register (or modify) the data.

- (5) Tap the [MODIFY] button and then [OK] button.


To cancel adding or saving, tap the [CANCEL] button.


✓ **Removing the filter cube name registered to the memory**

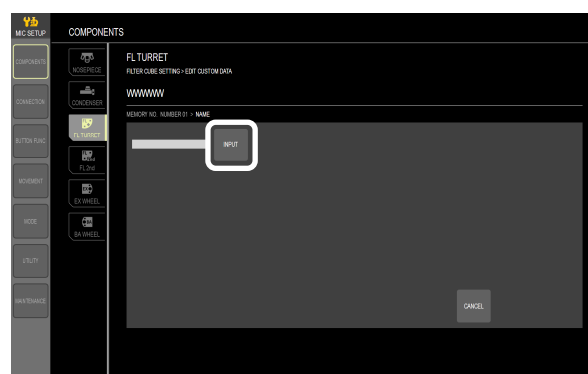
To remove the filter cube name registered to a memory address, tap the [DELETE] button. If the filter cube name to be removed has been registered to an turret address, settings in the turret address will also be removed.



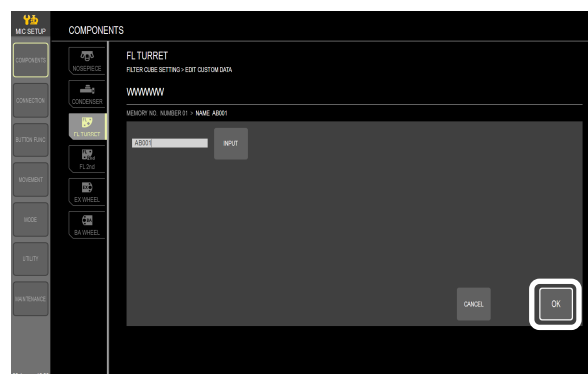
- (6) Tap the [INPUT] button, enter the name of the attached filter cube (up to five characters), and then tap the [ENTER] button.

Tapping the  button removes a character at the end of the data you entered.

Tapping the  button toggles between upper and lower cases for alphabet letters.

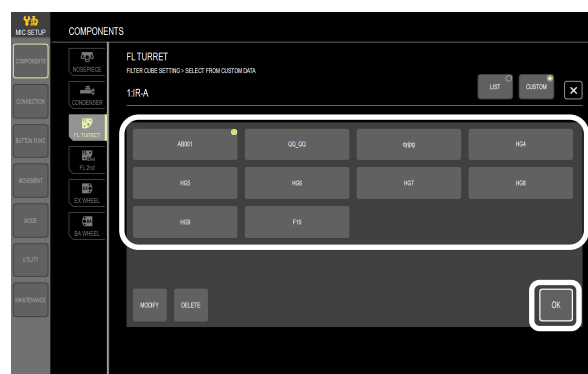


- (7) Tap the [OK] button.



- (8) Select the filter cube registered to the memory address and tap the [OK] button.

The selected filter cube is set to the turret address.



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see "1 Bulk Saving of Settings ([MAIN] Screen)" in this chapter.

2.4

Configuring the Excitation Filter/Barrier Filter Information

Ni-E

In this section, you configure the information for the excitation filter attached to the motorized excitation filter wheel and the information for the barrier filter attached to the motorized barrier filter wheel. The configured filter information is shown in a screen on the DS-L4 and the display panel of the microscope. If you have replaced or added filters, you need to reconfigure the settings.

✓ **Prerequisite for configuration**

- A motorized excitation filter wheel must be attached to the microscope in order to configure information of the excitation filter.
- A motorized barrier filter wheel must be attached to the microscope in order to configure information of the barrier filter.

2.4.1

Selecting and Configuring the Excitation Filter/Barrier Filter from the List

✓ **When appropriate filter is not on the list**

When an appropriate filter is not on the list, you can register any name by tapping the [CUSTOM] button. For more information, see “2.4.2 Arbitrarily Configuring the Name of Excitation/Barrier Filter” in this chapter.

[Procedure]

[MIC SETUP] → [COMPONENTS]

(1) **Select the [EX WHEEL] or [BA WHEEL] tab.**

Although the screens in the following procedure are those when you select [EX WHEEL], similar screens are displayed when you select [BA WHEEL].

(2) **Tap the wheel address button to be configured.**

If the excitation/barrier filter is displayed as [----], information for the filter is not configured. By default, all modifiable addresses are displayed as [----].

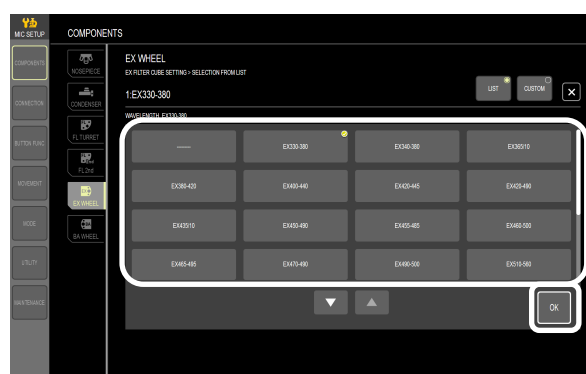
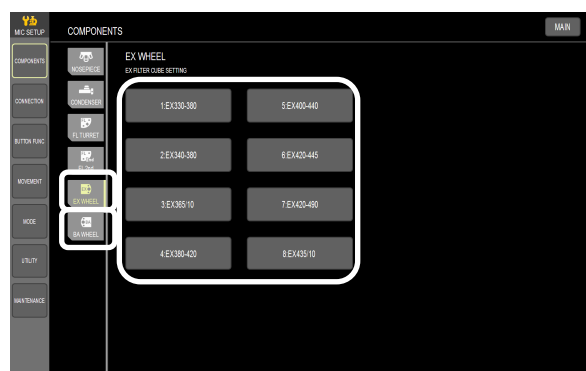
✓ **Absorption filter's wheel address**

Absorption filter address 1 is fixed to [OPEN].

(3) **Select the excitation/barrier filter attached to the microscope and tap the [OK] button.**

Selected excitation/barrier filter is set to the wheel address.

To quit setting, tap the [X] button.



(4) **Repeat steps (2) and (3) for all wheel addresses to be configured.**

After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see “1 Bulk Saving of Settings ([MAIN] Screen)” in this chapter.

2.4.2 Arbitrarily Configuring the Name of Excitation/Barrier Filter

When the excitation/barrier filter attached to the microscope is not on the list, you can configure any name. The name arbitrarily configured is registered to the memory (memory address 1 through 10).

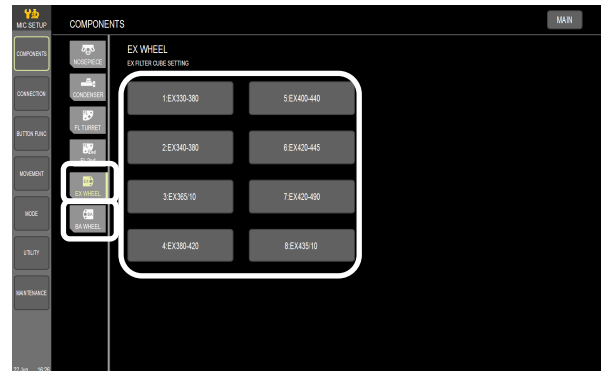
[Procedure]

[MIC SETUP] → [COMPONENTS]

- (1) Select the [EX WHEEL] or [BA WHEEL] tab.

Although the screens in the following procedure are those when you select [EX WHEEL], similar screens are displayed when you select [BA WHEEL].

- (2) Tap the wheel address button to be configured.



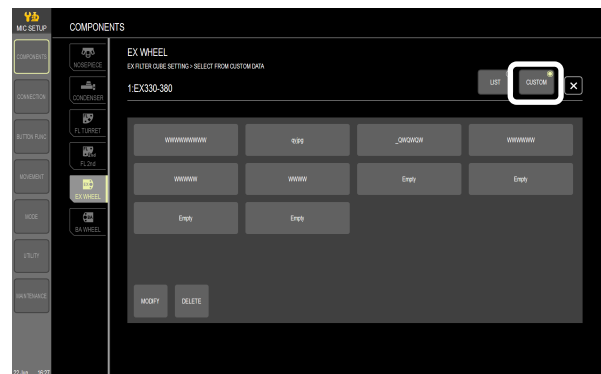
- (3) Tap the [CUSTOM] button on the excitation/barrier filter configuration screen.

The excitation/barrier filters registered to the memory are displayed.

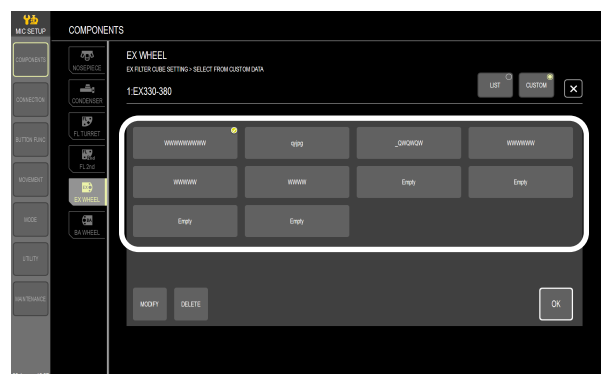
To quit setting, tap the [X] button.

✓ **When the excitation/barrier filter name is already registered to the memory**

If the name of the excitation/barrier filter to be used is already registered to the memory, you can complete the configuration by selecting the filter from the list and tapping the [OK] button.



- (4) Select the memory address (1 - 10) to which you want to register (or modify) the data.

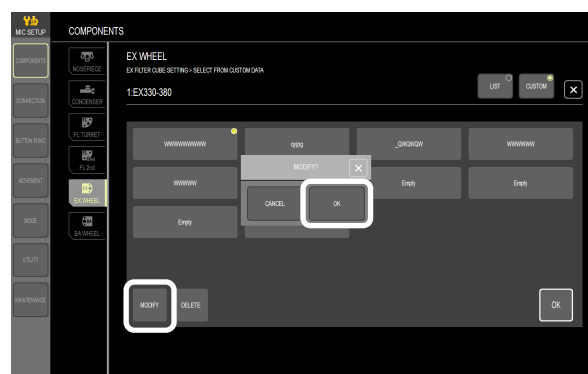


- (5) Tap the [MODIFY] button and then [OK] button.


To cancel adding or saving, tap the [CANCEL] button.


✓ **Removing the filter name registered to the memory**

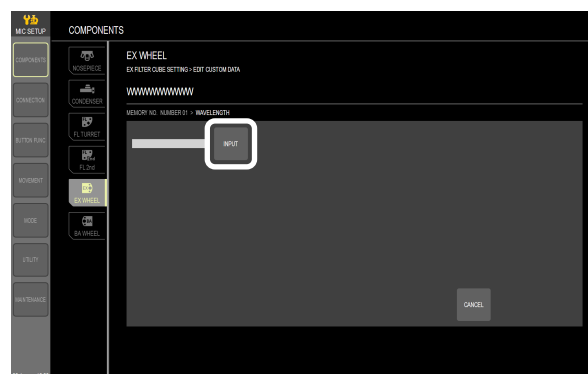
To remove the filter name registered to a memory address, tap the [DELETE] button. If the filter name to be removed has been registered to an wheel address, settings in the wheel address will also be removed.



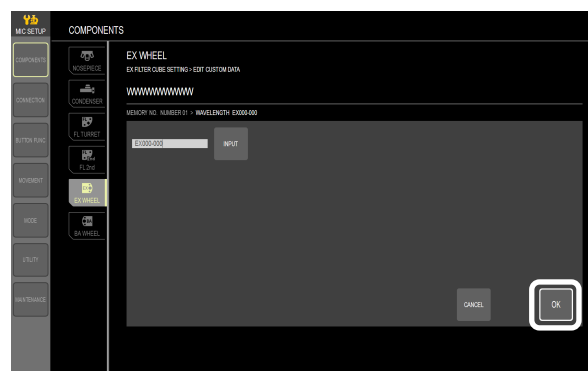
- (6) Tap the [INPUT] button, enter the name of the attached excitation/barrier filter (up to nine characters), and then tap the [ENTER] button.

Tapping the  button removes a character at the end of the data you entered.

Tapping the  button toggles between upper and lower cases for alphabet letters.

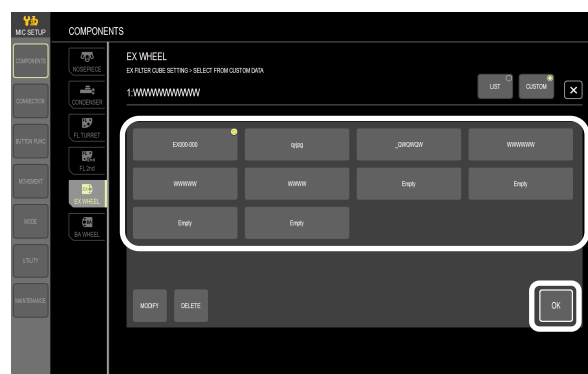


- (7) Tap the [OK] button.



- (8) Select the excitation/barrier filter registered to the memory address and tap the [OK] button.

Selected excitation/barrier filter is set to the wheel address.



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see "1 Bulk Saving of Settings ([MAIN] Screen)" in this chapter.

3 Setting the Connections of Motorized Units ([CONNECTION] Screen)

In the [CONNECTION] screen, you configure the connection between the digital camera and motorized shutter.

3.1 Configuring the Connection of Digital Camera

Ni-E Ni-U Ci-E

Configure according to this procedure when connecting a microscope and a camera with a trigger cable and capturing by outputting a trigger signal from the DSC connector on the microscope.

When this configuration is complete, the [CAPTURE FRONT/LEFT/RIGHT/AUX] button appears on the [MICROSCOPE CONTROL]/[MIC EASY] screens^{*1} and that button can be used to send a trigger signal for capturing.

This configuration is also necessary when using the CAPTURE button on the microscope to send a trigger signal for capturing.^{*2}

This configuration is unnecessary if you are capturing with a camera directly connected to this DS-L4 by tapping the [CAPTURE] button on the camera control screen.

Refer to the instruction manual provided with the trigger cable for the connection of a microscope and a camera.

^{*1} In addition to this configuration, you must place the [CAPTURE] button on the [MICROSCOPE CONTROL]/[MIC EASY] screens of Ni-E and Ni-U as described in Chapter 6, “4.1 Configuring the Screen Buttons for DS-L4”.

^{*2} When the CAPTURE button with default settings is tapped, a communication command is output from the USB connector for Ni-E and Ni-U and a trigger signal is output from the DSC connector for Ci-E.

For details on changing the setting, see Chapter 6, “4.2.3 Changing the Digital Camera Operated with the Microscope's CAPTURE Button”.

✓ Three capture operations possible from the DS-L4

Three different capture operations are possible from the DS-L4.

- Sending capture trigger signal from the microscope (only for Ni-E and Ni-U)
Use the [CAPTURE FRONT/LEFT/RIGHT/AUX] button on the [MICROSCOPE CONTROL] or [MIC EASY] screen. Tapping these buttons outputs the capture trigger signal via the DSC connector (DSC1 or DSC2 connector on Ni-E), instructing the connected microscope camera control unit to capture an image. This operation requires configuration on the [CONNECTION] screen.
- Capture operation using the [CAPTURE] button in the LIVE menu (For details, refer to the “Camera Operation” instruction manual)
- Capture operation by clicking with the mouse (For details, refer to the “Camera Operation” instruction manual)



The configurable DSC connectors are as follows:

Microscope	Position of the DSC Connector	Name of the DSC Connector
Ni-E	Rear of the microscope	DSC1
	Connector box	DSC2
Ni-U	Control Box B	DSC
Ci-E	Rear of the microscope	DSC

Setting items for Ni-E and Ni-U

Setting Item	Setting Value	Description
Camera mounting position	NOT-CONNECTED (default)	When no digital camera is connected to the DSC connector
	[FRONT]	When the digital camera connected to the DSC connector is attached to the tube adapter
	[LEFT]	When the digital camera connected to the DSC connector is attached to the DSC zooming port for quadocular tube
	[RIGHT]	When the digital camera connected to the DSC connector is attached to the back port unit
	[AUX]	When a digital camera is mounted in a position other than the above
Digital camera manufacturer	[Nikon]	Send the trigger signal for Nikon digital camera
	[Andor]	Send the trigger signal for Andor digital camera

Setting items for Ci-E

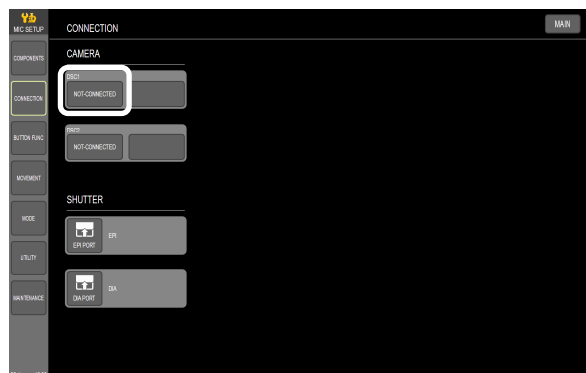
Setting Item	Setting Value	Description
Camera mounting position	NOT-CONNECTED (default)	When no digital camera is connected to the DSC connector
	[FRONT]	When the digital camera connected to the DSC connector is attached to the tube adapter
	[REAR]	When the digital camera connected to the DSC connector is attached to the DSC port for ergonomic binocular tube
	[AUX]	When a digital camera is mounted in a position other than the above
Digital camera manufacturer	[Nikon]	Send the trigger signal for Nikon digital camera
	[Andor]	Send the trigger signal for Andor digital camera

[Procedure]

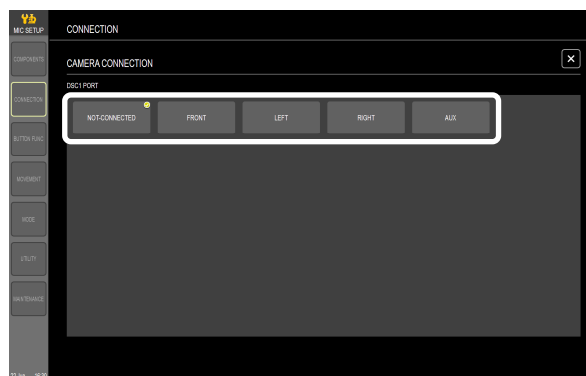
[MIC SETUP] → [CONNECTION]

- (1) **Tap the button for the DSC connector to be configured (left).**

A sub screen opens to select the position of the connected camera.



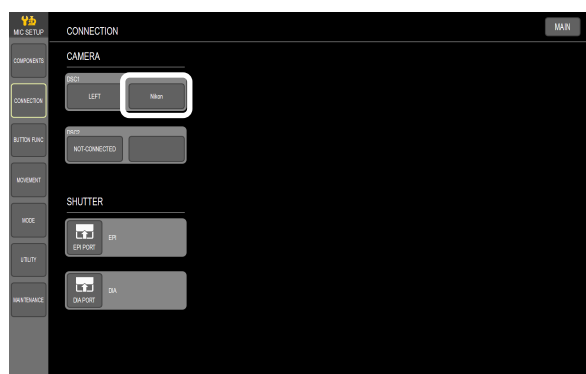
- (2) **Select [NOT-CONNECTED] if no camera is connected, otherwise select the position.**



- (3) **Tap the button for the DSC connector to be configured (right).**

A sub screen opens to select the manufacturer of the connected camera.

- (4) **Select the manufacturer of the camera.**



- (5) **Repeat steps (2) and (3) when you use two DSC connectors on Ni-E.**

After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see "1 Bulk Saving of Settings ([MAIN] Screen)" in this chapter.

3.2

Configuring the Connection of Motorized Shutter

Ni-E

Ni-U

When changing the usage of the motorized shutter to AUX (other than EPI/DIA), configure the motorized shutter connection with this procedure.

✓ **When the intended shutter is disabled**

If the dia-illumination shutter opens/closes when the [SHUTTER EPI] button is tapped or epi-illumination shutter opens/closes when the [SHUTTER DIA] button is tapped, the motorized shutter is not correctly connected to the EPI SHUTTER/DIA SHUTTER connector.

In this case, turn off the microscope and DS-L4, then reconnect the motorized shutter to the EPI SHUTTER/DIA SHUTTER connector of the microscope (the control box B for Ni-U). Or, check the usage of the motorized shutter connected to the EPI SHUTTER/DIA SHUTTER connector and change the usage with this configuration.

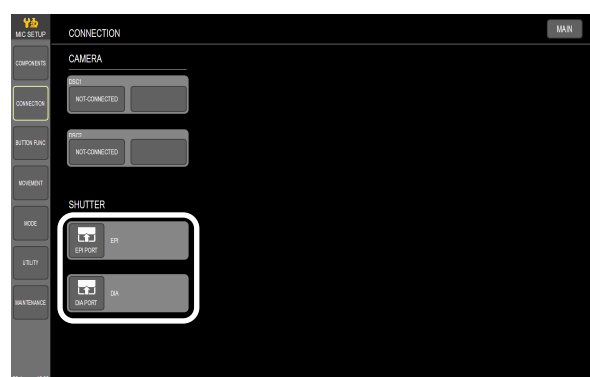
Setting Item	Setting Value	Description
EPI SHUTTER PORT (at the rear of the microscope for Ni-E, and the control box B for Ni-U)	[EPI] (default)	For epi-illumination
	[DIA]	For dia-illumination
	[AUX]	For auxiliary shutter
DIA SHUTTER PORT (at the connector box for Ni-E, and the control box B for Ni-U)	[EPI]	For epi-illumination
	[DIA] (default)	For dia-illumination
	[AUX]	For auxiliary shutter

[Procedure]

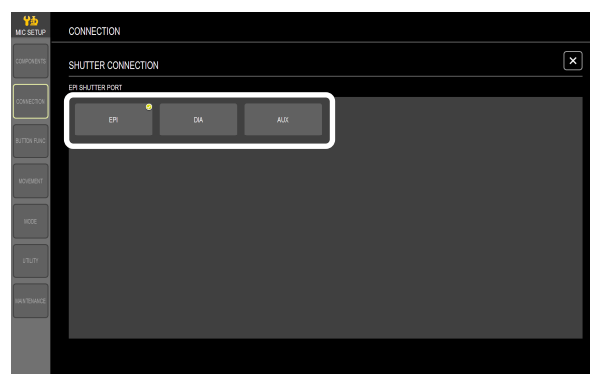
[MIC SETUP] → [CONNECTION]

(1) **Tap the button for the connector to be configured.**

A sub screen opens to select the function of the shutter.



(2) **Select the function of the shutter ([EPI], [DIA] or [AUX]).**



(3) **Repeat steps (1) and (2) to configure the other connector.**

After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see "1 Bulk Saving of Settings ([MAIN] Screen)" in this chapter.

4

Configuring the Functions of Buttons ([BUTTON FUNCTION] Screen)

[BUTTON FUNCTION] screen allows you to configure functions and display of the buttons on DS-L4 and the microscope.

4.1

Configuring the Screen Buttons for DS-L4

Ni-E

Ni-U









Up to fifteen buttons to control the microscope can be placed on the [MICROSCOPE CONTROL] screen. In addition, up to twelve buttons to control the microscope can be placed on the [MIC EASY] screen. You can choose from the following functions and place them on any position.













If the object to be operated by the placed button is not attached, the position of that button becomes blank.













For information on the functions and default location of buttons, see Chapter 2, "Basics of Microscope Operation with DS-L4".




"Allowed" → "Y"

"Not Allowed" → "N"

Button Icon	Main Category of Direct Operation Buttons	Shown in [MICROSCOPE CONTROL] Screen		Shown in [MIC EASY] Screen	
		Ni-E	Ni-U	Ni-E	Ni-U
 [NOSEPIECE]	-	Y	Y	Y	Y
 [Objective (Address)]	[NOSEPIECE]	Y	Y	Y	Y
 [PATH]	-	Y ([BINO], [FRONT], [REAR])	N	Y	N
 [ZOOM]	-	Y	N	Y	N
 [FL TURRET]	-	Y	Y	Y	Y
 [Filter Cube (Address)]	[FL TURRET]	Y	Y	Y	Y
 [FL 2nd]	-	Y	N	Y	N
 [Filter Cube 2nd (Address)]	[FL 2nd]	Y	N	Y	N

Button Icon	Main Category of Direct Operation Buttons	Shown in [MICROSCOPE CONTROL] Screen		Shown in [MIC EASY] Screen	
		Ni-E	Ni-U	Ni-E	Ni-U
 [EX WHEEL]	-	Y	N	Y	N
 [Excitation Filter (Address)]	[EX WHEEL]	Y	N	Y	N
 [BA WHEEL]	-	Y	N	Y	N
 [Barrier Filter (Address)]	[BA WHEEL]	Y	N	Y	N
 [CONDEN.]	-	Y	N	Y	N
 [Condenser Module (Address)]	[CONDEN.]	Y	N	Y	N
 [A. STOP]	-	Y	Y	Y	Y
 [INTSL]	-	Y	Y	Y	Y
 [Intensilight (ND number)]	[INTSL]	Y	Y	Y	Y
 [ND WHEEL]	-	Y	N	Y	N
 [LAMP]	-	Y ([LAMP CTRL], [ADJ.], [LAMP ON/OFF])		Y	Y
 [F. STOP]	-	Y	N	Y	N

Button Icon	Main Category of Direct Operation Buttons	Shown in [MICROSCOPE CONTROL] Screen		Shown in [MIC EASY] Screen	
		Ni-E	Ni-U	Ni-E	Ni-U
 [SHUTTER]	-	Y ([SHUTTER EPI/DIA/AUX], [SHUTTER EPI ALL])		Y	Y
 [SHUTTER EPI ALL]	[SHUTTER]	Displayed by placing the [SHUTTER] button		Y	Y
 [SHUTTER FL]	[SHUTTER]	Displayed by placing the [FL TURRET] button		Y	Y
 [SHUTTER FL 2nd]	[SHUTTER]	Displayed by placing the [FL 2nd] button	N	Y	N
 [SHUTTER INTSL]	[SHUTTER]	Displayed by placing the [INTSL] button		Y	Y
 [SHUTTER EPI/DIA/AUX]	[SHUTTER]	Displayed by placing the [SHUTTER] button		Y	Y
 [CAPTURE]	-	Y	Y	Y	Y
 [SAVE]	-	Displayed by placing the [LOAD] button		Y	Y
 [LOAD]	-	Y	Y	Y	Y
 [LOAD (MODE number)]	[LOAD]	Y	Y	Y	Y
 [XYZ]	-	Displayed on the left of the screen (cannot be changed)	N	Y	N
 [Z-axis RESET]	[XYZ]	Displayed on sub screen of [XYZ] button	N	Y	N

Button Icon	Main Category of Direct Operation Buttons	Shown in [MICROSCOPE CONTROL] Screen		Shown in [MIC EASY] Screen	
		Ni-E	Ni-U	Ni-E	Ni-U
 [ESCAPE]	[XYZ]	Displayed on sub screen of [XYZ] button	N	Y	N
 [Specimen Removal Position]	[XYZ]	Displayed on sub screen of [XYZ] button	N	Y	N
 [SLEEP]	-	Set separately. Refer to "4.1.2 Showing/Hiding the [SLEEP] Button" in this chapter.	N	Y	N

4.1.1 Selecting the Buttons to be Displayed

Ni-E

Ni-U

[Procedure]

[MIC SETUP] → [BUTTON FUNC]

- (1) (To change the configuration of the [MICROSCOPE CONTROL] screen)

Tap the [MIC BUTTON FUNCTION] button.

(To change the configuration of the [MIC EASY] screen)

Tap the [MIC EASY BUTTON FUNCTION] button under [MIC EASY].

Current settings are displayed.

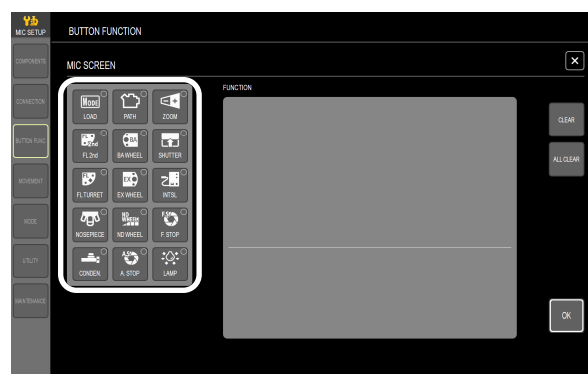


- (2) **Select the button of which you want to change the function assignment.**

A sub screen to select a function appears.

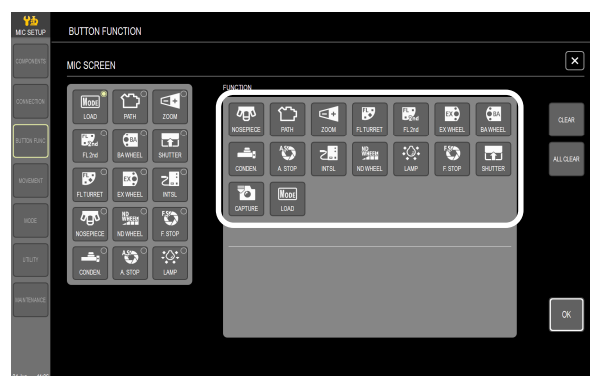
Tapping the [ALL CLEAR] button clears settings for all buttons.

(Although the following screens are example for [MICROSCOPE CONTROL] screen, operation is similar for [MIC EASY] screen.)

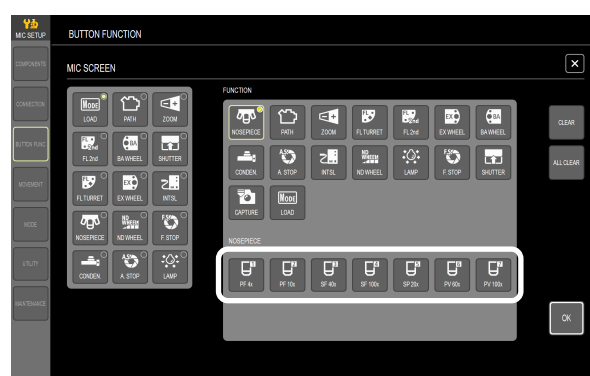


(3) Select the function you want to assign.

The selected function is shown with a check mark.
Tapping the [CLEAR] button assigns no function to the button and the button becomes blank.

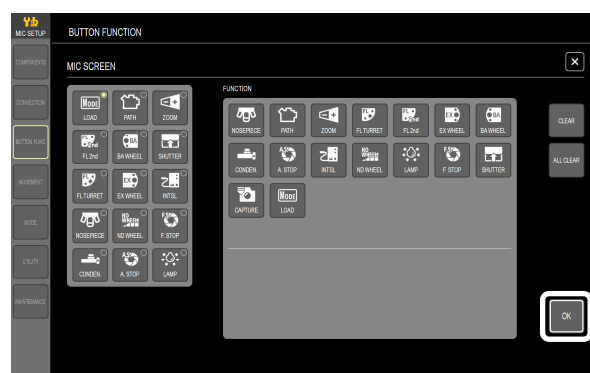
**✓ Layout of direct operation buttons**

When placing direct operation buttons (buttons which directly operate devices such as objectives or condenser modules without showing sub screen), select a main category button (with a yellow frame), and then select a button shown under it.

**(4) Repeat steps (2) and (3) for all buttons of which you want to change the functions.****(5) Tap the [OK] button.**

[BUTTON FUNCTION] screen is displayed.

To quit setting, tap the [X] button.



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see "1 Bulk Saving of Settings ([MAIN] Screen)" in this chapter.

4.1.2 Showing/Hiding the [SLEEP] Button

Ni-E

In this section, you configure whether to display the [SLEEP] button to use the sleep function. In order to display the [SLEEP] button on the [MIC EASY] screen, you must first place the [SLEEP] button in the screen. See “4.1.1 Selecting the Buttons to be Displayed” in this chapter.

Setting Item	Setting Value	Description
[SLEEP BUTTON]	ON	Shows the [SLEEP] button
	OFF (default)	Hides the [SLEEP] button

[Procedure]

[MIC SETUP] → [BUTTON FUNC]

Show/hide the [SLEEP] button by tapping the [SLEEP BUTTON] button.

ON (show)/OFF (hide) toggles each time you tap the [SLEEP BUTTON] button.



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see “1 Bulk Saving of Settings ([MAIN] Screen)” in this chapter.

4.2 Configuring Buttons on the Microscope

















Ni-E Ni-U Ci-E


In this section, you configure functions of buttons on the microscope.

4.2.1 Setting the Function of the Function Buttons

Ni-E

You can assign any functions among the following functions to six function buttons on the front of the Ni-E main body.

Function Icon	Function
  [CONDEN. (+/-)]	Switches the condenser module by rotating the motorized universal condenser turret forward or reversely.
 [SHUTTER FL]	Opens or closes the built-in shutter in the epi-fluorescence cube turret (1st layer).
  [FL 2nd(+/-)]	Switches the filter cube by rotating the epi-fluorescence cube turret (2nd layer) forward or reversely.
 [SHUTTER FL 2nd]	Opens or closes the built-in shutter in the epi-fluorescence cube turret (2nd layer).
  [EX WHEEL (+/-)]	Switches the excitation filter wheel by rotating the excitation filter wheel forward or reversely.
  [BA WHEEL (+/-)]	Switches the barrier filter wheel by rotating the barrier filter wheel forward or reversely.
  [BRIGHTEN]/[DARKEN]	Brightens or darkens the dia-illumination by rotating the ND filter wheel.
  [ZOOM+]/[ZOOM-]	Increases or decreases the zoom magnification of the motorized DSC zooming port.
 [SHUTTER EPI]	Opens/closes the EPI motorized shutter.
 [SHUTTER DIA]	Opens/closes the DIA motorized shutter.

Function Icon	Function
 [LOAD (MODE number)]	Loads a mode.

Default setting

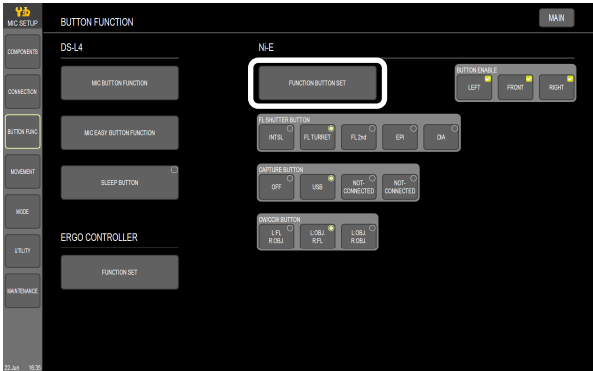
Button Number	Function
1	CONDEN. (-)
2	CONDEN. (+)
3	EX WHEEL (-)
4	EX WHEEL (+)
5	BA WHEEL (-)
6	BA WHEEL (+)

[Procedure]

[MIC SETUP] → [BUTTON FUNC]

- (1) Tap the [FUNCTION BUTTON SET] button under “Ni-E” indication.

Current settings are displayed.



- (2) Select the button of which you want to change the function assignment.

A sub screen to select a function appears.
Tapping the [ALL CLEAR] button clears settings for all buttons.

To quit setting, tap the [X] button.



4.2.2

Changing the Motorized Shutter Operated with the FL SHUTTER Button

Ni-E

You can change the motorized shutter to be operated with the FL SHUTTER button on the Ni-E main body.

Setting Item	Setting Value	Shutter to Be Operated
[FL SHUTTER BUTTON]	[INTSL]	Built-in shutter in the motorized HG precentered fiber illuminator
	[FL TURRET] (default)	Built-in shutter of the motorized epi-fluorescence cube turret
	[FL 2nd]	Built-in shutter of the motorized epi-fluorescence cube turret (2nd layer)
	[EPI]/[DIA]/[AUX]	Shutter configured as EPI, DIA, or AUX on the [CONNECTION] screen (You must change the connection configuration of the motorized shutter if the motorized shutter options shown here are not correct. See “3.2 Configuring the Connection of Motorized Shutter” in this chapter.)

[Procedure]

[MIC SETUP] → [BUTTON FUNC]

Choose the shutter to be operated among the options in the [FL SHUTTER BUTTON].

The displayed buttons depend on the connection configuration of the motorized shutter.



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see “1 Bulk Saving of Settings ([MAIN] Screen)” in this chapter.

4.2.3

Changing the Digital Camera Operated with the Microscope's CAPTURE Button

Ni-E Ni-U Ci-E

The capture method when the CAPTURE button of the microscope is pressed can be changed.

Setting Item	Setting Value	Capture Method
[CAPTURE BUTTON]	[OFF]	Disables the operation of the CAPTURE button.
	[USB] (Default for Ni-E/Ni-U)	Capturing by sending a communication command from the USB connector
	[FRONT]/[LEFT]/ [RIGHT]/[REAR]/[AUX] (DSC connector) (Default for Ci-E)	Capturing by output of trigger signal from the DSC connector

[Procedure]

[MIC SETUP] → [BUTTON FUNC]

Choose the capture method among the options in the [CAPTURE BUTTON].

The displayed buttons depend on the connection configuration of the digital camera. See Chapter 6, “3.1 Configuring the Connection of Digital Camera”.

(Following screens are for Ni-E)



For Ni-E and Ni-U, after making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see “1 Bulk Saving of Settings ([MAIN] Screen)” in this chapter.

For Ci-E, you cannot save changes to the settings made here. Tapping of the [SAVE] button is not necessary.

4.2.4

Changing the Motorized Device to be Operated with CW/CCW Button

Ni-E

You can change the motorized device to be operated with the CW/CCW buttons on the Ni-E main body.

Setting Item	Setting Value	Target of the Operation	
		CW/CCW buttons on the left	CW/CCW buttons on the right
[CW/CCW BUTTON]	[L:FL / R:OBJ.]	Motorized epi-fluorescence cube turret	Motorized Nosepiece
	[L:OBJ. / R:FL] (default)	Motorized Nosepiece	Motorized epi-fluorescence cube turret
	[L:OBJ. / R:OBJ.]	Motorized Nosepiece	Motorized Nosepiece

[Procedure]

[MIC SETUP] → [BUTTON FUNC]

Choose the device to be operated among the options in the [CW/CCW BUTTON].



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see "1 Bulk Saving of Settings ([MAIN] Screen)" in this chapter.

4.2.5

Enabling/Disabling the Button Operation

Ni-E

Ci-E

In order to avoid incorrect operation, buttons on the microscope can be enabled or disabled.

Setting Item	Setting Value	Description
[Ni-E LEFT]/ [Ci-E LEFT]	ON (default)	Operations using the left side buttons are enabled
	OFF	Operations using the left side buttons are disabled.
[Ni-E FRONT]	ON (default)	Operations using the front buttons are enabled
	OFF	Operations using the front buttons are disabled
[Ni-E RIGHT]/ [Ci-E RIGHT]	ON (default)	Operations using the right side buttons are enabled
	OFF	Operations using the right side buttons are disabled

[Procedure]

[MIC SETUP] → [BUTTON FUNC]

Enable or disable each control by tapping the button under [BUTTON ENABLE].

ON (enable)/OFF (disable) are toggled each time you tap the button.

(Following screens are for Ni-E)



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see "1 Bulk Saving of Settings ([MAIN] Screen)" in this chapter.

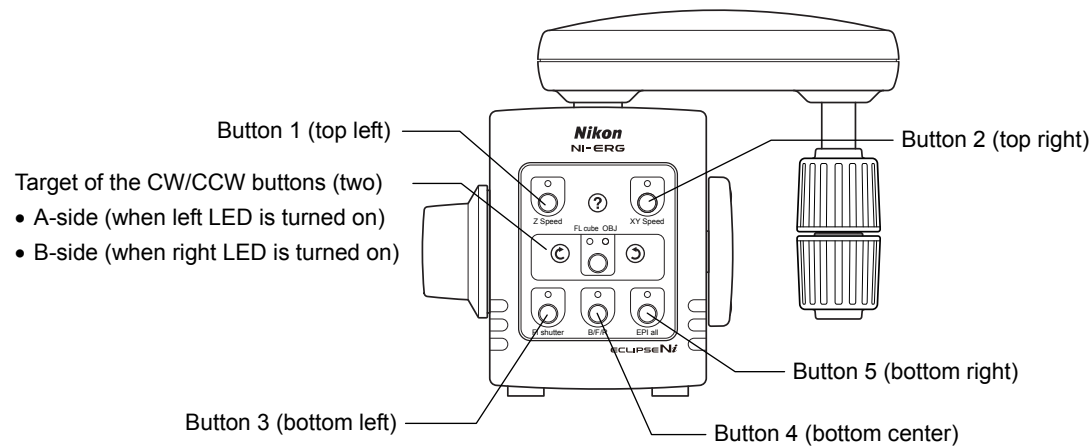
You can change the functions of the ergo controller buttons.



Prerequisite for configuration

In order to configure this setting, the ergo controller must be connected.

Configurable buttons are shown below.



Default targets of the CW/CCW buttons are as follows:












Setting Item	Target
A-side (when left LED is turned on)	Motorized epi-fluorescence cube turret (1st layer)
B-side (when right LED is turned on)	Motorized nosepiece

Default settings for buttons 1 through 5 are as follows:

Setting Item	Function
Button 1 (top left)	Z SPEED
Button 2 (top right)	XY SPEED
Button 3 (bottom left)	SHUTTER FL
Button 4 (bottom center)	B/F/R
Button 5 (bottom right)	SHUTTER EPI ALL

Configuring the target of the CW/CCW button

You can assign two (A-side and B-side) operations among the following operations to the CW/CCW buttons on the ergo controller.

Function Icon	Target
 [BA WHEEL]	Motorized barrier filter wheel (switches the barrier filters)
 [EX WHEEL]	Motorized excitation filter wheel (switches the excitation filters)
 [FL TURRET]	Motorized epi-fluorescence cube turret (switches the epi-fluorescence cubes)
 [FL 2nd]	Motorized epi-fluorescence cube turret on the 2nd layer (switches the epi-fluorescence cubes)
 [NOSEPIECE]	Motorized nosepiece (switches objectives)
 [INTSL]	Motorized HG precentered fiber illuminator (switches the ND)
 [CONDEN.]	Motorized universal condenser (switches the condenser modules)
 [A. STOP]	Motorized universal condenser (adjusts the DIA aperture diaphragm diameter)
 [ND WHEEL]	Motorized ND Filter (adjusts the transmittance)
 [ZOOM]	Motorized DSC zooming port (adjusts the zoom magnification)
 [F. STOP]	DIA field diaphragm (adjusts the diaphragm diameter)

[Procedure]

[MIC SETUP] → [BUTTON FUNC]

- (1) Tap the **[FUNCTION SET]** button under **[ERGO CONTROLLER]**.

Current settings are displayed.



- (2) Tap the button for which you want to change the motorized device assignment.
(Left: A, right: B)

A sub screen to select a motorized device appears. Tapping the **[ALL CLEAR]** button clears settings for all buttons.

To quit setting, tap the **[X]** button.



- (3) Select the motorized device you want to assign.

The selected motorized device is shown with a check mark.

Tapping the **[CLEAR]** button assigns no motorized device to the button and the button becomes disabled.



- (4) Repeat steps (2) and (3) if you want to change the assignment for another button.

- (5) Tap the **[OK]** button.












[BUTTON FUNCTION] screen is displayed.












After making changes to the settings, be sure to tap the **[SAVE]** button on the **[MAIN]** screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see "1 Bulk Saving of Settings ([MAIN] Screen)" in this chapter.

Setting the Functions of Buttons (1 to 5) Other than the CW/CCW Buttons

You can assign any functions among twenty functions to the five buttons other than ergo controller's [CW]/[CCW] buttons. The meaning of each button's LED depends on the configured function.

Function Icon	Function
 [Z SPEED]	<p>Switches the operation mode of the focus knobs between coarse, fine, and extra fine.</p> <p>LED off: coarse, LED on: fine, LED blinking: extra fine</p>
 [XY SPEED]	<p>Switches the operation mode of the stage knob between coarse, fine, and extra fine.</p> <p>LED off: coarse, LED on: fine, LED blinking: extra fine</p>
 [BINO]	<p>Switches the optical path of the motorized quadrocular tilting tube to 100% light distribution to the binocular section.</p> <p>LED on: 100% to binocular, LED off: 100% to tube adapter, or 100% to rear port</p>
 [FRONT]	<p>Switches the optical path of the motorized quadrocular tilting tube to 100% to the tube adapter.</p> <p>LED on: 100% to tube adapter, LED off: 100% to binocular or 100% to rear port</p>
 [REAR]	<p>Switches the optical path of the motorized quadrocular tilting tube to 100% to rear port.</p> <p>LED on: 100% to rear port, LED off: 100% to binocular or 100% to tube adapter</p>
 [B100/F100]	<p>Switches the optical path in the motorized quadrocular tilting tube between 100% to binocular and 100% to tube adapter.</p> <p>LED on: 100% to binocular, LED blinking: 100% to tube adapter, LED off: 100% to rear port</p>
 [F100/R100]	<p>Switches the optical path in the motorized quadrocular tilting tube between 100% to tube adapter and 100% to rear port.</p> <p>LED on: 100% to binocular, LED blinking: 100% to tube adapter, LED off: 100% to rear port</p>
 [R100/B100]	<p>Switches the optical path in the motorized quadrocular tilting tube between 100% to rear port and 100% to binocular.</p> <p>LED on: 100% to binocular, LED blinking: 100% to tube adapter, LED off: 100% to rear port</p>
 [B/F/R]	<p>Switches the optical path in the motorized quadrocular tilting tube among 100% to binocular, 100% to tube adapter, and 100% to rear port.</p> <p>LED on: 100% to binocular, LED blinking: 100% to tube adapter, LED off: 100% to rear port</p>
 [SHUTTER FL]	<p>Opens/closes the motorized epi-fluorescence cube turret's built-in shutter.</p> <p>LED on: shutter closed, LED off: shutter open</p>
 [SHUTTER FL2]	<p>Opens/closes the second motorized epi-fluorescence cube turret's built-in shutter.</p> <p>LED on: shutter closed, LED off: shutter open</p>

Function Icon	Function
 [SHUTTER EPI]	<p>Opens/closes the EPI motorized shutter.</p> <p>LED on: shutter closed, LED off: shutter open</p>
 [SHUTTER DIA]	<p>Opens/closes the DIA motorized shutter.</p> <p>LED on: shutter closed, LED off: shutter open</p>
 [SHUTTER INTSL]	<p>Opens/closes the built-in shutter in the motorized HG precentered fiber illuminator.</p> <p>LED on: shutter closed, LED off: shutter open</p>
 [SHUTTER EPI ALL]	<p>Opens/closes all shutters in the motorized epi-fluorescence cube turret, EPI motorized shutter, and the built-in shutter in the HG precentered fiber illuminator at the same time.</p> <p>LED on: shutter closed, LED off: shutter open (LED will be lit if any shutter is closed)</p>
 [NOSEPIECE ROTATION]	<p>Rotates the motorized nosepiece clockwise.</p>
 [NOSEPIECE REVERSE ROTATION]	<p>Rotates the motorized nosepiece counterclockwise.</p>
 [CAPTURE]	<p>Same function as microscope's CAPTURE button.</p>
 [Z-axis RESET]	<p>Resets the position display of the elevating section to zero.</p>
 [SLEEP]	<p>Stop the power supply to the motorized devices to decrease the generation of noise.</p> <p>LED on: sleeping state, LED off: normal state</p>

[Procedure]

[MIC SETUP] → [BUTTON FUNC]

- (1) Tap the [FUNCTION SET] button under [ERGO CONTROLLER].

Current settings are displayed.



- (2) Tap the button of which you want to change the function assignment.

A sub screen to select a motorized device appears. Tapping the [ALL CLEAR] button clears settings for all buttons.

To quit setting, tap the [X] button.



- (3) Select the function you want to assign.

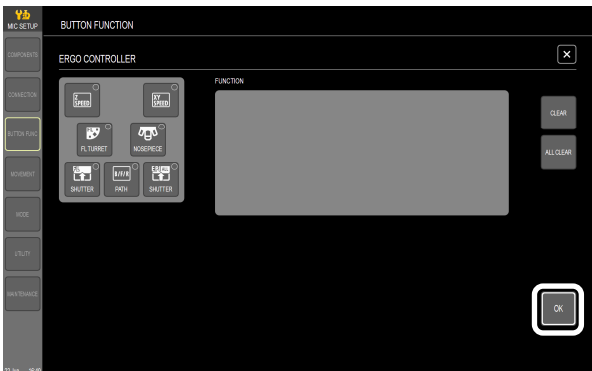
The selected function is shown with a check mark. Tapping the [CLEAR] button assigns no function to the button and the button becomes disabled.



- (4) Repeat steps (2) and (3) if you want to change the assignment for other buttons.

- (5) Tap the [OK] button.

[BUTTON FUNCTION] screen is displayed.



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see "1 Bulk Saving of Settings ([MAIN] Screen)" in this chapter.

In order to avoid incorrect operation, buttons on the remote control pad can be enabled or disabled.

Setting Item	Setting Value	Description
[TOP]	ON (default)	Button enabled
	OFF	Button disabled

[Procedure]

[MIC SETUP] → [BUTTON FUNC]

- (1) Tap the [TOP] button under [REMOTE CONTROL PAD] to enable or disable buttons on the remote control pad.

ON (enable)/OFF (disable) are toggled each time you tap the [TOP] button.



This setting cannot be saved to microscope's memory.

5 Configuring the Movement of Motorized Devices ([MOVEMENT] Screen)

In the [MOVEMENT] screen, you can configure the movement of motorized devices.

5.1 Configuring Interlocked Operation

Ni-E

You can configure to interlock operations of multiple motorized devices. Switching of objective, zoom magnification, or optical path, or triggering of capture from the microscope (by USB communication command/trigger signal), etc., can be configured to trigger specified operations of other motorized devices. To interlock, you have to configure it in advance.

✓ [LINK] button

When you tap the [LINK] button on the nosepiece sub screen on the [MICROSCOPE CONTROL] screen or [MIC EASY] screen, you can go directly to the [MOVEMENT] screen of the [MIC SETUP].

LINK

5.1.1 Configuring the Interlocked Operation with Switching of Objectives

Ni-E

You can interlock other motorized devices with the switching of objectives when the nosepiece is rotated and the objective is switched.

To perform interlock operation, configure the operation to be performed when switched to each nosepiece address.

✓ Prerequisite for configuration

[ESCAPE]

In order to interlock, a motorized nosepiece must be attached.

[F. STOP]

In order to interlock, the motorized (or intelligent) nosepiece must be attached. In addition, the information for objectives must be configured.

[A. STOP], [CONDEN.]

In order to interlock, the motorized universal condenser and motorized (or intelligent) nosepiece must be attached. In addition, the information for objectives must be configured.

[ND]

In order to interlock, the motorized ND filter wheel and motorized (or intelligent) nosepiece must be attached. In addition, the information for objectives must be configured.

✓ For intelligent nosepiece

When manually turning the intelligent nosepiece, interlocked operation is triggered when the nosepiece has been set at a click position. However, ALF (parfocal correction) and retracting are not performed.

No operations are triggered when rotating the nosepiece manually in sleep mode even if interlocking has been set (interlocked operation is disabled).

Setting Item	Device to Be Interlocked	Setting Value	Operation to Be Interlocked
[ESCAPE]	Elevating section of Ni-E main body	[ON]	Retract the elevating section to the position set by the software limit before switching objectives, then move it to the original position after switching the objectives. This operation is required to prevent the objective with high magnification from contacting with the specimen when the objective is near the specimen. (For information on setting the software limit, see “6.4 Setting the Software Limits” in this chapter.)
		[OFF] (default)	Does not retract
[A. STOP]	DIA aperture diaphragm on motorized universal condenser	[75%]	Set the aperture to 75% of the objective’s numerical aperture
		[INTELLIGENT]	Reproduces any aperture diaphragm adjustment performed during the observation when the objective is returned to the original objective after switching to another objective.* ³
		[OPEN]	Sets maximum value.
		[CLOSE]	Sets minimum value.
		[OFF] (default)	Does not interlock.
[F. STOP]	DIA field diaphragm of Ni-E main body	[100%]	Matches with the field of view* ¹
		[INTELLIGENT]	Reproduces any field diaphragm adjustment performed during the observation when the objective is returned to the original objective after switching to another objective.* ³
		[OPEN]	Sets maximum value.
		[CLOSE]	Sets minimum value.
		[OFF] (default)	Does not interlock.
[ND]	Motorized ND filter wheel	[NORMAL]	Sets the transmittance to the standard value calculated from the magnification and numerical aperture of the objective.* ²
		[INTELLIGENT]	Reproduces any ND filter adjustment performed during the observation when the objective is returned to the original objective after switching to another objective.* ³
		[OFF] (default)	Does not interlock.
[CONDEN.]	Motorized Universal Condenser	Module name for addresses 1 through 7	Brings the specified condenser module into the optical path.
		[OFF] (default)	Does not interlock.

*1: Automatically adjusts taking into account the difference in the field of view depending on the optical path when a motorized quadrocular tilting tube is attached. Also, when motorized zooming port is attached and the optical path is set to [REAR], the field diaphragm is adjusted automatically taking into account the zoom magnification. (For a manual zooming port, it is adjusted assuming that the 1.0x zoom is used.)
Adjusted with the field number of 25 when a manual tube is attached.

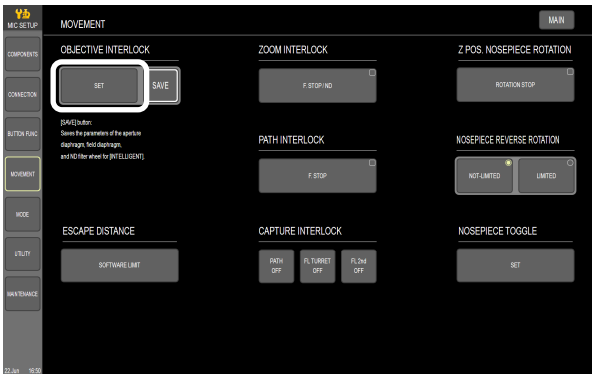
*2: The size of the aperture diaphragm is another factor that affects the brightness of the field of view. When the motorized ND filter wheel is set to [NORMAL] or [INTELLIGENT], ND filter is adjusted assuming the aperture diaphragm is 75% of the numerical aperture of the objective. Therefore, if the interlock setting of the aperture diaphragm is not set to 75%, the transmittance of the adjusted ND filter may not be optimum. In such a case, adjust with the [ND WHEEL] button on the [MICROSCOPE CONTROL] or [MIC EASY] screen. Also, when the motorized zooming port is attached and the optical path is set to [REAR], the transmittance is adjusted automatically taking into account the zoom magnification. (For a manual zooming port, it is adjusted assuming that the 1.0x zoom is used.)

*3: Once you turn off the DS-L4, the values in the previous state are cleared and the default value is restored. See “5.1.2 Changing the Initial Value of the [INTELLIGENT]” in this chapter to maintain the state of [INTELLIGENT] even when the power is turned OFF.

[Procedure]

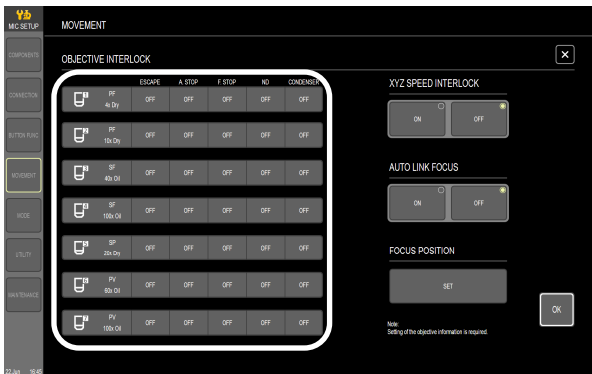
[MIC SETUP] → [MOVEMENT]

- (1) Tap the [SET] button under [OBJECTIVE INTERLOCK].
Current settings are displayed.

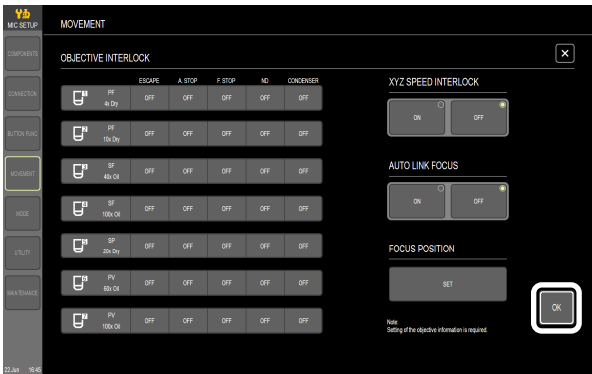


- (2) If any change is required, tap the button for the intended objective.
Select relevant settings of escape state, aperture diaphragm, ND wheel, and condense.

To quit setting, tap the [X] button.



- (3) After completing the setting, tap the [OK] button.
[MOVEMENT] screen is displayed.



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see "1 Bulk Saving of Settings ([MAIN] Screen)" in this chapter.

5.1.2

Changing the Initial Value of the [INTELLIGENT]

Ni-E

Among the devices interlocked with switching objectives, [INTELLIGENT] can be selected as the operation when switching the objectives for aperture diaphragm, field diaphragm, or ND wheel. When [INTELLIGENT] is selected, any adjustment performed during the observation can be reproduced when the objective is returned to the original objective after switching to another objective. However, once you turn off the DS-L4 and then turn it on, the values of the adjusted state are cleared and the initial values are restored.

In order to use the [INTELLIGENT] status for aperture diaphragm, field diaphragm, and ND wheel when you turn on the DS-L4 next or later, you must save the status of the device. This saves the aperture diaphragm, field diaphragm, and ND wheel status currently used in [INTELLIGENT] to the memory in the microscope and it is used as the initial value of [INTELLIGENT] when you subsequently turn on the DS-L4.

[Procedure]

[MIC SETUP] → [MOVEMENT]

- (1) Tap the [SAVE] button under [OBJECTIVE INTERLOCK].

A confirmation dialog box appears.

- (2) Tap the [OK] button.

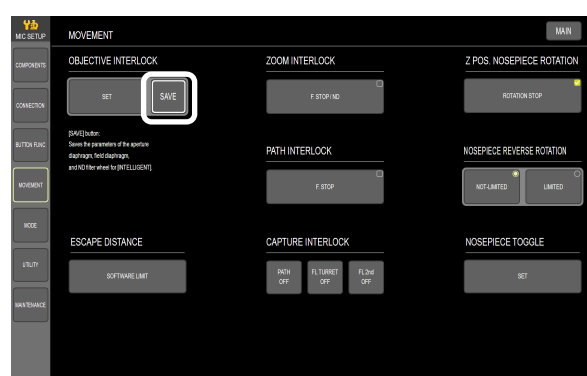
The status of the aperture diaphragm, field diaphragm, and ND wheel, which is used when you select [INTELLIGENT], is saved.

To cancel saving, tap the [CANCEL] button.

✓ **When returning the changed initial value of [INTELLIGENT] to the factory setting**

When the information of the objective is reset, the initial value of [INTELLIGENT] for that nosepiece address is restored to the factory setting.

See Chapter 6, “2.1 Configuring the Objective Information” for details on configuring objective information.



5.1.3

Automatically Switching the Movement Speed of the Microscope's Elevating Section and Motorized Stage

Ni-E

The movement speed of the microscope's elevating section and motorized stage operated with the ergo controller (or joystick) can be switched automatically according to the magnification of the objective.

Prerequisite for configuration

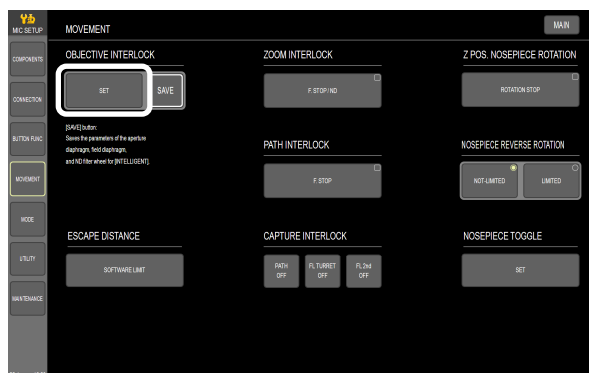
In order to perform this configuration, motorized (or intelligent) nosepiece, and ergo controller (or joystick) must be attached. In addition, the information for objectives must be configured.

Setting Item	Setting Value	Operation to Be Interlocked
[XYZ SPEED]	ON	Changes the movement speed of the microscope's elevating section and motorized stage according to the magnification of the objective: 2x, 4x, 10x: Coarse 20x, 40x: Fine 60x, 100x: Extra fine
	OFF (default)	Does not interlock.

[Procedure]

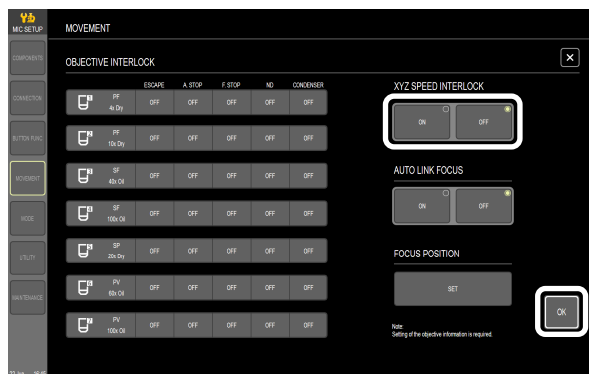
[MIC SETUP] → [MOVEMENT]

(1) Tap the [SET] button under [OBJECTIVE INTERLOCK].



(2) Tap the [ON]/[OFF] button of [XYZ SPEED INTERLOCK] to change the setting.

To quit setting, tap the [X] button.



(3) After completing the setting, tap the [OK] button.

[MOVEMENT] screen is displayed.

After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see "1 Bulk Saving of Settings ([MAIN] Screen)" in this chapter.

5.1.4

Configuring the Parfocal Correction Function (Auto Link Focus)

NI-E

Parfocal correction is a function to automatically correct the difference between focal points of objectives when objective is switched by configuring focal point of each objective in advance.

Note that parfocal correction is not performed when you switch objectives when the objective is retracted using the [ESCAPE] button. When Auto Link Focus is ON, parfocal correction is performed when the objective is automatically retracted or refocused according to the interlock setting of switching objectives.

✔ Prerequisite for configuration

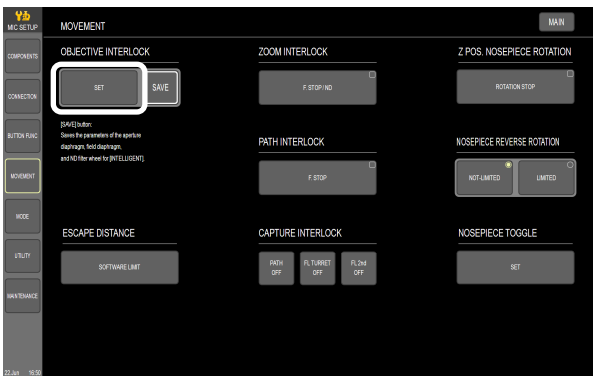
In order to perform this configuration, the motorized nosepiece must be attached.

Configuring the focal point

By setting the focal point for each objective, parfocal correction is appropriately performed when objectives are switched. Be sure to perform this configuration if you plan to use parfocal correction.

[MIC SETUP] → [MOVEMENT]

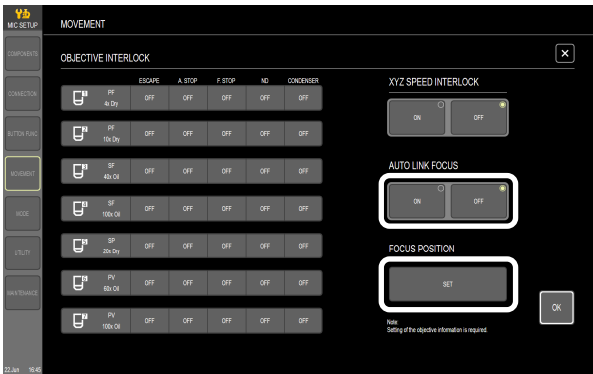
(1) Tap the [SET] button under [OBJECTIVE INTERLOCK].



(2) If [AUTO LINK FOCUS] is set to [ON], change the setting to [OFF].

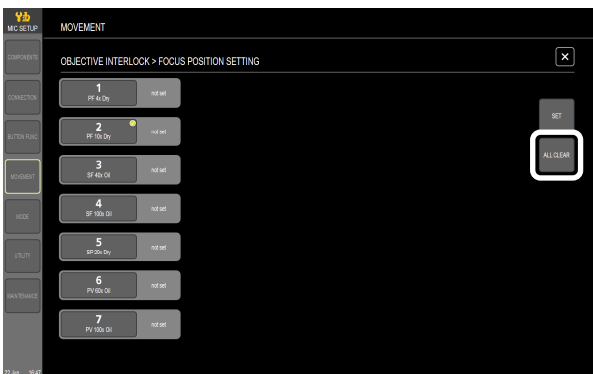
The focal point can be set only when parfocal correction (Auto Link Focus) is set to [OFF].

(3) Tap the [SET] button under [FOCUS POSITION].



(4) Tap the [ALL CLEAR] button.

Previous settings are removed.



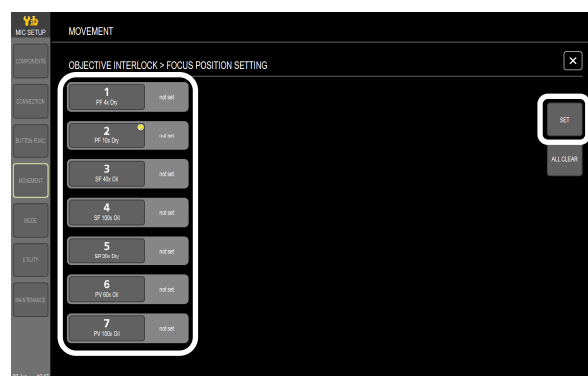
- (5) Tap the button for address 1 to bring the objective in address 1 into the optical path.
- (6) Use the focus knob on the microscope to focus on the specimen.
- (7) Tap the [SET] button to save the focal point of the address 1.

The configuration status is shown in the [FOCUS POSITION] section on the right.

[set]: Focal point has been configured

[not set]: Focal point has not been configured

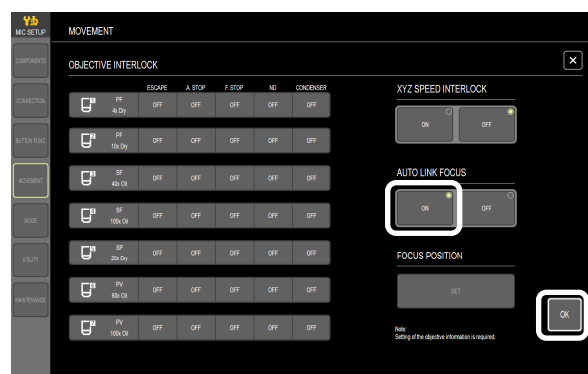
- (8) Save the focal points for address 2 and later in the same way.



✓ **For addresses where no objective is attached**

Be sure to set the focal points for all nosepiece addresses. For addresses where no objective is attached, save the focal point with the same status as the previous address. If you don't set the focal point, parfocal correction is not performed when the address is switched from the position without objective to the position with objective, or vice versa.

- (9) When you have saved focal points for all addresses, tap the [OK] button.
- (10) Set [AUTO LINK FOCUS] to [ON].
The parfocal correction is turned on.
- (11) Tap the [OK] button.
[MOVEMENT] screen is displayed.



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see "1 Bulk Saving of Settings ([MAIN] Screen)" in this chapter.

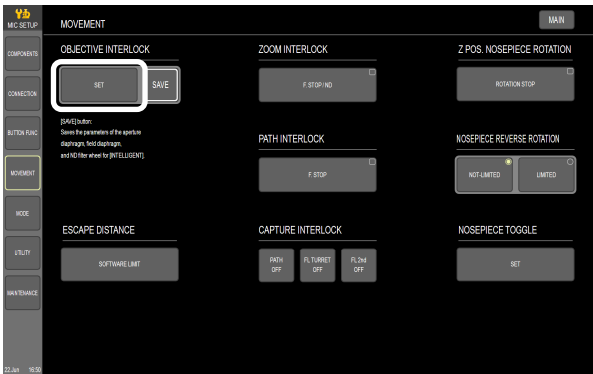
Enabling or disabling the parfocal correction

In this section, you enable or disable the parfocal correction function. If you want to use the parfocal correction function, you have to set the focal point in advance. If the focal point is not set after attaching the objective, see the previous section “Configuring the focal point”.

Setting Item	Setting Value	Operation to Be Interlocked
[AUTO LINK FOCUS]	ON	Enables parfocal correction.
	OFF (default)	Disables parfocal correction.

[MIC SETUP] → [MOVEMENT]

(1) Tap the [SET] button under [OBJECTIVE INTERLOCK].

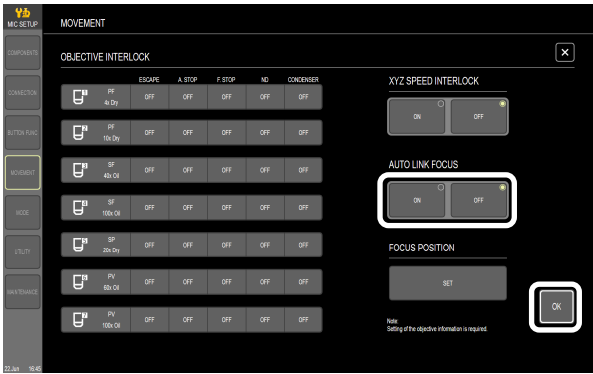


(2) Set [AUTO LINK FOCUS] as appropriate.

To quit setting, tap the [X] button.

(3) Tap the [OK] button.

[MOVEMENT] screen is displayed.



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope’s memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see “1 Bulk Saving of Settings ([MAIN] Screen)” in this chapter.

5.1.5

Configuring the Interlocked Operation with Switching of Zoom Magnification

Ni-E

The DIA field diaphragm and motorized ND filter wheel can be adjusted automatically when the zoom magnification is switched.

✔ **Prerequisite for configuration**

In order to perform this configuration, the motorized DSC zooming port, motorized (or intelligent) nosepiece, and motorized quadrocular tilting tube must be attached. In addition, the information for objectives must be configured.

To interlock the ND filter, the motorized ND filter wheel must be attached as well. Also, the interlocking function is disabled when the microscope is in sleep mode.

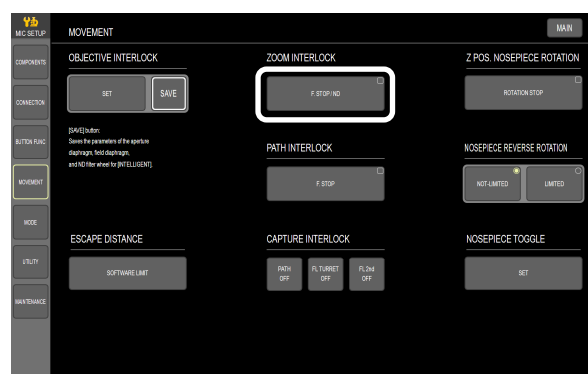
Setting Item	Device to Be Interlocked	Setting Value	Operation to Be Interlocked
[F. STOP / ND]	Ni-E Main Body (DIA field diaphragm), motorized ND filter wheel	ON	Adjusts the field diaphragm and motorized ND filter according to the interlock setting for objective switching. (For the settings, refer to “5.1.1 Configuring the Interlocked Operation with Switching of Objectives” in this section. No adjustment is performed when the interlock setting for objective switching is set to [OFF].)
		OFF (default)	Does not interlock.

[Procedure]

[MIC SETUP] → [MOVEMENT]

Tap the [F. STOP/ND] button under [ZOOM INTERLOCK] to enable or disable the function.

The function is toggled each time you tap the button.



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see “1 Bulk Saving of Settings ([MAIN] Screen)” in this chapter.

5.1.6

Configuring the Interlocked Operation with Switching of Optical Path

Ni-E

The DIA field diaphragm can be adjusted automatically when the optical path is switched.

✓ **Prerequisite for configuration**

In order to perform this configuration, the motorized (or intelligent) nosepiece and motorized quadrocular tilting tube must be attached. In addition, the information for objectives must be configured.

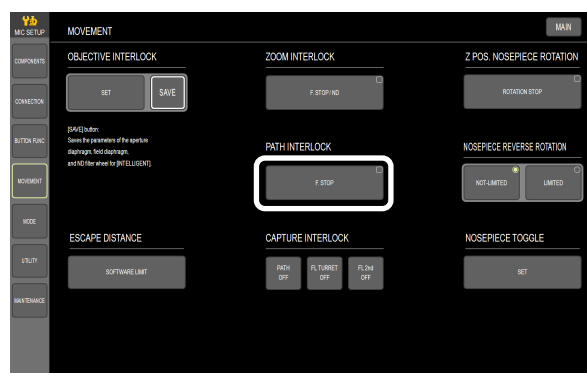
Setting Item	Device to Be Interlocked	Setting Value	Operation to Be Interlocked
[F. STOP]	Ni-E Main Body (DIA field diaphragm)	ON	Adjusts the field diaphragm according to the interlock setting for objective switching. (For the settings, refer to “5.1.1 Configuring the Interlocked Operation with Switching of Objectives” in this section. No adjustment is performed when the interlock setting for objective switching is set to [OFF].)
		OFF (default)	Does not interlock.

[Procedure]

[MIC SETUP] → [MOVEMENT]

Tap the [F. STOP] button under [PATH INTERLOCK] to enable or disable the function.

The function is toggled each time you tap the button.



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see “1 Bulk Saving of Settings ([MAIN] Screen)” in this chapter.

5.1.7

Configuring the Interlocked Operation with Capture Command Sending or Trigger Signal Output

Ni-E

Motorized quadrocular tilting tube and motorized epi-fluorescence cube turret can be switched by interlocking them with the sending of a capture command from the microscope's USB connector or output of a capture trigger signal from the DSC connector.

✔ **Prerequisite for configuration**

In order to perform this configuration, the target device for interlocking must be attached.

✔ **Operation to trigger an interlocked operation**

Based on the configuration made here, the specified operation is automatically performed when you send a capture command/capture trigger signal from the microscope by tapping the [CAPTURE FRONT/LEFT/RIGHT/AUX] button on the [MICROSCOPE CONTROL] or [MIC EASY] screen or pressing the [CAPTURE] button on the microscope. Interlocked operation is not performed when you capture the image using the camera directly connected to the DS-L4 by tapping the [CAPTURE] button on the camera control screen.

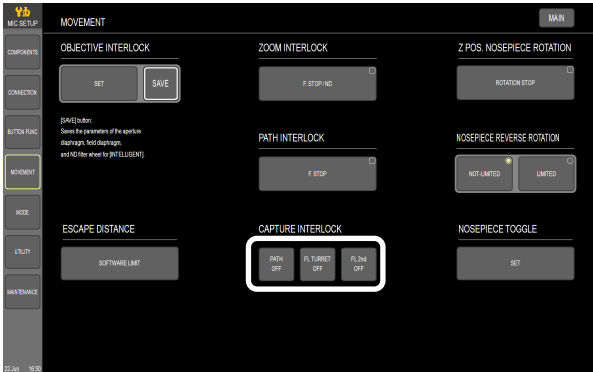
Setting Item	Device to Be Interlocked	Setting Value	Operation to Be Interlocked
[PATH]	Motorized quadrocular tilting tube	[FRONT]	Switches the optical path to tube adapter (When the interlock with optical path switching is enabled, the field diaphragm is also adjusted according to the interlock setting for objective switching. For the settings, refer to "5.1.1 Configuring the Interlocked Operation with Switching of Objectives" in this section.)
		[REAR]	Switches the optical path to rear port (When the interlock with optical path switching is enabled, the field diaphragm is also adjusted according to the interlock setting for objective switching. For the settings, refer to "5.1.1 Configuring the Interlocked Operation with Switching of Objectives" in this section.)
		[OFF] (Default)	Does not interlock.
[FL TURRET]	Motorized epi-fluorescence cube turret	Name of the filter cube at address 1 through 6	Brings the specified filter cube into the optical path.
		[OFF] (Default)	Does not interlock.
[FL 2nd]	Motorized epi-fluorescence cube turret (2nd layer)	Name of the filter cube at address 1 through 6	Brings the specified filter cube into the optical path.
		[OFF] (Default)	Does not interlock.

[Procedure]

[MIC SETUP] → [MOVEMENT]

Tap the [PATH], [FL TURRET], and [FL 2nd] button under [CAPTURE INTERLOCK] to change the settings.

Tapping each button opens a sub screen showing options. Select the desired interlocked operation.



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see “1 Bulk Saving of Settings ([MAIN] Screen)” in this chapter.

5.2

Setting the Retracting Amount of the Elevating Section

Ni-E

By performing the retracting operation, you can configure the distance the elevating section (stage for focusing stage system or objective for focusing nosepiece system) moves from the current position.

For focusing stage system, the stage lowers by the distance set for the retracting amount.

For focusing nosepiece system, the objective rises by the distance set for the retracting amount.

The elevating section retracts when:

- You press the ESCAPE button on the Ni-E main body
- You tap the [ESCAPE] button on the DS-L4
- You tap the [SAMPLE REMOVE POSITION] button on the DS-L4
- Retraction is interlocked with switching objectives

Setting Item	Setting Value	Retracting Amount
[ESCAPE DISTANCE]	[5 mm]	5 mm from the current position
	[10 mm]	10 mm from the current position
	[SOFTWARE LIMIT] (default)	Software limit position set on the [UTILITY] screen. For more information, see “6.4 Setting the Software Limits” in this chapter.

[Procedure]

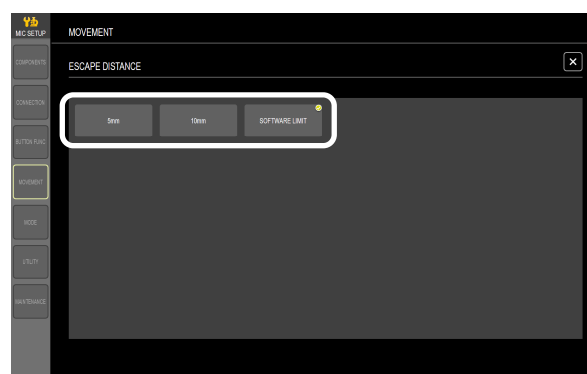
[MIC SETUP] → [MOVEMENT]

(1) Tap the button under [ESCAPE DISTANCE].

A sub screen opens to select the option for retracting amount.

**(2) Select the escape amount.**

The retracting amount is set.



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see “1 Bulk Saving of Settings ([MAIN] Screen)” in this chapter.

5.3

Disabling the Rotation of the Motorized Nosepiece Depending on the Position of the Elevating Section

Ni-E

This is a function to prevent objectives from touching the specimen.

You can disable the nosepiece rotation if the elevating section is above the specified position. The configured upper limit is applied to all nosepiece addresses.

This function is automatically turned OFF when the power is turned off. This setting can not be saved by tapping the [SAVE] button on the [MAIN] screen.

✔ Prerequisite for configuration

In order to perform this configuration, the motorized nosepiece must be attached.

✔ Effect of the vibration of the elevating section

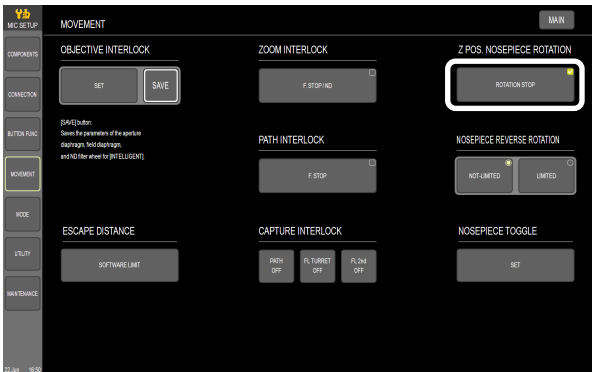
Near the configured value, vibration may move the elevating section and rotate the motorized nosepiece.

Setting Item	Setting Value	Description
[ROTATION STOP]	ON	Disabling the nosepiece rotation if the elevating section is above the specified position
	OFF (default)	Does not limit the position of the elevating section.

[Procedure]

[MIC SETUP] → [MOVEMENT]

- (1) Switch between ON (limited) and OFF (not limited) by tapping the [ROTATION STOP] button under [Z POS. NOSEPIECE ROTATION].



- (2) (Only when turned ON) Turn the focus knob to move the elevating section to the position where you want to set as the limit and tap the [OK] button.

The nosepiece does not rotate if the elevating section is above the current position.

To quit setting, tap the [CANCEL] button.



5.4

Disabling the Reverse Rotation of the Nosepiece

Ni-E

Ni-U

Ci-E

Since the focal depth of the objective with low magnification is deep, such an objective may be positioned close to the specimen when used. When the objective is switched to the high magnification objective in this situation, the tip of the objective may contact with the specimen. In order to prevent this, you can prohibit rotation from address 1 to the next address 6 (for sextuple nosepiece) or from address 1 to the next address 7 (for septuple nosepiece) with this setting.

✔ **Prerequisite for configuration**

In order to perform this configuration, the motorized nosepiece must be attached.

✔ **When turning the nosepiece by specifying an address directly**

Even when [LIMITED] is selected with this setting, address 6 or 7 enters into the optical path when the nosepiece is rotated by specifying the address directly. (For example, in sextuple nosepiece, tapping the button for nosepiece address 6 when address 1 is in the optical path, the nosepiece rotates in the order of 1→2→3→4→5→6 and address 6 enters into the optical path.) When [NOT-LIMITED] is selected with this setting, the nosepiece rotates in the direction that is the shorter distance to the specified address.

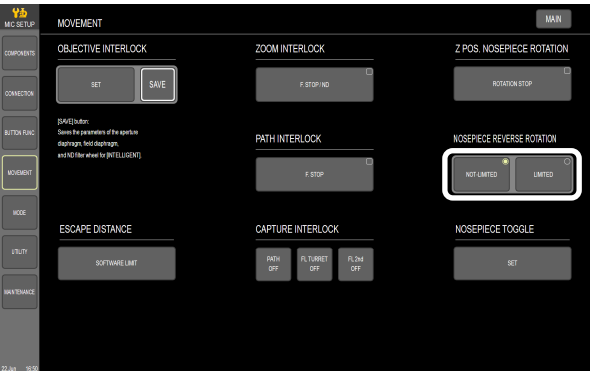
Setting Item	Setting Value	Description
[NOSEPIECE REVERSE ROTATION]	[NOT-LIMITED] (default)	Reverse rotation from any address is not prohibited.
	[LIMITED]	(For sextuple nosepiece) Prohibits the reverse rotation from address 1 to 6. (For septuple nosepiece) Prohibits the reverse rotation from address 1 to 7.

[Procedure]

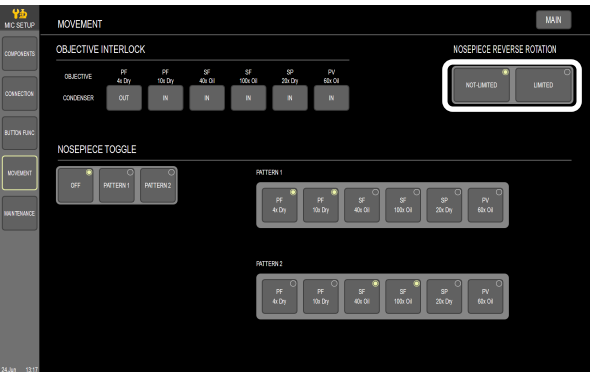
[MIC SETUP] → [MOVEMENT]

Switch the setting by tapping the [NOT-LIMITED] or [LIMITED] button under [NOSEPIECE REVERSE ROTATION].

(For Ni-E/Ni-U)



(For Ci-E)



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see "1 Bulk Saving of Settings ([MAIN] Screen)" in this chapter.

5.5

Configuring the Toggle Function (Alternating between Two Objectives)

Ni-E Ni-U Ci-E

Toggle function allows you to view the specimen while alternately switching between two objectives configured in advance. This operation is performed with the microscope's or ergo controller's nosepiece forward rotation/reverse rotation buttons. Two pairs of objectives can be configured: toggle pattern 1 and toggle pattern 2.



Prerequisite for configuration

In order to perform this configuration, the motorized nosepiece must be attached.

Setting Item	Setting Value	Action When the Nosepiece Rotation/Reverse Rotation Button Is Tapped
[NOSEPIECE TOGGLE]	[OFF] (default)	Turns off the toggle function.
	[PATTERN 1]	Switching between two addresses configured in the toggle pattern 1.
	[PATTERN 2]	Switching between two addresses configured in the toggle pattern 2.

Default toggle patterns

Setting Item	Addresses Used
[PATTERN 1]	1, 2
[PATTERN 2]	3, 4

5.5.1 Enabling/Disabling the Toggle Function

[Procedure]

[MIC SETUP] → [MOVEMENT]

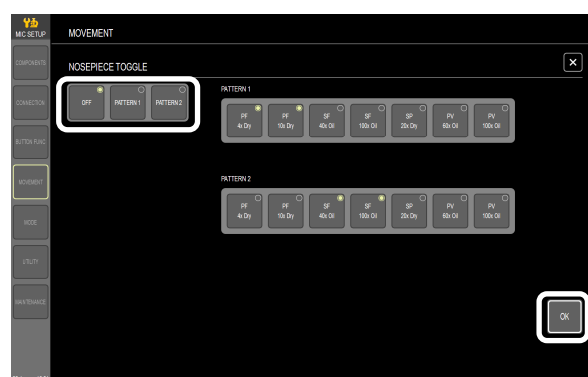
- (1) Tap the [SET] button under [NOSEPIECE TOGGLE] (this operation is not required for Ci-E. Go to the next step.)

(For Ni-E/Ni-U)



- (2) Tap the [OFF], [PATTERN 1], or [PATTERN 2] button under [NOSEPIECE TOGGLE] to select the action when nosepiece rotation/reverse rotation button is tapped.

(For Ni-E/Ni-U)

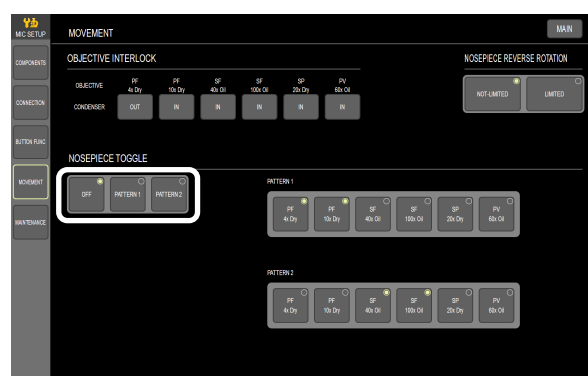


To quit setting, tap the [X] button. (Ni-E only)

- (3) Tap the [OK] button (this operation is not required for Ci-E).

[MOVEMENT] screen is displayed.

(For Ci-E)



When using Ni-E or Ni-U, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory after making changes to the settings. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see "1 Bulk Saving of Settings ([MAIN] Screen)" in this chapter. When using Ci-E, this setting cannot be saved to microscope's memory.

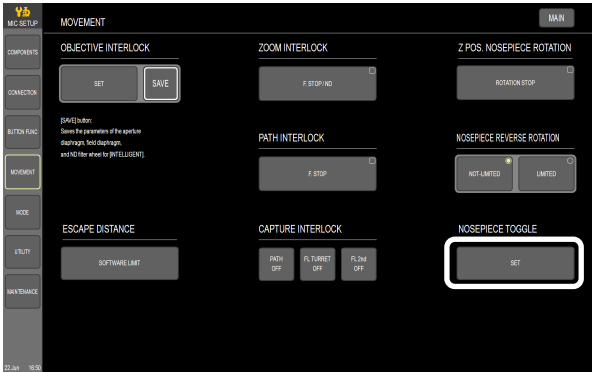
5.5.2 Configuring the Addresses Used by Toggle Function

[Procedure]

[MIC SETUP] → [MOVEMENT]

- (1) Tap the [SET] button under [NOSEPIECE TOGGLE] (this operation is not required for Ci-E. Go to the next step.)

(For Ni-E)



- (2) For [PATTERN 1] or [PATTERN 2], tap two buttons for addresses you want to use for toggle function.

Two addresses can be specified for each toggle pattern. Specifying third address cancels the address you specified first.

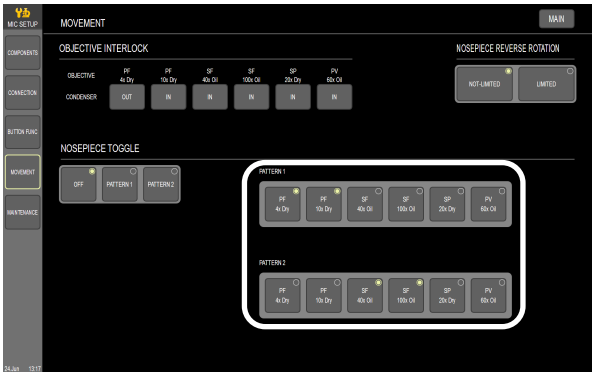
To quit setting, tap the [X] button. (Ni-E only)

- (3) Tap the [OK] button (this operation is not required for Ci-E).
[MOVEMENT] screen is displayed.

(For Ni-E)



(For Ci-E)



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see "1 Bulk Saving of Settings ([MAIN] Screen)" in this chapter.

If the motorized swing-out condenser is attached, you can configure the system so that the condenser top lens is automatically swung out when switching to the low-magnification objective.

✓ **Prerequisite for configuration**

In order to perform this configuration, the motorized swing-out condenser must be attached.

Default setting

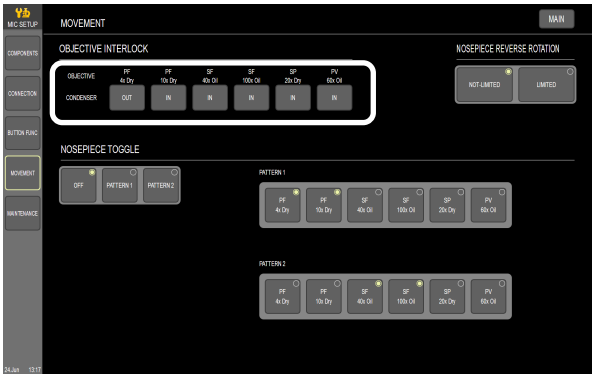
Nosepiece Address	Top Lens Status
1	OUT (swing out)
2 to 6	IN (bring into optical path)

[Procedure]

[MIC SETUP] → [MOVEMENT]

- (1) Tap the [IN]/[OUT] button under [CONDENSER] to enable or disable the top lens swing-out.

[IN] (bring into the optical path) and [OUT] (swing out) toggles each time you tap the [IN]/[OUT] button.



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see "1 Bulk Saving of Settings ([MAIN] Screen)" in this chapter.

6

Configuring Other Functions ([UTILITY] Screen, [MAINTENANCE] Screen)

6.1

Setting the Display of the Ni-E Front Display Panel

Ni-E

There are nine status display patterns for the front display panel of the Ni-E main body. Patterns displayed at the startup can be changed by this setting.

By default, pattern 1 is displayed. (For different display patterns, refer to the Ni-E instruction manual “Operation”).

[Procedure]

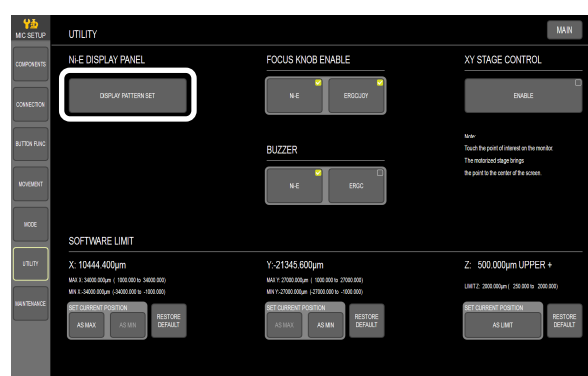
[MIC SETUP] → [UTILITY]

- (1) Tap the [DISPLAY PATTERN SET] button under [Ni-E DISPLAY PANEL].

A dialog screen appears.

- (2) Press the DISPLAY Previous/Next button on the main body to switch to the pattern to display at startup.

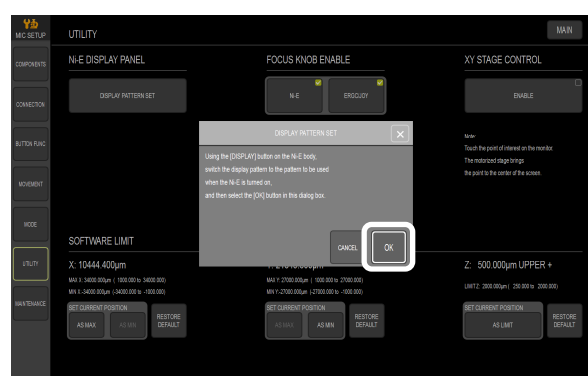
You can switch between status display and FUNCTION button's function display by pressing the microscope's DISPLAY toggle button. You can also set the FUNCTION button's function display as the pattern for startup.



- (3) Tap the [OK] button.

The pattern selected in step (2) is set as the display pattern at startup.

To quit setting, tap the [CANCEL] button.



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see “1 Bulk Saving of Settings ([MAIN] Screen)” in this chapter.

6.2

Enabling/Disabling the Operation of the Elevating Section

Ni-E

You can enable or disable the focus knob to operate the elevating section of the main body. The ESCAPE button is not affected by this setting.

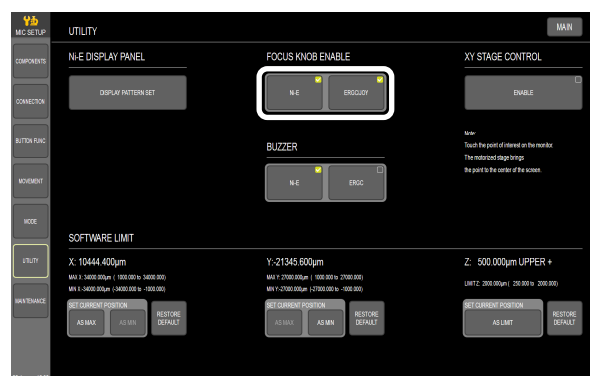
Setting Item	Target of the Configuration	Setting Value	Description
[Ni-E]	Ni-E focus knob	ON (default)	Operation is enabled
		OFF	Operation is disabled
[ERGC/JOY]	Focus knob of the ergo controller or the joystick	ON (default)	Operation is enabled
		OFF	Operation is disabled

[Procedure]

[MIC SETUP] → [UTILITY]

Enable or disable the function by tapping the [Ni-E] or [ERGC/JOY] button under [FOCUS KNOB ENABLE].

ON (enable)/OFF (disable) are toggled each time you tap the button.



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see "1 Bulk Saving of Settings ([MAIN] Screen)" in this chapter.

6.3

Turning ON/OFF the Buzzer

Ni-E

You can enable or disable the buzzer which sounds when you press the operation buttons.

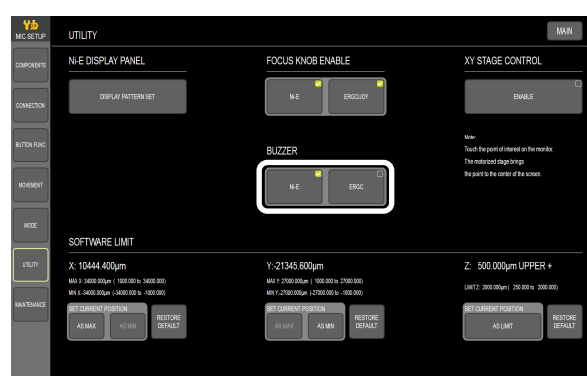
Setting Item	Target of the Configuration	Setting Value	Description
[Ni-E]	The buzzer when you press the operation buttons of Ni-E main body	ON (default)	Buzzer ON
		OFF	Buzzer OFF
[ERGC]	The buzzer when you press the operation buttons on the ergo controller	ON	Buzzer ON
		OFF (default)	Buzzer OFF

[Procedure]

[MIC SETUP] → [UTILITY]

Tap the [Ni-E] or [ERGC] button under [BUZZER] to enable or disable the buzzer.

The buzzer ON/OFF is toggled each time you tap the button.



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see "1 Bulk Saving of Settings ([MAIN] Screen)" in this chapter.

6.4 Setting the Software Limits

Ni-E

You can configure the software limit position for the elevating section and motorized XY stage of the Ni-E main body.

✔ **Prerequisite for configuration**

In order to set the limit in XY direction, the motorized XY stage must be attached.

✔ **Stop position during actual operation**

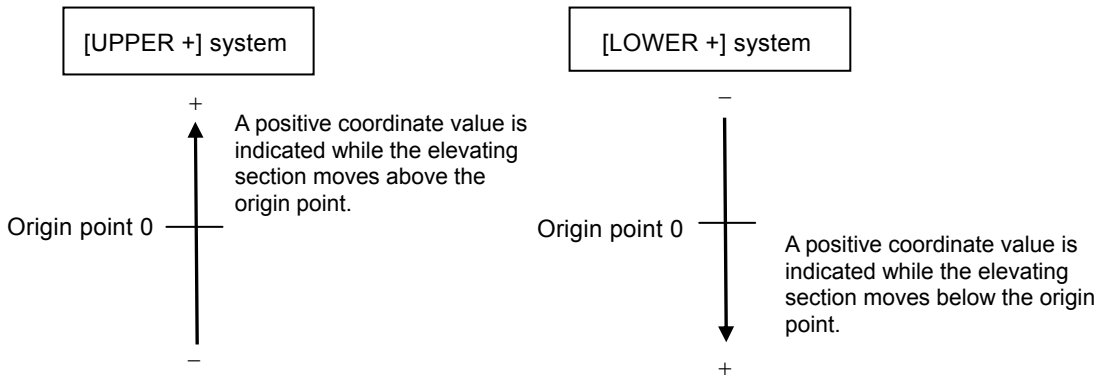
When controlling the elevating section with the focus knob, the actual stop position is up to 20 μm beyond the set limit position.

When controlling the stage in the XY direction with the ergo controller or joystick, the actual stop position is up to 800 μm beyond the set limit position.

Setting Item		Default Setting	Configurable Range
Z-axis upper limit (only for focusing stage system)		2000.000 μm	8000.000 μm to 2000.000 μm
Z-axis lower limit (only for focusing nosepiece system)	"UPPER +" indicated*	-2000.000 μm	-2000.000 μm to 10000.000 μm
	"LOWER +" indicated*	2000.000 μm	-10000.000 μm to 2000.000 μm
X-axis maximum value		34000.000 μm	10000.000 μm to 34000.000 μm
X-axis minimum value		-34000.000 μm	-34000.000 μm to -1000.000 μm
Y-axis maximum value		27000.000 μm	1000.000 μm to 27000.000 μm
Y-axis minimum value		-27000.000 μm	-27000.000 μm to -1000.000 μm

✔ **Z-coordinates for the focusing nosepiece system**

Two systems are used to read Z-axis coordinate values for the focusing nosepiece system, application of which depends on the environment of your microscope system. Check for the "UPPER +" or "LOWER +" indication on the right of the current Z-coordinate on the [MIC SETUP] → [UTILITY] screen.



6.4.1

Configuring the Limit Position for the Elevating Section

You can define a limit position for movement of the elevating section by actually moving it to the desired position.

[Procedure]

[MIC SETUP] → [UTILITY]

- (1) Use the focus knob to move the elevating section to a point that you want to set as a limit position.
- (2) Tap the [SET CURRENT POSITION AS LIMIT] button.

The limit position is defined based on the current position. Tapping the [RESTORE DEFAULT] button resets the setting to the default value.

✔ **Limit position to be set**

For focusing stage system, a limit position is set $0.5\ \mu\text{m}$ above the current position and for focusing nosepiece system, $0.5\ \mu\text{m}$ below the current position.

✔ **If the elevating section is currently at the limit position, it cannot be returned to default.**

In this case, move the elevating section below the limit position (above for focusing nosepiece system) and then tap the [RESTORE DEFAULT] button once more.

✔ **Z-coordinate for the focusing nosepiece system**

Two systems are used to read Z-axis coordinate values for the focusing nosepiece system, application of which depends on the environment of your microscope system. For details, see “6.4 Setting the Software Limits” in this chapter.



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see “1 Bulk Saving of Settings ([MAIN] Screen)” in this chapter.

6.4.2

Configuring the Limit Position of the Motorized XY Stage

[MIC SETUP] → [UTILITY]

- (1) Use the ergo controller or joystick to move the motorized stage to a point that you want to set as the limit of movement.
- (2) Tap the [SET CURRENT POSITION AS MAX] or [SET CURRENT POSITION AS MIN] button for X or Y-axis under [SOFTWARE LIMIT].

The limit position is set based on the current position.

Tapping the [RESTORE DEFAULT] button resets the setting to the default value.



✓ **Maximum/minimum value to be set**

When setting the maximum or minimum value, a value 0.5 μm greater or less than the current position is set (the front, back, right, and left limits are also the current value added or deducted by 0.5 μm).

✓ **If the stage is currently at the limit position, it cannot be returned to default.**

In this case, move the stage within the limit position and then tap the [RESTORE DEFAULT] button once more.

After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see "1 Bulk Saving of Settings ([MAIN] Screen)" in this chapter.

6.5

Setting the Driving Speed of the Epi-Fluorescence Cube Turret

Ni-E

Ni-U

When you use a filter cube which includes the thick dichroic mirror, you must lower the movement speed of the epi-fluorescence cube turret.

If you are using two layered motorized epi-fluorescence cube turrets, configure 1st and 2nd layers separately.

✔ **Prerequisite for configuration**

In order to perform this configuration, the motorized epi-fluorescence cube turret must be attached.

Setting Item	Setting Value	Description
[EPI-FLUORESCENCE CUBE TURRET]	[HIGH] (default)	When using only standard filter cube
	[LOW]	When using any filter cube which includes thick dichroic mirror
[2nd EPI-FLUORESCENCE CUBE TURRET] (When using two layered motorized epi-fluorescence cub turrets)	[HIGH] (default)	When using only standard filter cube
	[LOW]	When using any filter cube which includes thick dichroic mirror

[Procedure]

[MIC SETUP] → [MAINTENANCE]

Select a movement speed from the options shown in the [FL TURRET DRIVE SPEED] section.



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see "1 Bulk Saving of Settings ([MAIN] Screen)" in this chapter.

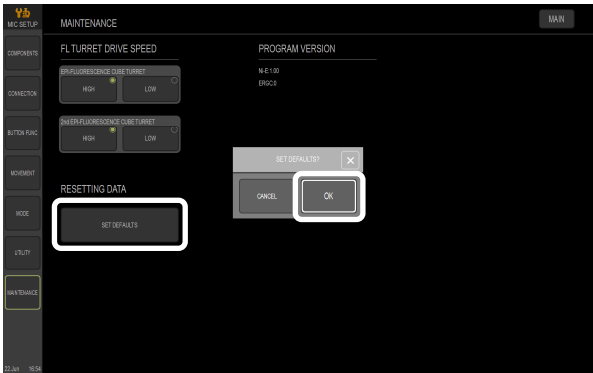
You can restore the factory default settings. Doing this operation restores all settings that can be configured in the [MIC SETUP] (including the information for attached optical elements, microscope settings saved as a mode, and initial value of interlock setting [INTELLIGENT]) to the factory default settings.

[Procedure]

[MIC SETUP] → [MAINTENANCE]

- (1) Tap the [SET DEFAULTS] button under the [RESETTING DATA] section.
A confirmation screen appears.
- (2) Tap the [OK] button.
To cancel restoring to factory setting, tap the [CANCEL] button.
- (3) After the confirmation screen disappeared, turn OFF the microscope unit and turn it ON again.
The setting saved in the microscope's memory is restored to factory default.

(For Ni-E/Ni-U)



(For Ci-E)



You can check the program version of the microscope system and the ergo controller.

[Procedure]

[MIC SETUP] → [MAINTENANCE]

Check the information shown in the [PROGRAM VERSION] section.

The program version of the microscope system is displayed.

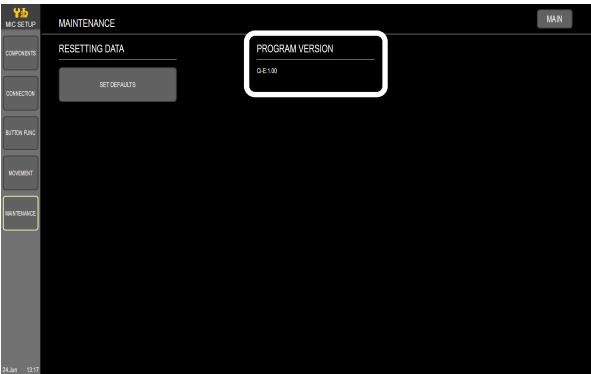
When you are using an ergo controller with Ni-E, the program version of the ergo controller is displayed after [ERGC:].

When you are using a joystick with Ni-E, the program version of the joystick is displayed after [JOY:].

(For Ni-E/Ni-U)



(For Ci-E)



Misuse of this product may adversely affect performance, even if this product is properly functional. If any of the following problems occurs, be sure to check the following table for possible causes before requesting service.

If you detect problems that are not listed below or the problem still persists after measures are taken, turn off the device and contact your nearest Nikon representative.

The following table shows only problems when operating the microscope. Refer to the separately provided "Camera Operation" instruction manual for DS-L4 hardware related problems such as DS-L4 not turning on.

1

Display

Problem	Cause	Measure
Microscope operation screen does not appear.	DS-L4 is not connected properly.	Turn off the microscope, motorized accessory devices, and DS-L4, then reconnect DS-L4 to the microscope (the control box B for Ni-U).
	Two or more USB hubs are used in series.	Do not use any USB hubs or do not use in series.
	Microscope is not turned on.	Turn off DS-L4, turn on the microscope (the control box A/B for Ni-E/Ni-U), then turn on DS-L4.
Buttons to operate the motorized devices or configuration screen for motorized devices do not appear (excluding the digital camera and motorized shutter connected to the DSC connector)	(Only for Ni-E and Ni-U) The system configuration is set not to display the buttons.	Change the layout of buttons. See Chapter 6, "4.1.1 Selecting the Buttons to be Displayed".
	Devices are not connected properly.	Turn off the microscope, motorized accessory devices, and DS-L4, then connect or attach motorized devices to the microscope correctly.
(Only for Ni-E and Ni-U) Buttons to control the EPI/DIA/AUX motorized shutter are not displayed correctly.	The system configuration is set not to display the buttons.	Change the layout of buttons. See Chapter 6, "4.1.1 Selecting the Buttons to be Displayed".
	Incorrect connection setting.	Check the connection and configure the system accordingly. See Chapter 6, "3.2 Configuring the Connection of Motorized Shutter".
(Only in Ni-E/Ni-U) In the [CAPTURE] button in the [MICROSCOPE CONTROL] screen or [MIC EASY] screen, button for correct camera ([CAPTURE FRONT/LEFT/RIGHT/AUX]) is not displayed.	Information is not configured correctly.	Configure the information for the camera in [MIC SETUP] → [CONNECTION]. See Chapter 6, "3.1 Configuring the Connection of Digital Camera".
Information about optical elements (objective, condenser module, epi-fluorescence filter cube, or excitation/barrier filter) is not displayed correctly. When the optical element button is tapped, an element different from the one on the button enters the optical path.	Information is not configured correctly.	Set the correct information in [MIC SETUP] → [COMPONENTS]. See Chapter 6, "2 Configuring Optical Elements Information ([COMPONENTS] Screen)".

Problem	Cause	Measure
(Ni-E only) There is no [SLEEP] button on the [MICROSCOPE CONTROL] screen.	The [SLEEP] button is set to be hidden on the [BUTTON FUNC] screen.	Configure to show the [SLEEP] button on the [BUTTON FUNC] screen. Refer to Chapter 6, “4.1.2 Showing/Hiding the [SLEEP] Button”.
(Ni-E only) There is no [SLEEP] button on the [MIC EASY] screen.	The [SLEEP] button is not configured on the [BUTTON FUNC] screen to be placed on the [MIC EASY] screen. Or the [SLEEP] button is set to be hidden. Or both.	On the [BUTTON FUNC] screen, configure to place the [SLEEP] button on the [MIC EASY] screen and shown the [SLEEP] button. See Chapter 6, “4.1.1 Selecting the Buttons to be Displayed” and “4.1.2 Showing/Hiding the [SLEEP] Button”.

2

Operation

■ General

Problem	Cause	Measure
Buttons on the microscope does not work.	Buttons are disabled.	Enable the button operation. See Chapter 6, “4.2.5 Enabling/Disabling the Button Operation”.
(Only in Ni-E) When the FL SHUTTER button or CW/CCW button is pressed on the microscope, the intended device is not activated.	Target for each operation by button is not correctly configured.	Change the targets of button operations. See Chapter 6, “4.2.2 Changing the Motorized Shutter Operated with the FL SHUTTER Button” and “4.2.4 Changing the Motorized Device to be Operated with CW/CCW Button”.
(Only in Ni-E) Operation is not performed as intended when the buttons on Ni-E main body or ergo controller are pressed.	Functions are not correctly configured.	See Chapter 6, “4.2.1 Setting the Function of the Function Buttons” and “4.3 Configuring the Functions of the Ergo Controller Buttons”.
(Only in Ni-E and Ni-U) Control buttons for nosepiece, epi-fluorescence cube turret, etc. are displayed, but do not work when tapped.	Intelligent nosepiece or intelligent epi-fluorescence cube turret is attached instead of motorized nosepiece or motorized epi-fluorescence cube turret.	Intelligent nosepiece or intelligent epi-fluorescence cube turret can not be operated from DS-L4. Operate them manually.
	The device is in sleep state.	Exit the sleep state. See Chapter 5, “3 Entering the Sleep State (Noise Reduction)”.
Buzzer does not sound when buttons are pressed.	Buzzer is turned off.	Turn on the buzzer. See Chapter 6, “6.3 Turning ON/OFF the Buzzer”.
The [CW/CCW BUTTON] selection status is not displayed on the [BUTTON FUNC] screen of [MIC SETUP].	Settings have been made with Ni Setup Tool.	When you use the Ni Setup Tool, you can select patterns other than the three types displayed on the DS-L4 button. In this case, the selection status is not displayed on DS-L4. (This is not an error.)

■ Operation of the elevating section and motorized XY stage

(Only in Ni-E) Elevating section can not be operated using Ni-E main body, ergo controller, or joystick.	Operation of the elevating section is disabled.	Enable the operation. See Chapter 6, "6.2 Enabling/Disabling the Operation of the Elevating Section".
(Only in Ni-E) Elevating section or motorized XY stage can not be moved to an intended position.	Small ranges are set for the software limit configuration.	Change the software limit setting. See Chapter 6, "6.4 Setting the Software Limits".
The [ESCAPE] button is disabled.	The stage is moved to the specimen removal position.	Tap the [Specimen Removal Position] button to reset the specimen removal position. See Chapter 5, "1.18.3 Retracting the Elevating Section and Moving the Stage to the Specimen Removal Position".
The [Specimen Removal Position] button is disabled.	The elevating section is in the retracted state.	Tap the [ESCAPE] button to reset the retracted state of the elevating section. See Chapter 5, "1.18.2 Retracting the Elevating Section".

■ Operation of the nosepiece

(Only in Ni-E) Sometimes, the motorized nosepiece does not rotate depending on the position of the elevating section.	Rotation stop of the motorized nosepiece is set to ON.	Disable the rotation stop. See Chapter 6, "5.3 Disabling the Rotation of the Motorized Nosepiece Depending on the Position of the Elevating Section".
(Only in Ni-E) Motorized devices are not interlocked when rotating the nosepiece, adjusting the zoom magnification, switching the optical path, or with the output of capture command/capture trigger signal.	Interlocking is not configured.	Configure interlocking. See Chapter 6, "5.1 Configuring Interlocked Operation".
(Only in Ni-E) Interlocked operation when switching objectives does not work as intended.	Interlocking is not correctly configured.	Configure correctly. See Chapter 6, "5.1.1 Configuring the Interlocked Operation with Switching of Objectives".
	Incorrect configuration of the objectives.	Configure correctly. See Chapter 6, "2.1 Configuring the Objective Information".
(Only in Ci-E) Operation of the motorized swing-out condenser is not linked to the rotation of the nosepiece.	Interlocking is not configured.	Configure interlocking. See Chapter 6, "5.6 Configuring Top Lens Swing-out of the Motorized Swing-out Condenser".
The motorized nosepiece skips addresses.	The toggle function is ON.	Turn the toggle function OFF. See Chapter 6, "5.5 Configuring the Toggle Function (Switching between Two Objectives)".

■ Operation of the dia-illumination lamp/LED

Dia-illumination lamp/LED can not be turned on or off from DS-L4.	DS-L4 does not have control.	Give control to DS-L4. See Chapter 5, "1.14 Adjusting the Dia-illumination Lamp/LED".
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■ Capture operation

Capturing with a digital camera cannot be started.	Camera trigger cable is not properly connected.	Turn off the microscope, DS-L4, and the camera, then reconnect the camera trigger cable of the digital camera to the microscope.
	Connection of the digital camera is not configured correctly.	Check the connection between the digital camera and the DSC connector, and configure the system accordingly. See Chapter 6, “3.1 Configuring the Connection of Digital Camera”.
Intended digital camera does not work when CAPTURE button is pressed on the microscope.	Target of the button operation is not correctly configured.	Change the target of the button operation. See Chapter 6, “4.2.3 Changing the Digital Camera Operated with the Microscope’s CAPTURE Button”.

■ Operation of the motorized shutter

(Only in Ni-E and Ni-U) The dia-illumination shutter opens or closes each time the [SHUTTER EPI] button is tapped. The epi-illumination shutter opens or closes each time the [SHUTTER DIA] button is tapped.	Motorized shutter is not connected properly.	Turn off the microscope and DS-L4, then reconnect the motorized shutter to the EPI SHUTTER/DIA SHUTTER connector of the microscope (the control box B for Ni-U).
		Check the usage of the motorized shutter connected to the EPI SHUTTER/DIA SHUTTER connector of the microscope (the control box B for Ni-U) and change the usage setting. See Chapter 6, “3.2 Configuring the Connection of Motorized Shutter”.

■ Operation of a registered mode

(Only in Ni-E and Ni-U) Behavior of a registered mode is not as intended.	The target to load is not configured correctly. Previous mode setting remains.	Configure the target to load correctly and save the state again. See Chapter 5, “2.1 Registering/Changing Target Motorized Devices” or “2.2 Saving/Updating a Mode (State of Motorized Devices)”.
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3

Saving Settings

Problem	Cause	Measure
Settings are restored to the previous value when DS-L4 is turned on.	Settings are not saved.	After configuring the settings, be sure to tap the [SAVE] button on the [MIC SETUP] - [MAIN] screen to save settings. See Chapter 6, “1 Bulk Saving of Settings ([MAIN] Screen)”. See Chapter 6, “5.1.2 Changing the Initial Value of the [INTELLIGENT]”.
State of the [INTELLIGENT] is restored to the previous value when DS-L4 is turned on.	State of the [INTELLIGENT] is not saved.	Save the state of the [INTELLIGENT] as an initial value. See Chapter 6, “5.1.2 Changing the Initial Value of the [INTELLIGENT]”.

Part 2

Industrial Microscope

Composition of Part 2

Part 2 describes the method to connect a DS-L4 DS Camera Control Unit to an industrial microscope and display the status of the microscope on DS-L4.

Chapter 1 Devices Whose Status Is Viewable on DS-L4

Chapter 2 Viewing the Status of Microscope on DS-L4

Chapter 3 Settings

Chapter 4 Troubleshooting

Devices Whose
Status Is Viewable on
DS-L4

Viewing the Status
of Microscope on
DS-L4

Settings

Troubleshooting

⚠ WARNING

Before using this product, thoroughly read the “Safety Precautions” at the beginning of the “Camera Operation” separately provided and be sure to follow the warnings and precautions indicated therein.

In addition, thoroughly read the instruction manuals for the products used with this system (such as microscope main body or motorized accessory devices) and be sure to follow the warnings and precautions indicated therein.

✔ Procedure for Connecting Each Device

For details on the procedure for connecting the microscope main body, DS-L4, and individual parts, refer to the instruction manual of your microscope and also the “Camera Operation” instruction manual of DS-L4.

By connecting the DS-L4 microscope camera control unit to the microscope, the status of the microscope and accessories can be displayed on DS-L4.

This chapter describes the microscopes and accessories whose statuses can be viewed on the DS-L4 microscope camera control unit and the required settings.

1

**Devices Whose Status Is Viewable on the DS-L4
Connected to ECLIPSE L200N/L200ND/L300N/L300ND**

When the DS-L4 is connected to ECLIPSE L200N/L200ND/L300N/L300ND, the status of the following devices is viewable on DS-L4.

Configurations required before using accessories vary depending on the type of accessories you use. Refer to the following table to perform the required configuration.

Device	Information Viewable on DS-L4	Required Configuration
ECLIPSE L200N/L200ND/L300N/L300ND microscopes	Address of nosepiece in optical path, objective information	Information on attached objectives (See Chapter 3, “2.1 Configuring the Objective Information”)
	Status of EPI aperture diaphragm	None
	Epi-illumination ON/OFF, lamp voltage	None
	Dia-illumination ON/OFF, lamp voltage (Only for L200ND and L300ND. However, epi-illumination lamp and dia-illumination lamp cannot be used at the same time.)	None
C-HGFIE HG Precentered Fiber Illuminator (motorized)	Open/close state of the built-in shutter, built-in ND dimming value	None
-	Current microscopy method	None

2

Devices Whose Status Is Viewable on the DS-L4 Connected to ECLIPSE MA200

When the DS-L4 is connected to ECLIPSE MA200, the status of the following devices is viewable on the DS-L4.

Configurations required before using accessories vary depending on the type of accessories you use. Refer to the following table to perform the required configuration.

Device	Information Viewable on DS-L4	Required Configuration
ECLIPSE MA200 microscope	Epi-illumination ON/OFF, lamp voltage	None
LV-NU5AI/LV-NU5AC motorized quintuple universal nosepiece	Nosepiece type	None
LV-NU5I/D-NID6/D-NI7 intelligent nosepiece	Address of nosepiece in optical path, objective lens information	Information on attached objectives (See Chapter 3, "2.1 Configuring the Objective Information")
MA2-MC Magnification Module	Magnification of the magnification module	None
C-HGFIE HG Precentered Fiber Illuminator (motorized)	Open/close state of the built-in shutter, built-in ND dimming value	None

3

Devices Whose Status Is Viewable on the DS-L4 Connected to ECLIPSE LV100DA-U/LV100NDA

When the DS-L4 is connected to ECLIPSE LV100DA-U/LV100NDA, the status of the following devices is viewable on the DS-L4.

Configurations required before using accessories vary depending on the type of accessories you use. Refer to the following table to perform the required configuration.

Device	Information Viewable on DS-L4	Required Configuration
ECLIPSE LV100DA-U/LV100NDA microscope	Epi-illumination: ON/OFF, lamp voltage	None
	Dia-illumination ON/OFF, lamp voltage (Epi-illumination lamp and dia-illumination lamp cannot be used at the same time.)	None
LV-NU5AI/LV-NU5A/LV-NU5AC motorized quintuple universal nosepiece	Address of nosepiece in optical path, objective lens information	Information on attached objectives (See Chapter 3, "2.1 Configuring the Objective Information")
LV-UEPI2A epi-illumination attachment	Address of turret in optical path, filter cube information	Information about the attached filter cube (See Chapter 3, "2.2 Configuring the Filter Cube Information (Only for LV100DA-U/LV100NDA and SMZ18/SMZ25)")
	EPI aperture diaphragm diameter	None

Device	Information Viewable on DS-L4	Required Configuration
C-HGFIE HG Precentered Fiber Illuminator (motorized)	Open/close state of the built-in shutter, built-in ND dimming value	None
-	Current microscopy method	None

4

Devices that can be Controlled and Monitored from DS-L4 Connected to ECLIPSE LV150NA/LV-NCNT-N Motorized Nosepiece Controller

When the DS-L4 is connected to ECLIPSE LV150NA or LV-NCNT-N motorized nosepiece controller, following devices can be controlled on the DS-L4.

Configurations required before using accessories vary depending on the type of accessories you use. Refer to the following table to perform the required configuration.

Device	Operation Available on DS-L4	Required Configuration
LV-NU5A/LV-NU5AC/LV-NU5AI motorized quintuple universal nosepiece	Switching objectives	Information on attached objectives (See Chapter 3, "2.1 Configuring the Objective Information")

5

Devices Whose Status Is Viewable on the DS-L4 Connected to LV-INAD Adapter for Intelligent Nosepiece

When the DS-L4 is connected to the LV-INAD Adapter for Intelligent Nosepiece, the status of the following devices is viewable on the DS-L4.

Refer to the following table to perform the required configuration.

Device	Information Viewable on DS-L4	Required Configuration
LV-NU5I intelligent universal quintuple nosepiece	Address of nosepiece in optical path, objective lens information	Information on attached objectives (See Chapter 3, "2.1 Configuring the Objective Information")

6

Devices Whose Status Is Viewable on the DS-L4 Connected to SMZ18/SMZ25 Stereo Microscope

When the DS-L4 is connected to the SMZ18/SMZ25 zooming body via P2-CTLA/P2-CTLB control box*, status of the following devices is viewable on the DS-L4.

Configurations required before using accessories vary depending on the type of accessories you use. Refer to the following table to perform the required configuration.

* P2-CTLB control box is only available when SMZ18 zooming body is included in the microscope system.

Device	Information Viewable on DS-L4	Required Configuration
SMZ18/SMZ25 zooming body	Zoom magnification	None
P2-RNI2 intelligent nosepiece	Address of nosepiece in optical path, objective lens information	Information on attached objectives (See Chapter 3, "2.1 Configuring the Objective Information")
P2-EFLM motorized epi-fluorescence attachment P2-EFLI epi fluorescence attachment (intelligent)	Address of turret in optical path, filter cube information	Information about the attached filter cube (See Chapter 3, "2.2 Configuring the Filter Cube Information (Only for LV100DA-U/LV100NDA, SMZ18, and SMZ25)")
C-HGFIE HG precentered fiber illuminator (motorized)	Open/close state of the built-in shutter, built-in ND dimming value	None
P2-DBL LED diascope illumination base	Diascopic illumination LED ON/OFF, brightness level	None
P2-MFU motorized focus unit	Current Z position, Z position status of the vertical movement section	None

7

Devices Whose Status Is Viewable on the DS-L4 Connected to SMZ1270i Stereo Microscope

When the DS-L4 is connected to SMZ1270i, the status of the following devices is viewable on the DS-L4.

Configurations required before using accessories vary depending on the type of accessories you use. Refer to the following table to perform the required configuration.

Device	Information Viewable on DS-L4	Required Configuration
SMZ1270i zooming body	Zoom magnification	None
P-RNI2 intelligent nosepiece	Address of nosepiece in optical path, objective lens information	Information on attached objectives (See Chapter 3, "2.1 Configuring the Objective Information")

Viewing the Status of Microscope on DS-L4

This chapter describes the procedure to power on and off the DS-L4 and the configuration of screens that show the information on the microscope.

1

Powering On/Off the Devices

Powering ON the devices and displaying the MIC EASY screen

1

Turn on the powers of the microscope main body and motorized parts.

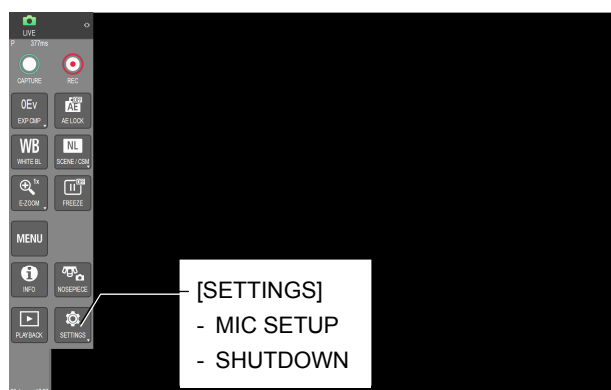
The motorized devices are initialized.

For details on turning on the power, refer to the instruction manual provided with your microscope.

2

Turn on the powers of DS-L4 and the camera.

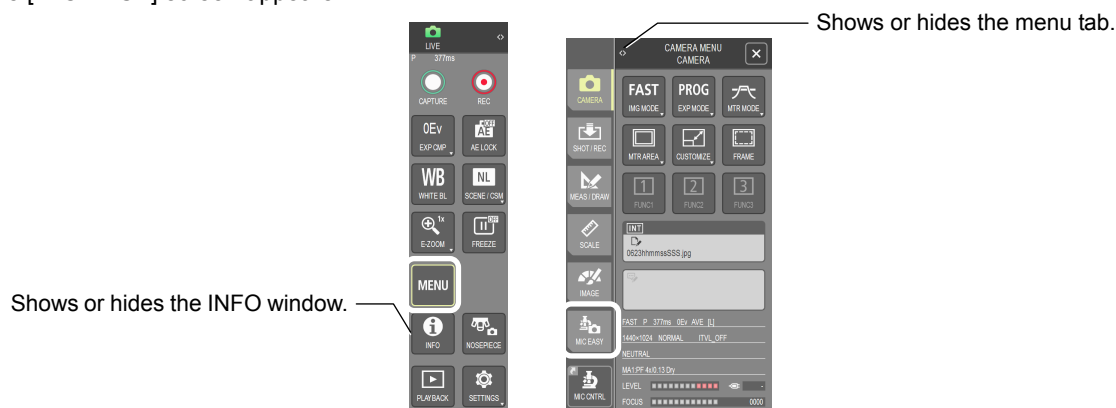
The startup screen appears, and the system configuration data and settings are acquired from the main body. If the DS-L4 user has already been registered, log in to DS-L4 according to the instruction on the screen. The completion of the initial operations takes about 40 seconds, depending on the configuration of the microscope system.



3

Tap [MENU], and tap [MIC EASY] button on the menu tab.

The [MIC EASY] screen appears.



Shutdown

- 1** Tap [SETTINGS] on the LIVE or VIEW menu.
- 2** Tap [SHUT DOWN].
- 3** Press the power switch of the camera to turn it off.
- 4** Turn off the powers to the microscope main unit and motorized parts.

2

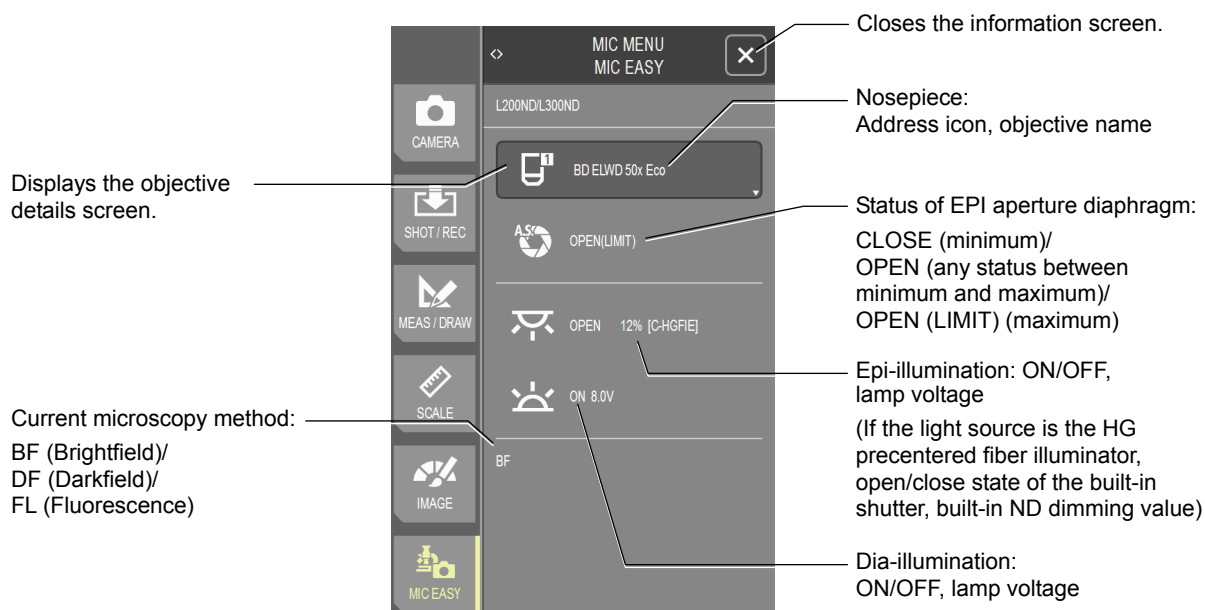
Information Screen for ECLIPSE L200N/L200ND/L300N/L300ND

✓ The displayed content will differ depending on the configuration and settings of your microscope.

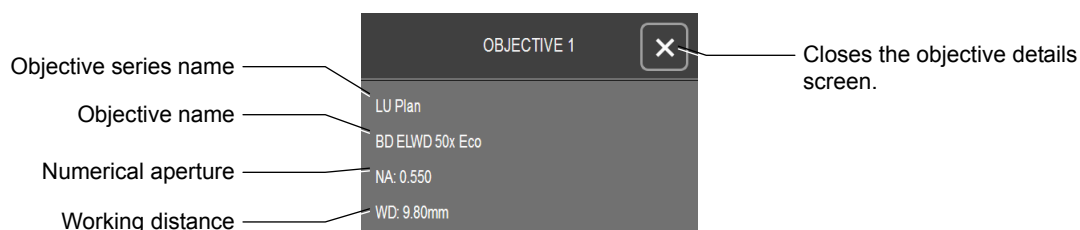
The screen will only show devices that are connected to the microscope and recognized by DS-L4. For this reason, the composition of the screen will differ depending on the configuration of the microscope. For information on microscopes and devices that can be recognized by DS-L4, refer to Chapter 1, "Devices Whose Status Is Viewable on DS-L4".

The information screen displays the status of the microscope.

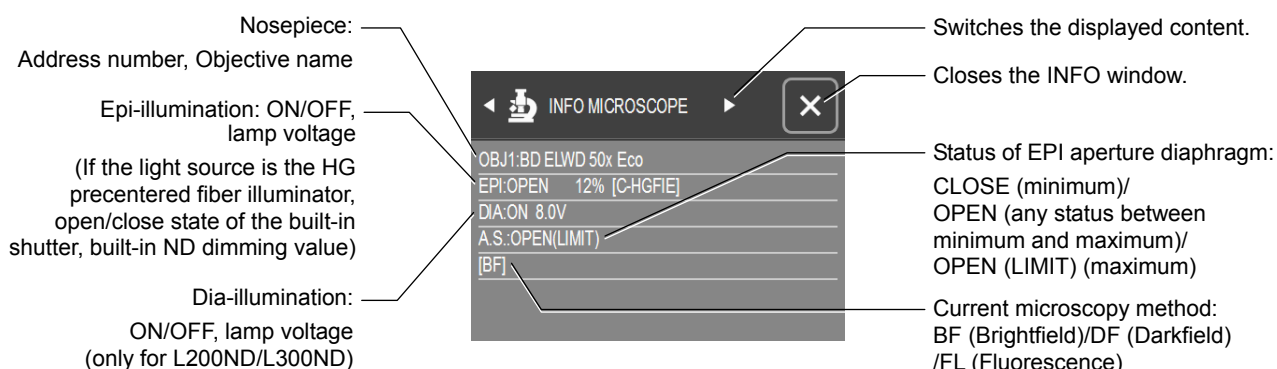
MIC EASY Screen



Objective Details Screen



INFO Window



3

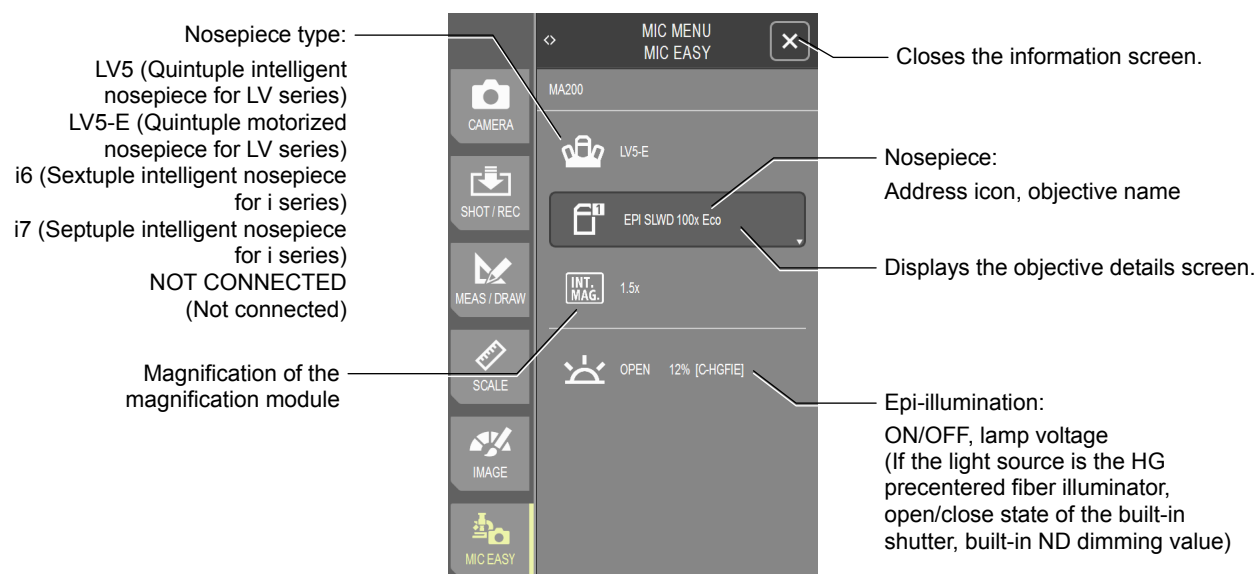
Information Screen for ECLIPSE MA200

✓ The displayed content will differ depending on the configuration and settings of your microscope.

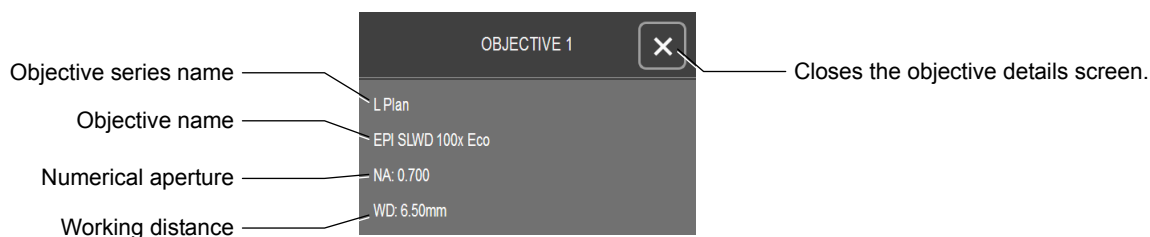
The screen will only show devices that are connected to the microscope and recognized by DS-L4. For this reason, the composition of the screen will differ depending on the configuration of the microscope. For information on microscopes and devices that can be recognized by DS-L4, refer to Chapter 1, "Devices Whose Status Is Viewable on DS-L4".

The information screen displays the status of the microscope.

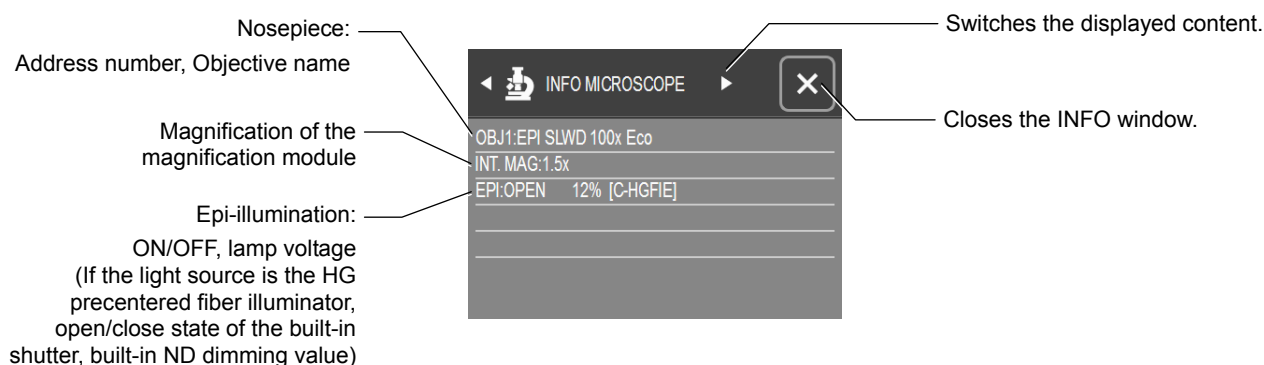
MIC EASY Screen



Objective Details Screen



INFO Window



4

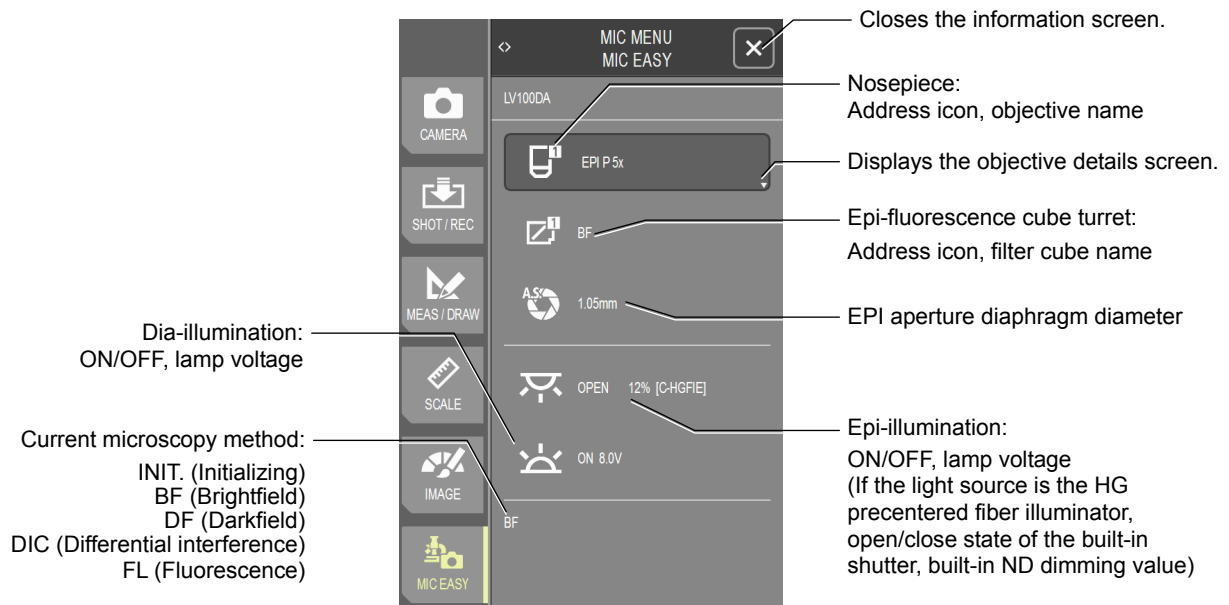
Information Screen for ECLIPSE LV100DA-U/LV100NDA

✓ **The displayed content will differ depending on the configuration and settings of your microscope.**

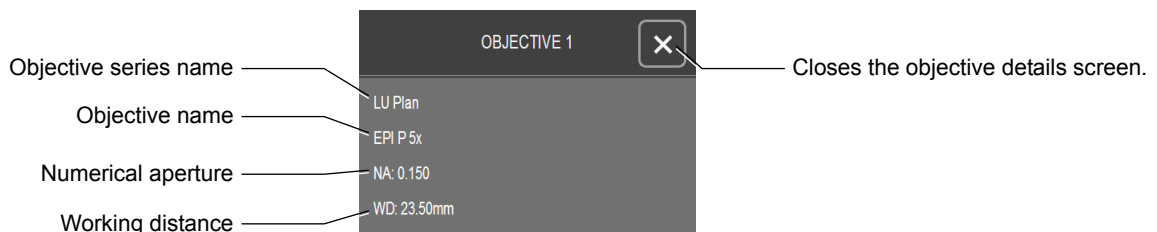
The screen will only show devices that are connected to the microscope and recognized by DS-L4. For this reason, the composition of the screen will differ depending on the configuration of the microscope. For information on microscopes and devices that can be recognized by DS-L4, refer to Chapter 1, "Devices Whose Status Is Viewable on DS-L4".

The information screen displays the status of the microscope.

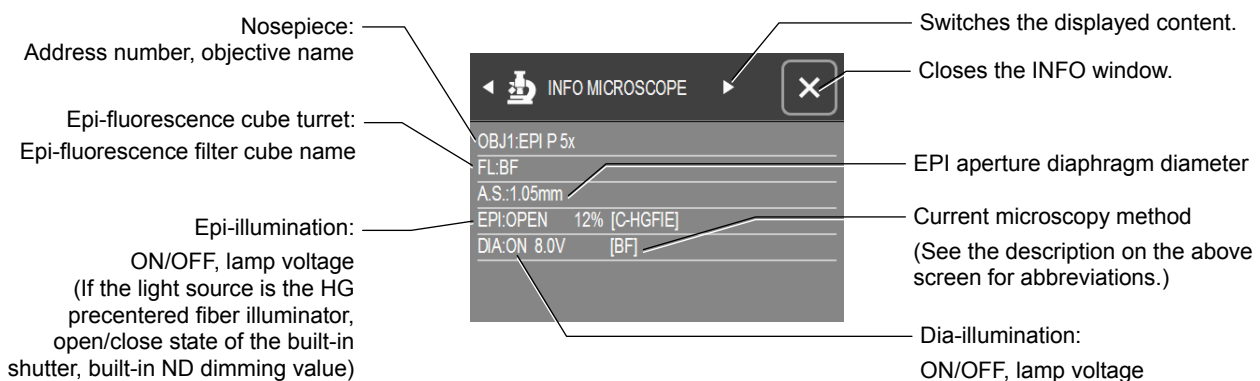
MIC EASY Screen



Objective Details Screen



INFO Window



5

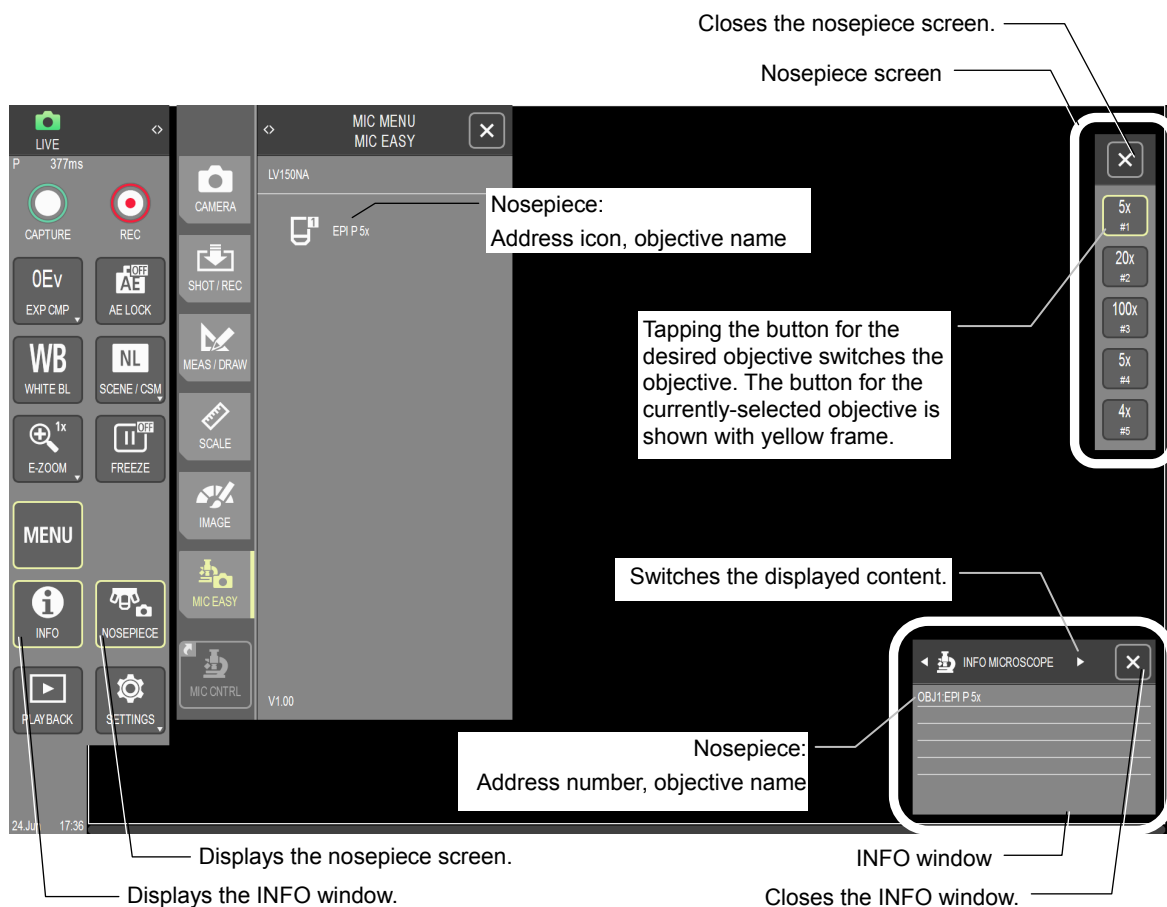
Information Screen for ECLIPSE LV150NA/LV-NCNT-N Motorized Nosepiece Controller

✓ The displayed content will differ depending on the configuration and settings of your microscope.

The screen will only show devices that are connected to the microscope and recognized by DS-L4. For this reason, the composition of the screen will differ depending on the configuration of the microscope. For information on microscopes and devices that can be recognized by DS-L4, refer to Chapter 1, “Devices Whose Status Is Viewable on DS-L4”.

The information screen displays the status of the microscope.

MIC EASY Screen



6

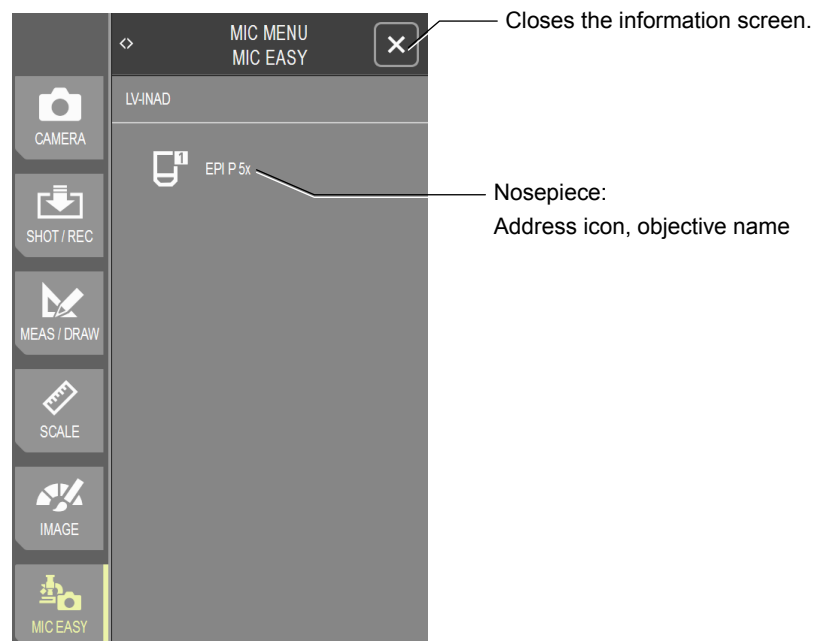
Information Screen for LV-INAD Adapter for Intelligent Nosepiece

✓ The display appearance depends on the configuration or setting of the microscope.

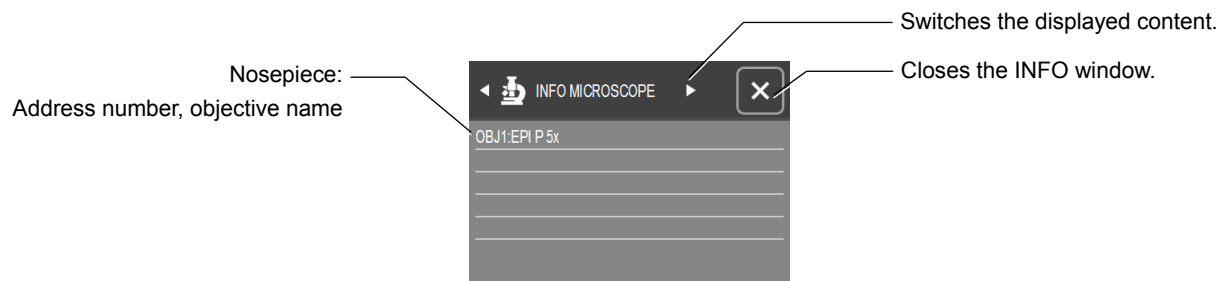
On the window only devices that are connected to the microscope and detected by the DS-L4 are displayed. Therefore, the display appearance will depend on the configuration of the microscope. See Chapter 1 “Devices for Which Their Status Can be Detected by DS-L4” for the devices that can be detected by the DS-L4 from your microscope and accessories.

The Info window displays the status of the microscope.

MIC EASY Screen



INFO Window



7

Information Screen for SMZ18/SMZ25 Stereo Microscope

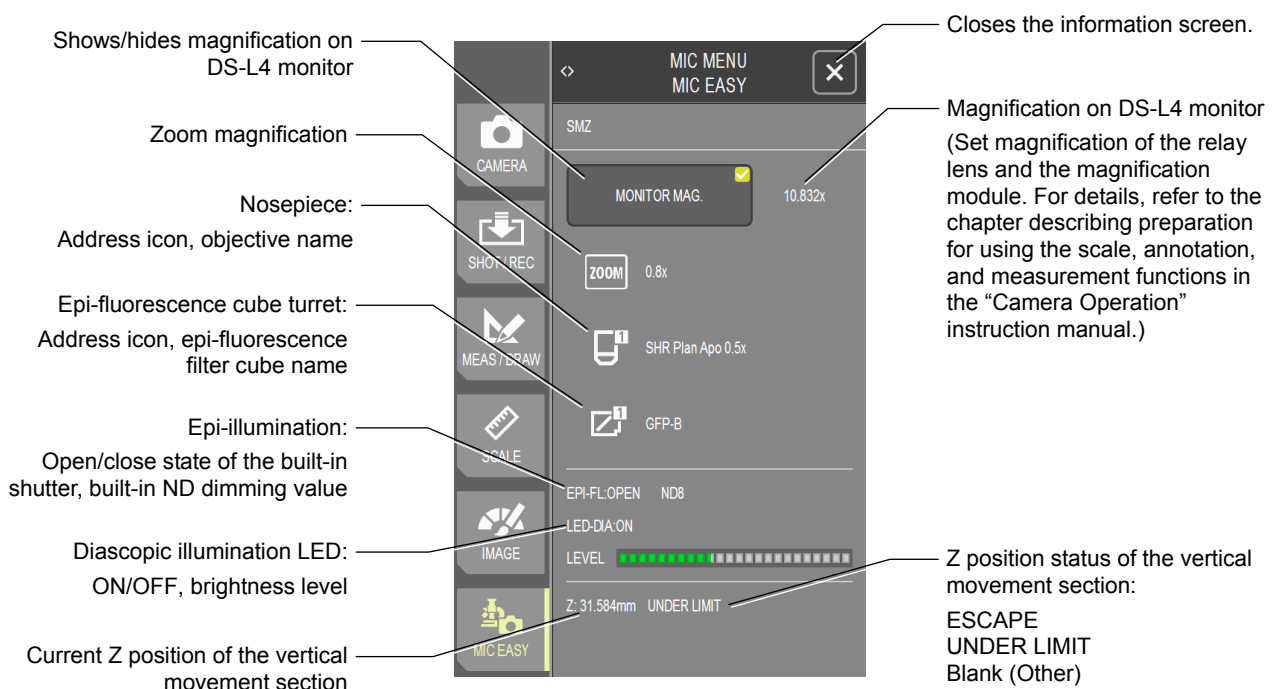
✓ The display appearance depends on the configuration or setting of the microscope.

On the window only devices that are connected to the microscope (P2-CTLA/P2-CTLB control box) and detected by the DS-L4 are displayed.

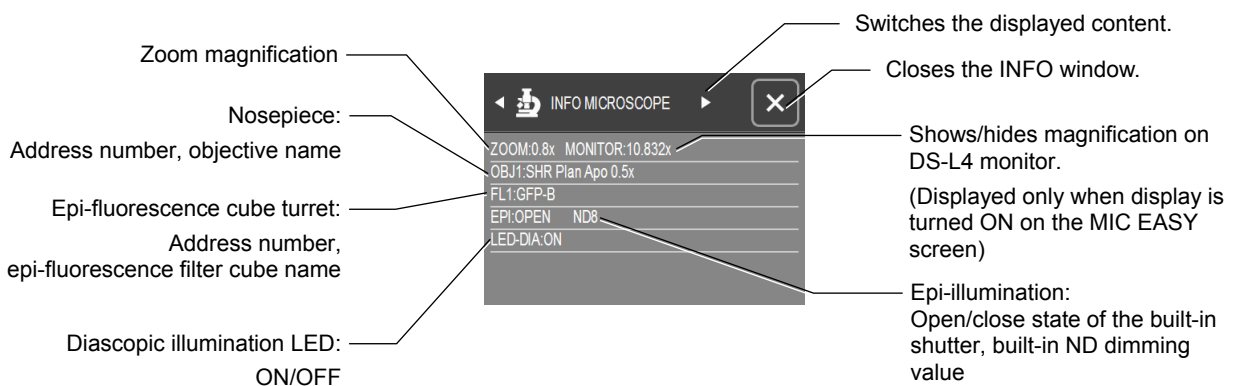
Therefore, the display appearance will depend on the configuration of the microscope. See Chapter 1 “Devices for Which Their Status Can be Detected by DS-L4” for the devices that can be detected by the DS-L4 from your microscope zooming body and accessories.

The Info window displays the status of the microscope.

MIC EASY Screen



INFO Window



8

Information Screen for SMZ1270i Stereo Microscope

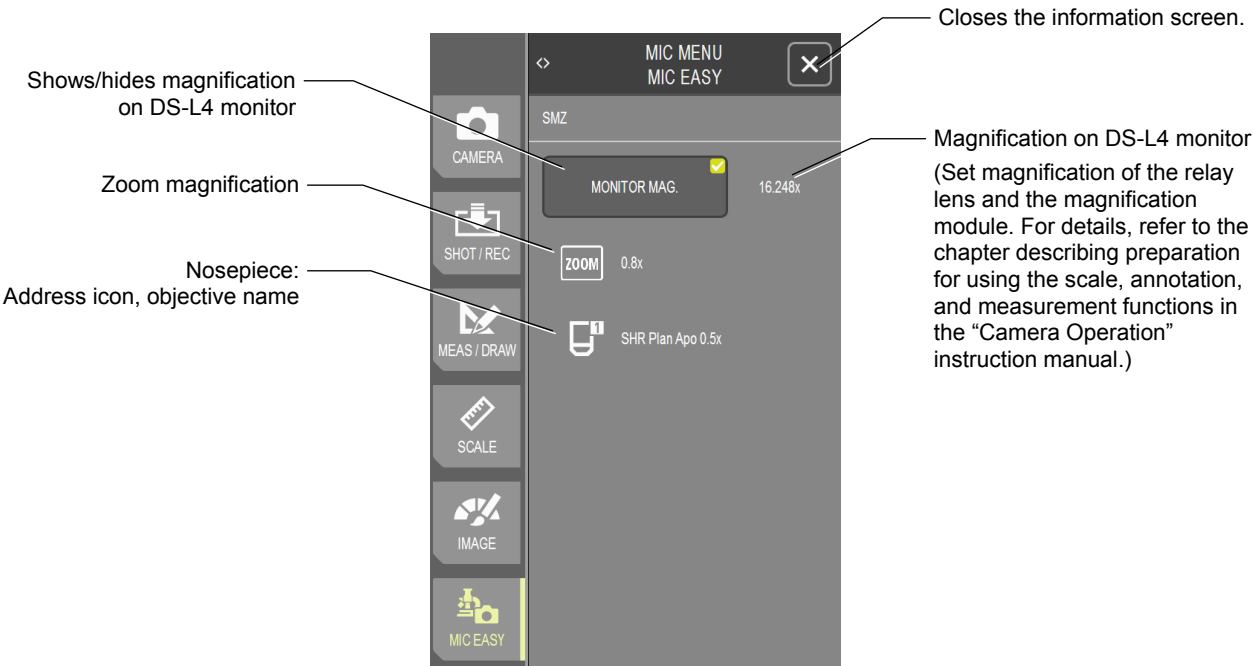
✔ The display appearance depends on the configuration or setting of the microscope.

On the window only devices that are connected to the microscope and detected by the DS-L4 are displayed. Therefore, the display appearance will depend on the configuration of the microscope. See Chapter 1 “Devices for Which Their Status Can be Detected by DS-L4” for the devices that can be detected by the DS-L4 from your microscope and accessories.

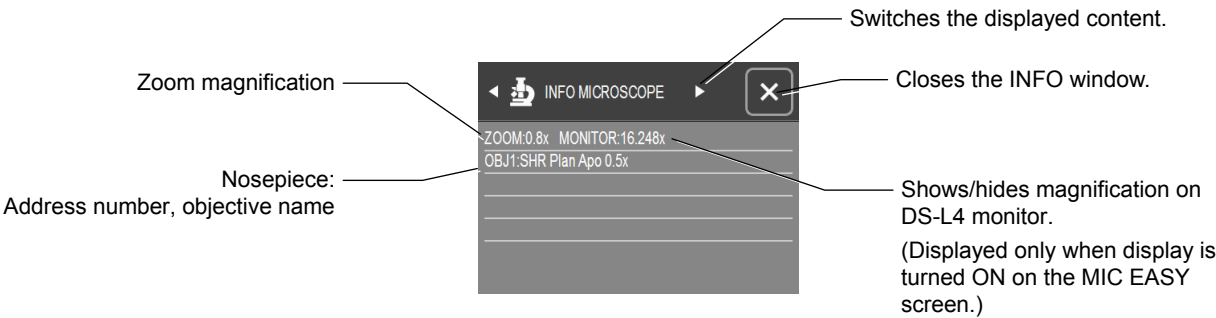
The Info window displays the status of the microscope.

MIC EASY Screen

Viewing the Status
of Microscope on
DS-L4



INFO Window



In this chapter, you configure the information on the optical elements attached to the microscope. The information of the optical elements you entered here is displayed on the DS-L4 screen.

! Tap the [SAVE] button after changing the settings.

After making changes to the settings, be sure to tap the [SAVE] button on the [MIC SETUP] - [MAIN] screen to save the settings to the microscope's memory (memory of nosepiece controller if LV-NCNT-N). If the microscope is turned off without saving settings, previous values are restored. For more information, see "1 Bulk Saving of Settings ([MAIN] Screen)" in this chapter.

1

Bulk Saving of Settings ([MAIN] Screen)

After making changes on the [MIC SETUP], be sure to tap the [SAVE] button on the [MIC SETUP] - [MAIN] screen to save the settings to the microscope's memory (memory of nosepiece controller if LV-NCNT-N). If the microscope is turned off without saving settings, previous values are restored.

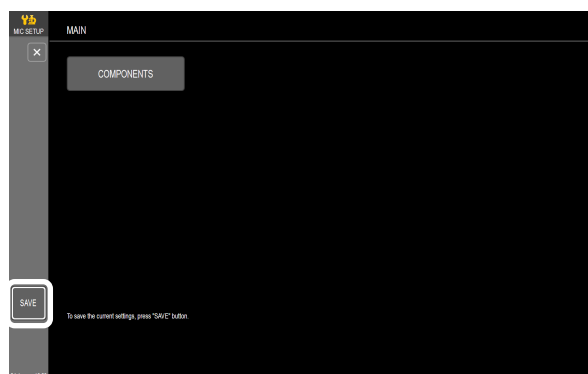
- (1) After changing the settings, tap the [MAIN] button to go back to the [MIC SETUP] - [MAIN] screen.



- (2) Tap the [SAVE] button.

A confirmation dialog box appears.

If there is no data to be saved, the [SAVE] button is disabled.

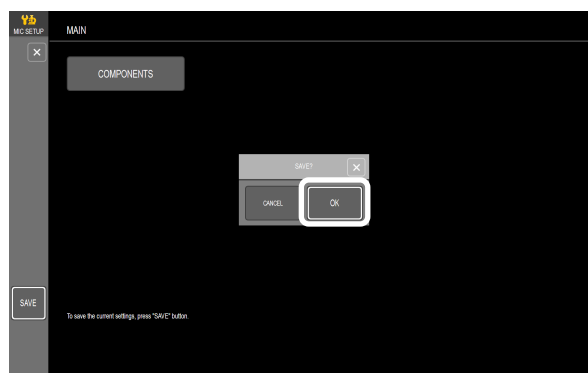


- (3) Tap the [OK] button.

Settings are saved.

To cancel saving, tap the [CANCEL] button.

Tapping the [X] button on the upper-left of the screen closes [MIC SETUP].



✓ Settings to be saved

Tapping the [SAVE] button will save all changes that have been made since the settings were last saved.

To save the settings individually, perform the above save procedure after each configuration operation.

If you want the settings to be temporal (only while the system is turned on), you do not have to save settings.

2 Configuring Optical Elements Information ([COMPONENTS] Screen)

In the [COMPONENTS] screen, you can configure information for optical elements attached to the microscope such as objectives.

2.1 Configuring the Objective Information

In this section, you configure the information of the objectives attached to the motorized nosepiece or the intelligent nosepiece. If you have replaced or added objectives, you need to reconfigure the settings.

✓ Prerequisite for configuration

A motorized or intelligent nosepiece must be attached to the microscope in order to perform this configuration.

2.1.1 Selecting and Configuring the Objective from the List

✓ When appropriate objective is not on the list

When an appropriate objective is not on the list, you can register any objective by tapping the [CUSTOM] button (only for MA200, L200N/L200ND, L300N/L300ND, LV-NCNT-N, and LV100DA-U/LV100NDA). For more information, see “2.1.2 Arbitrarily Configuring the Data of Objective”.

[Procedure]

[MIC SETUP] → [COMPONENTS]

(1) Select the [NOSEPIECE] tab.

The screens in the following procedure are for LV100DA-U/LV100NDA. They vary depending on the model.

(2) Tap the nosepiece address button to be configured.

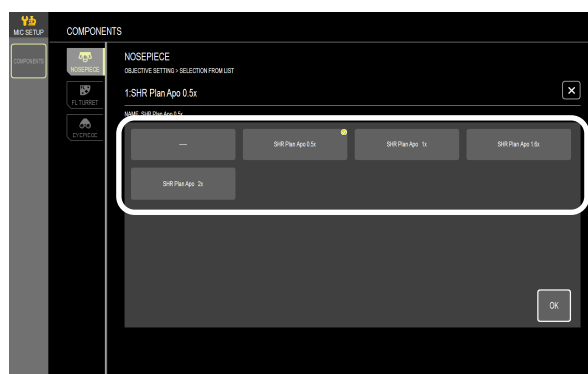
If the objective is displayed as [-----], information for the objective is not configured. By default, all addresses are displayed as [-----].



(3) (For SMZ18, SMZ25, and SMZ1270i) Select the objective attached to the microscope and tap the [OK] button.

Step (4) is not required. Go to step (5).

To quit setting, tap the [X] button.

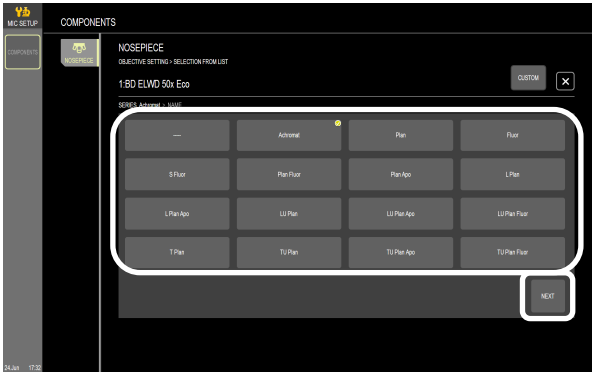


(For MA200, L200N/L200ND, L300N/L300ND, LV-NCNT-N, LV100DA-U/LV100NDA)

Select the name of the series of the objective attached to the microscope and tap the [NEXT] button.

When [▲] and [▼] buttons are shown at the lower edge of the list, you can tap [▲] or [▼] button to go to other pages.

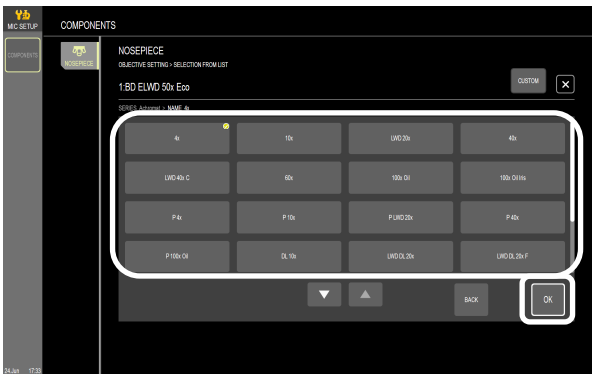
To quit setting, tap the [X] button.



(4) (For MA200, L200N/L200ND, L300N/L300ND, LV-NCNT-N, LV100DA-U/LV100NDA)

Select the attached objective and tap the [OK] button.

The selected objective is set to the nosepiece address.



(5) Repeat steps (3) and (4) for all nosepiece addresses to be configured.

After configuring, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory (memory of nosepiece controller if LV-NCNT-N). If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see "1 Bulk Saving of Settings ([MAIN] Screen)" in this chapter.

2.1.2 Arbitrarily Configuring the Data of Objective

When the objective attached to the microscope is not on the list, you can arbitrarily configure the objective's data. (Only for MA200, L200N/L200ND, L300N/L300ND, LV-NCNT-N, and LV100DA-U/LV100NDA)

[Procedure]

[MIC SETUP] → [COMPONENTS]

(1) Select the [NOSEPIECE] tab.

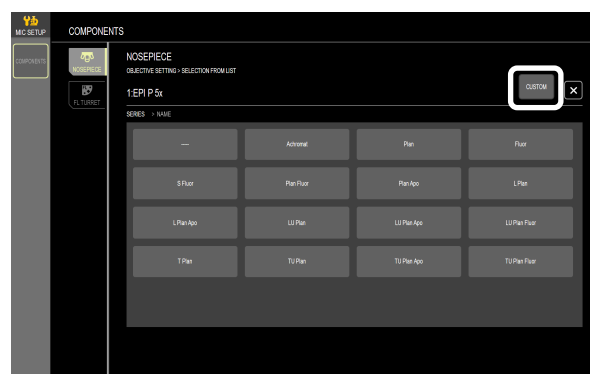
The screens in the following procedure are for LV100DA-U. They vary depending on the model.

(2) Tap the nosepiece address button to be configured.



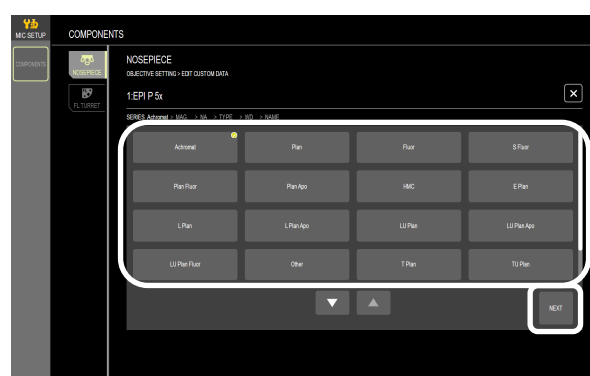
(3) Tap the [CUSTOM] button on the objective configuration screen.

To quit setting, tap the [X] button.



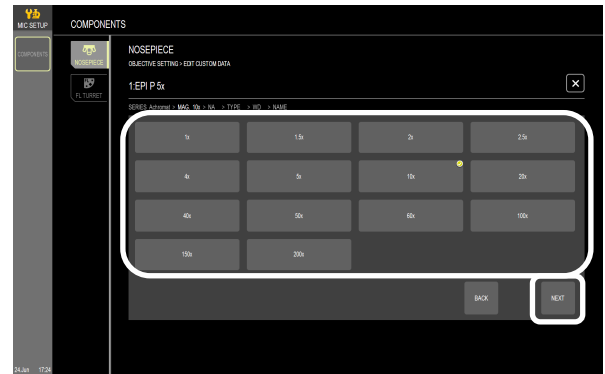
(4) Select the name of the series of the objective attached to the microscope and tap the [NEXT] button.

When [▲] and [▼] buttons are shown at the lower edge of the list, you can tap [▲] or [▼] button to go to other pages.




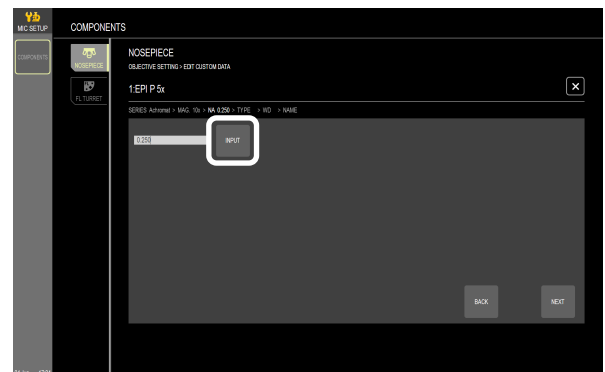
- (5) Select the magnification of the objective attached to the microscope and tap the [NEXT] button.

To return to the previous screen, tap the [BACK] button.

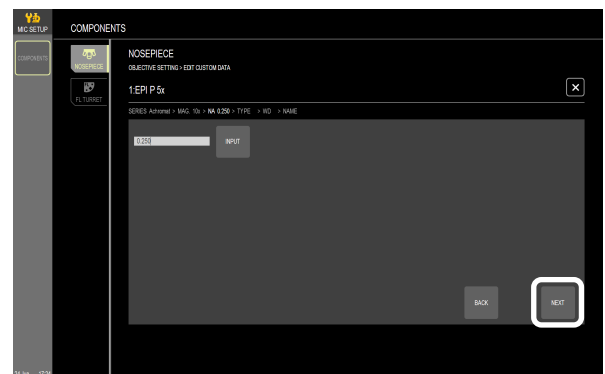


- (6) Tap the [INPUT] button, enter the numerical aperture of the attached objective, and then tap the [ENTER] button.

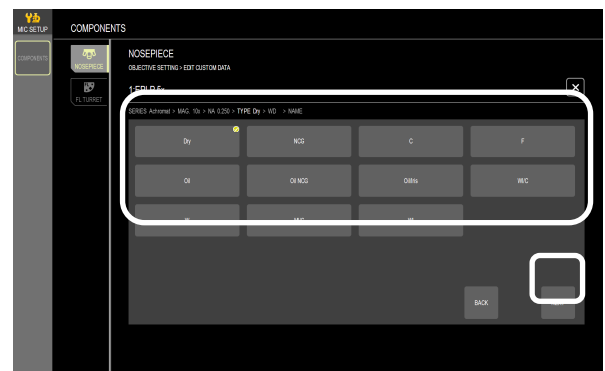
Tapping the  button removes a character at the end of the data you entered.




- (7) Tap the [NEXT] button.

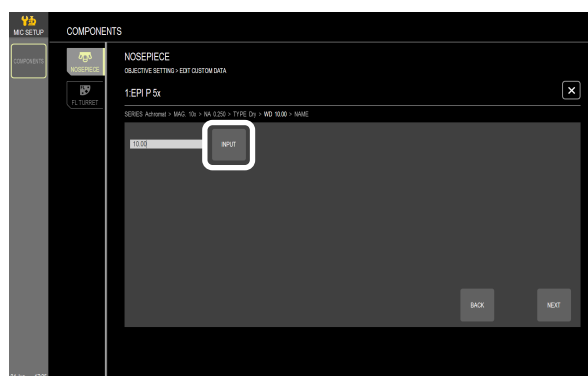


- (8) Select the immersion type of the objective attached to the microscope and tap the [NEXT] button.

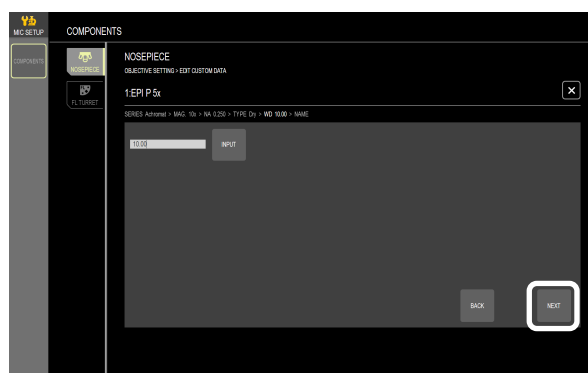


- (9) Tap the [INPUT] button, enter the working distance of the attached objective, and then tap the [ENTER] button.


Tapping the  button removes a character at the end of the data you entered.




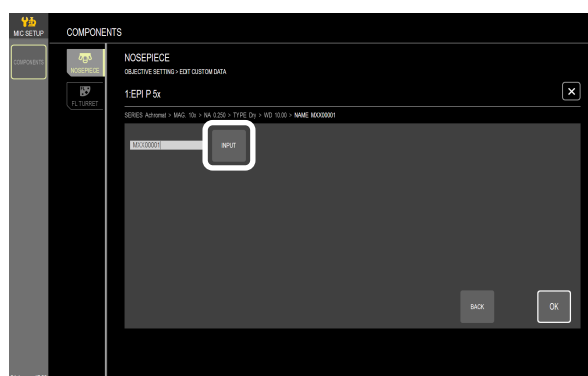
- (10) Tap the [NEXT] button.



- (11) Tap the [INPUT] button, enter the name of the attached objective (up to twenty characters), and then tap the [ENTER] button.

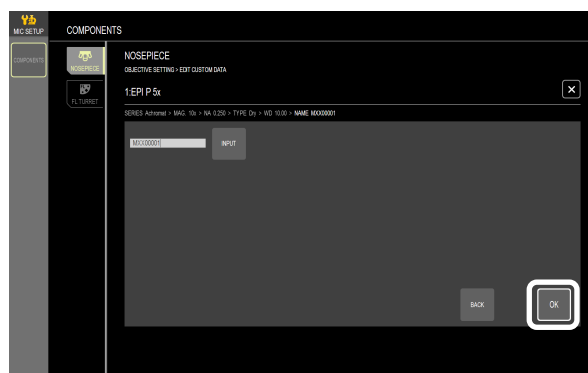
Tapping the  button removes a character at the end of the data you entered.

Tapping the  button toggles between upper and lower cases for alphabet letters.



- (12) Tap the [OK] button.

The objective is set to the nosepiece address.



After configuring, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory (memory of nosepiece controller if LV-NCNT-N). If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see "1 Bulk Saving of Settings ([MAIN] Screen)" in this chapter.

2.2

Configuring the Filter Cube Information (Only for LV100DA-U/LV100NDA, SMZ18, and SMZ25)

In this section, you configure the information for the filter cube attached to the motorized or intelligent epi-fluorescence cube turret. If you have replaced or added filter cubes, you need to reconfigure the settings.

✓ Prerequisite for configuration

A motorized or intelligent epi-fluorescence cube turret must be attached to the microscope in order to perform this configuration.

2.2.1

Selecting and Configuring the Filter Cube from the List

✓ When appropriate filter cube is not on the list

When an appropriate filter cube is not on the list, you can register any name by tapping the [CUSTOM] button (only in LV100DA-U/LV100NDA). For more information, see “2.2.2 Arbitrarily Configuring the Name of Filter Cube (Only for LV100DA-U/LV100NDA and SMZ18/SMZ25)” in this chapter.

[Procedure]

[MIC SETUP] → [COMPONENTS]

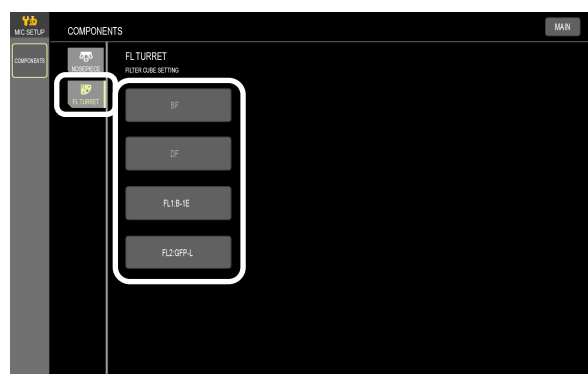
(1) Select the [FL TURRET] tab.

The screens in the following procedure are for LV100DA-U/LV100NDA. They vary depending on the model.

(2) Tap the turret address button to be configured.

In LV100DA-U/LV100NDA, address 1 is fixed to BF and address 2 is fixed to DF. The setting can be modified only for address 3 and 4.

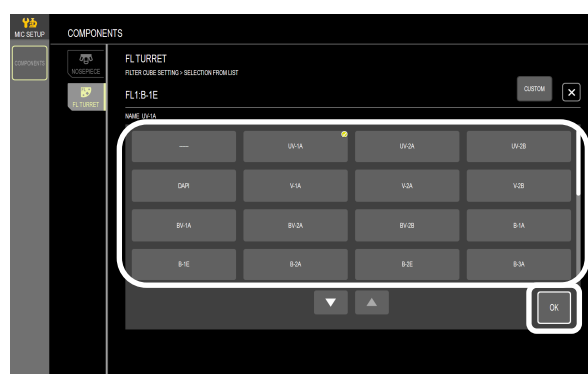
If the filter cube is displayed as [----], information for the filter cube is not configured. By default, all modifiable addresses are displayed as [----].



(3) Select the filter cube attached to the microscope and tap the [OK] button.

When [▲] and [▼] buttons are shown at the lower edge of the list, you can tap [▲] or [▼] button to go to other pages. The selected filter cube is set to the turret address.

To quit setting, tap the [X] button.



(4) Repeat steps (2) and (3) for all turret addresses to be configured.

After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see “1 Bulk Saving of Settings ([MAIN] Screen)” in this chapter.

2.2.2

Arbitrarily Configuring the Name of Filter Cube (Only for LV100DA-U/LV100NDA, and SMZ18/SMZ25)

When the filter cube attached to the microscope is not on the list, you can configure any name.

Configuration procedures are described separately for LV100DA-U/LV100NDA and SMZ18/SMZ25. See the relevant section.

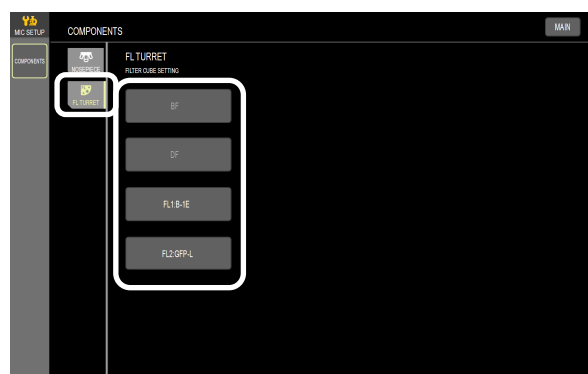
For LV100DA-U/LV100NDA

[Procedure]

[MIC SETUP] → [COMPONENTS]

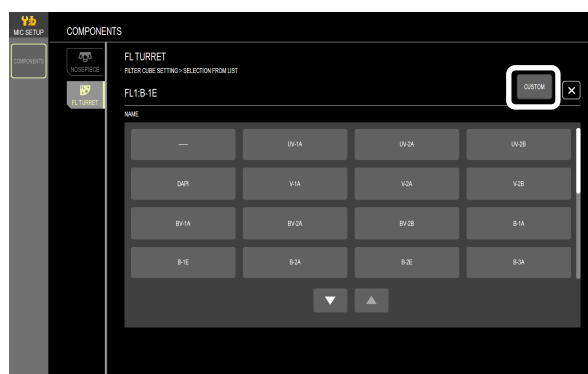
- (1) Select the [FL TURRET] tab.
- (2) Tap the turret address button to be configured.

Address 1 is fixed to BF and address 2 is fixed to DF. The setting can be modified only for address 3 and 4.



- (3) Tap the [CUSTOM] button on the filter cube configuration screen.

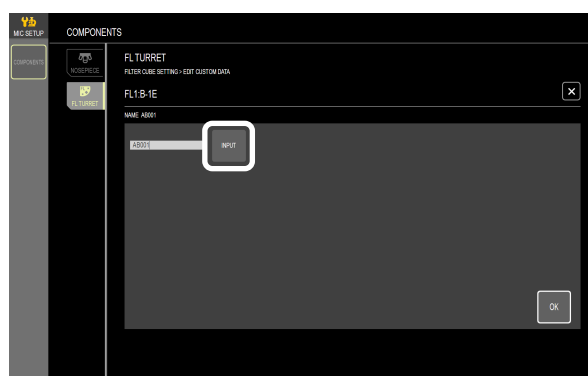
To quit setting, tap the [X] button.



- (4) Tap the [INPUT] button, enter the name of the attached filter cube (up to five characters), and then tap the [ENTER] button.

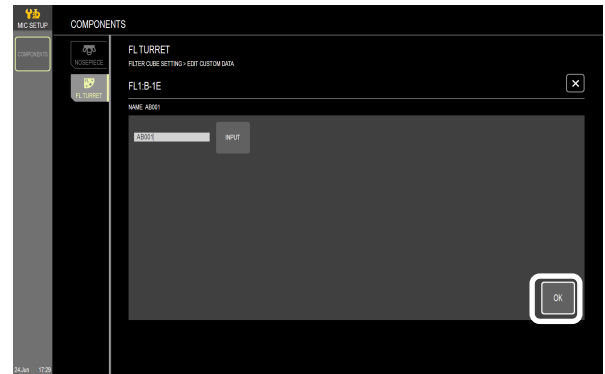
Tapping the button removes a character at the end of the data you entered.

Tapping the button toggles between upper and lower cases for alphabet letters.



(5) Tap the [OK] button.

Filter cube is set to the turret address.



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see “1 Bulk Saving of Settings ([MAIN] Screen)” in this chapter.

For SMZ18/SMZ25

See “2.3.2 Arbitrarily Configuring the Name of Filter Cube” in Chapter 6 of Part 1 for configuration procedures.

2.3 Configuring the Eyepiece Information (Only for SMZ18/SMZ25)

This section describes the setup procedure for the eyepiece attached to the binocular section.

[Procedure]

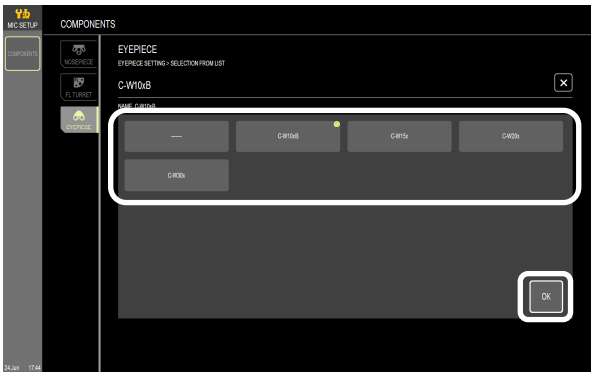
[MIC SETUP] → [COMPONENTS]

- (1) Select the [EYEPIECE] tab.
- (2) Tap the eyepiece button to be configured.
If the eyepiece is displayed as [-----], information for the eyepiece is not configured. By default, the button is displayed as [-----].



- (3) Select the eyepiece attached to the microscope and tap the [OK] button.
The eyepiece information is set.

To quit setting, tap the [X] button.



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see "1 Bulk Saving of Settings ([MAIN] Screen)" in this chapter.

3

Configuring Accessory Device Connection ([CONNECTION] Screen) (Only for SMZ1270i)

In the [CONNECTION] screen, you can configure the connection between the microscope and the P-CI coaxial epi illuminator.

[Procedure]

[MIC SETUP] → [CONNECTION]

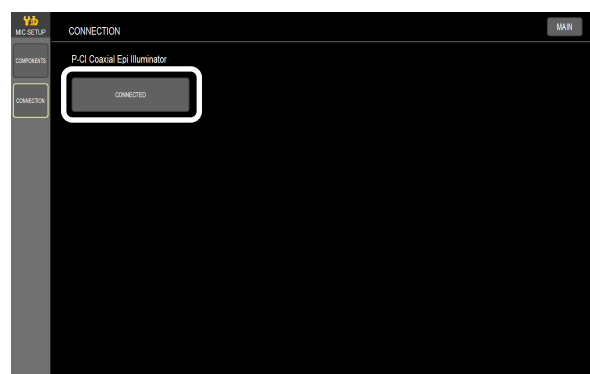
Tap the [CONNECTED]/[NOT-CONNECTED] button.

The [CONNECTED]/[NOT-CONNECTED] indication toggles each time you tap the button.

✔ Button indication

For a system with the coaxial epi illuminator, be sure that [CONNECTED] is indicated on the button.

With the [CONNECTED] status, monitor magnification is set to 1.5x.



After making changes to the settings, be sure to tap the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the microscope is turned off without saving settings, previous values are restored. For more information on saving, see "1 Bulk Saving of Settings ([MAIN] Screen)" in this chapter.

Misuse of this product may adversely affect performance, even if this product is properly functional. If any of the following problems occurs, be sure to check the following table for possible causes before requesting service.

If you detect problems that are not listed below or the problem still persists after measures are taken, turn off the device and contact your nearest Nikon representative.

The following table shows only problems when operating the microscope. Refer to the separately provided "Camera Operation" instruction manual for DS-L4 hardware related problems such as DS-L4 not turning on.

1

Display

Problem	Cause	Measure
MIC EASY screen does not appear.	DS-L4 is not connected to the microscope (or nosepiece controller) properly.	Turn off the microscope (or nosepiece controller), motorized accessory devices, and DS-L4, then reconnect DS-L4 to the microscope (or nosepiece controller) with a USB cable.
	Two or more USB hubs are used in series.	Do not use any USB hubs or do not use in series.
	Microscope (or nosepiece controller) is not turned on.	Turn off DS-L4, turn on the microscope (or nosepiece controller), then turn on DS-L4.
Device status is not displayed. Device configuration screen is not displayed.	Accessories are not properly connected to the microscope.	Turn off the microscope, accessories, and DS-L4, then connect or attach each device to the microscope correctly.
Information about optical elements (objective or epi-fluorescence filter cube) is not displayed correctly.	Information is not configured correctly.	Set the correct information in [MIC SETUP] → [COMPONENTS] screen. See Chapter 3, "2 Configuring Optical Elements Information ([COMPONENTS] Screen)".

2

Operation

■ Button Operation

Problem	Cause	Measure
(Only with LV150NA and LV-NCNT-N) Buttons on the nosepiece does not work.	Motorized nosepiece is not properly connected to the microscope or nosepiece controller.	Turn off the microscope (or nosepiece controller) and DS-L4, then connect or attach the motorized nosepiece correctly.

3

Setting

Problem	Cause	Measure
Settings are restored to the previous value when DS-L4 is turned on.	Settings are not saved.	After configuring, be sure to tap the [SAVE] button on the [MIC SETUP] - [MAIN] screen to save settings. See Chapter 3, "1 Bulk Saving of Settings ([MAIN] Screen)".