

Nikon

DS Camera Control Unit

DS-L3

< Instructions >

—— Microscope Operation ——

Introduction

Thank you for purchasing a Nikon product.

This instruction manual is written for users of the Nikon DS-L3 DS 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-L3 DS Camera Control Unit is provided in three volumes.

- ◆ **Camera Operation** (Describes the operation of the camera connected to the DS-L3.)
- ◆ **Quick Reference** (Describes the operation of the camera connected to the DS-L3.)
- ◆ **Microscope Operation** (Describes how to check the status and operate the microscope from the DS-L3 screen.)

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.

Contents (Details)

Introduction	i
Contents of the Manual	ii
Symbols Used in This Manual	ii

Part 1

Biological Microscope

Chapter 1

Motorized Units Operable from DS-L3 1-1

1 Devices Operable From DS-L3 Connected to Ni-E	1-1
2 Devices Operable From DS-L3 Connected to Ni-U	1-3
3 Devices Operable From DS-L3 Connected to Ci-E	1-3

Chapter 2

Basics of Microscope Operation with DS-L3 1-4

1 Powering On/Off the Devices	1-4
2 Switching Between Camera Control and Microscope Control	1-5
3 Screens for Ni-E	1-6
3.1 MICROSCOPE CONTROL Screen (Ni-E)	1-6
3.2 CAM-MIC CONTROL Screen (Ni-E)	1-7
3.3 MICROSCOPE INFORMATION Screen (Ni-E)	1-8
3.4 Microscope Operation Buttons (Ni-E)	1-10
4 Screens for Ni-U	1-15
4.1 MICROSCOPE CONTROL Screen (Ni-U)	1-15
4.2 CAM-MIC CONTROL Screen (Ni-U)	1-16
4.3 MICROSCOPE INFORMATION Screen (Ni-U)	1-17
4.4 Microscope Operation Buttons (Ni-U)	1-18
5 Screens for Ci-E	1-21
5.1 CAM-MIC CONTROL Screen (Ci-E)	1-21
5.2 MICROSCOPE INFORMATION Screen (Ci-E)	1-22
5.3 Microscope Operation Buttons (Ci-E)	1-23

Chapter 3

Preparation for Microscopy 1-24

1 Configuring Optical Elements Information	1-24
1.1 Configuring the Objective Information	Ni-E Ni-U Ci-E 1-24
1.2 Configuring the Condenser Module Information	Ni-E 1-24
1.3 Configuring the Filter Cube Information	Ni-E Ni-U 1-25
1.4 Configuring the Excitation Filter/Barrier Filter Information	Ni-E 1-25
2 Configuring the Digital Camera Connection	Ni-E Ni-U Ci-E 1-26
3 Saving the Settings	Ni-E Ni-U Ci-E 1-26

Chapter 4

Microscopy with DS-L3 1-27

Individual Operations 1-38

1	Operating Motorized Devices.....				1-38
1.1	Switching the Objective (Motorized Nosepiece)	Ni-E	Ni-U	Ci-E	1-38
1.2	Switching the Optical Path (Motorized Quadrocular Tilting Tube)	Ni-E			1-41
1.3	Adjusting the Zoom Magnification (Motorized DSC Zooming Port)	Ni-E			1-42
1.4	Switching the Filter Cube (Motorized Epi-fluorescence Cube Turret).....	Ni-E	Ni-U		1-43
1.5	Opening/Closing the Motorized Epi-fluorescence Cube Turret's Built-in Shutter	Ni-E	Ni-U		1-45
1.6	Opening/Closing All Shutters for Epi-illumination	Ni-E	Ni-U		1-47
1.7	Switching the Excitation Filter (Motorized Excitation Filter Wheel).....	Ni-E			1-49
1.8	Switching the Barrier Filter (Motorized Barrier Filter Wheel)	Ni-E			1-51
1.9	Switching the Condenser Module (Motorized Universal Condenser).....	Ni-E			1-52
1.10	Adjusting the DIA Aperture Diaphragm (Motorized Universal Condenser).....	Ni-E			1-54
1.11	Swinging Out the Condenser Top Lens (Motorized Swing-out Condenser).....			Ci-E	1-55
1.12	Operating the Motorized HG Precentered Fiber Illuminator (Intensilight).....	Ni-E	Ni-U		1-56
1.13	Adjusting the ND Filter for Dia-illumination (Motorized ND Filter Wheel)	Ni-E			1-59
1.14	Adjusting the Dia-illumination Lamp/LED	Ni-E	Ni-U	Ci-E	1-60
1.15	Adjusting the DIA Field Diaphragm.....	Ni-E			1-63
1.16	Opening/Closing the EPI/DIA/AUX Motorized Shutter.....	Ni-E	Ni-U		1-64
1.17	Outputting Capture Trigger Signals from the Microscope.....	Ni-E	Ni-U		1-65
1.18	Operating the Elevating Section and the Motorized XY Stage.....	Ni-E			1-66
2	Using the MODE Function	Ni-E	Ni-U		1-69
2.1	Registering/Changing Target Motorized Devices.....				1-69
2.2	Saving/Updating a Mode (State of Motorized Devices)				1-72
2.3	Loading a Mode.....				1-74
2.4	Deleting a Mode				1-75
3	Entering the Sleep State (Noise Reduction).....	Ni-E			1-76
4	Changing the Background Color of the [MICROSCOPE CONTROL] Screen.....	Ni-E	Ni-U		1-76
5	Operating the Motorized XY Stage with the Position Specified on the Monitor	Ni-E			1-77
5.1	Enabling the XY Movement with the Position Specified on the Monitor.....				1-77
5.2	Operating the Motorized XY Stage with the Position Specified.....				1-78
6	Running the Scan Large Image Function Using NIS-Elements Software	Ni-E			1-80
6.1	Operation Flow				1-81
6.2	Pre-configuration				1-82

Settings..... 1-99

6.3	Setting Up Scan Conditions and File Saving Options.....	1-84
6.4	Starting and Exiting DS-L3 Mode / Ni-E Mode.....	1-85
6.5	Operational Details.....	1-87
6.6	Warning Message List.....	1-98
1	Bulk Saving of Settings ([MAIN] Screen)	Ni-E Ni-U Ci-E 1-100
2	Configuring Optical Elements Information ([COMPONENTS] Screen).....	1-101
2.1	Configuring the Objective Information	Ni-E Ni-U Ci-E 1-101
2.2	Configuring the Condenser Module Information.....	Ni-E 1-108
2.3	Configuring the Filter Cube Information.....	Ni-E Ni-U 1-112
2.4	Configuring the Excitation Filter/Barrier Filter Information	Ni-E 1-117
3	Setting the Connections of Motorized Units ([CONNECTION] Screen).....	1-121
3.1	Configuring the Connection of Digital Camera	Ni-E Ni-U Ci-E 1-121
3.2	Configuring the Connection of Motorized Shutter.....	Ni-E Ni-U 1-124
4	Configuring the Functions of Buttons ([BUTTON FUNC] Screen)	1-125
4.1	Configuring the Screen Buttons for DS-L3	Ni-E Ni-U 1-125
4.2	Configuring Buttons on the Microscope.....	Ni-E Ni-U Ci-E 1-131
4.3	Configuring the Function of the Ergo Controller Buttons	Ni-E 1-138
4.4	Enabling/Disabling the Buttons on the Ci-E Remote Control Pad	Ci-E 1-146
5	Configuring the Movement of Motorized Devices ([MOVEMENT] Screen).....	1-147
5.1	Configuring Interlocked Operation.....	Ni-E 1-147
5.2	Setting the Retracting Amount of the Elevating Section	Ni-E 1-158
5.3	Disabling the Rotation of the Motorized Nosepiece Depending on the Position of the Elevating Section	Ni-E 1-159
5.4	Disabling the Reverse Rotation of the Nosepiece	Ni-E Ni-U Ci-E 1-160
5.5	Configuring the Toggle Function (Alternating between Two Objectives)	Ni-E Ni-U Ci-E 1-162
5.6	Configuring Top Lens Swing-out of the Motorized Swing-out Condenser.....	Ci-E 1-165
6	Configuring Other Functions ([UTILITY] Screen, [MAINTENANCE] Screen)	1-166
6.1	Setting the Display of the Ni-E Front Display Panel	Ni-E 1-166
6.2	Enabling/Disabling the Operation of the Elevating Section	Ni-E 1-167
6.3	Turning ON/OFF the Buzzer.....	Ni-E 1-168
6.4	Setting the Software Limits.....	Ni-E 1-169
6.5	Setting the Driving Speed of the Epi-Fluorescence Cube Turret	Ni-E Ni-U 1-172
6.6	Restoring the Factory Default Settings.....	Ni-E Ni-U Ci-E 1-173
6.7	Displaying the Program Version	Ni-E Ni-U Ci-E 1-174

Troubleshooting..... 1-175

1	Display	1-175
2	Operation	1-176
3	Saving Settings	1-179

Part 2**Industrial Microscope****Chapter
1****Devices Whose Status Is Viewable on DS-L3..... 2-1**

- 1 Devices Whose Status Is Viewable on the DS-L3 Connected to ECLIPSE L200N/L200ND/L300N/L300ND.....2-1
- 2 Devices Whose Status Is Viewable on the DS-L3 Connected to ECLIPSE MA200.....2-2
- 3 Devices Whose Status Is Viewable on the DS-L3 Connected to MULTIZOOM AZ100M.....2-2
- 4 Devices Whose Status Is Viewable on the DS-L3 Connected to ECLIPSE LV100DA-U2-3
- 5 Devices that can be Controlled and Monitored from DS-L3 Connected to ECLIPSE LV150A/LV150NA/LV-NCNT2 Nosepiece Controller 2/ LV-NCNT-N Motorized Nosepiece Controller2-3
- 6 Devices Whose Status Is Viewable on the DS-L3 Connected to LV-INAD Adapter for Intelligent Nosepiece2-4
- 7 Devices Whose Status Is Viewable on the DS-L3 Connected to SMZ18/SMZ25 Stereo Microscope2-4
- 8 Devices Whose Status Is Viewable on the DS-L3 Connected to SMZ1270i Stereo Microscope2-5

**Chapter
2****Viewing the Status of Microscope on DS-L3 2-6**

- 1 Powering On/Off the Devices.....2-6
- 2 Switching between Camera Control Screen and MIC INFO Screen.....2-7
- 3 Information Screen for ECLIPSE L200N/L200ND/L300N/L300ND.....2-8
- 4 Information Screen for ECLIPSE MA2002-9
- 5 Information Screen for MULTIZOOM AZ100M2-10
- 6 Information Screen for ECLIPSE LV100DA-U2-11
- 7 Information Screen for ECLIPSE LV150A/LV150NA/LV-NCNT2 Nosepiece Controller 2/ LV-NCNT-N Motorized Nosepiece Controller2-12
- 8 Information Screen for LV-INAD Adapter for Intelligent Nosepiece2-13
- 9 Information Screen for SMZ18/SMZ25 Stereo Microscope.....2-14
- 10 Information Screen for SMZ1270i Stereo Microscope2-15

**Chapter
3****Settings..... 2-16**

- 1 Bulk Saving of Settings ([MAIN] Screen)2-16
- 2 Configuring Optical Elements Information ([COMPONENTS] Screen).....2-17
 - 2.1 Configuring the Objective Information2-17
 - 2.2 Configuring the Filter Cube Information (Only for AZ100M, LV100DA-U, SMZ18, and SMZ25)2-24
 - 2.3 Configuring the Eyepiece Information (Only for SMZ18 and SMZ25).....2-27
- 3 Configuring Accessory Device Connection ([CONNECTION] Screen) (Only for SMZ1270i)....2-28

**Chapter
4****Troubleshooting..... 2-29**

- 1 Display2-29
- 2 Operation2-30
- 3 Setting2-30

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-L3 DS Camera Control Unit connected to a biological microscope Ni-E, Ni-U, or Ci-E.

Introduction

Contents of the Manual

Symbols Used in This Manual

Chapter 1 Motorized Units Operable from DS-L3

Chapter 2 Basics of Microscope Operation with DS-L3

Chapter 3 Preparation for Microscopy

Chapter 4 Microscopy with DS-L3

Chapter 5 Individual Operations

Chapter 6 Settings

Chapter 7 Troubleshooting

Motorized Units
Operable from DS-L3

Basics of Microscope
Operation with DS-L3

Preparation for
Microscopy

Microscopy
with DS-L3

Individual
Operations

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-L3, and motorized accessories, refer to the instruction manual of your microscope and also the “Camera Operation” instruction manual of DS-L3.

By connecting the DS-L3 Camera Control Unit to a Ni/Ci series microscope, you can use the touch panel on the DS-L3 to control and monitor the microscope and accompanying motorized devices attached to the microscope. DS-L3 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-L3.

1

Devices Operable From DS-L3 Connected to Ni-E

When the DS-L3 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-L3	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-L3	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	Movement of the stage so that the specified position is centered on the screen	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-L3 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-L3 Connected to Ni-U

Device	Operation Available on DS-L3	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		
NI-ND6-I Intelligent DIC Sextuple Nosepiece	Address detection for nosepiece in optical path	
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-L3 Connected to Ci-E

Device	Operation Available on DS-L3	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")

This chapter describes the startup and shutdown procedures for the DS-L3, as well as the composition of the screens used for microscope operation.

1

Powering On/Off the Devices

Powering ON the devices

1

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

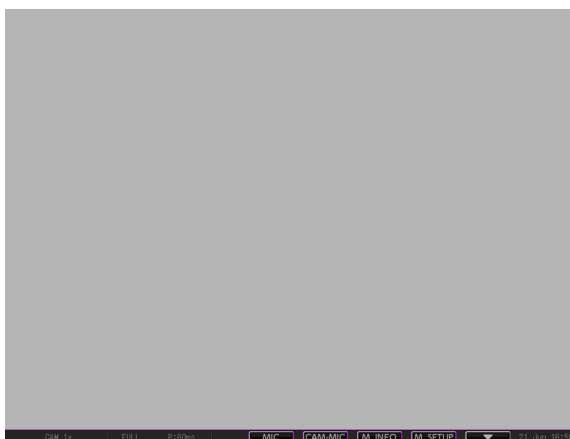
The motorized devices are initialized.

For details on turning on the power, refer to the instruction manual provided with your microscope.

2

Press the power switch of DS-L3 to turn on the unit.

The startup screen appears. The system configuration data and settings are acquired from the main body, and then the following screen appears. The completion of the initial operations takes about 30 seconds, depending on the configuration of the microscope system. If you want to use an application software on the connected PC, start the application software last.



Note that if you are using microscope Ni-E or Ni-U, and a digital camera is not connected to DS-L3, the following [MICROSCOPE CONTROL] screen appears after the initialization is completed.



Shutdown

1

Press the power switch of DS-L3 to turn off the unit.

2

Turn off the powers of the microscope main body and the motorized parts.

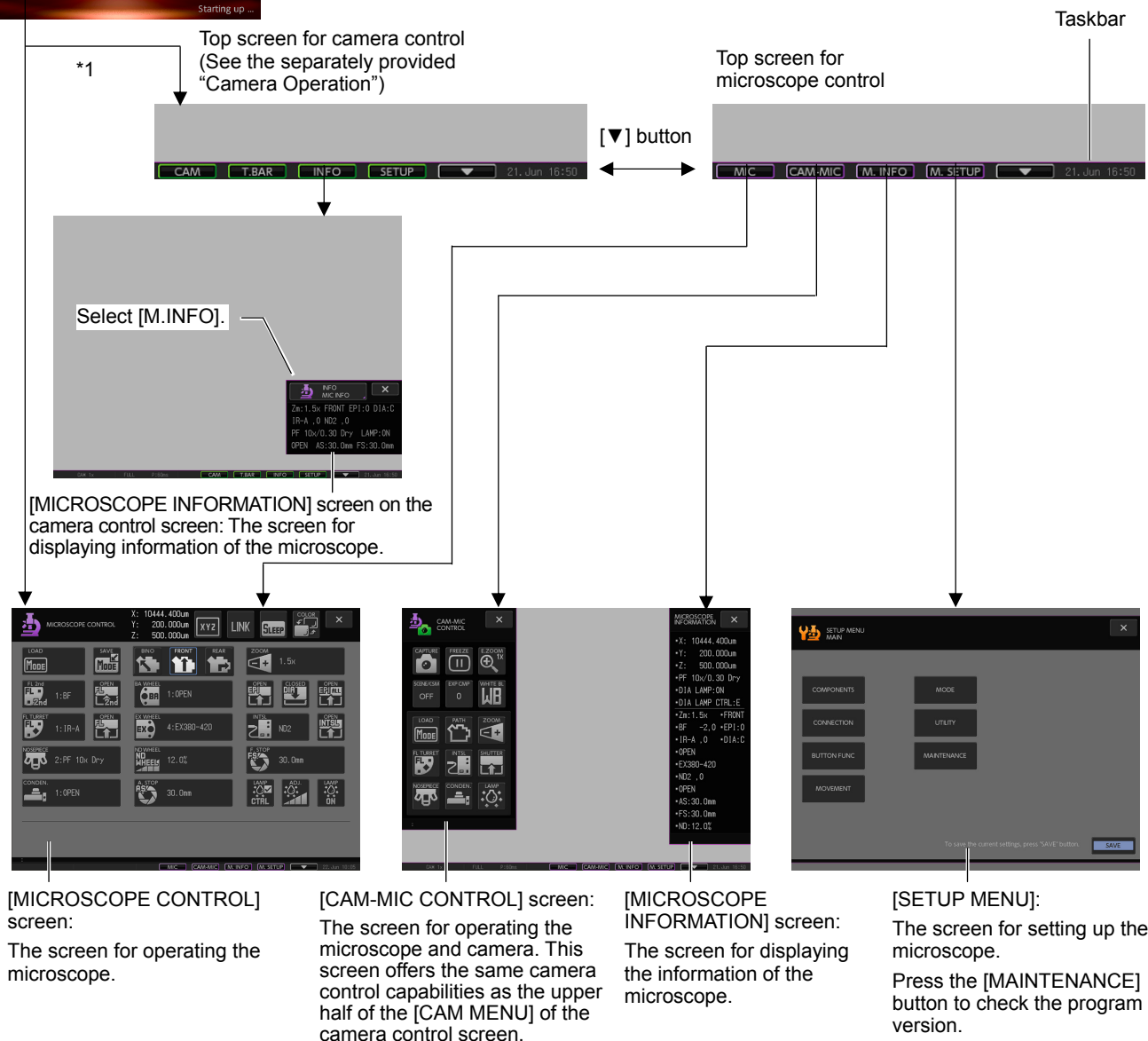
2

Switching Between Camera Control and Microscope Control

Startup screen



*1: If you are using the microscope Ni-E or Ni-U, and a digital camera is not connected to DS-L3, the [MICROSCOPE CONTROL] screen appears after the startup screen.



When the power is turned on, the startup screen appears, followed by the camera control screen.

To control the microscope, press the **[▼]** button on the taskbar to switch from the camera control screen to the top screen of microscope control, and then press the **[MIC]** button or the **[CAM-MIC]** button.

Also, when you want to switch from the microscope control screen to the top screen of camera control, press the **[▼]** button on the taskbar.

Menu size on the screen

Changing the display size of a menu on the camera control screen makes the [CAM-MIC CONTROL] and [MICROSCOPE INFORMATION] screens smaller. For details, see Chapter 13 "13.2.1 (5) Configuring the position and size of the menu" in the "Camera Operation" instruction manual. (A bigger menu is used in this manual.)

3

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-L3. 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-L3, refer to Chapter 1, "Motorized Units Operable from DS-L3".

The button layout on the [MICROSCOPE CONTROL] and [CAM-MIC CONTROL] 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-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.

X: X coordinate of the motorized XY stage
Y: Y coordinate of the motorized XY stage
Z: Z coordinate of the microscope's elevating section
(The display of Z coordinate flashes in escape state. Also, the X, Y, Z coordinates blink when at specimen removal position.)

Opens the sub screen for controlling the elevating section and motorized XY stage (see Chapter 5, "1.18 Operating the Elevating Section and the Motorized XY Stage").

Moves to the [SETUP MENU] - [MOVEMENT] screen.

Switches normal mode/sleep mode (see Chapter 5, "3 Entering the Sleep State (Noise Reduction)") (hidden by default)

Changes the background color. (See Chapter 5, "4 Changing the Background Color of the [MICROSCOPE CONTROL] Screen".)

Closes the [MICROSCOPE CONTROL] screen.

Operation buttons (optical path, etc.)

Press a button to operate the corresponding motorized device. The selected button is displayed with a blue frame.

ON/OFF or open/close button (lamp, motorized shutter, etc.)

Indicates the current status with an icon. Each time the button is pressed, the status switches and the corresponding motorized device operates.

Closes the sub screen.

These buttons are enabled when the DS-L3 has control of the lamp.

A button for opening an operation sub screen (nosepiece, FL turret, etc.)

Press the button to open a sub screen at the bottom of the screen.

Sub screen

Operation buttons

Press a button to operate the corresponding motorized device. The selected button is displayed with a blue frame.

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



Slider

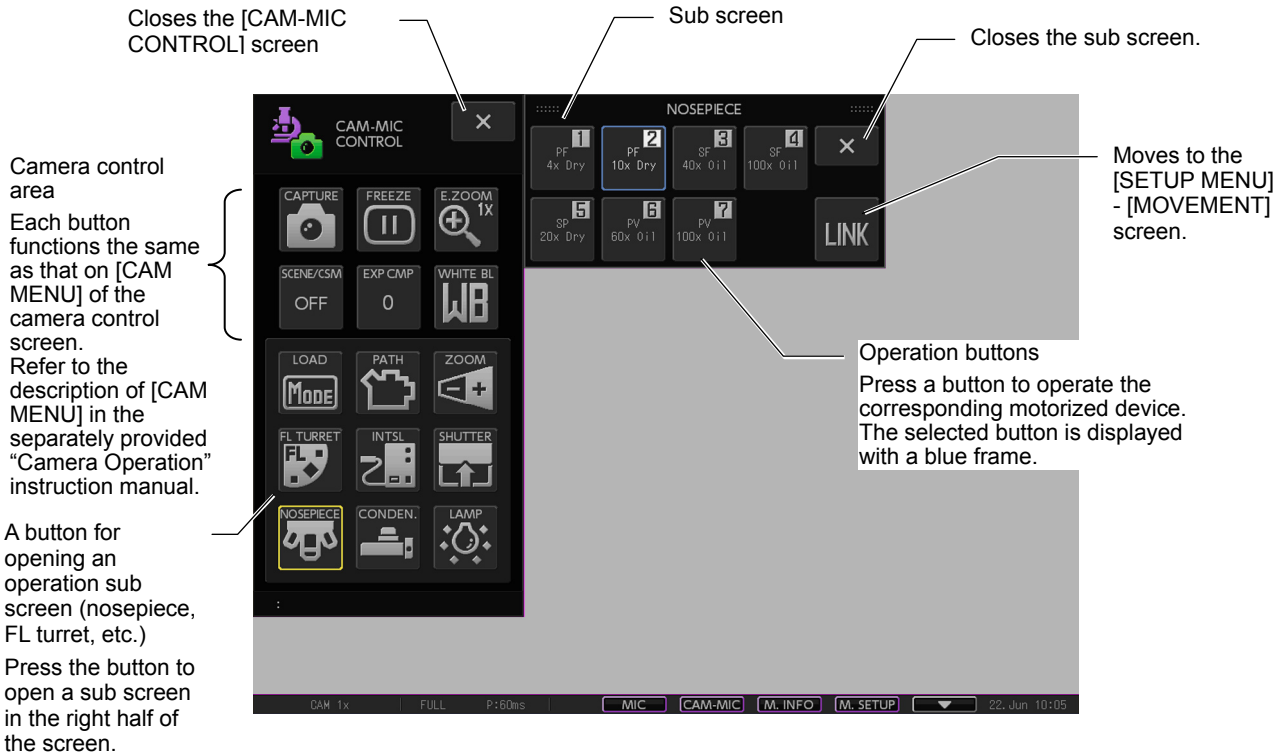
Available operations:

- Dragging the yellow marker being pressed
- Pressing the [◀] or [▶] button
- Pressing the area to the left or right of the yellow marker (for greater movement than when using the [◀] or [▶] button)

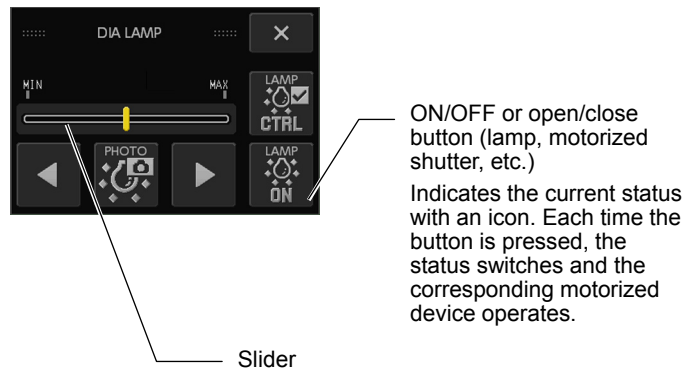
3.2

CAM-MIC CONTROL Screen (Ni-E)

The [CAM-MIC CONTROL] screen provides buttons for both camera control (upper half) and microscope control (lower half). The default button layout is shown below.



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



Available operations:

- Dragging the yellow marker being pressed
- Pressing the [◀] or [▶] button
- Pressing the area to the left or right of the yellow marker (for greater movement than when using the [◀] or [▶] button)

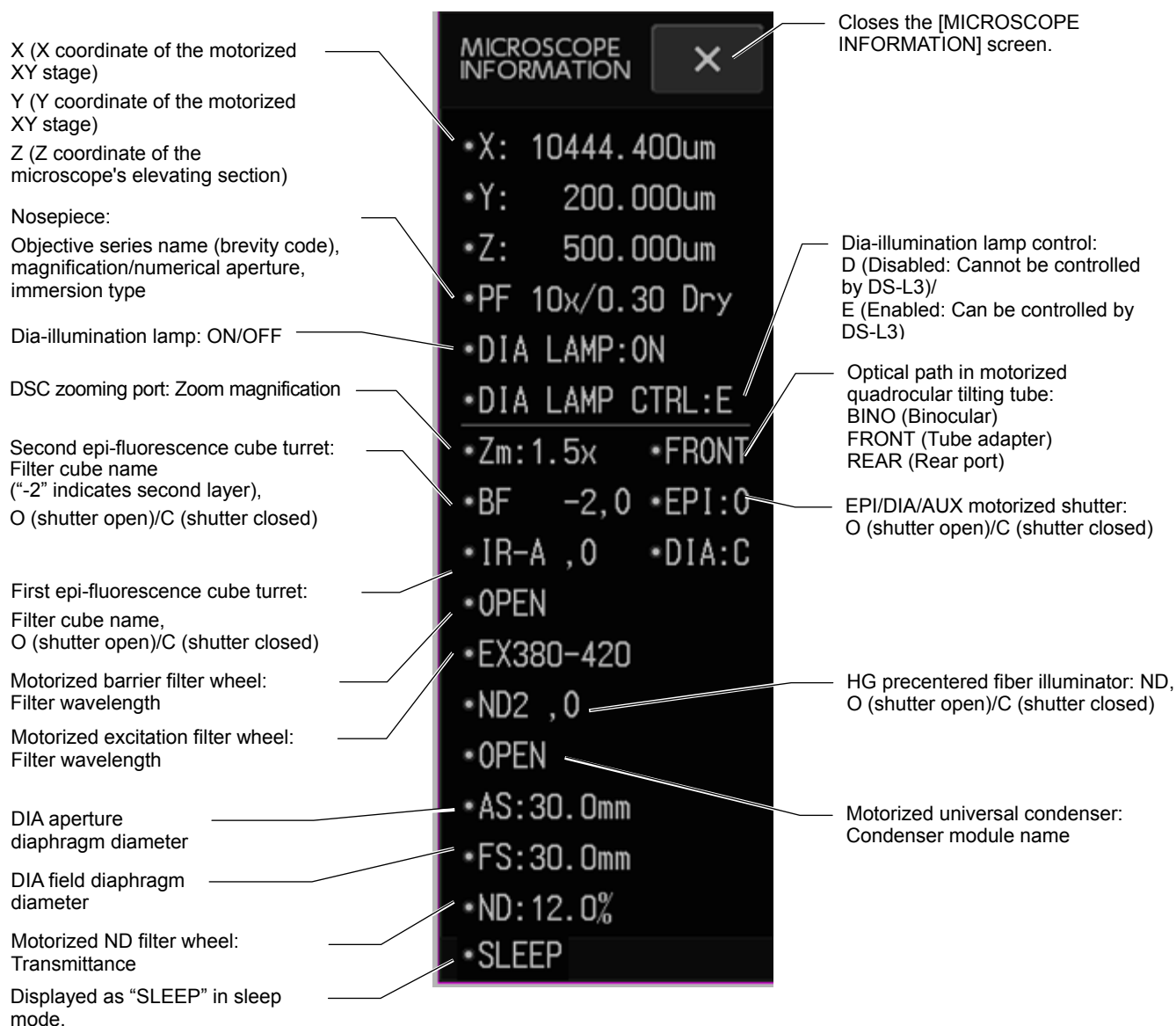
3.3

MICROSCOPE INFORMATION Screen (Ni-E)

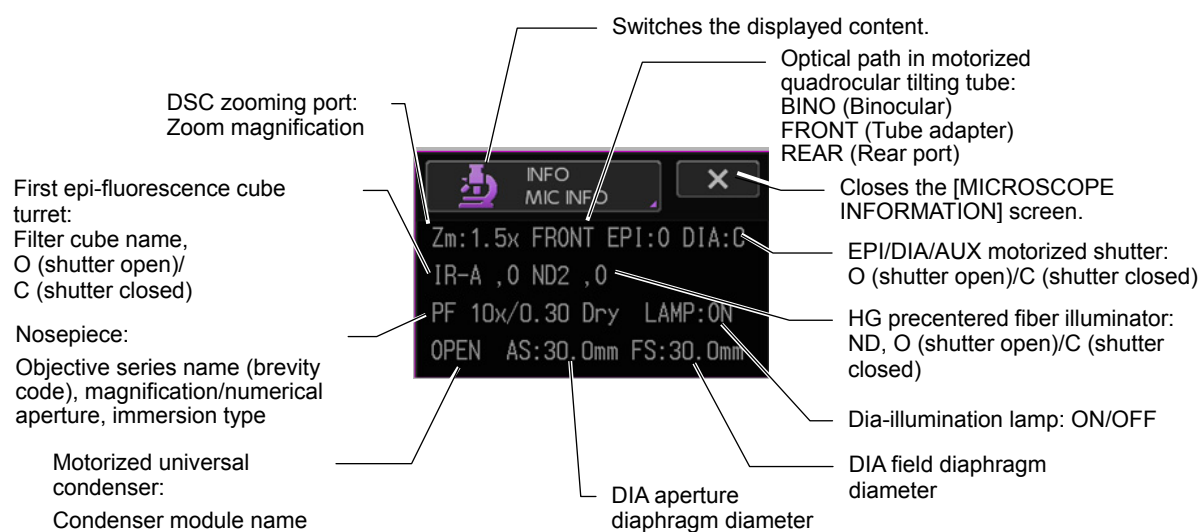
The [MICROSCOPE INFORMATION] screen displays the status of the microscope.

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

CAM-MIC CONTROL screen



Camera control screen

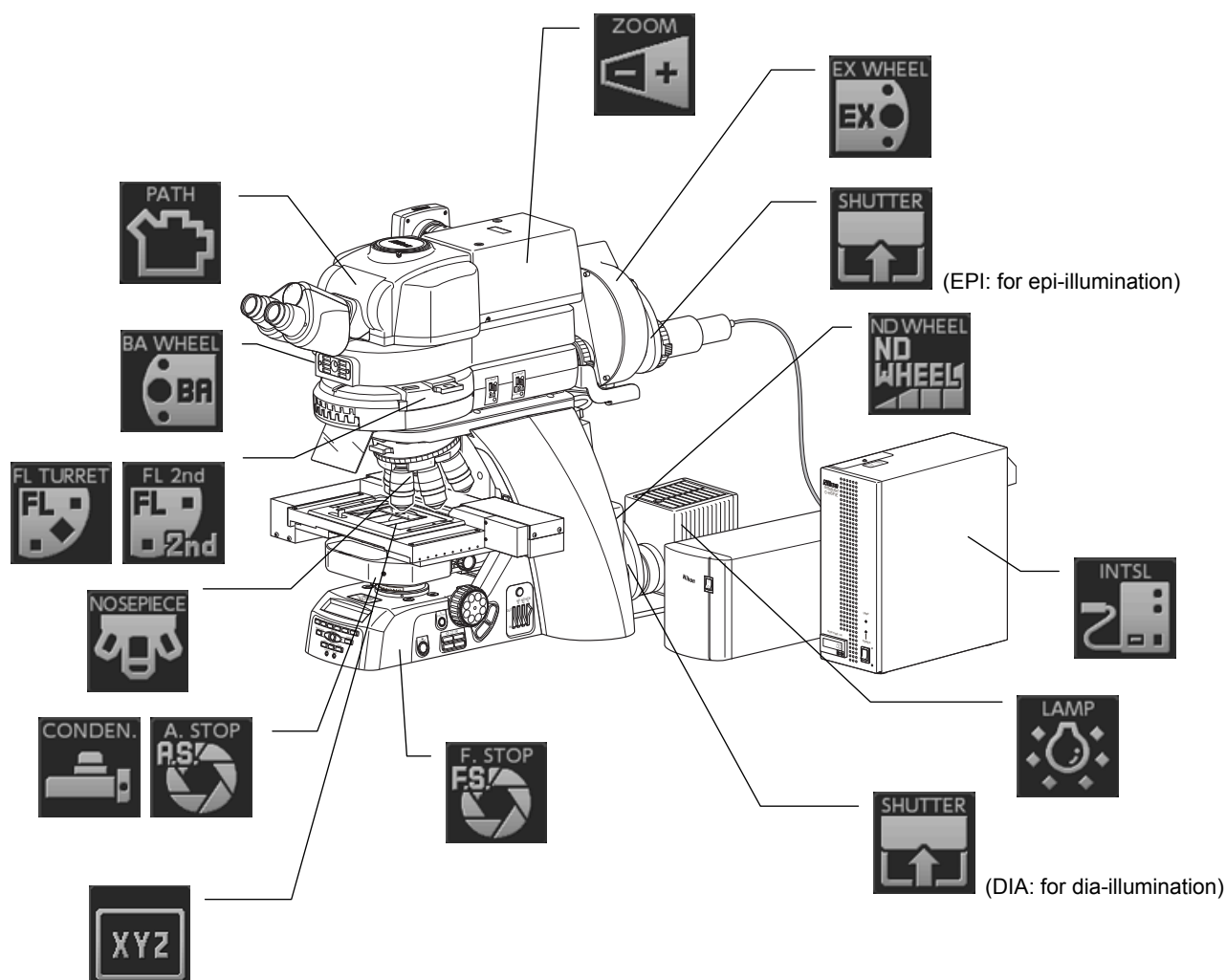






















3.4 Microscope Operation Buttons (Ni-E)











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















[MICROSCOPE CONTROL] and [CAM-MIC CONTROL] screens only show buttons for devices operable from the DS-L3. 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-L3, refer to Chapter 1, "Motorized Units Operable from DS-L3".









Some buttons are not displayed by default, even if the corresponding device is operable from DS-L3. 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)"
 [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)"

Operation Button (Ni-E)		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.	
 [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-L3.	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-L3 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. Press the button again to restore 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). Pressing 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)”
 [COLOR]		Changes the background color of the [MICROSCOPE CONTROL] screen.	Chapter 5 “4 Changing the Background Color of the [MICROSCOPE CONTROL] Screen”

4

Screens for Ni-U

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

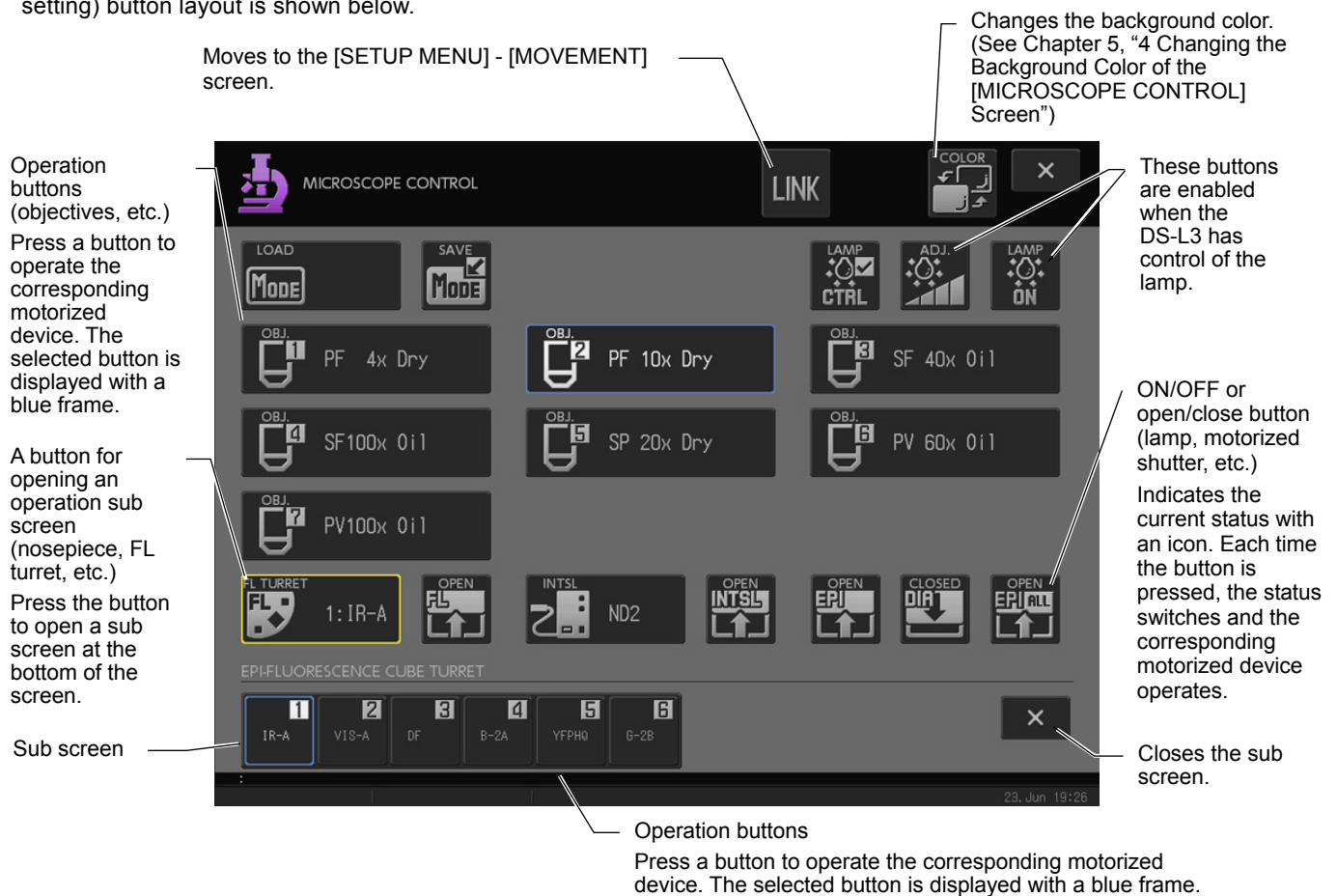
The screen only shows devices that are connected to the microscope and recognized by DS-L3. For this reason, the composition of the screen differs depending on the configuration of the microscope. For information on microscopes and devices that can be recognized by DS-L3, refer to Chapter 1, "Motorized Units Operable from DS-L3".

The button layout on the [MICROSCOPE CONTROL] and [CAM-MIC CONTROL] 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".

4.1

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

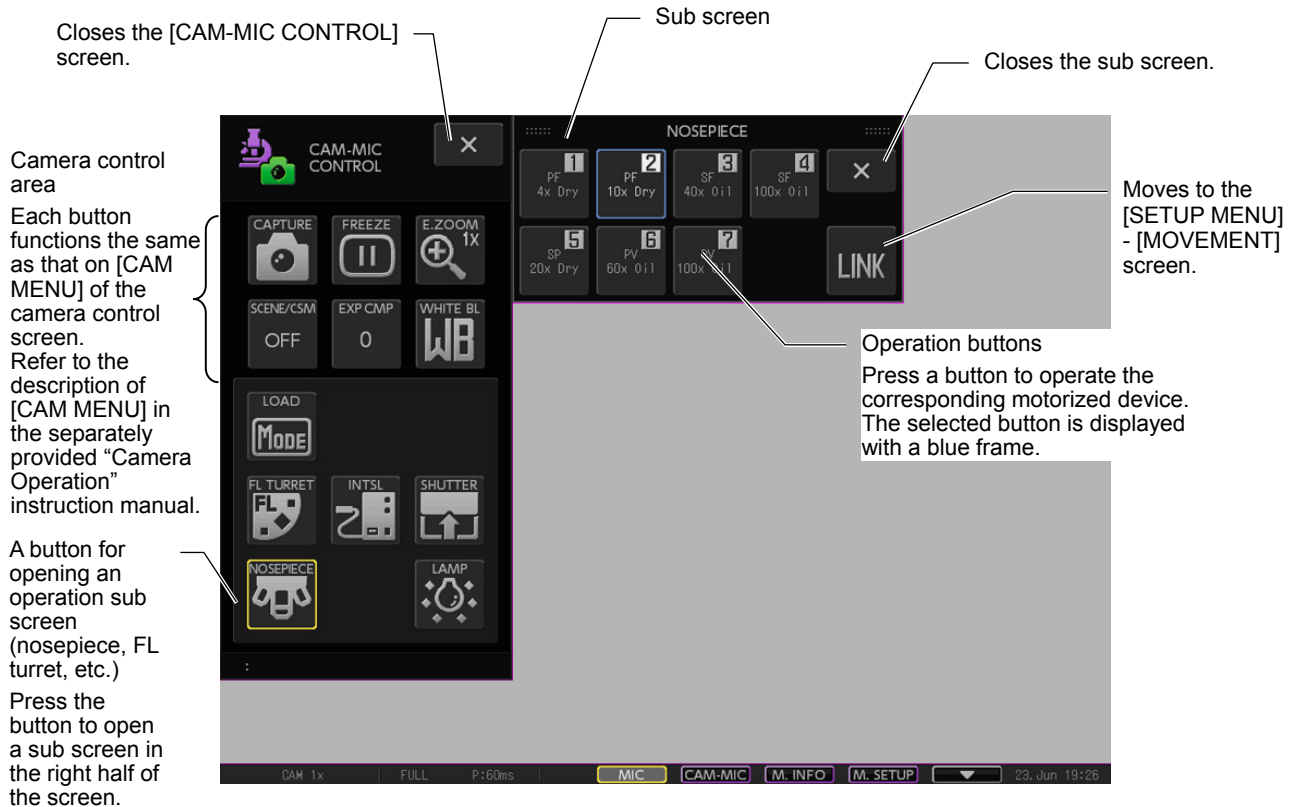
Available operations:

- Dragging the yellow marker being pressed
- Pressing the [◀] or [▶] button
- Pressing the area to the left or right of the yellow marker (for greater movement than when using the [◀] or [▶] button)

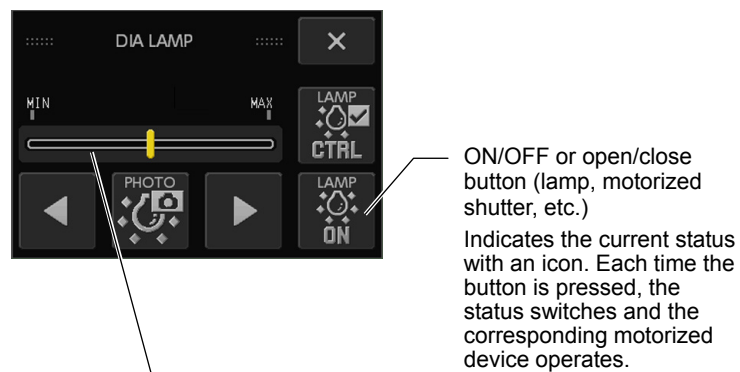
4.2

CAM-MIC CONTROL Screen (Ni-U)

The [CAM-MIC CONTROL] screen provides buttons for both camera control (upper half) and microscope control (lower half). The default button layout is shown below.



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



Slider

Available operations:

- Dragging the yellow marker being pressed
- Pressing the [◀] or [▶] button
- Pressing the area to the left or right of the yellow marker (for greater movement than when using the [◀] or [▶] button)

4.3

MICROSCOPE INFORMATION Screen (Ni-U)

The [MICROSCOPE INFORMATION] screen displays the status of the microscope.

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

CAM-MIC CONTROL screen

Nosepiece:

Objective series name (brevity code),
magnification/numerical aperture,
immersion type

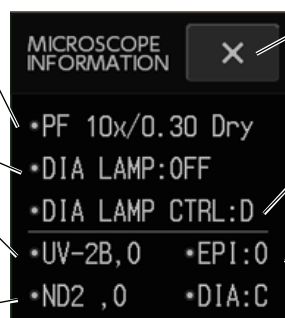
Dia-illumination lamp: ON/OFF

Epi-fluorescence cube turret:

Filter cube name,
O (shutter open)/C (shutter closed)

HG precentered fiber illuminator:

ND, O (shutter open)/
C (shutter closed)



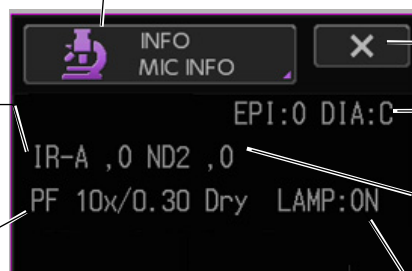
Closes the [MICROSCOPE
INFORMATION] screen.

Dia-illumination lamp control:
D (Disabled: Cannot be controlled by
DS-L3)/
E (Enabled: Can be controlled by DS-L3)

EPI/DIA/AUX motorized shutter:
O (shutter open)/C (shutter closed)

Camera control screen

Switches the displayed
content.



Epi-fluorescence cube turret in 1st layer:
Filter cube name,
O (shutter open)/C (shutter closed)

Nosepiece:

Objective series name
(brevity code),
magnification/numerical
aperture, immersion

Closes the [MICROSCOPE
INFORMATION] screen.

EPI/DIA/AUX motorized shutter:
O (shutter open)/C (shutter closed)

HG precentered fiber illuminator:
ND, O (shutter open)/
C (shutter closed)

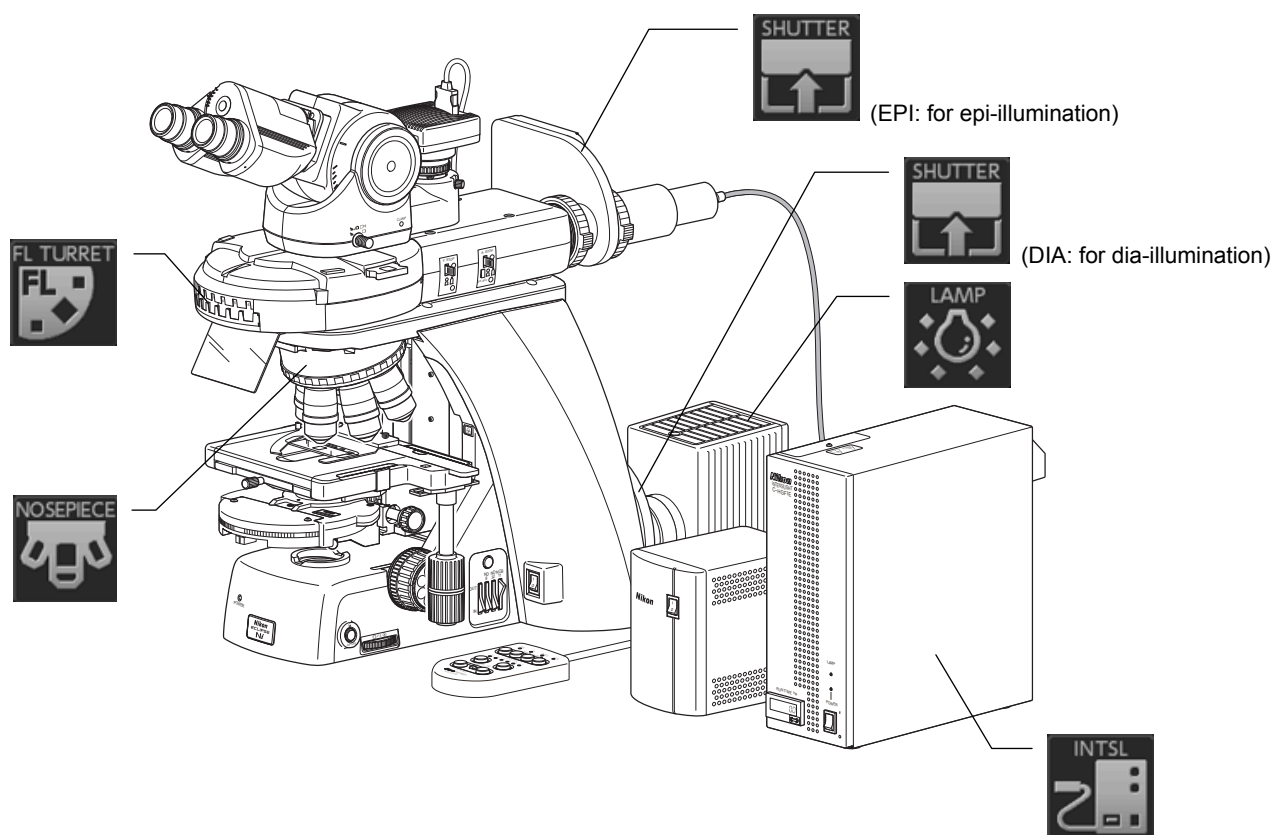
Dia-illumination lamp:
ON/OFF






4.4 Microscope Operation Buttons (Ni-U)
















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










[MICROSCOPE CONTROL] and [CAM-MIC CONTROL] screens only show buttons for devices operable from the DS-L3. 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-L3, refer to Chapter 1, "Motorized Units Operable from DS-L3".

Some buttons are not displayed by default, even if the corresponding device is operable from DS-L3. 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-L3.	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"
	 [COLOR]	Changes the background color of the [MICROSCOPE CONTROL] screen.	Chapter 5 "4 Changing the Background Color of the [MICROSCOPE CONTROL] Screen"

5

Screens for Ci-E

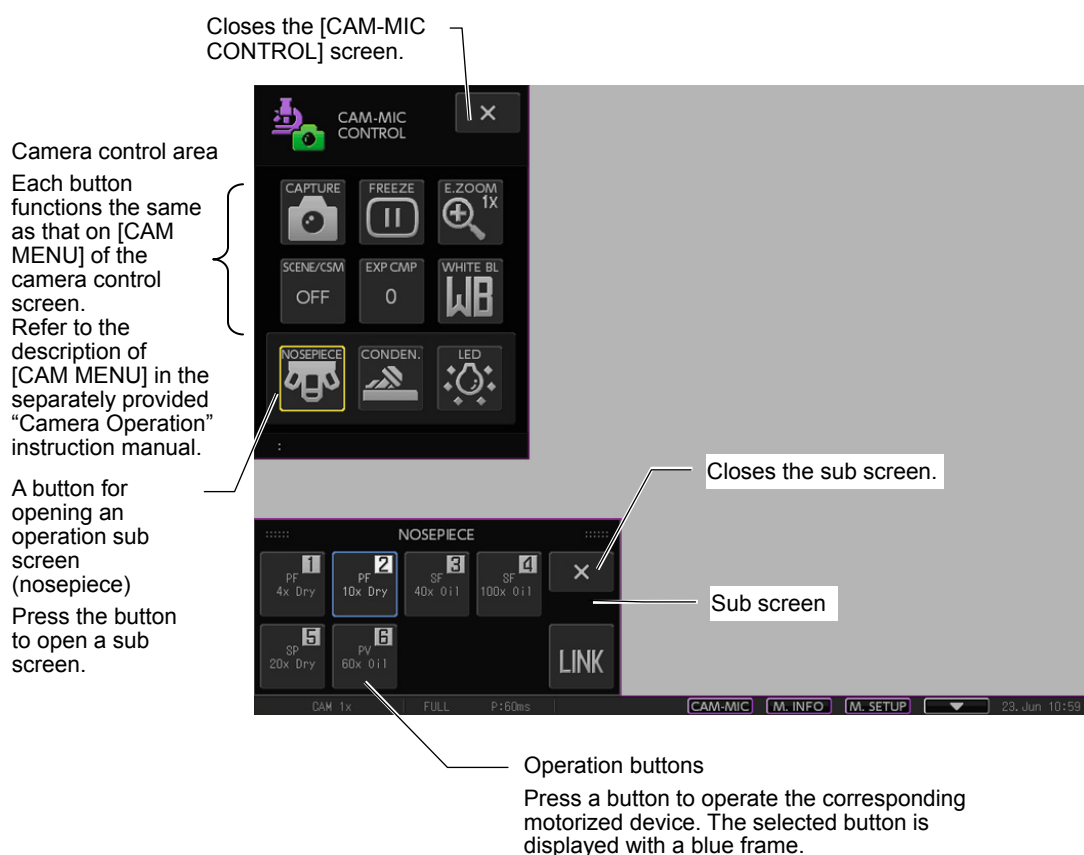
✓ The displayed content will differ depending on the configuration and settings of your microscope.

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

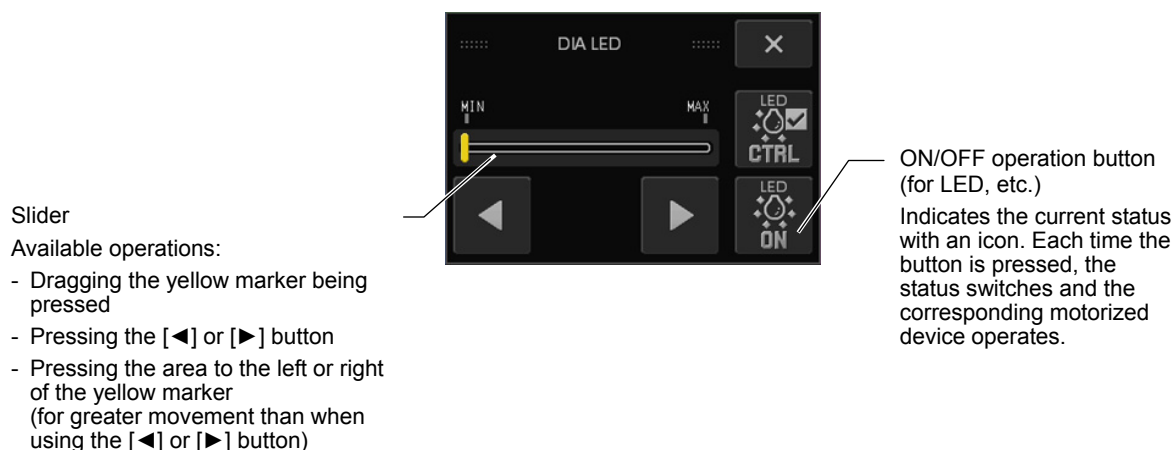
5.1

CAM-MIC CONTROL Screen (Ci-E)

The [CAM-MIC CONTROL] screen provides buttons for both camera control (upper half) and microscope control (lower half).



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



5.2

MICROSCOPE INFORMATION Screen (Ci-E)

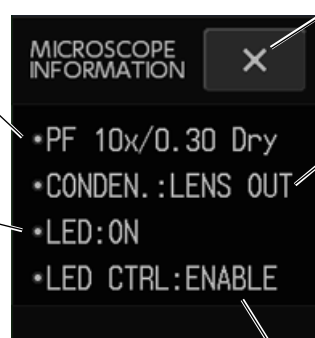
The [MICROSCOPE INFORMATION] screen displays the status of the microscope.

CAM-MIC CONTROL screen

Nosepiece:

Objective series name
(brevity code),
magnification/numerical
aperture, immersion type

Dia-illumination LED: ON/OFF



Closes the [MICROSCOPE INFORMATION] screen.

Status of the motorized swing-out
condenser's top lens:
LENS IN (lens in optical path)/
LENS OUT (lens out of optical path)

Dia-illumination LED control:
DISABLE (Cannot be controlled by DS-L3)/
ENABLE (Can be controlled by DS-L3)

Camera control screen

Nosepiece:

Objective series name (brevity
code), magnification/numerical
aperture, immersion type

Status of the motorized
swing-out condenser's top
lens:

LENS IN (lens in optical path)/
LENS OUT (lens out of optical
path)



Switches the displayed content.

Closes the [MIC INFO] screen.

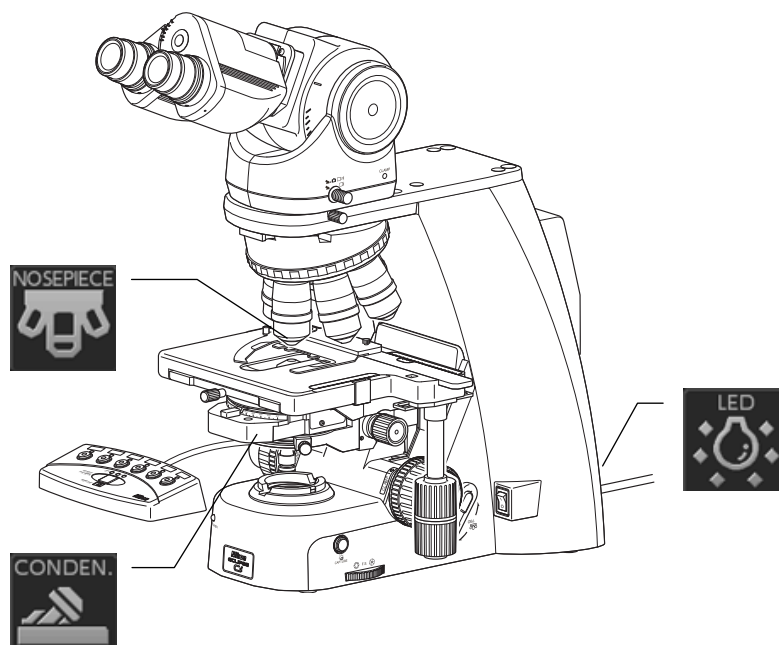
Dia-illumination LED: ON/OFF







5.3

Microscope Operation Buttons (Ci-E)

The buttons displayed on the [CAM-MIC CONTROL] 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
 [LED]	 [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 CTRL]	Transfers the control of the dia-illumination LED between the microscope and DS-L3.	Chapter 5, "1.14.1 Transferring the Control of the Dia-illumination Lamp/LED"
 [LED]	-	Adjusts the brightness of the dia-illumination LED.	Chapter 5, "1.14.3 Adjusting the Brightness of the Dia-illumination Lamp/LED"
	 [LED ON/OFF]	Turns the dia-illumination LED ON/OFF.	Chapter 5, "1.14.2 Turning the Dia-illumination Lamp/LED ON/OFF"

This chapter describes various settings required for using DS-L3 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-L3 screen.

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

After making changes to the settings, be sure to press the [SAVE] button on the [SETUP MENU] - [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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".

[SETUP MENU]→[COMPONENTS]

- (1) Select the [NOSEPIECE] tab.
- (2) Press the nosepiece address button to be configured.
- (3) Select the [SERIES], [MAG.], and [DETAIL] for the attached objective, then press the [OK] button.
When an appropriate objective is not on the list, you can register any objective by pressing the [OPTIONAL] 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".

[SETUP MENU]→[COMPONENTS]

- (1) Select the [CONDEN.] tab.
- (2) Press the turret address button to be configured.
- (3) Select the attached condenser module, and press the [OK] button.
When an appropriate condenser module is not on the list, you can register any module by pressing the [OPTIONAL] 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”.

[SETUP MENU]→[COMPONENTS]

- (1) **Select the [FL TURRET] tab (or the [FL 2nd] tab for the second turret).**
- (2) **Press the turret address button to be configured.**
- (3) **Select the attached filter cube, and press the [OK] button.**
When an appropriate filter cube is not on the list, you can register any filter cube by pressing the [OPTIONAL] 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”.

[SETUP MENU]→[COMPONENTS]

- (1) **Select the [EX WHEEL] or [BA WHEEL] tab.**
- (2) **Press the turret address button to be configured.**
- (3) **Select the attached excitation/barrier filter, and press the [OK] button.**
When an appropriate filter is not on the list, you can register any filter by pressing the [OPTIONAL] 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 camera control unit 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 head directly connected to this DS-L3 by pressing the [CAPTURE] button on the camera control screen.

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

[Procedure]

[SETUP MENU] → [CONNECTION]

- (1) **Press the button for the DSC connector to be configured.**
A sub screen for selecting the digital camera position appears.
- (2) **Select [NOT-CONNECTED] if no camera is connected, otherwise select the position.**
- (3) **Select the camera manufacturer.**
- (4) **Repeat steps (2) and (3) when you use two DSC connectors on Ni-E.**

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

After making changes to the settings, be sure to press the [SAVE] button on the [SETUP MENU] - [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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 [SETUP MENU], be sure to press the [SAVE] button on the [SETUP MENU] - [MENU] screen to save the settings to the microscope's memory. If the DS-L3 is turned off without saving settings, previous values are restored.

- (1) **After changing a setting, press the [<<MAIN] button to go back to the [SETUP MENU] - [MAIN] screen.**
- (2) **Press the [SAVE] button.**
A confirmation dialog box appears.
If there is no setting data to be saved, the [SAVE] button is disabled.
- (3) **Press the [YES] button.**
The settings are saved.

To cancel saving, press the [NO] button.

Pressing the [X] button on the upper-right of the screen closes the [SETUP MENU].

✓ Settings to be saved

Pressing 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 DS-L3 is turned off).

This chapter describes the microscopy operation procedures for DS-L3, 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.

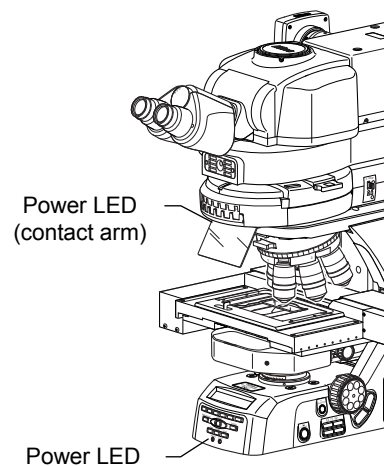
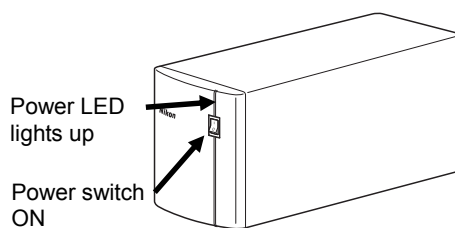
- DS-L3 DS Camera Control Unit (with camera head connected)
- NI-TT-E Motorized Quadrocular Tilting Tube
- NI-RPZ-E Motorized DSC Zooming Port for Quadrocular Tube (with the above camera head connected to the camera port)
- NI-N7-E Motorized Septuple Nosepiece (with configuration completed for the attached 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-L3) 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.



✓ Power ON display

When the power is turned on, operation progress is displayed on the front display panel of the microscope main body.

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

```
Ni-E Ux.xx-xxxx.xx
Data Loading...
```

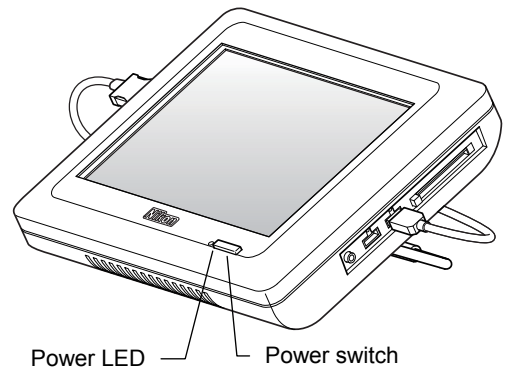
Top: Model name, firmware version
Bottom: Program startup progress

```
Ni-E Ux.xx-xxxx.xx
Initializing.....
```

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

2 Press the power switch of DS-L3 to turn on the unit.

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



3 Switch DS-L3 to the [MICROSCOPE CONTROL] screen.

Press the [▼] button on the DS-L3 screen to switch to the top screen for microscope control, then press the [MIC] button to switch to the [MICROSCOPE CONTROL] screen.

4 Turn on the dia-illumination lamp and adjust the brightness.

- (1) Press the [LAMP CTRL] button on the DS-L3 screen to control the dia-illumination lamp from DS-L3.



When DS-L3 has control



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



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



✓ For improved color reproduction

Press 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.

Press the [BINO] button on the DS-L3 screen.

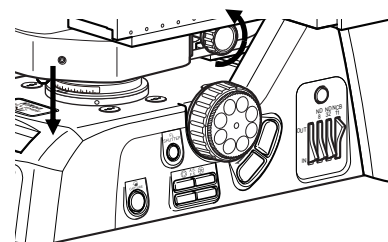
Three buttons are provided for switching the optical path in the tube. The button for the currently selected optical path is shown with a blue frame.

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



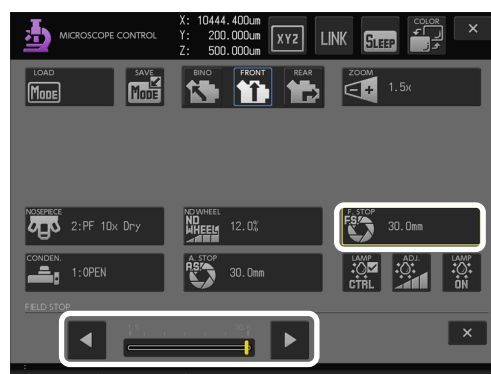
6 Lower the condenser slightly from the uppermost position.

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) Press the [F. STOP] button on the DS-L3 screen to open the sub screen. Move the slider to the right end.

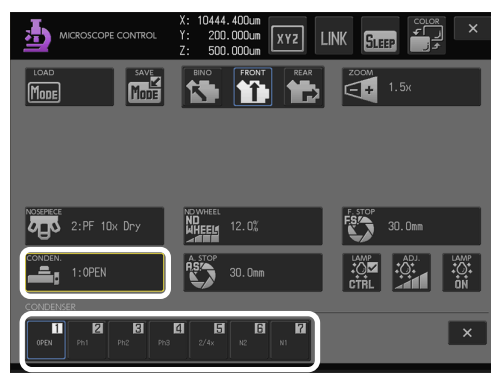


- (2) Press the [A. STOP] button on the DS-L3 screen to open the sub screen. Move the slider to the right end.



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

Press the [CONDEN.] button on the DS-L3 screen to open the sub screen. Select [OPEN].



9 Bring the 10x objective into the optical path.

Press the [NOSEPIECE] button on the DS-L3 screen to open the sub screen. Select a 10x objective.

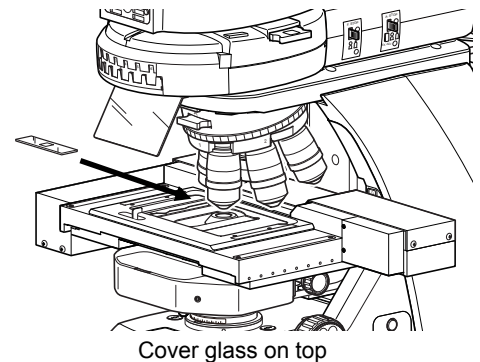


10 Place a specimen on the stage, and move the stage to bring the target into view.

- (1) Press the [XYZ] button on the DS-L3 screen to open the sub screen. Press the [Specimen Removal Position] button to move the stage.



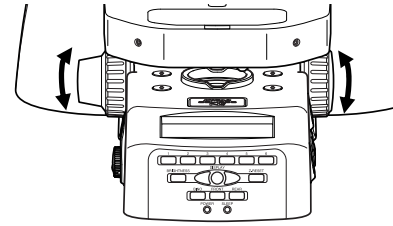
- (2) Open the claw of the specimen holder's moving part and place the specimen onto the stage, gently stowing the claw back to fix the specimen.



- (3) Press 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.

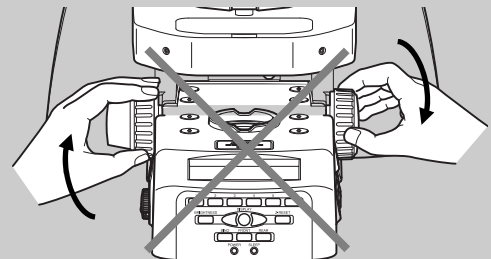


Z-axis coordinate



! 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.

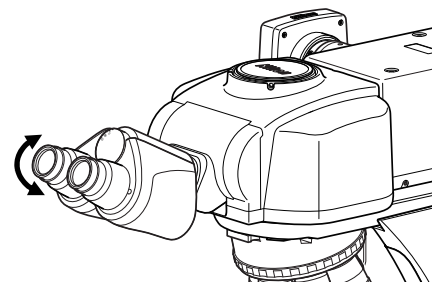
✓ Zero resetting the Z-axis coordinate

Press 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.



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.

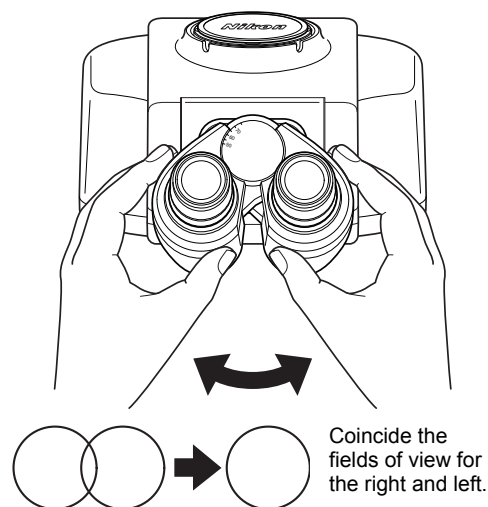


13 Adjust the interpupillary distance.

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.

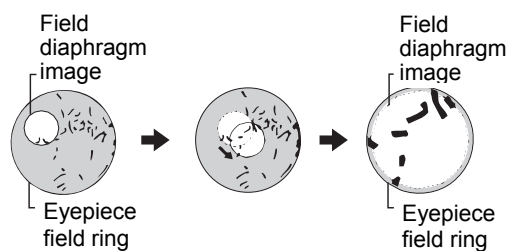
✓ Tip on adjusting the interpupillary distance

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



14 Focus and center the condenser.

- (1) Press the [F. STOP] button on the DS-L3 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) Press 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.

Press the [NOSEPIECE] button on the DS-L3 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.

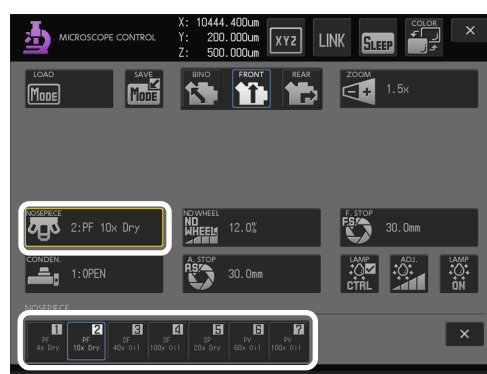
- Retraction of the Ni-E microscope's elevating section and its restoration after switching of the objective that follows
- Aperture diaphragm adjustment on the motorized universal condenser
- DIA field diaphragm adjustment on the Ni-E microscope main body
- ND filter transmittance adjustment on the 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.

Press the [A. STOP] button on the DS-L3 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

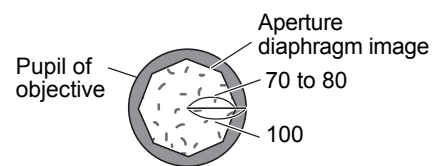
In this case, the diaphragm diameter to set the aperture diaphragm of the condenser to 70% can be determined as follows:

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

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



Aperture diaphragm viewed with a centering telescope



Plan 40X

40x / 0.75

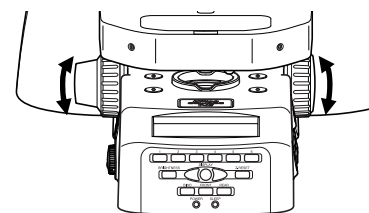
∞ / -WD



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.

Press the [F. STOP] button on the DS-L3 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.

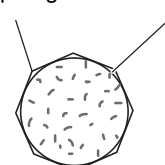
✓ Adjustment timing for the field diaphragm

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

Press the [ND WHEEL] button on the DS-L3 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) Press the [REAR] button on the DS-L3 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) Press the [CAM-MIC] button to switch to the [CAM-MIC CONTROL] screen, which allows the microscope to be operated while viewing images captured by the camera.
- (3) Press 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) Press the [CAPTURE] button to capture an image. Use the buttons in the upper half of the [CAM-MIC CONTROL] screen to configure the camera settings as necessary. (To configure with more details, press the [▼] button to switch to the camera control screen and change the configuration.)

✓ Capture operation available on DS-L3

DS-L3 offers two capturing operations, each with differing operation methods.

- Capture operation of digital camera directly controlled by this DS-L3 (operation in this procedure)
- 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-L3 by pressing its 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-L3 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-L3. 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-L3, refer to Chapter 1, “Motorized Units Operable from DS-L3”.

The button layout on the [MICROSCOPE CONTROL] and [CAM-MIC CONTROL] 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

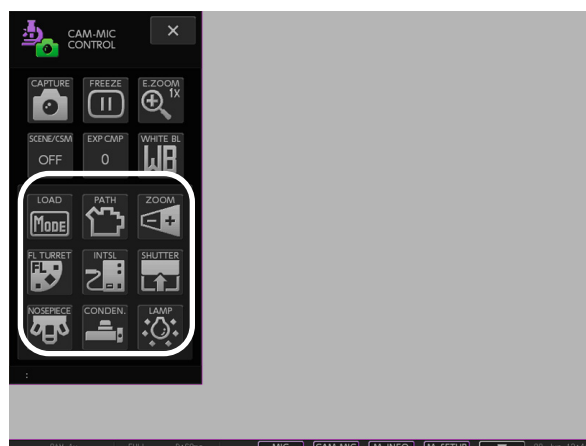
Operating Motorized Devices

Motorized devices can be operated from the [MICROSCOPE CONTROL] screen or the lower half of the [CAM-MIC CONTROL] screen.

[MICROSCOPE CONTROL] Screen
(Displayed with [MIC] button on taskbar)



[CAM-MIC CONTROL] Screen
(Displayed with [CAM-MIC] button on taskbar)



1.1

Switching the Objective (Motorized Nosepiece)

Ni-E

Ni-U

Ci-E

To switch the objective by rotating the motorized nosepiece, use the [NOSEPIECE] button or the [Objective (Address)] buttons.

✓ **Prerequisite for motorized operation**

In order to switch the objective from DS-L3, a motorized nosepiece must be attached to the microscope. When an intelligent nosepiece is attached, while the objective information will be displayed, you will not be able to switch the objective from DS-L3. The following operations cannot be performed if neither a motorized nosepiece nor an intelligent nosepiece is attached.

Operation with the [NOSEPIECE] Button

Display Status of the [NOSEPIECE] Button

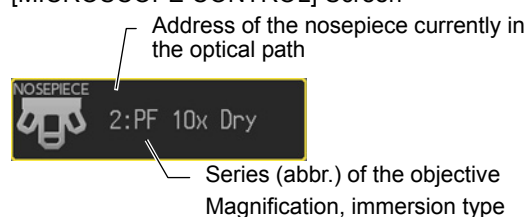
	[MICROSCOPE CONTROL] Screen	[CAM-MIC CONTROL] Screen
Ni-E	Displayed by default	Displayed by default
Ni-U	Can be displayed by setting	Displayed by default
Ci-E	-	Displayed (cannot be changed)

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

[Procedure]

- (1) Press the [NOSEPIECE] button.

[MICROSCOPE CONTROL] Screen



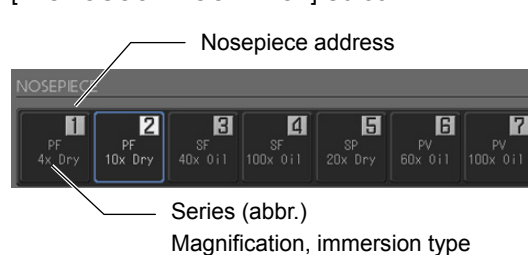
[CAM-MIC CONTROL] Screen



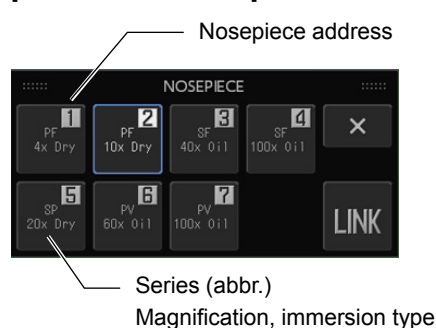
- (2) Press the button for the objective to be used.

The objective is switched. The button for the currently selected objective is shown with a blue frame.

[MICROSCOPE CONTROL] Screen



[CAM-MIC CONTROL] Screen



Direct Operation with [Objective (Address)] Buttons

Display Status of [Objective (Address)] Buttons

	[MICROSCOPE CONTROL] Screen	[CAM-MIC CONTROL] 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

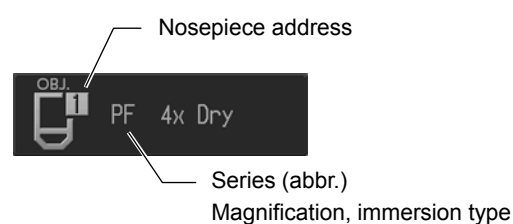
(For details on displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”.)

[Procedure]

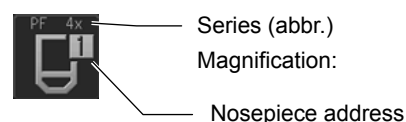
Press an [Objective (Address)] button.

The objective is switched. The button for the currently selected objective is shown with a blue frame.

[MICROSCOPE CONTROL] Screen



[CAM-MIC CONTROL] 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)”.

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



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	[CAM-MIC CONTROL] 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]

- Press the [PATH] button.**
(This operation is not necessary on [MICROSCOPE CONTROL] screen. Go to the next step.)
- Press the button for the optical path ([BINO]: binocular section/[FRONT]: tube adapter/[REAR]: rear port) to be used.**

The optical path is switched. The button for the currently selected optical path is shown with a blue frame.

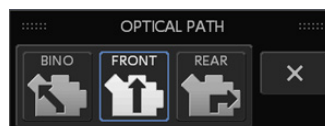
[CAM-MIC CONTROL] Screen



[MICROSCOPE CONTROL] Screen



[CAM-MIC CONTROL] 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”. Press 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	[CAM-MIC CONTROL] Screen
Ni-E	Displayed by default	Displayed by default

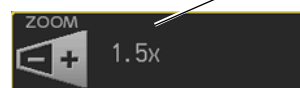
(For details on displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”.)

[Procedure]

(1) Press the [ZOOM] button.

[MICROSCOPE CONTROL] Screen

Current zoom magnification



[CAM-MIC CONTROL] Screen

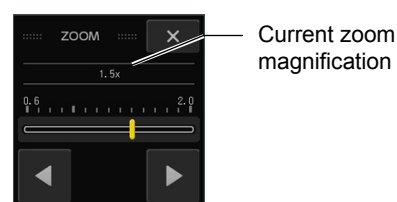


(2) Move the slider to adjust the zoom magnification.

[MICROSCOPE CONTROL] Screen



[CAM-MIC CONTROL] Screen



✓ **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”. Press 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-L3, 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	[CAM-MIC CONTROL] 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	[CAM-MIC CONTROL] 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) Press the [FL TURRET] button.

[MICROSCOPE CONTROL] Screen

Address of the turret currently in the optical path



Filter cube

[CAM-MIC CONTROL] Screen



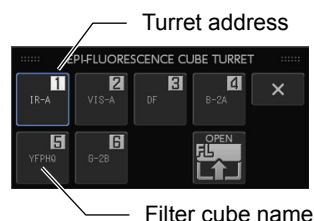
(2) Press the button for the filter cube to be used.

The filter cube is switched. The button for the currently selected filter cube is shown with a blue frame.

[MICROSCOPE CONTROL] Screen



[CAM-MIC CONTROL] 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	[CAM-MIC CONTROL] 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)

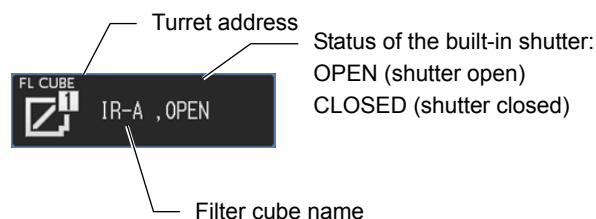
	[MICROSCOPE CONTROL] Screen	[CAM-MIC CONTROL] Screen
Ni-E	Can be displayed by setting	Can be displayed by setting

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

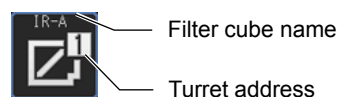
[Procedure]**Press a [Filter Cube (Address)] button.**

The filter cube is switched. The button for the currently selected filter cube is shown with a blue frame.

[MICROSCOPE CONTROL] Screen



[CAM-MIC CONTROL] 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-L3, 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	[CAM-MIC CONTROL] 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	[CAM-MIC CONTROL] 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) Press the [FL TURRET] or [SHUTTER] button.
(This operation is not required if the [SHUTTER FL] button is already displayed. Go to the next step.)

[CAM-MIC CONTROL] Screen



- (2) Press the [SHUTTER FL] button.

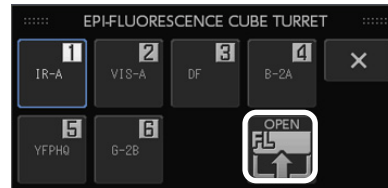
The shutter opens or closes each time the button is pressed.

[MICROSCOPE CONTROL] Screen

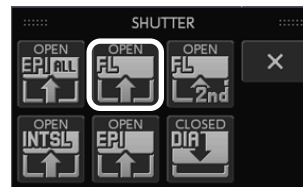


[CAM-MIC CONTROL] Screen

(Sub screen of the [FL TURRET] button)



(Sub screen of the [SHUTTER] button)



When the shutter is open



When the shutter is closed



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	[CAM-MIC CONTROL] 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) Press the [SHUTTER] button.

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

Press the [SHUTTER EPI ALL] button to open/close the shutters.

[CAM-MIC CONTROL] Screen



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

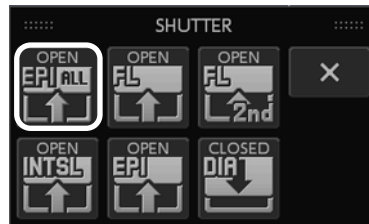
All epi-illumination shutters open or close each time the [SHUTTER EPI ALL] button is pressed.

[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.

[CAM-MIC CONTROL] Screen



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

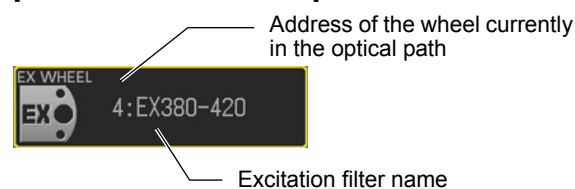
	[MICROSCOPE CONTROL] Screen	[CAM-MIC CONTROL] Screen
Ni-E	Displayed by default	Can be displayed by setting

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

[Procedure]

- (1) Press the [EX WHEEL] button.

[MICROSCOPE CONTROL] Screen



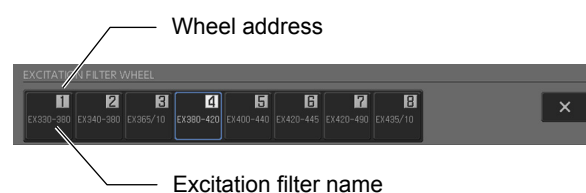
[CAM-MIC CONTROL] Screen



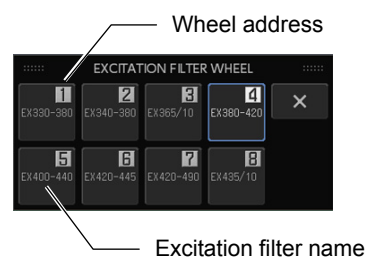
(2) Press the button for the excitation filter to be used.

The excitation filter is switched. The button for the currently selected excitation filter is shown with a blue frame.

[MICROSCOPE CONTROL] Screen



[CAM-MIC CONTROL] Screen



Direct Operation with [Excitation Filter (Address)] Buttons

Display Status of [Excitation Filter (Address)] Buttons

	[MICROSCOPE CONTROL] Screen	[CAM-MIC CONTROL] 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]

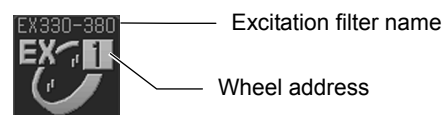
Press an [Excitation Filter (Address)] button.

The excitation filter is switched. The button for the currently selected excitation filter is shown with a blue frame.

[MICROSCOPE CONTROL] Screen



[CAM-MIC CONTROL] 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

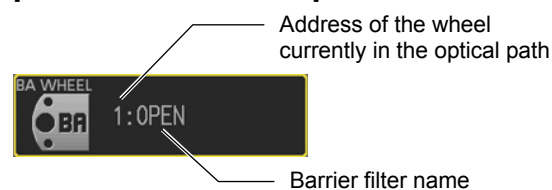
	[MICROSCOPE CONTROL] Screen	[CAM-MIC CONTROL] Screen
Ni-E	Displayed by default	Can be displayed by setting

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

[Procedure]

- (1) Press the [BA WHEEL] button.

[MICROSCOPE CONTROL] Screen



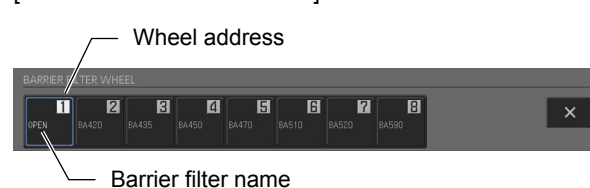
[CAM-MIC CONTROL] Screen



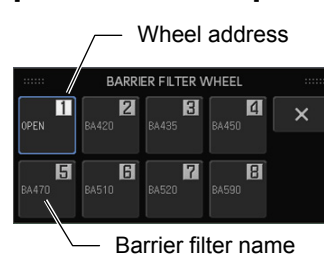
- (2) Press the button for the barrier filter to be used.

The barrier filter is switched. The button for the currently selected barrier filter is shown with a blue frame.

[MICROSCOPE CONTROL] Screen



[CAM-MIC CONTROL] Screen



Direct Operation with [Barrier Filter (Address)] Buttons

Display Status of [Barrier Filter (Address)] Buttons

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

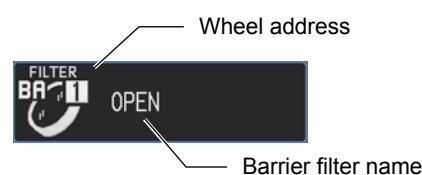
(For details on displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”.)

[Procedure]

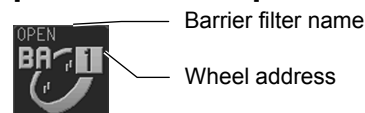
Press a [Barrier Filter (Address)] button.

The barrier filter is switched. The button for the currently selected barrier filter is shown with a blue frame.

[MICROSCOPE CONTROL] Screen



[CAM-MIC CONTROL] Screen



1.9

Switching the Condenser Module (Motorized Universal Condenser)

Ni-E

To switch the condenser module in the motorized universal condenser, press 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

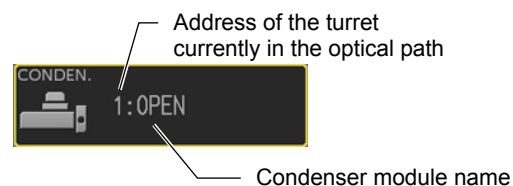
	[MICROSCOPE CONTROL] Screen	[CAM-MIC CONTROL] Screen
Ni-E	Displayed by default	Displayed by default

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

[Procedure]

- (1) Press the [CONDEN.] button.

[MICROSCOPE CONTROL] Screen



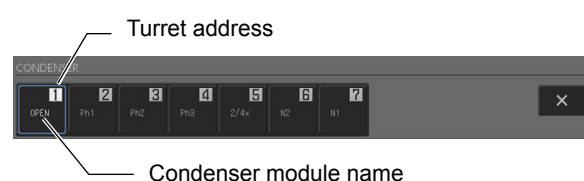
[CAM-MIC CONTROL] Screen



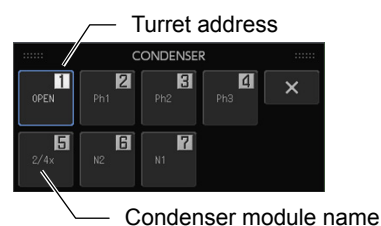
- (2) Press the button for the condenser module to be used.

The condenser module is switched. The button for the currently selected condenser module is shown with a blue frame.

[MICROSCOPE CONTROL] Screen



[CAM-MIC CONTROL] Screen



Direct Operation with [Condenser Module (Address)] Buttons

Display Status of [Condenser Module (Address)] Buttons

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

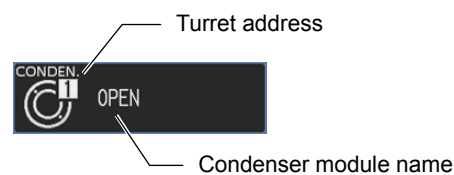
(For details on displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”.)

[Procedure]

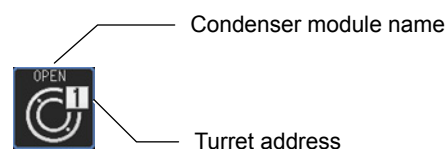
Press the **[Condenser Module (Address)]** button.

The condenser module is switched. The button for the currently selected condenser module is shown with a blue frame.

[MICROSCOPE CONTROL] Screen



[CAM-MIC CONTROL] 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

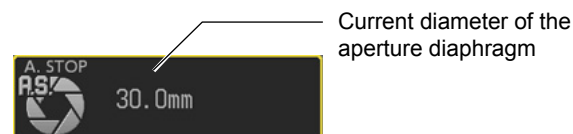
	[MICROSCOPE CONTROL] Screen	[CAM-MIC CONTROL] Screen
Ni-E	Displayed by default	Can be displayed by setting

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

[Procedure]

(1) Press the **[A. STOP]** button.

[MICROSCOPE CONTROL] Screen



[CAM-MIC CONTROL] Screen



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

[MICROSCOPE CONTROL] Screen



[CAM-MIC CONTROL] Screen



Current 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	[CAM-MIC CONTROL] Screen
Ci-E	-	Displayed (cannot be changed)

[Procedure]

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

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

[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	[CAM-MIC CONTROL] 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) Press the [INTSL] or [SHUTTER] button.
(This operation is not required if the [SHUTTER INTSL] button is already displayed. Go to the next step.)

[CAM-MIC CONTROL] Screen



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

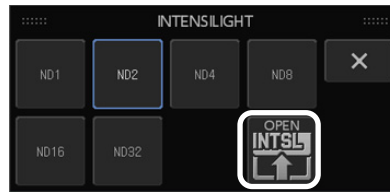
The shutter opens or closes each time the button is pressed.

[MICROSCOPE CONTROL] Screen

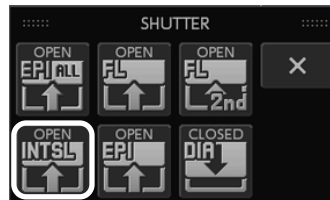


[CAM-MIC CONTROL] Screen

(Sub screen of the [INTSL] button)



(Sub screen of the [SHUTTER] button)



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	[CAM-MIC CONTROL] 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) Press the [INTSL] button.

[MICROSCOPE CONTROL] Screen



[CAM-MIC CONTROL] Screen



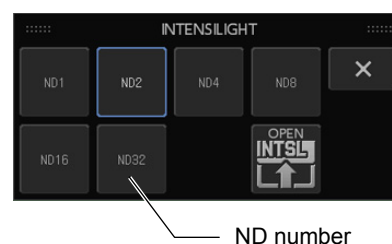
- (2) Press the button for the ND to be used.

The ND is switched. The button for the currently selected ND is shown with a blue frame.

[MICROSCOPE CONTROL] Screen



[CAM-MIC CONTROL] Screen



Direct Operation with [Intensilight (ND number)] Buttons

Display Status of [Intensilight (ND number)] Buttons

	[MICROSCOPE CONTROL] Screen	[CAM-MIC CONTROL] 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

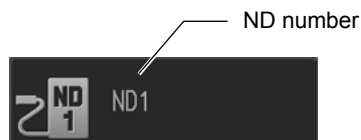
(For details on displaying/hiding the buttons, refer to Chapter 6, “4.1.1 Selecting the Buttons to be Displayed”.)

[Procedure]

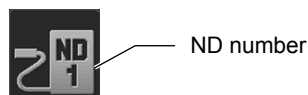
Press an [Intensilight (ND number)] button.

The ND is switched. The button for the currently selected ND is shown with a blue frame.

[MICROSCOPE CONTROL] Screen



[CAM-MIC CONTROL] 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

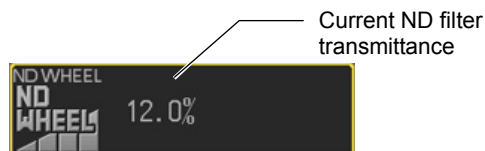
	[MICROSCOPE CONTROL] Screen	[CAM-MIC CONTROL] Screen
Ni-E	Displayed by default	Can be displayed by setting

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

[Procedure]

(1) Press the [ND WHEEL] button.

[MICROSCOPE CONTROL] Screen



[CAM-MIC CONTROL] Screen

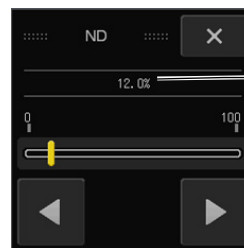


(2) Move the slider to adjust the transmittance.

[MICROSCOPE CONTROL] Screen



[CAM-MIC CONTROL] Screen



Current ND filter
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-L3, you must first transfer the control from the microscope to DS-L3. If DS-L3 does not have control, the button will be grayed out and disabled. When DS-L3 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	[CAM-MIC CONTROL] 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) Press 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) Press the [LAMP CTRL]/[LED CTRL] button to transfer the control.

The control is transferred between DS-L3 and the microscope each time the [LAMP CTRL]/[LED CTRL] button is pressed.

[CAM-MIC CONTROL] Screen



[MICROSCOPE CONTROL] Screen



[CAM-MIC CONTROL] Screen



When DS-L3 does not have control



When DS-L3 has control



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

[Procedure]

- (1) Press 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) Press 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 pressed.
(DS-L3 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”.)

[CAM-MIC CONTROL] Screen



[MICROSCOPE CONTROL] Screen



[CAM-MIC CONTROL] Screen



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

[Procedure]

- (1) (For [MICROSCOPE CONTROL] screen)
Press the [ADJ.] button.
(For [CAM-MIC CONTROL] screen)
Press the [LAMP]/[LED] button.

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

[MICROSCOPE CONTROL] Screen



[CAM-MIC CONTROL] Screen



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

(DS-L3 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



[CAM-MIC CONTROL] Screen



✓ **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, press 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

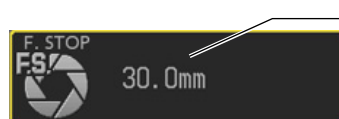
	[MICROSCOPE CONTROL] Screen	[CAM-MIC CONTROL] Screen
Ni-E	Displayed by default	Displayed by default

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

[Procedure]

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

[MICROSCOPE CONTROL] Screen



Current diameter of the field diaphragm

[CAM-MIC CONTROL] Screen

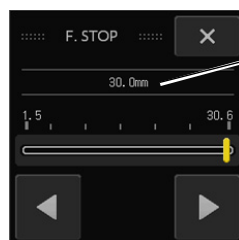


- (2) Move the slider to adjust the diameter of the field diaphragm.

[MICROSCOPE CONTROL] Screen



[CAM-MIC CONTROL] Screen



Current diameter of the field diaphragm

1.16

Opening/Closing the EPI/DIA/AUX Motorized Shutter

Ni-E

Ni-U

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	[CAM-MIC CONTROL] 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) Press the [SHUTTER] button.

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

[CAM-MIC CONTROL] Screen



- (2) Press 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 pressed.

When the shutter is open



When the shutter is closed



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

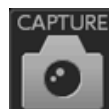
The following procedure requires configuration of the digital camera connected to the DSC connector. Refer to Chapter 6, “3.1 Configuring the Connection of Digital Camera”.

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

✔ Two capture operations possible from the DS-L3

Two different capture operations are possible from the DS-L3.

- 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 [CAM-MIC CONTROL] screen. Pressing these buttons outputs the capture trigger signal via the DSC connector (DSC1 or DSC2 connector on Ni-E), instructing the connected camera control unit to capture an image. This operation requires configuration on the [CONNECTION] screen. (If the camera trigger cable from the DSC connector of the microscope is connected to the DS-L3, the DS-L3 performs capturing.)
- Capturing with a digital camera directly controlled by the DS-L3 (For details, refer to the “Camera Operation” instruction manual)
Use the [CAPTURE] button at the upper left of the [CAM-MIC CONTROL] screen, or the [CAPTURE] button on the camera control screen. When you press these buttons, the camera head directly connected to this DS-L3 via a DS camera cable captures the image. You do not need to configure the connection in the [CONNECTION] screen.



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

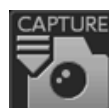
	[MICROSCOPE CONTROL] Screen	[CAM-MIC CONTROL] Screen
Ni-E	Can be displayed by setting	Can be displayed by setting (Sub screen of [CAPTURE] button displayed at the bottom of screen)
Ni-U	Can be displayed by setting	Can be displayed by setting (Sub screen of [CAPTURE] button displayed at the bottom of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

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

[Procedure]

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

[CAM-MIC CONTROL] Screen



- (2) Press 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 the [CAPTURE FRONT/LEFT/RIGHT/AUX] button on the DS-L3 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”. Press 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-L3 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	[CAM-MIC CONTROL] 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-L3 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.

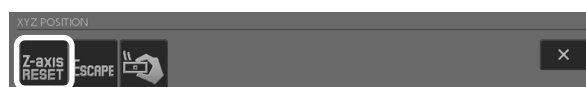
[Procedure]

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

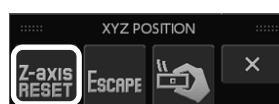
The current position of the elevating section is displayed as 0.000 μm .



[MICROSCOPE CONTROL] Screen



[CAM-MIC CONTROL] Screen



1.18.2 Retracting the Elevating Section

[Procedure]

- (1) **Press the [XYZ] button.**
(This operation is not required if the [ESCAPE] button is already displayed on the [CAM-MIC CONTROL] screen. Go to the next step.)



- (2) **Press 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.

Press 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



[CAM-MIC CONTROL] 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.

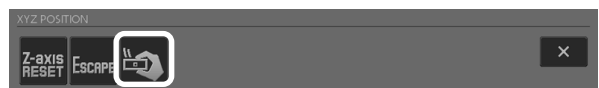
[Procedure]**(1) Press the [XYZ] button.**

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

**(2) Press 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



[CAM-MIC CONTROL] 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.

Press 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.

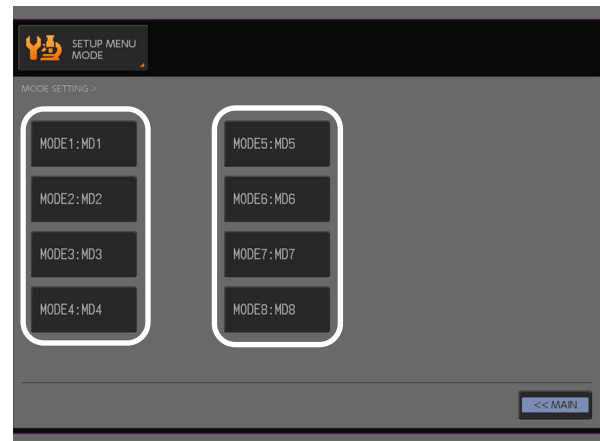
The following motorized devices can be selected.

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]

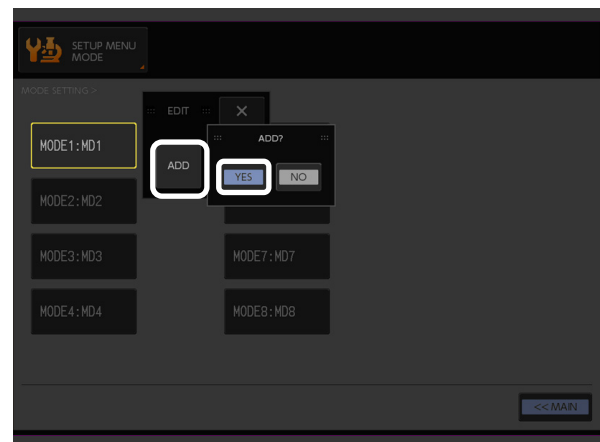
[SETUP MENU]→[MODE]

(1) Press the mode button to be used.

(2) (To register a new mode)
 Press the [ADD] button, then the [YES] button.

(To change the target motorized device of the already registered mode)
 Press the [MODIFY] button, then the [YES] button.

To cancel adding or saving, press the [NO] button.

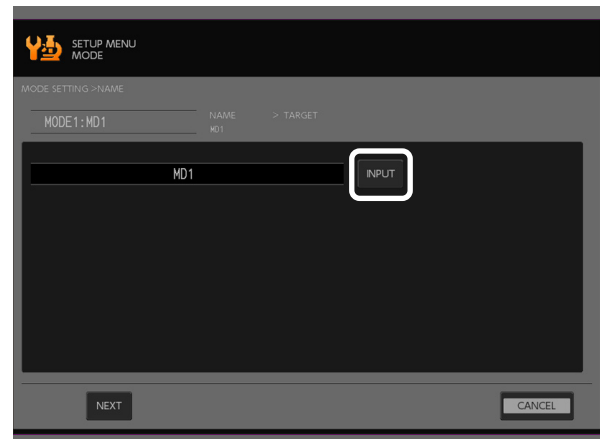


(3) Press the [INPUT] button to enter a name for the mode, and then press the [ENTER] button.

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

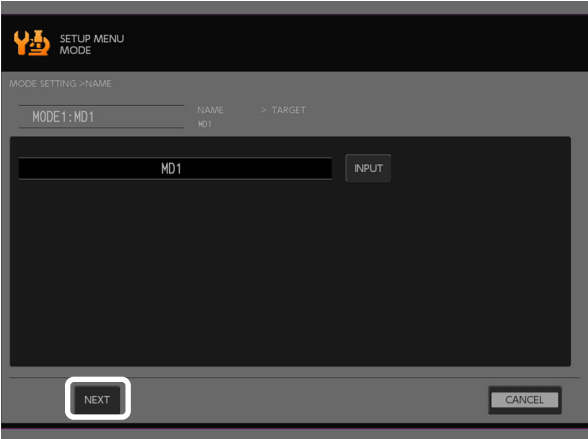
Pressing the [CLR] button clears the data you entered.
 Pressing the [BS] button removes a character at the end of the data you entered.
 Press the [SHIFT] button to switch between upper and lower case alphabets.

To quit setting, press the [CANCEL] button.





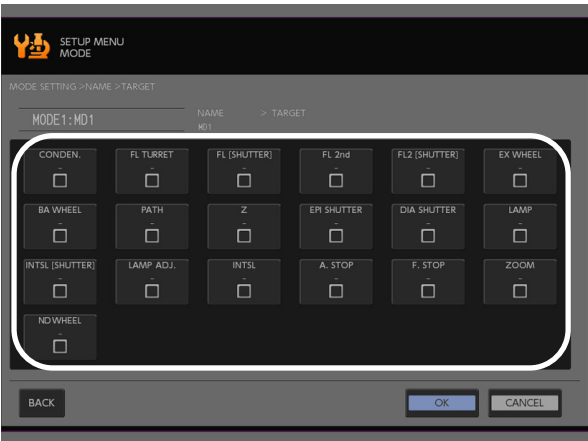
(4) Press the [NEXT] button.



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

The device is selected or unselected each time the button is pressed. The button of unattached motorized device is disabled.

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



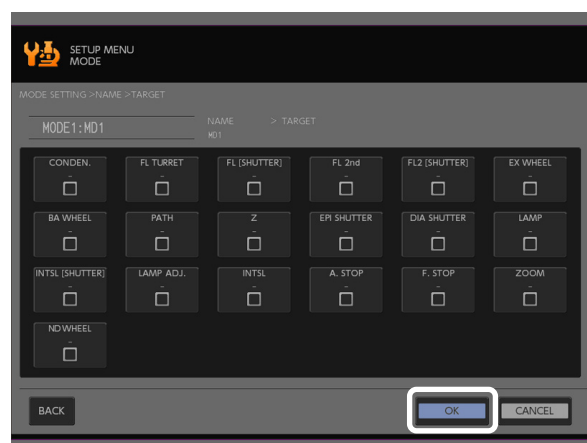
(6) Press the [OK] button.

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 press 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 press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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	[CAM-MIC CONTROL] 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) Press the [SAVE] button.



[MICROSCOPE CONTROL] Screen



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

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

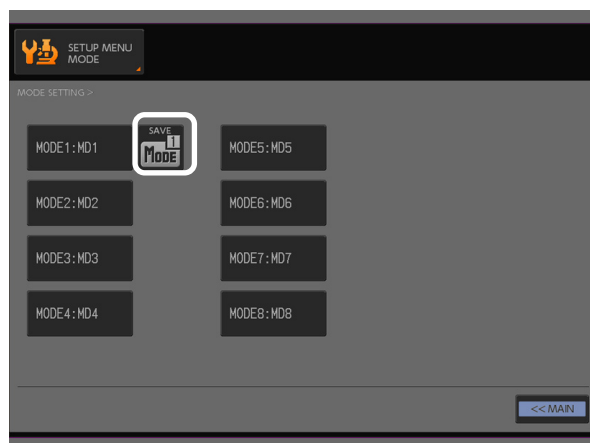
If a motorized device is placed at an inappropriate position, it will automatically be excluded.

[CAM-MIC CONTROL] Screen



✓ [SAVE] button on the [MODE] screen

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

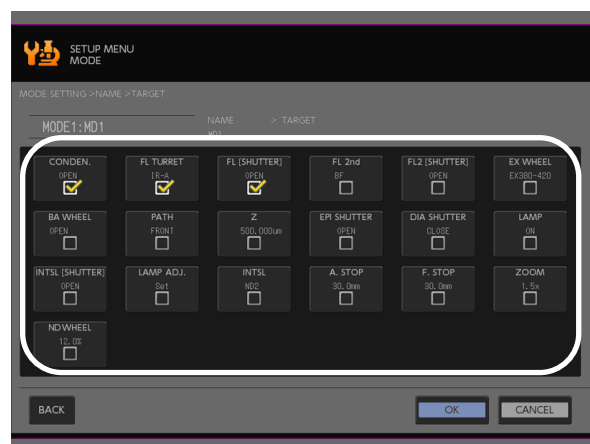


✓ Checking the saved mode

To check the state saved to a mode for a motorized device, open the selection screen of the target motorized device (Press the mode no. button on the [MODE] screen of the [SETUP MENU], press 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.

Press the [CANCEL] 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	[CAM-MIC CONTROL] 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) Press the [LOAD] button.



(2) Press the button for the mode to be restored.

The stored microscopy state is restored.

[MICROSCOPE CONTROL] Screen



[CAM-MIC CONTROL] Screen



Direct Operation with [LOAD (MODE number)] Buttons

Display Status of [LOAD (MODE number)] Buttons

	[MICROSCOPE CONTROL] Screen	[CAM-MIC CONTROL] 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]

Press 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**

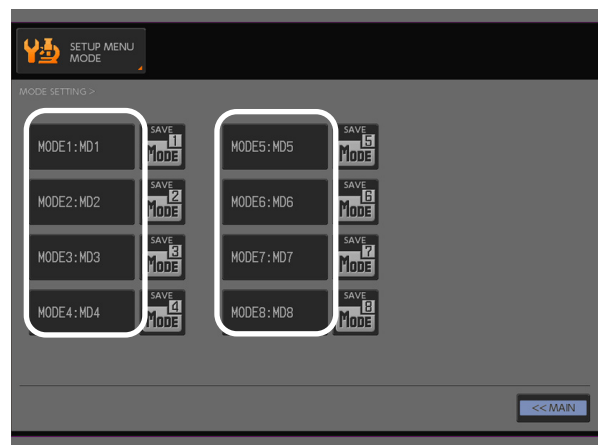
Once a mode is deleted, the device states can no longer be restored for the target devices of that mode. However, the device state data remains intact within the microscope's internal memory. For this reason, when reusing the same mode number, the mode must be overwritten by pressing the [SAVE] button 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]

[SETUP MENU] → [MODE]

- (1) Press the button for the mode to be deleted.



- (2) Press the [DELETE] button, then the [YES] button.

Mode settings are removed.

To cancel deleting, press the [NO] button.



After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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	[CAM-MIC CONTROL] 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 [CAM-MIC CONTROL] 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]**Press the [SLEEP] button.**

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

When in the normal state



When in the sleep state



4

Changing the Background Color of the [MICROSCOPE CONTROL] Screen

Ni-E

Ni-U

The background color of the [MICROSCOPE CONTROL] screen can be changed.

Select from four colors (light gray, gray, dark gray, and blue) to suit your work environment. Light gray is selected by default.

The background color setting is not saved. Once DS-L3 is turned off, it is reset to default next time DS-L3 is turned on.

Display Status of the [COLOR] Button

	[MICROSCOPE CONTROL] Screen
Ni-E	Displayed at the top of the screen (cannot be changed)
Ni-U	Displayed at the top of the screen (cannot be changed)

[Procedure]**Press the [COLOR] button.**

Each time the button is pressed, the background color cycles from light gray through gray, dark gray, and blue, and then back to light gray.



5

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

Ni-E

Touch (or click with a mouse) the live image on the DS-L3 monitor to move the motorized XY stage so that the image will be centered on the monitor.

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

5.1

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	Touching (or clicking with the mouse) on the screen to specify a position allows the motorized XY stage to move so that the position will be centered on the monitor.
	OFF (Default)	Does not allow the motorized XY stage to move according to the position specification.

[Procedure]

[SETUP MENU] → [UTILITY]

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



After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to DS-L3's memory. If the DS-L3 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)".

5.2

Operating the Motorized XY Stage with the Position Specified

Touch (or click with the mouse) a position you want to center on the screen when a live image is displayed on the screen. Conditions as shown below must be met to move the XY stage with this operation:

- **A live image must be displayed on the screen.**

This function is not available when:

- A still or replayed image is displayed or the screen is in dual-screen mode,
- An error or confirmation message is displayed,
- The Scan Large Image function is running, or
- The DS-L3 is in standby state (blank screen).

In addition to the above, this function is not available on the camera control screen when:

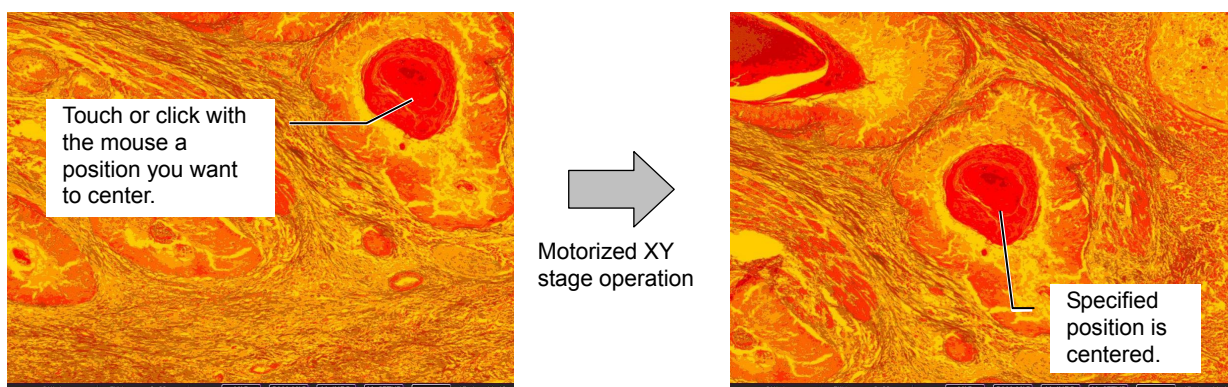
- A submenu is displayed on the [CAN MENU] screen.
- A function is selected on the [TOOLBAR] (the button of the selected function is framed in blue), or
- A setup menu for camera control operations is displayed.

- **The optical path should be set to [FRONT] or [REAR] when a motorized tilting quadrocular tube is mounted.**

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

Touching (or clicking 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 [CAM-MIC CONTROL] or [MICROSCOPE INFORMATION] screen is displayed, you can operate the XY stage by touching where the live image is displayed.

✓ Conditions for proper operation

For proper XY stage operation, calibration must be configured correctly, and the camera head 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.
- **Calibration settings have been registered.**
See Chapter 11, “11.2.4 Registering Calibration Settings” in the “Camera Operation” instruction manual for details. (Even if the [OPTICAL] calibration mode is selected so that the objective information registered on the microscope is used, enter the magnification of the relay lens and press the [SAVE] button.)
- **The camera head 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.

✔ Specifying a position near task bar buttons

Note that when touching an area close to task bar buttons ([MIC]/[CAM-MIC]/[M. INFO]/[M. SETUP]/[▼]) as a targeted position, one of those buttons may be selected. (Specifying with the mouse when the task bar button frame is yellow, one of those buttons is selected.)

Make multiple movements to target the area close to the task bar.

✔ XY stage operation in continuous shot mode

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

The Scan Large Image function is used to obtain a high resolution image of a wide field of view by capturing image data of the wide view field in divided pieces and stitching the captured image pieces together.

To use the Scan Large Image function, first check that your microscope system meets the requirement to capture and stitch images using the function. Pre-configuration is required on the DS-L3 to setup the Ni-E microscope system, and on the PC (NIS-Elements) to setup other items. In addition to pre-configuration, NIS-Elements setup is required for scan conditions and file saving options. After configurations are complete, define an area to be scanned and start the scan. NIS-Elements will run the scan.

Three operation modes are available to define a scan area (see the table below). Select the desired mode on NIS-Elements.

This instruction manual provides operation procedures and other information for two of the three operation modes, the DS-L3 mode and Ni-E mode. For information of using NIS-Elements with the DS-L3, see Chapter 14, “14.3 Accessing the DS-L3 Using NIS-Elements” in the “Camera Operation” instruction manual.

Operation Mode	Defining a Scan Area
NIS-Elements mode	Define a scan area and start the scan on NIS-Elements. For details, see NIS-Elements online help.
DS-L3 mode	Define a scan area on the image (macro image ^{*1} or live image) shown on the DS-L3 monitor, and start the scan with the DS-L3 button.
Ni-E mode	Define a scan area while observing the specimen through eyepiece of the Ni-E microscope to start the scan. You can not use the DS-L3 monitor to define a scan area or to start the scan with this mode.

^{*1} A macro image is an image captured using a low-magnification objective.

✓ Operating conditions of the Scan Large Image function

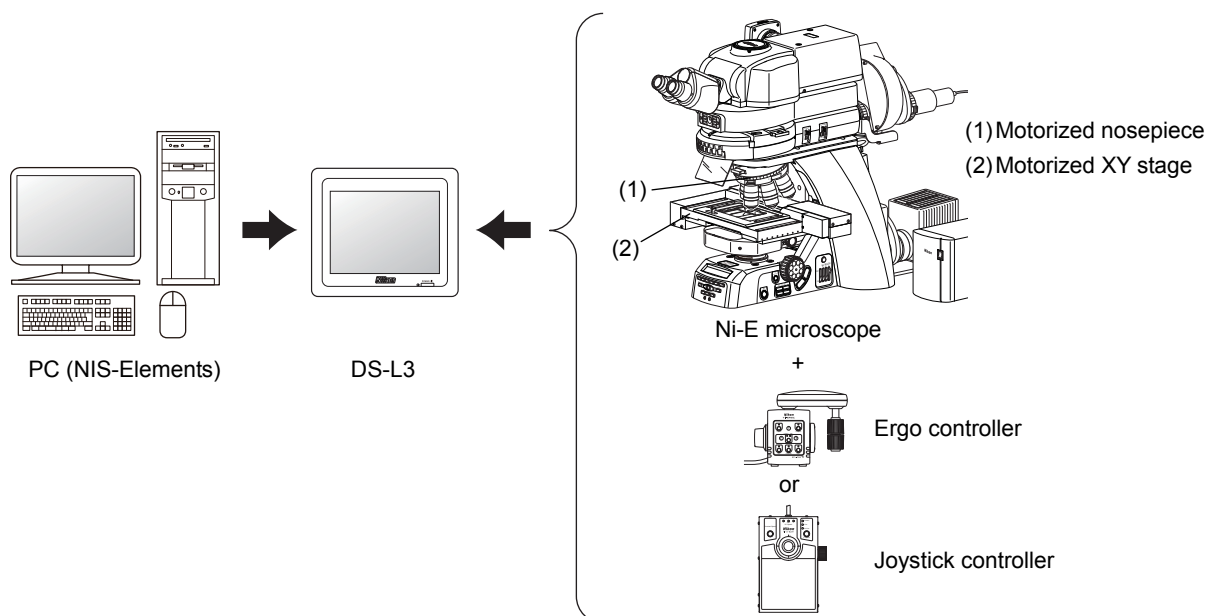
Before using the function, make sure that the following operating conditions are met.

PC environment has:

- NIS-Elements AR/BR/D (Ver.4.10 or later) installed

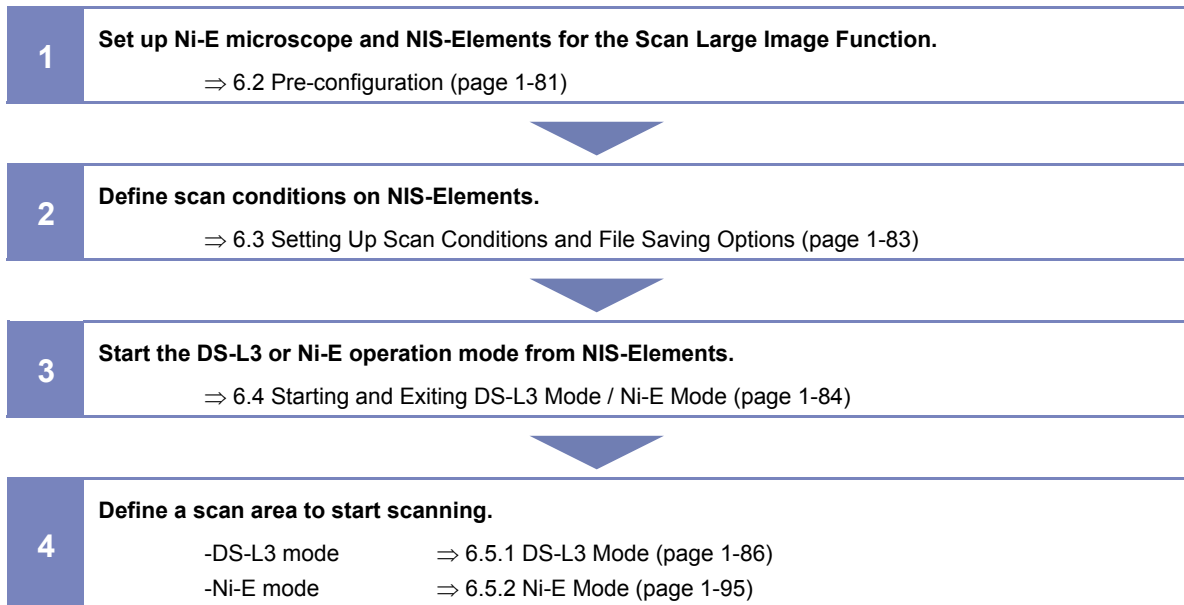
Microscope system configuration includes:

- Ni-E Microscope
- Motorized nosepiece
- Motorized XY stage
- Ergo controller or joystick controller



6.1 Operation Flow

Given below is an operation flow chart of the Scan Large Image function.



6.2 Pre-configuration

To use the Scan Large Image function, you need to perform relevant settings on DS-L3 for Ni-E microscope and other items on NIS-Elements. Read the sections below and be sure to complete setup for all the items.

6.2.1 Ni-E Microscope Settings on DS-L3

Check the setting items shown below, and complete any item that has not yet been set.

Setting Item		Setting Value	Description
Objective information		As appropriate	See Chapter 6, "2.1 Configuring the Objective Information" for details.
Parfocal correction	Focal point	As appropriate	See Chapter 6, "5.1.4 Configuring the Parfocal Correction Function (Auto Link Focus)" for details.
	ALF	ON	
Capture interlock		OFF	See Chapter 6, "5.1.7 Configuring the Interlocked Operation with Capture Command Sending or Trigger Signal Output" for details.
Software limit for the elevating section movement		As appropriate ^{*1}	See Chapter 6, "6.4.1 Configuring the Upper/Lower Limit of the Elevating Section" for details.

*1: As you use the scan large image function, objectives are automatically switched according to the configuration. With a high-magnification objective, the automatic objective switching operation can cause the objective to come into contact with the specimen. In order to prevent such contact from happening, set an upper limit value for the elevating section movement to secure a sufficient space for objective movement.

6.2.2 Settings on NIS-Elements

Start NIS-Elements to configure the following:

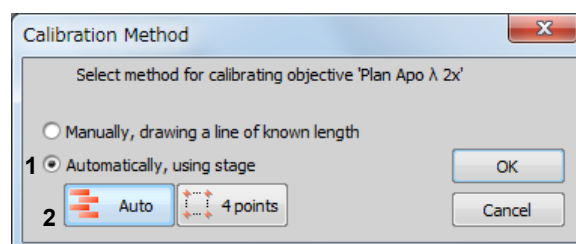
- Calibration of objectives
- Optical configuration for macro images
- Optical configuration for scan

Setting the calibration of objectives

Follow the procedure below to set the calibration of objectives to automatic.

[Procedure]

- (1) On the NIS-Elements main window, select [Recalibrate Objective ...] from the [Calibration] menu.
- (2) When the [Calibration Method] window is displayed,
 1. Select the [Automatically, using stage] option, and
 2. Click [Auto].

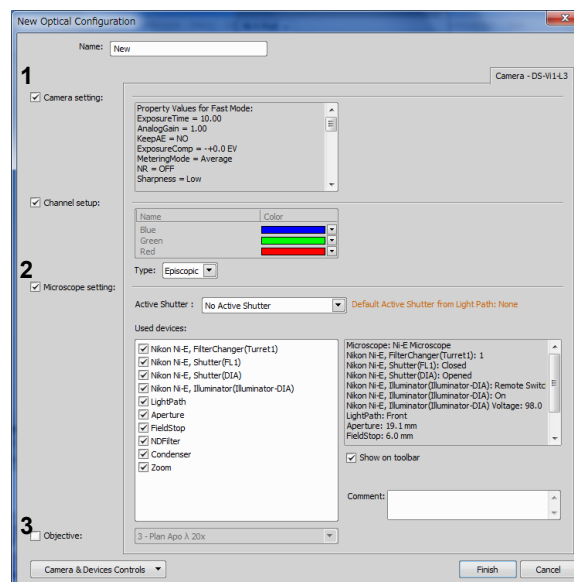


Registering optical configuration

Follow the procedure below to register the camera/microscope/objectives used for capturing macro image and scanning.

[Procedure]

- (1) On the NIS-Elements main window, select [New Optical Configuration] from the [Calibration] menu.
- (2) When the [New Optical Configuration] window is displayed, perform macro image setting as shown below.
 1. [Camera setting]
For exposure setting, select [Manual Exposure].
 2. [Microscope setting]
Optical path: Select the optical path for the camera by which a macro image is to be captured.
Others: Set up for the bright-field microscopy.
 3. [Objective]
Uncheck this checkbox.



✓ Notes on [Microscope setting]

- If the optical path is set with [Camera Light Path], make sure that your desired optical path is selected with [Acquire] > [Camera Light Path]. If an unintended optical path is set, select the optical path for the camera by which a macro image is to be captured.
- Lamp voltage setting
Set the same lamp voltage for capturing a macro image and scanning an image. If you want to change the brightness, use ND filters or adjust with the exposure time.

- (3) On the [New Optical Configuration] window, perform scan setting as shown below.
 1. [Camera setting]
For exposure setting, select [Manual Exposure].
 2. [Microscope setting]
Optical path: Select the optical path for the camera by which an image is to be scanned.
Others: Set up for the bright-field microscopy.
 3. [Objective]
Uncheck this checkbox.

6.3

Setting Up Scan Conditions and File Saving Options

To use the Scan Large Image function, you need to specify scan conditions and file saving options on NIS-Elements in addition to performing pre-configuration described in section 6.2. To setup scan conditions for items not mentioned in this manual, see NIS-Elements online help.

[Procedure]

(1) On the NIS-Elements main window, select **[Scan Large Image]** from the **[Acquire]** menu.

(2) When the **[Scan Large Image]** window is displayed, configure the settings as shown below.

1. [Capturing] area

[Macro Image]: Select an objective (a low magnification objective) and an optical configuration for capturing a macro image.

[Scanning]: Select an objective (a high magnification objective) and an optical configuration for scanning.

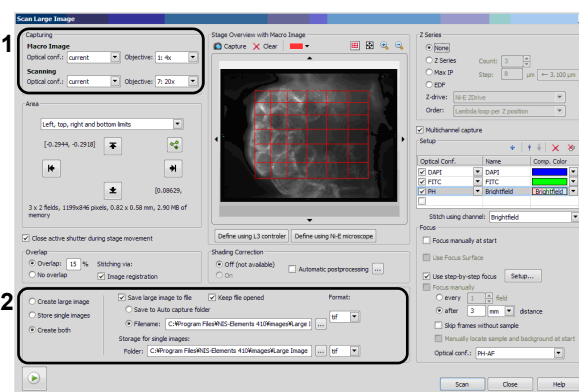
For **[Macro Image]** setting, select an optical configuration of the bright-field microscopy.

2. File save settings

Image option: Select from **[Create large image]**, **[Store single images]** or **[Create both]**.

File format: Select from the **[Format]** drop down box.

Destination: Specify a path in the **[Filename]/[Folder]** boxes.



6.4

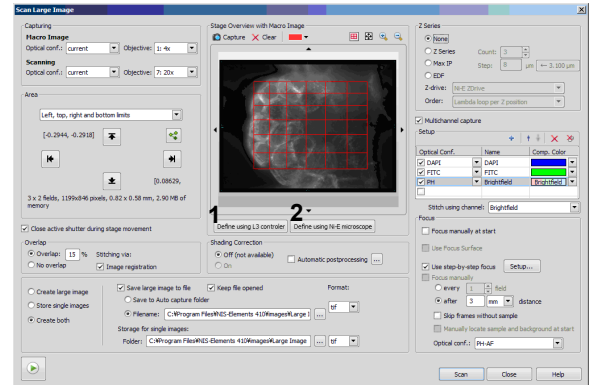
Starting and Exiting DS-L3 Mode / Ni-E Mode

You can access to DS-L3's two operation modes for the Scan Large Image function, DS-L3 mode and Ni-E mode, from NIS-Elements. To exit the operation mode, use the command button of either the DS-L3 or NIS-Elements.

[Start-up]

- (1) On NIS-Elements' [Scan Large Image] window ([Acquire] menu > [Scan Large Image]), select one of the two buttons to access to the desired operation mode.

1. [Define using L3 controller] button:
Select this to use the DS-L3 mode.
2. [Define using Ni-E microscope] button:
Select this to use the Ni-E mode.



- (2) Screen for the selected operation mode, DS-L3 or Ni-E mode, is displayed on the DS-L3 monitor.

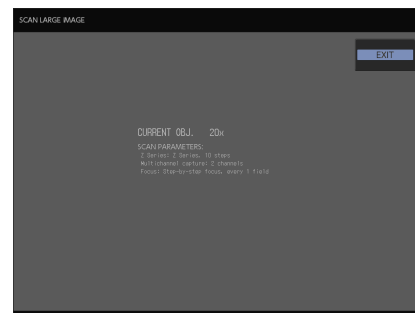
✓ **DS-L3 screen in the Ni-E mode**

In the Ni-E mode, the DS-L3 screen only displays the [EXIT] button, which is used to exit the function, and magnification information of objectives as well as scan information. You use the CAPTURE button on the microscope to define a scan area while observing through the Ni-E microscope eyepiece instead of the DS-L3 monitor.

DS-L3 mode:



Ni-E mode:



[Exit]

- (1) Press the [EXIT] button on the upper right of the DS-L3 mode or Ni-E mode screen.

DS-L3 mode screen

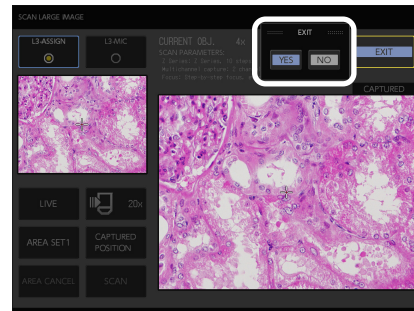


Ni-E mode screen



- (2) The [EXIT] dialog box appears. Press the [YES] button to exit the operation mode.

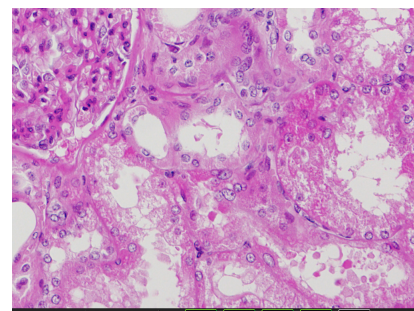
DS-L3 mode screen



Ni-E mode screen



- (3) The DS-L3 mode or Ni-E mode exits and the DS-L3 monitor shows the live image.



6.5 Operational Details

This section explains operation procedures for the two modes (DS-L3 mode/Ni-E mode), from steps to define a scan area to start the scan, and to complete scanning. Start the operation after you have completed the steps described above:

- Checking operating conditions (see the opening in Section 6)
- Ni-E microscope settings on the DS-L3 and other settings on NIS-Elements (see Section 6.2)
- Setting up scan conditions and file saving options (see Section 6.3)

6.5.1 DS-L3 Mode

In the DS-L3 mode, set the scan area and start the scan by viewing an image on the DS-L3 monitor.

The DS-L3 monitor shows the screen as shown below in the DS-L3 mode.



The image display areas (large/small) show a macro and the live image. While a macro image is shown in the large image display area, the live image is shown in the small image display area, and while the live image is shown in the large image display area, a macro image is shown in the small image display area. The image shown in the large image display area is mainly used to define a scan area.

The DS-L3 mode has two scan area setting modes, L3-ASSIGN and L3-MIC modes.

- **L3-ASSIGN** Define a scan area on a macro image shown in the large image display area. Operation steps are simple since the motorized XY stage operation is not required.
- **L3-MIC** Define a scan area by controlling the motorized XY stage while viewing the live image shown in the large image display area. You can define a scan area beyond the area of the specimen shown in the image display area.

The scan setting mode is set to [L3-ASSIGN] upon startup of the DS-L3 mode executed from NIS-Elements. Steps for scan area setting varies depending on the selected mode and the type of image in the large image display area (see the table below).

Scan Area Setting Mode	Image in the Image Display Area (Large)	Scan Area Specification
[L3-ASSIGN]	Macro image	(1) Touch (or click with the mouse) a point on the macro image. (2) Press the [Area Set] button. (3) Press the CAPTURE button of the Ni-E microscope.
	Live image	Scan area setting is unavailable. (Press the [CAPTURE] button to switch the image on the large image display area to a macro image, on which scan area setting is available.)
[L3-MIC]	Live image	(1) Press the [Area Set] button. (2) Press the CAPTURE button on the Ni-E microscope.

Screen functions in the DS-L3 mode



Operation Button		Function
1	L3-ASSIGN	Selects the L3-ASSIGN mode for scan area setting. Displays a macro image in the large image display area and the live image in the small image display area upon selection of the mode. Ready for capture. Note: The previous scan area setting made in the L3-MIC mode is cleared upon selection of the L3-ASSIGN mode.
2	L3-MIC	Selects the L3-MIC mode for scan area setting. Displays the live image in the large image display area and a macro image in the small image display area upon selection of the mode. Note: The previous scan area setting made in the L3-ASSIGN mode is cleared upon selection of the L3-MIC mode.
3	LIVE/ CAPTURE	LIVE Enabled during the L3-ASSIGN mode. Displays the live image in the large image display area and a macro image in the small image display area. The previous scan area setting made is cleared upon pressing of the button. The button name changes to [CAPTURE]. Note: Once the button name is changed to [CAPTURE], scan area setting is no longer available until [CAPTURE] is executed.
		CAPTURE Execution during the L3-ASSIGN mode captures a macro image and shows the captured macro image in the large image display area while showing the live image in the small image display area. The button name changes to [LIVE]. Note: Pressing the button during the L3-MIC mode clears the scan area setting being made. Note: If the objective used is not the low-magnification objective selected on NIS-Elements, the [CAPTURE] button will be disabled.
4	Objective (magnification)	Switches between a low- and a high-magnification objective (magnification is shown on the button) according to the configuration on NIS-Elements.

	Operation Button	Function
5	AREA SET	Sets the corner point to define a scan area. Note: Use the same tool to specify the first and the second corner points for scan area setting. When the first corner point is specified by touching on a macro image on the monitor (during L3-ASSIGN mode), or by pressing the CAPTURE button of the Ni-E microscope, the [AREA SET] button turns disabled.
	AREA SET 1	Shows an area setting mark at the center mark position of a macro image to specify the first corner point for a scan area.
	AREA SET 2	Shows an area setting mark at the center mark position of a macro image to specify the second corner point for a scan area, by which the frame connecting the first and the second corner points appears to define the scan area. When in the L3-MIC mode, the scan starts upon specification of the second corner point. Note: In the L3-ASSIGN mode, the [SCAN] button is enabled upon specification of the second corner point.
6	CAPTURED POSITION	Moves the motorized XY stage to the position at which the current macro image was captured. Note: After an image is captured, changing specimens may cause an objective to come into contact with the specimen when this button is executed. Do not change the specimen used before exiting the DS-L3 mode.
7	AREA CANCEL	Cancels the corner point specified with the [AREA SET 1] or [AREA SET 2] button.
8	SCAN	Starts the scan when in the L3-ASSIGN mode. Note: Scanning starts automatically upon specification of the second corner point during the L3-MIC mode.
9	EXIT	Exits the DS-L3 operation mode. Note: The DS-L3 monitor shows the live image.

Marks displayed as a guide for scan area setting

Mark	Function
Center mark 	Indicates the position of the motorized XY stage on the live and the macro images. Note: The center mark is always at the center of the live image in the display area.
Area setting mark 	Indicates the corner point that has been specified on a macro image.
Out-of-range marks 	Indicates the direction the motorized XY stage is in, by appearing on a macro image. The center mark changes to an out-of-range mark if the motorized XY stage moves beyond the area shown in the macro image.
	An outward arrow appears at one of the four corners on the macro image to indicate that the stage is outside the macro image range in terms of both the X- and Y-directions.
	An outward arrow appears at the middle point of the left or right frame border on the macro image to indicate that the stage is outside the macro image range in terms of the X-direction.
	An outward arrow appears at the middle point of the upper or bottom frame border on the macro image to indicate that the stage is outside the macro image range in terms of the Y-direction.
	<p>Ex.) With the scan area setting mode set to L3-ASSIGN (the live image is displayed in the small image display area and a macro image in the large image display area), the motorized XY stage is moved to the upper left of the image.</p> <p>As the center mark initially shown at the center of the macro image moves upper left and goes beyond the image range, the center mark disappears and is replaced by the out-of-range mark for the upper left direction.</p> <div> <p>The motorized XY stage is at the position it was when the macro image was captured.</p> </div> <div> <p>The center mark moves as the motorized XY stage moves.</p> </div> <div> <p>The center mark disappears and an out-of-range mark appears as the motorized XY stage moves beyond the area shown in the image display area.</p> </div>

Operation in L3-ASSIGN mode

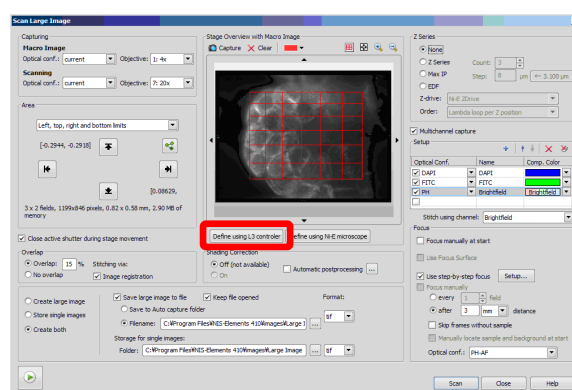
In the L3-ASSIGN mode, touch (or click with the mouse) the macro image on the DS-L3 monitor to define a scan area and press the [SCAN] button to start the scan.

✓ Defining a scan area while viewing the live image

In L3-ASSIGN mode, besides the scan area setting steps described below, you can choose an operation procedure similar to that of the L3-MIC mode. You can define a scan area by moving the motorized XY stage while viewing the live image shown in the small image display area, and use the [AREA SET] button (or the CAPTURE button of the Ni-E microscope) to set the specified area as the scan area. Note that, in the L3-ASSIGN mode, you always use the [SCAN] button to start scanning. In addition, unlike the L3-MIC mode, you cannot set a scan area beyond the range shown in the macro image. For details of the operation procedure, see “Operation in L3-MIC mode” section.

[Procedure]

- (1) Access the [Scan Large Image] window on NIS-Elements to select the DS-L3 mode.
(See “6.4 Starting and Exiting DS-L3 Mode / Ni-E Mode”).



- (2) Make sure that [L3-ASSIGN] is selected as the scan area setting mode on the [Scan Large Image] screen of the DS-L3.



(3) Define a scan area.

1. Touch (or click with the mouse) one of the four corners of an area you want to scan. An area setting mark (▢) appears at the specified point, indicating that the point has been set as the first corner point for area setting.
2. Touch (or click with the mouse) the corner (of the area you want to scan) diagonally across from the first corner point specified in the step 1. An area setting mark (▢) appears at that position indicating that the point has been set as the second corner point for area setting. Once the second corner point is specified, a frame will appear on the scan area.

**✓ Redefining the scan area**

- Undoing the scan area setting with the [AREA CANCEL] button

Press the [AREA CANCEL] button after the first or the second corner point setting to cancel the operation. Pressing the button after specifying the second corner point cancels only the second corner point and brings you back to the screen with only the first corner point specified. Repeat steps 1 and/or 2 above after canceling the setting.

- Moving the area setting mark

Touch the area setting mark you want to move. The mark color changes to yellow and the scan area frame line changes to dotted line.

Touch the screen to specify the destination point.*1

Area setting mark moves to the specified destination and the mark changes back to its original color.

*1 Alternatively, control the motorized XY stage while viewing the live image shown in the image display area (small) to move the desired portion of the image to the center. Press the [AREA SET] button (or CAPTURE button of the Ni-E microscope) to set the new area.

**(4) Start scanning.**

1. The [SCAN] button will be enabled once the scan area is defined. Press this button to start scanning.



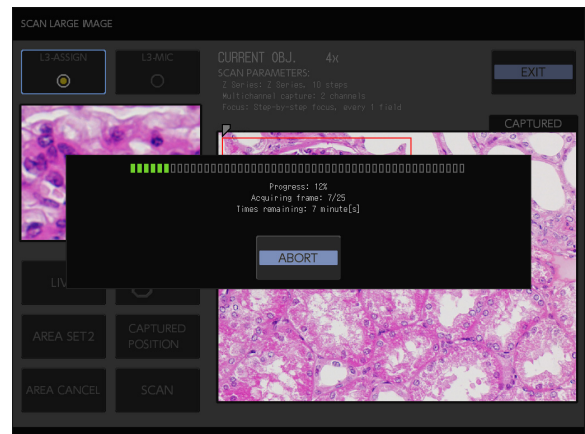
- Once the scan has started, a progress bar is displayed on the DS-L3 monitor.

✓ **If the progress bar does not update**

If there seems to be no progress bar update, follow instructions on the dialog shown on the NIS-Elements window.

✓ **Aborting the scan**

Press the [ABORT] button under the progress bar displayed on the DS-L3 monitor during the scan and press the [YES] button on the dialog to abort the scan. The scan area setting will also be cleared upon aborting the scan.



- Message "COMPLETED" appears once the scan has been completed. Press the [OK] button. The progress bar and the message disappear and the scan area setting will be cleared.

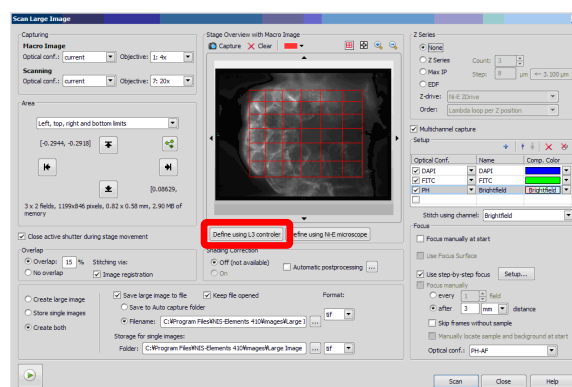


Operation in L3-MIC mode

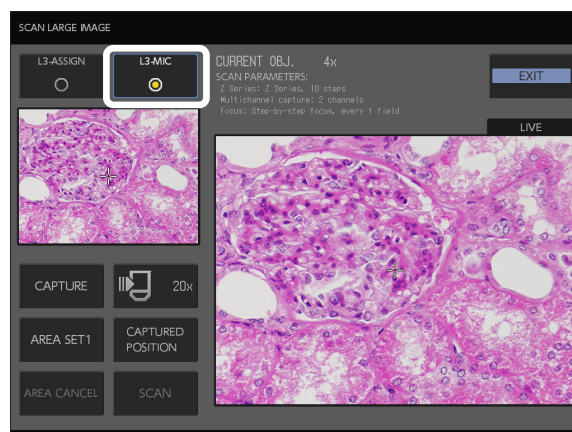
In the L3-MIC mode, define a scan area by moving the motorized XY stage while viewing the live image shown in the large image display area, and use the [AREA SET] button to set the scan area. During scan area setting operation, the area setting mark or out-of-range mark, and the scan area frame appear on the macro image in the small image display area. Scanning starts automatically upon specification of the second corner point for the scan area by pressing the [AREA SET] button.

[Procedure]

- (1) Access the [Scan Large Image] window on NIS-Elements to select the DS-L3 mode.
(See “6.4 Starting and Exiting DS-L3 Mode / Ni-E Mode”.)



- (2) Press the [L3-MIC] button on the [DS-L3 Scan Large Image] screen to select the L3-MIC scan area setting mode.



- (3) Define a scan area.

1. Use the motorized XY stage to move one of the four corners of an area you want to scan to the center of the live image. When the position is good, press the [AREA SET] button to set the first corner point for the scan area.

You can undo the setting of the first corner point with the [AREA CANCEL] button. Repeat step 1 above after canceling the setting.

2. Use the motorized XY stage to move the corner diagonally across from the first corner point specified in the step 1 to the center of the live image. When the position is good, press the [AREA SET] button to set the second corner point to define the scan area.



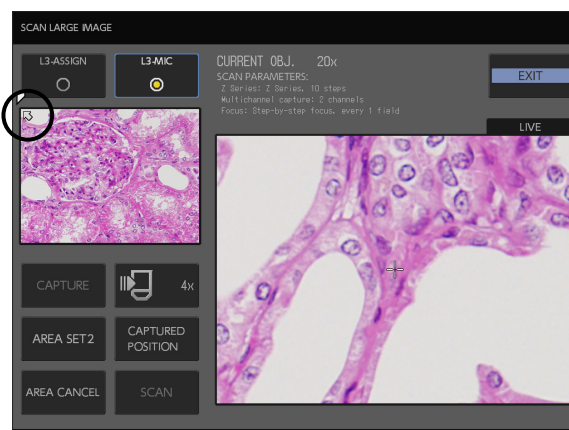
✓ Defining a scan area with the CAPTURE button of the Ni-E microscope

For the scan area setting on the live image, you can use the CAPTURE button of the Ni-E microscope instead of the [AREA SET] button.

In such a case, use the CAPTURE button of the Ni-E microscope to specify both the first and second corner points. If you specify the first corner point with the CAPTURE button of the Ni-E microscope, the [AREA SET] button will be disabled until the area setting has been completed.

✓ Defining a scan area beyond the range shown in the macro image

You can define a scan area by viewing the live image even if the scan area is beyond the range shown in the macro image (or the motorized XY stage is outside the range shown in the macro image). Note that in such a case the center mark disappears and an out-of-range mark appears on the macro image. For details of the out-of-range mark, see the table "Marks displayed as a guide for scan area setting" (page 1-88) in "Screen Functions in the DS-L3 Mode".



(4) Scanning starts upon the specification of the second corner point.

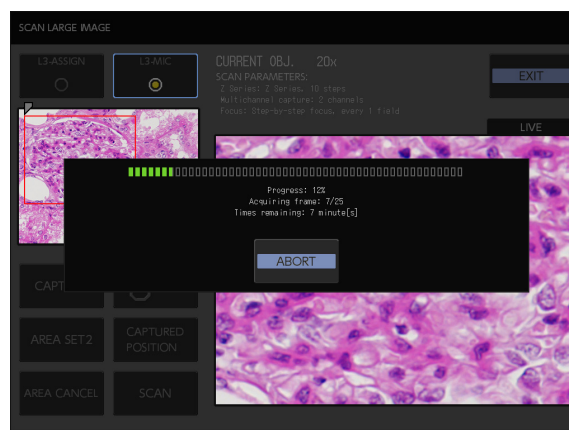
1. When the scan starts, a progress bar is shown on the DS-L3 monitor.

✓ If the progress bar does not update

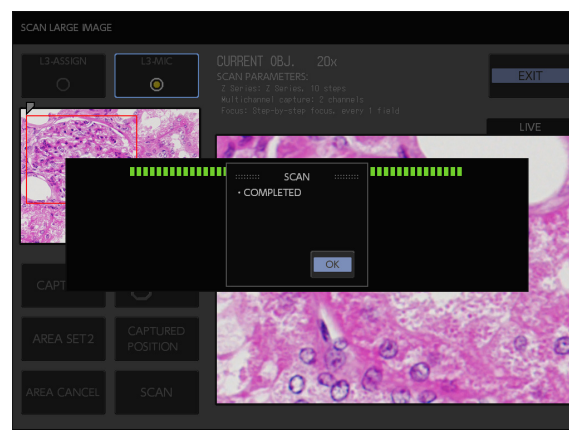
If there seems to be no progress bar update, follow instructions on the dialog shown on the NIS-Elements window.

✓ Aborting the scan

Press the [ABORT] button displayed with the progress bar on the DS-L3 monitor during the scan and press the [YES] button on the dialog to abort the scan. In such a case, the scan area setting will also be cleared.



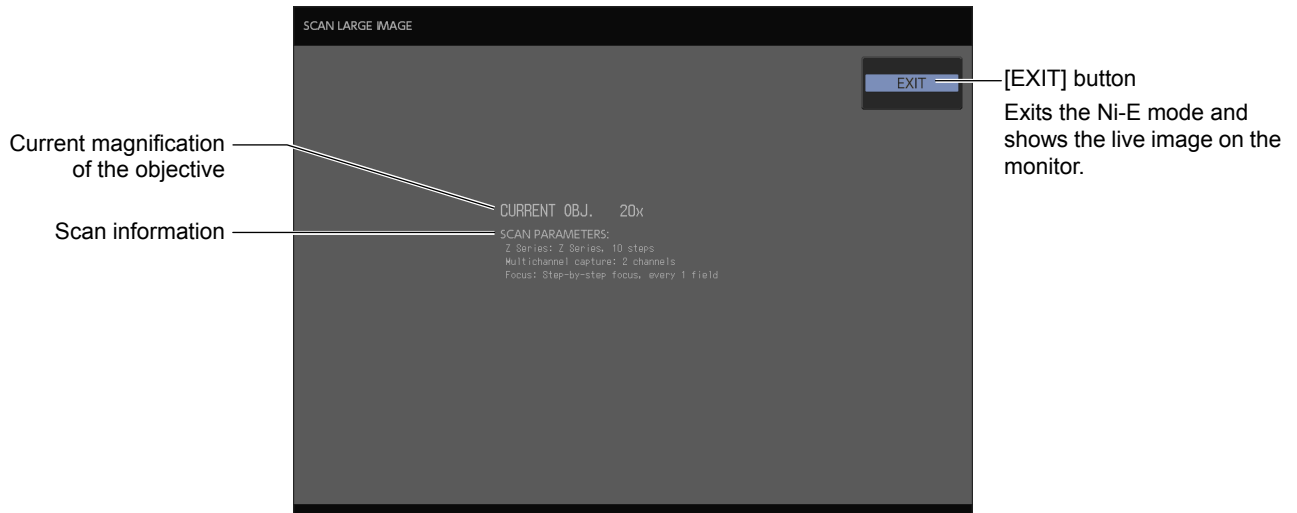
2. Message "COMPLETED" appears when the scan is completed. Press the [OK] button.
The progress bar and the message disappear and the scan area setting will be cleared.



6.5.2 Ni-E Mode

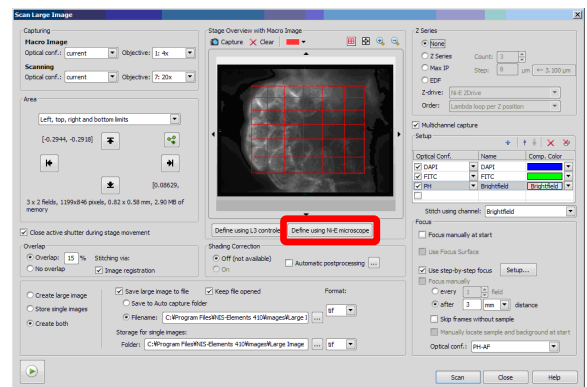
In the Ni-E mode, define a scan area with the CAPTURE button of the Ni-E microscope while observing through the eyepiece to start the scan.

The DS-L3 monitor shows the current magnification of the objective and scan information while in the Ni-E mode.

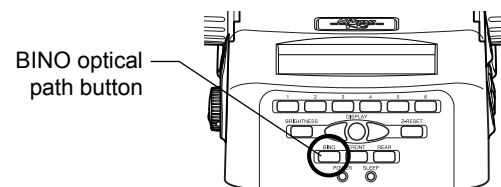


Operation procedure

- Access the [Scan Large Image] window on NIS-Elements to select the Ni-E mode.
(See “6.4 Starting and Exiting DS-L3 Mode / Ni-E Mode”.)

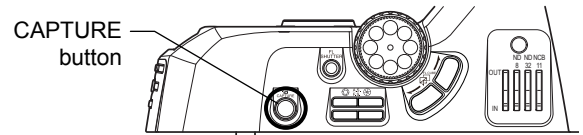


- Set the optical path of the tube to “BINO”.
Use the [BINO] optical path button of the Ni-E microscope to set the optical path to “BINO”.



(3) Define a scan area.

1. Use the motorized XY stage to move one of the four corners of an area you want to scan to the center of the field of view while observing through the Ni-E microscope eyepiece. Press the CAPTURE button of the Ni-E microscope to specify the first corner point for the scan area.
2. Use the motorized XY stage to move the corner (of the area you want to scan) diagonally across from the first corner point specified in the step 1 to the center of the field of view. Press the CAPTURE button of the Ni-E microscope to specify the second corner point for the scan area.



(4) Scanning starts upon the specification of the second corner point.

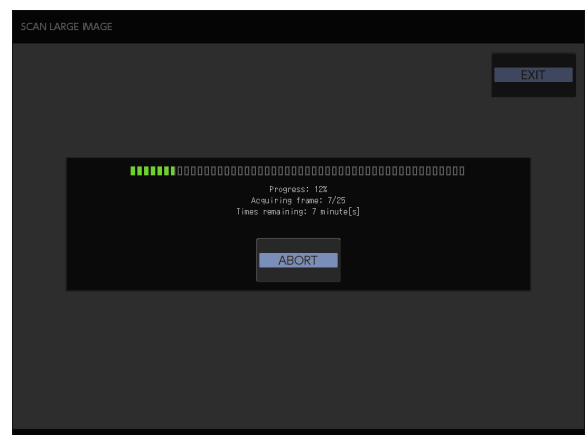
1. When the scan starts, a progress bar is shown on the DS-L3 monitor.

✓ If the progress bar does not update

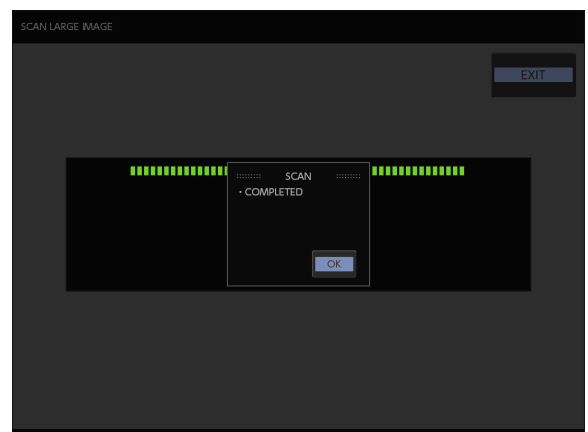
If there seems to be no progress bar update, follow instructions on the dialog shown on the NIS-Elements window.

✓ Aborting the scan

Press the [ABORT] button displayed with the progress bar during the scan and press the [YES] button on the dialog to abort the scan. The scan area setting will also be cleared upon aborting the scan.



2. Message "COMPLETED" appears when the scan is completed. Press the [OK] button. The progress bar and the message disappear and the scan area setting will be cleared.



6.6

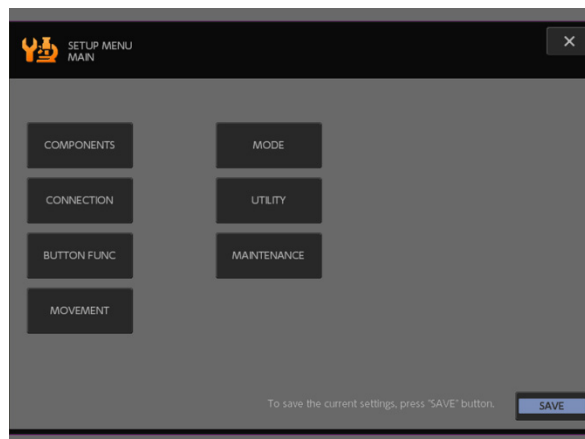
Warning Message List

This section explains warning messages displayed in the Scan Large Image function and their remedies.

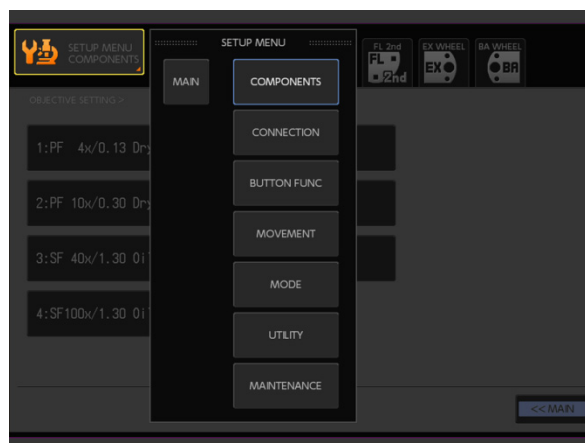
Message	Meaning	Action
LARGE IMAGE MODE ERROR (DS-L3 IN PROCESS)	DS-L3 is processing a continuous image capture or displaying a thumbnail so that the Scan Large Image mode is not available.	Abort the continuous image capture or display of the thumbnail before entering the Scan Large Image mode.
LARGE IMAGE MODE ERROR (DEVICE NOT FOUND)	Device(s) required to capture a large image is (are) not connected to DS-L3.	Connect all the necessary devices before starting the Scan Large Image mode.
SPECIFIED POS. INVALID (OUTSIDE THE CAPT. IMAGE)	The position specified with the [AREA SET] button of DS-L3 or the CAPTURE button of the Ni-E microscope is outside the range shown in the macro image.	Reposition so that it is inside the macro image.
SPECIFIED POS. INVALID (STAGE RANGE LIM.)	The position specified on the macro image is outside the motorized XY stage operation.	Reposition so that it is inside the motorized XY stage operation.
SCAN PROCESS ABORTED.	NIS-Elements aborted the scan.	Set a scan area again and rescan, or press the [EXIT] button to exit the function.
SCAN PROCESS FAILED.	NIS-Elements failed to scan.	Set a scan area again and rescan, or press the [EXIT] button to exit the function.

This chapter describes the procedure to change the various settings of the microscope and DS-L3 from the screen on DS-L3. These configurations are performed on [SETUP MENU].

[MAIN] screen of the [SETUP MENU]
(Displayed with [SETUP] button on the taskbar)



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



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

After making changes to the settings, be sure to press the [SAVE] button on the [SETUP MENU] - [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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 [SETUP MENU], be sure to press the [SAVE] button on the [SETUP MENU] - [MAIN] to save the settings to the microscope's memory. If the DS-L3 is turned off without saving settings, previous values are restored.

[Procedure]

- (1) **After changing the settings, press the [<< MAIN] button to go back to the [SETUP MENU] - [MAIN] screen.**

- (2) **Press the [SAVE] button.**

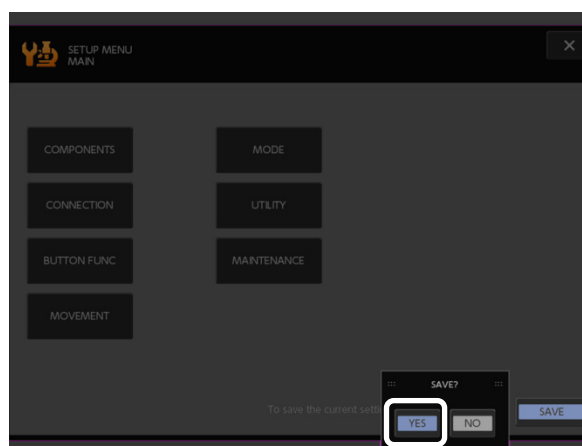
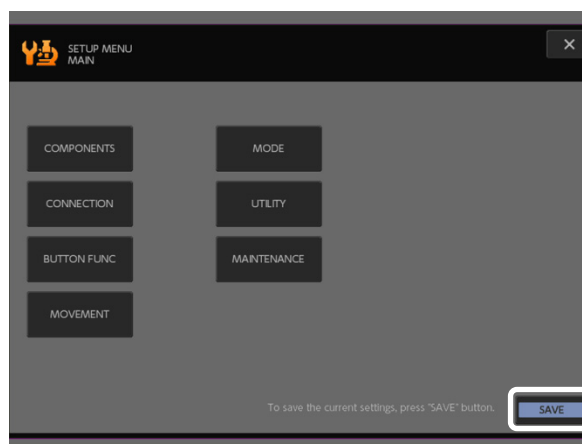
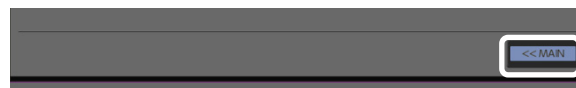
A confirmation dialog box appears.

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

- (3) **Press the [YES] button.**

Settings are saved.

To cancel saving, press the [NO] button.
Pressing the [X] button on the upper-right of the screen closes the [SETUP MENU].



✔ **Settings to be saved**

Pressing 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 DS-L3 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-L3 (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.

✓ Registration of calibration settings is required to use DS-L3's scale/measurement function.

To use the DS-L3 scale/measurement function, make sure to register the calibration settings after configuring objective information. If the [X] button of the [SETUP MENU] screen is pressed after configuring the information of the objective, you are prompted to register the calibration setting. For the details of the registration of the calibration settings, see Chapter 11 "11.2.4 Registering the Calibration Settings" in the "Camera Operation" instruction manual.

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 pressing the [OPTIONAL] button. For more information, see "2.1.2 Arbitrarily Configuring the Data of Objective" in this chapter.

[Procedure]

[SETUP MENU] → [COMPONENTS]

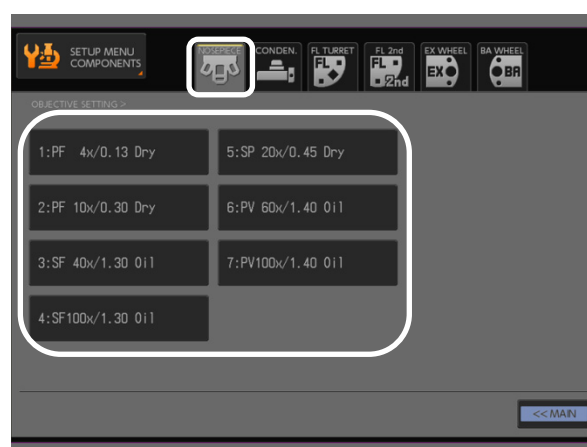
- (1) Select the [NOSEPIECE] tab.
- (2) Press the nosepiece address button to be configured.

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 press the [NEXT] button.

When [▲] and [▼] buttons are shown at the right edge of the list, you can press [▲] or [▼] button to go to other pages.

To quit setting, press the [CANCEL] button.



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

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



- (5) Select the product code of the objective attached to the microscope and press 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 press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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.

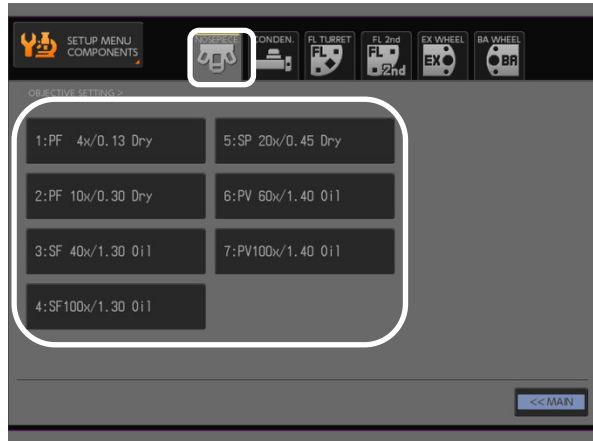
2.1.2 Arbitrarily Configuring the Data of Objective

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]

[SETUP MENU] → [COMPONENTS]

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



- (3) Press the [OPTIONAL] button on the objective configuration screen.

The objectives registered to the memory are displayed.

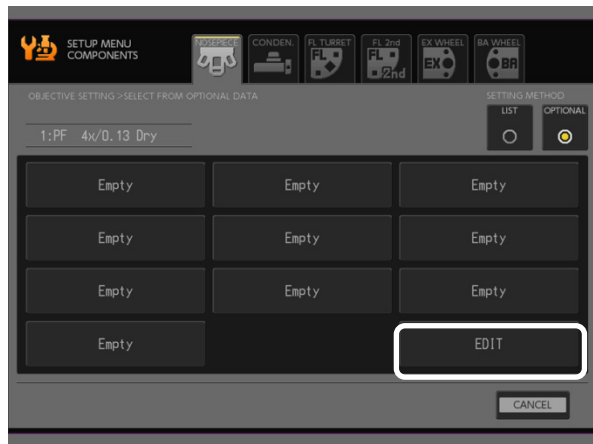
To quit setting, press the [CANCEL] button.

✓ **When the data is already registered to the memory**

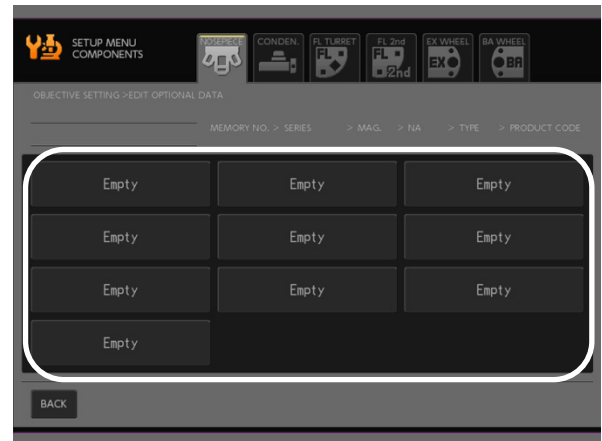
If the data for the objective to be used is already registered to the memory, you can complete the configuration by selecting the objective from the list and pressing the [OK] button.



- (4) Press the [EDIT] button to go to the edit screen.



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



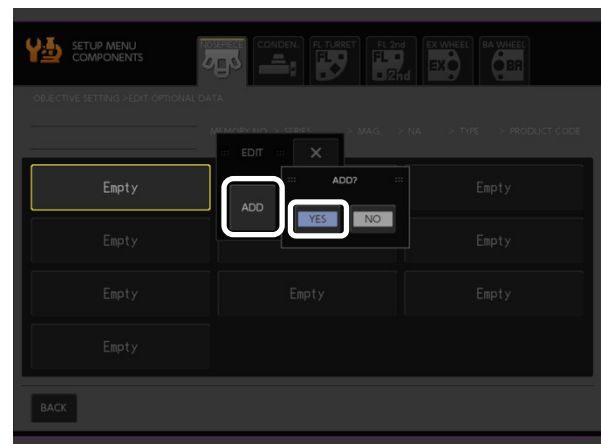
- (6) (To newly register)
Press the [ADD] button and then [YES] button.

(To modify the data already registered to a memory address) Press the [MODIFY] button and then [YES] button.

To cancel adding or saving, press the [NO] button.

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

To remove the data of the objective registered to the memory address, press 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.



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

When [▲] and [▼] buttons are shown at the right edge of the list, you can press [▲] or [▼] button to go to other pages.



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

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



- (9) Press the [INPUT] button, enter the numerical aperture of the attached objective, press the [ENTER] button, and then the [NEXT] button.

Pressing the [CLR] button clears the data you entered.
Pressing the [BS] button removes a character at the end of the data you entered.



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

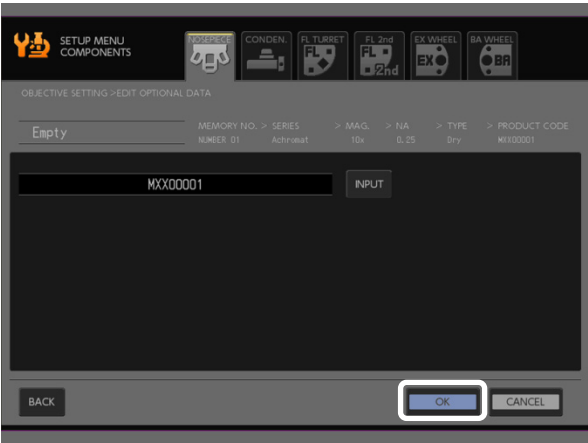


- (11) Press the [INPUT] button, enter the product code of the attached objective, and then press the [ENTER] button.

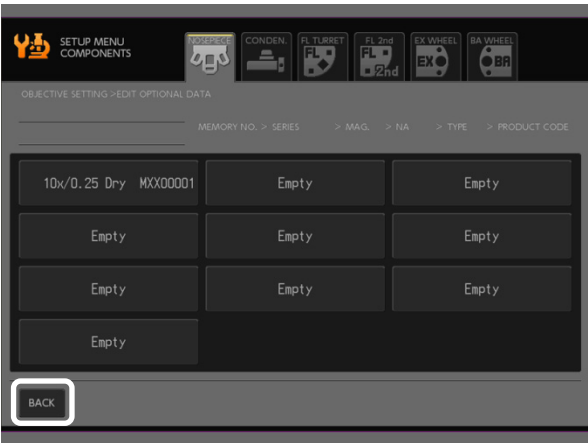
Pressing the [CLR] button clears the data you entered.
Pressing the [BS] button removes a character at the end of the data you entered.
Pressing the [SHIFT] button toggles between upper and lower cases for alphabet letters.



- (12) Press the [OK] button.

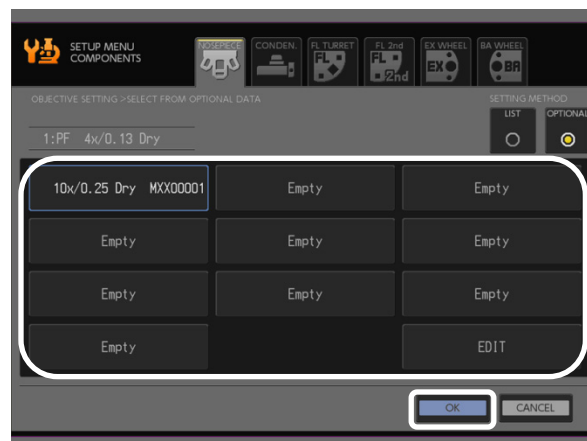


- (13) Confirm that the data was registered to the memory address, then press the [BACK] button to exit the edit screen.



- (14) **Select the objective registered to the memory address and press the [OK] button.**

The selected objective is set to the nosepiece address.



After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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-L3 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 pressing the [OPTIONAL] button. For more information, see “2.2.2 Arbitrarily Configuring the Name of Condenser Module” in this chapter.

[Procedure]

[SETUP MENU] → [COMPONENTS]

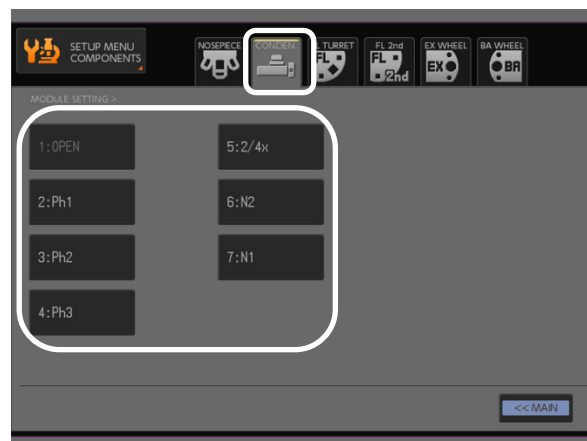
(1) **Select the [CONDEN.] tab.**

(2) **Press 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 press the [OK] button.**

The selected condenser module is set to the turret address.

To quit setting, press the [CANCEL] button.



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

After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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.

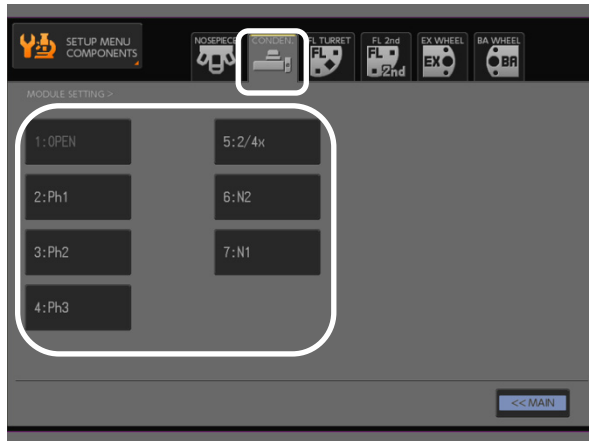
2.2.2 Arbitrarily Configuring the Name of Condenser Module

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]

[SETUP MENU] → [COMPONENTS]

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



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

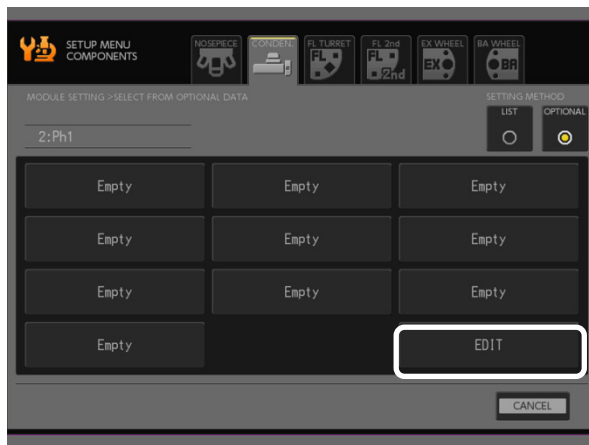
To quit setting, press the [CANCEL] button.

✓ **When the module name is already registered to the memory**

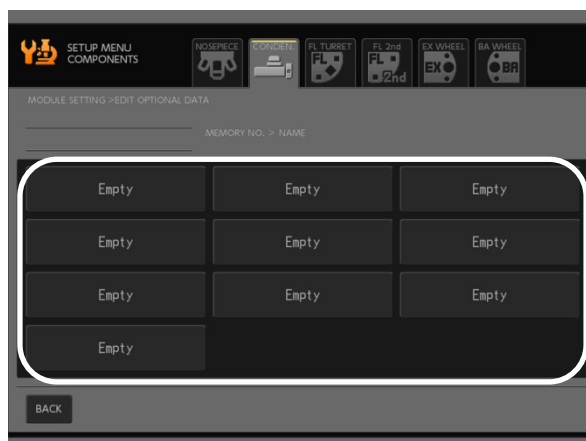
If the name of the module to be used is already registered to the memory, you can complete the configuration by selecting the condenser module from the list and pressing the [OK] button.



- (4) Press the [EDIT] button to go to the edit screen.



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



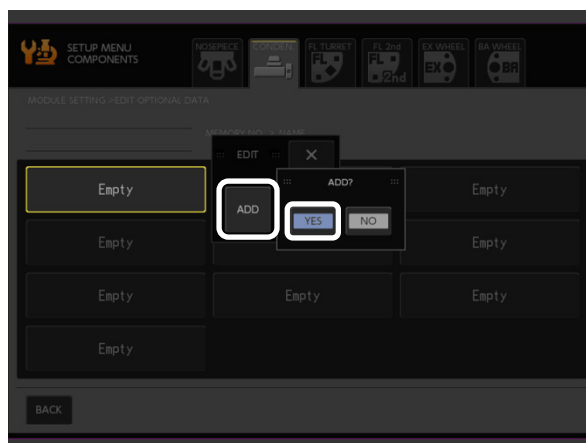
- (6) (To newly register)
Press the [ADD] button and then [YES] button.

(To modify the data already registered to a memory address) Press the [MODIFY] button and then [YES] button.

To cancel adding or saving, press the [NO] button.

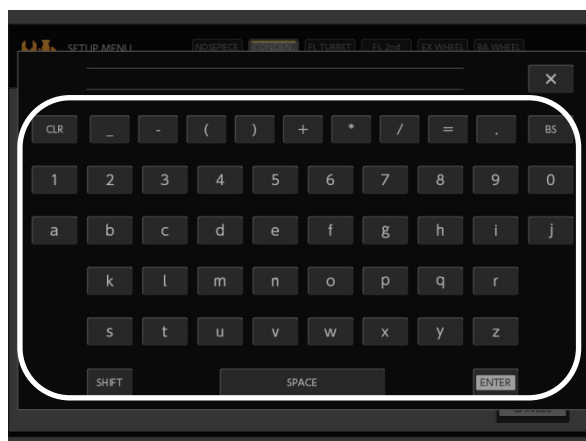
✓ **Removing the module name registered to the memory**

To remove the module name registered to a memory address, press 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.

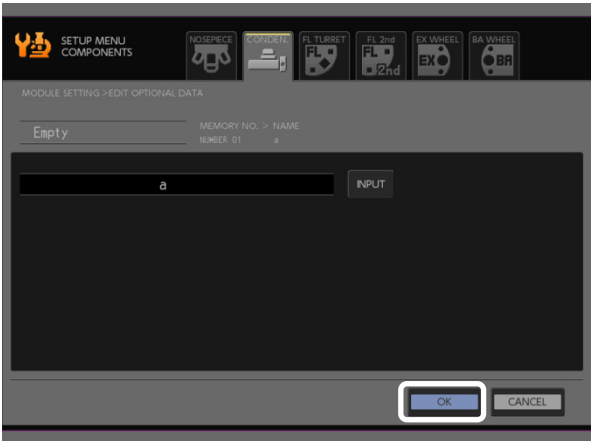


- (7) Press the [INPUT] button, enter the name of the attached condenser module (up to five characters), and then press the [ENTER] button.

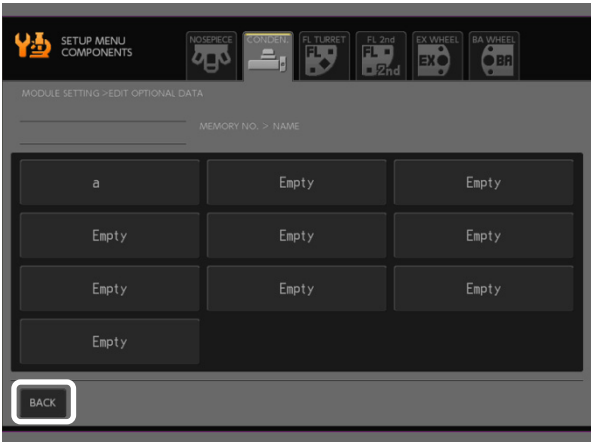
Pressing the [CLR] button clears the data you entered.
Pressing the [BS] button removes a character at the end of the data you entered.
Pressing the [SHIFT] button toggles between upper and lower cases for alphabet letters.



(8) Press the [OK] button.

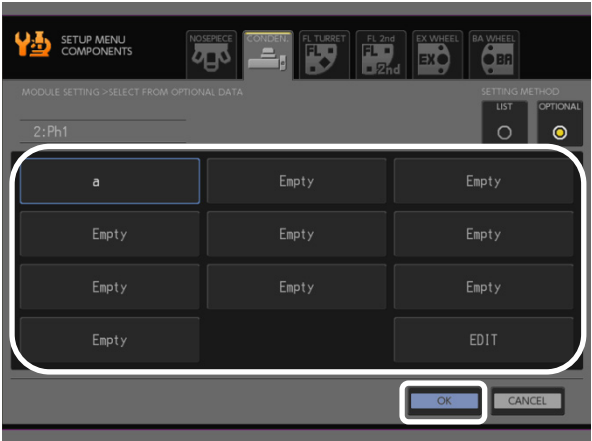


(9) Confirm that the name was registered to the memory address, then press the [BACK] button to exit the edit screen.



(10) Select the condenser module registered to the memory address and press the [OK] button.

The selected condenser module is set to the turret address.



After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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-L3 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 pressing the [OPTIONAL] button. For more information, see “2.3.2 Arbitrarily Configuring the Name of Filter Cube” in this chapter.

[Procedure]

[SETUP MENU] → [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) **Press 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 press the [OK] button.**

The selected filter cube is set to the turret address.

Only turret address 1 can select [OPEN].

To quit setting, press the [CANCEL] button.



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

After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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]

[SETUP MENU] → [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) Press the turret address button to be configured.



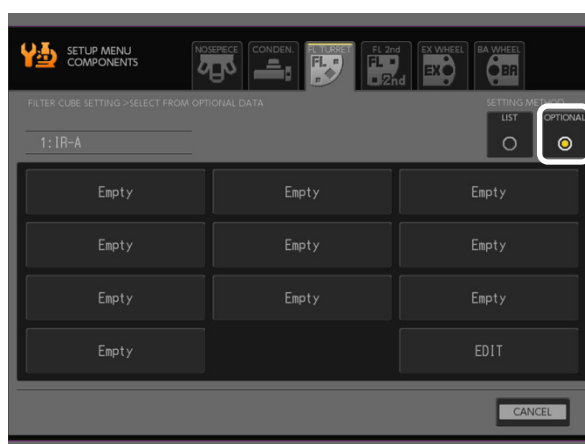
- (3) Press the [OPTIONAL] button on the filter cube configuration screen.

The condenser modules registered to the memory are displayed.

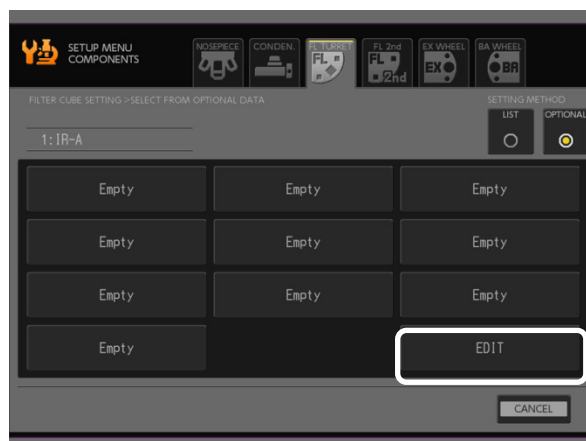
To quit setting, press the [CANCEL] button.

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

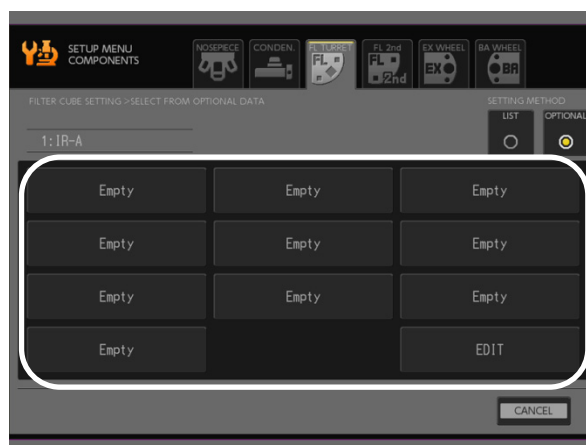
If the name of the filter cube to be used is already registered to the memory, you can complete the configuration by selecting the filter cube from the list and pressing the [OK] button.



- (4) Press the [EDIT] button to go to the edit screen.



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



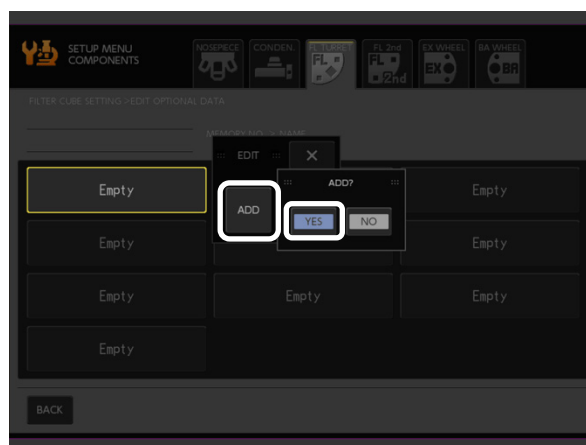
- (6) (To newly register)
Press the [ADD] button and then [YES] button.

(To modify the data already registered to a memory address) Press the [MODIFY] button and then [YES] button.

To cancel adding or saving, press the [NO] button.

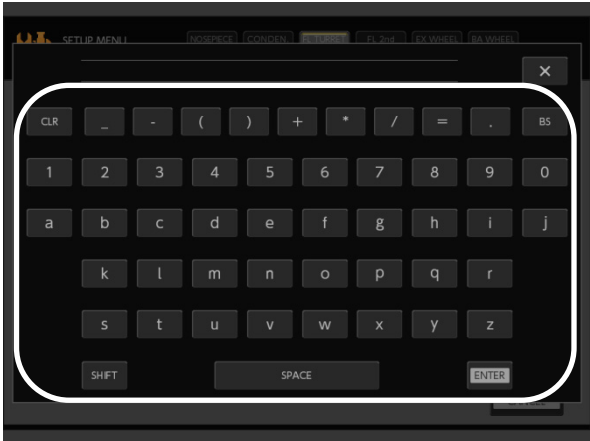
✓ **Removing the filter cube name registered to the memory**

To remove the filter cube name registered to a memory address, press 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.



- (7) Press the [INPUT] button, enter the name of the attached filter cube (up to five characters), and then press the [ENTER] button.

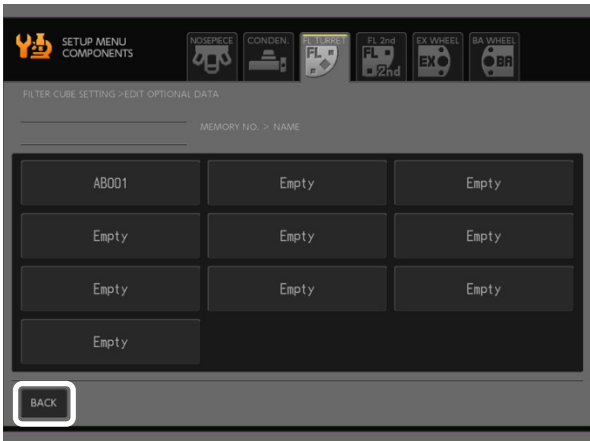
Pressing the [CLR] button clears the data you entered.
Pressing the [BS] button removes a character at the end of the data you entered.
Pressing the [SHIFT] button toggles between upper and lower cases for alphabet letters.



- (8) Press the [OK] button.

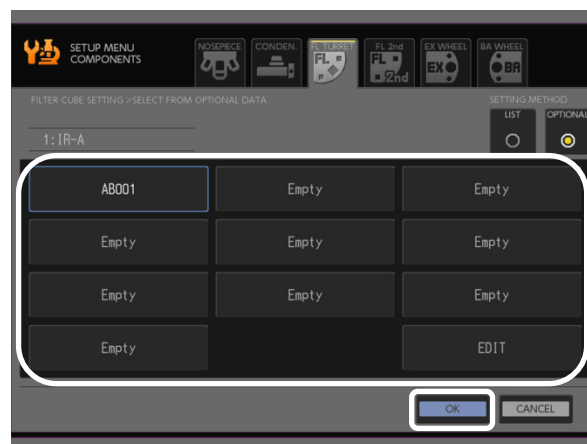


- (9) Confirm that the name was registered to the memory address, then press the [BACK] button to exit the edit screen.



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

The selected filter cube is set to the turret address.



After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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-L3 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 pressing the [OPTIONAL] button. For more information, see “2.4.2 Arbitrarily Configuring the Name of Excitation/Barrier Filter” in this chapter.

[Procedure]

[SETUP MENU] → [COMPONENTS]

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

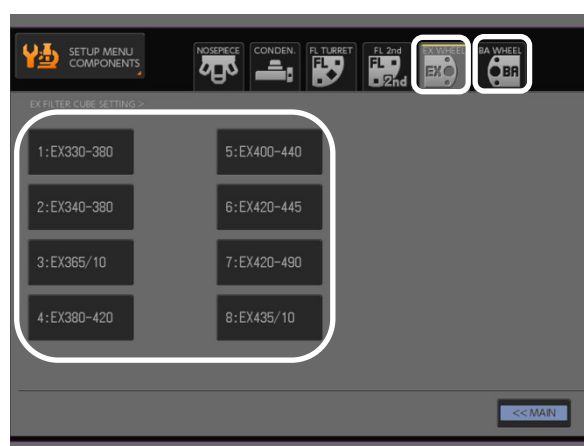
Although the screens in the following procedure are those when you select [EX WHEEL], similar screens are displayed when you select [BA WHEEL].

(2) **Press 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 press the [OK] button.**

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

To quit setting, press the [CANCEL] button.



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

After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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).

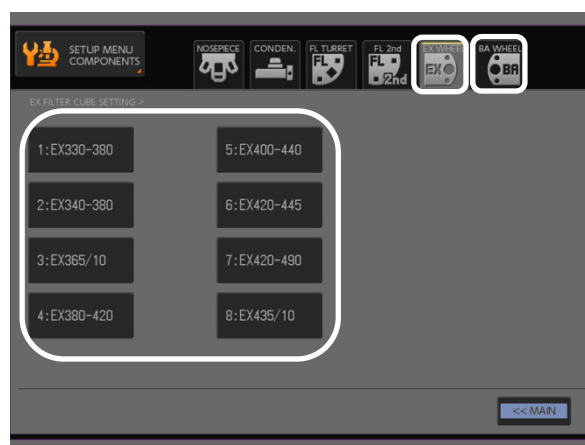
[Procedure]

[SETUP MENU] → [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) **Press the wheel address button to be configured.**



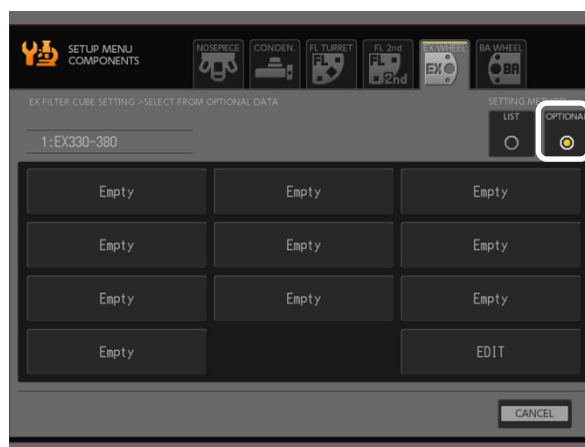
- (3) **Press the [OPTIONAL] button on the excitation/barrier filter configuration screen.**

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

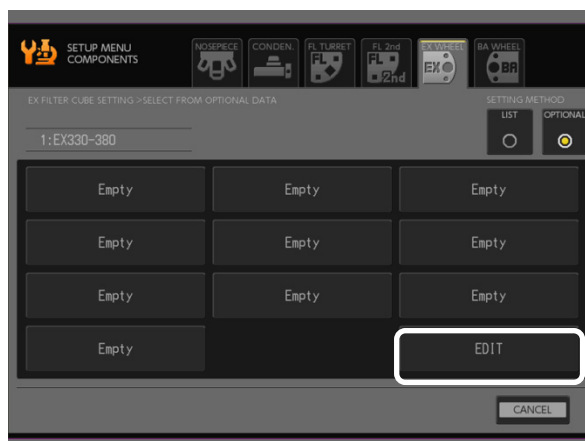
To quit setting, press the [CANCEL] button.

✓ **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 pressing the [OK] button.



- (4) **Press the [EDIT] button to go to the edit screen.**



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



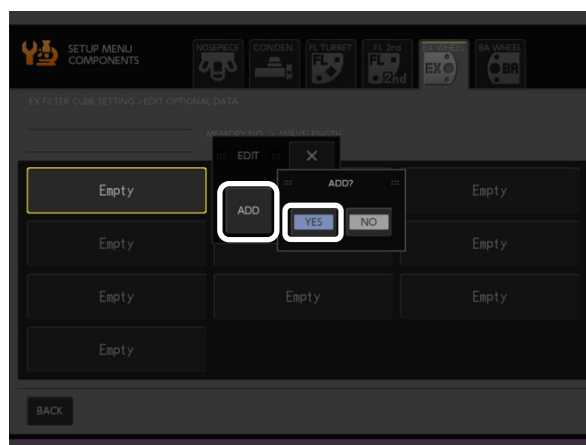
- (6) (To newly register)
Press the [ADD] button and then [YES] button.

(To modify the data already registered to a memory address)
Press the [MODIFY] button and then [YES] button.

To cancel adding or saving, press the [NO] button.

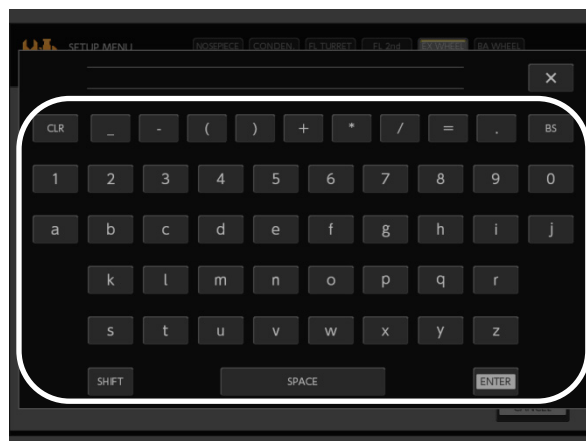
✓ **Removing the filter name registered to the memory**

To remove the filter name registered to a memory address, press 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.



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

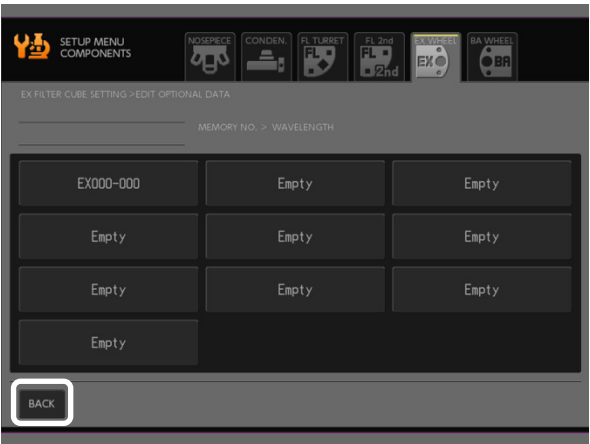
Pressing the [CLR] button clears the data you entered.
Pressing the [BS] button removes a character at the end of the data you entered.
Pressing the [SHIFT] button toggles between upper and lower cases for alphabet letters.



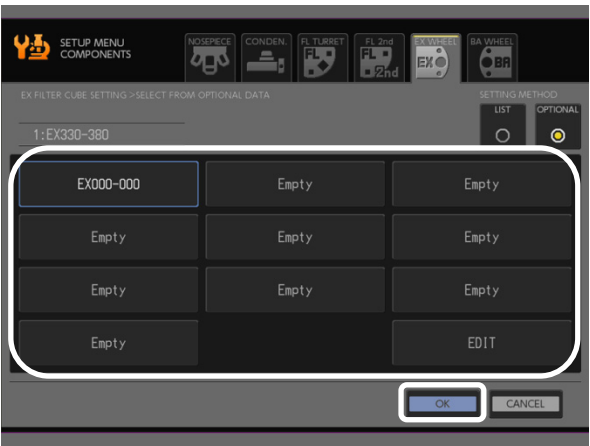
(8) Press the [OK] button.



(9) Confirm that the name was registered to the memory address, then press the [BACK] button to exit the edit screen.



(10) Select the excitation/barrier filter registered to the memory address and press the [OK] button.
Selected excitation/barrier filter is set to the wheel address.



After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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 the microscope and camera control unit 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]/[CAM-MIC CONTROL] 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 head directly connected to this DS-L3 by pressing the [CAPTURE] button on the camera control screen.

Refer to the instruction manual provided with the trigger cable for the connection of the microscope with the camera control unit.

*1 In addition to this configuration, you must place the [CAPTURE] button on the [MICROSCOPE CONTROL]/[CAM-MIC CONTROL] screens of Ni-E and Ni-U as described in Chapter 6, "4.1 Configuring the Screen Buttons for DS-L3".

*2 When the CAPTURE button with default settings is pressed, 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".

✔ Two capture operations possible from the DS-L3

Two different capture operations are possible from the DS-L3.

- 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 [CAM-MIC CONTROL] screen. Pressing these buttons outputs the capture trigger signal via the DSC connector (DSC1 or DSC2 connector on Ni-E), instructing the connected camera control unit to capture an image. This operation requires configuration on the [CONNECTION] screen. (If the camera trigger cable from the DSC connector of the microscope is connected to the DS-L3, the DS-L3 performs capturing.)
- Capturing with a digital camera directly controlled by the DS-L3
Use the [CAPTURE] button at the upper left of the [CAM-MIC CONTROL] screen or the [CAPTURE] button on the camera operation screen. When you press these buttons, the camera head directly connected to this DS-L3 via a DS camera cable captures the image. You do not need to configure the connection in the [CONNECTION] screen.



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 head 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

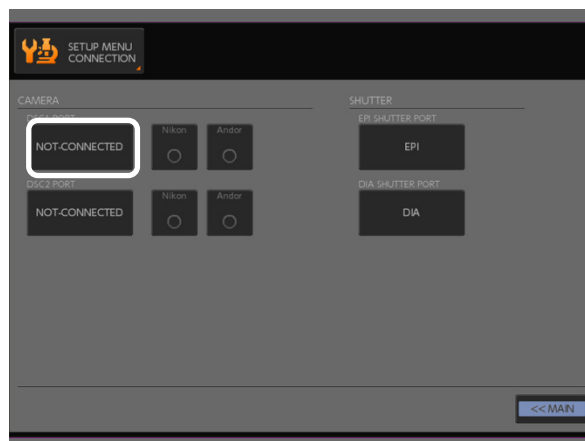
Setting Item	Setting Value	Description
Camera head mounting position	NOT-CONNECTED (default)	When no digital camera is connected to the DSC connector
	[FRONT]	When the digital camera connected to the DSC connector is attached to the tube adapter
	[REAR]	When the digital camera connected to the DSC connector 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]

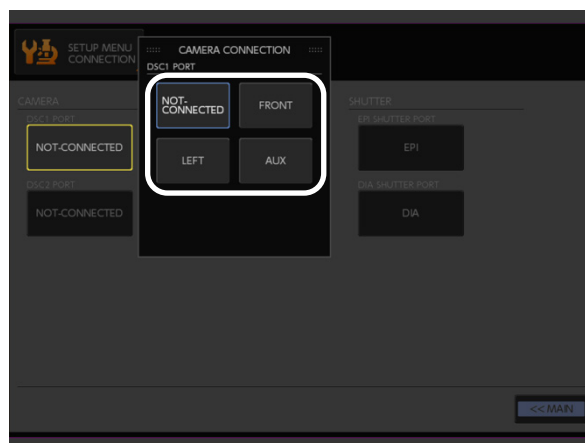
[SETUP MENU] → [CONNECTION]

- (1) Press the button for the DSC connector to be configured.

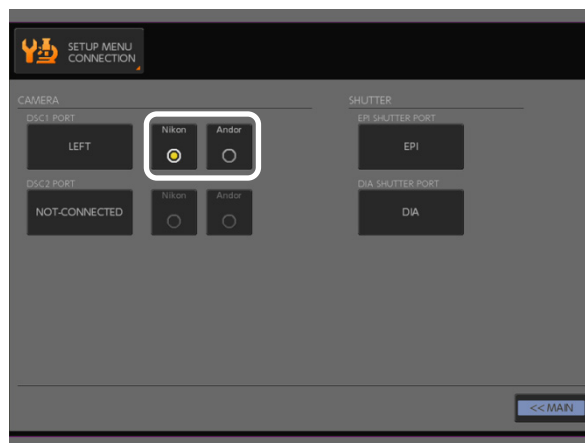
A sub screen opens to select the position of the connected camera head.



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



- (3) Select the manufacturer of the camera.
- (4) Repeat steps (2) and (3) when you use two DSC connectors on Ni-E.



After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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 pressed or epi-illumination shutter opens/closes when the [SHUTTER DIA] button is pressed, the motorized shutter is not correctly connected to the EPI SHUTTER/DIA SHUTTER connector.

In this case, turn off the microscope and DS-L3, 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]

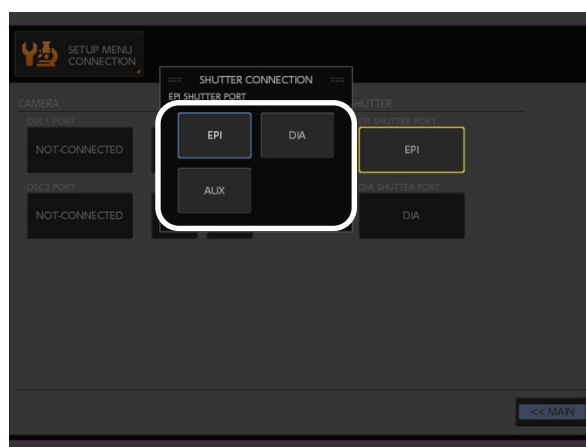
[SETUP MENU] → [CONNECTION]

(1) **Press 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 press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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 FUNC] Screen)

[BUTTON FUNC] screen allows you to configure functions and display of the buttons on DS-L3 and the microscope.

4.1 Configuring the Screen Buttons for DS-L3

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 [CAM-MIC CONTROL] 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-L3".


"Allowed" → "Y"

"Not Allowed" → "N"

Button Icon	Main Category of Direct Operation Buttons	Shown in [MICROSCOPE CONTROL] Screen		Shown in [CAM-MIC CONTROL] 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 [CAM-MIC CONTROL] 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
 [SHUTTER]	-	Y ([SHUTTER EPI/DIA/AUX], [SHUTTER EPI ALL])		Y	Y

Button Icon	Main Category of Direct Operation Buttons	Shown in [MICROSCOPE CONTROL] Screen		Shown in [CAM-MIC CONTROL] Screen	
		Ni-E	Ni-U	Ni-E	Ni-U
 [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 at the top of the screen (cannot be changed)	N	Y	N
 [Z-axis RESET]	[XYZ]	Displayed on sub screen of [XYZ] button	N	Y	N
 [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

Button Icon	Main Category of Direct Operation Buttons	Shown in [MICROSCOPE CONTROL] Screen		Shown in [CAM-MIC CONTROL] Screen	
		Ni-E	Ni-U	Ni-E	Ni-U
 [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]

[SETUP MENU] → [BUTTON FUNC]

- (1) (To change the configuration of the [MICROSCOPE CONTROL] screen)
Press the [FUNC SET] button under [MICROSCOPE CONTROL].

(To change the configuration of the [CAM-MIC CONTROL] screen)
Press the [FUNC SET] button under [CAM-MIC CONTROL].

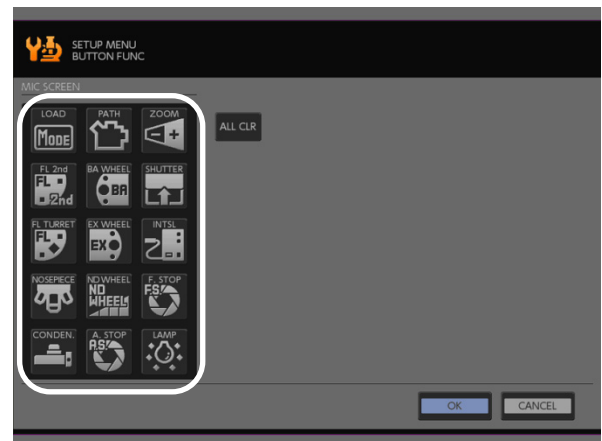
Current settings are displayed.



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

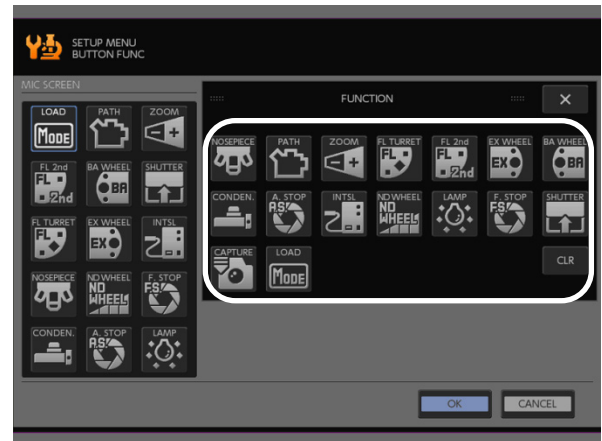
A sub screen to select a function appears.
Pressing the [ALL CLR] button clears settings for all buttons.

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



(3) Select the function you want to assign.

The selected function is shown with blue frame.
Pressing the [CLR] 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, and then select a button shown under it.



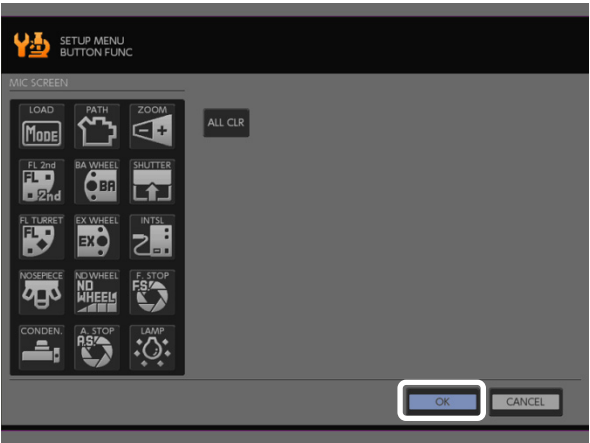
- (4) Repeat steps (2) and (3) for all buttons of which you want to change the functions.
- (5) Close the sub screen by pressing the [x] button at the upper-right corner of the sub screen.



(6) Press the [OK] button.

[BUTTON FUNC] screen is displayed.

To quit setting, press the [CANCEL] button.



After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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 [CAM-MIC CONTROL] 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
[Display]	ON	Shows the [SLEEP] button
	OFF (default)	Hides the [SLEEP] button

[Procedure]

[SETUP MENU] → [BUTTON FUNC]

Show/hide the [SLEEP] button by pressing the [DISPLAY] button under the [SLEEP BUTTON].

ON (show)/OFF (hide) toggles each time you press the [DISPLAY] button.



After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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.
 [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]

[SETUP MENU] → [BUTTON FUNC]

- (1) Press the [FUNC SET] button under the [FUNCTION BUTTON].

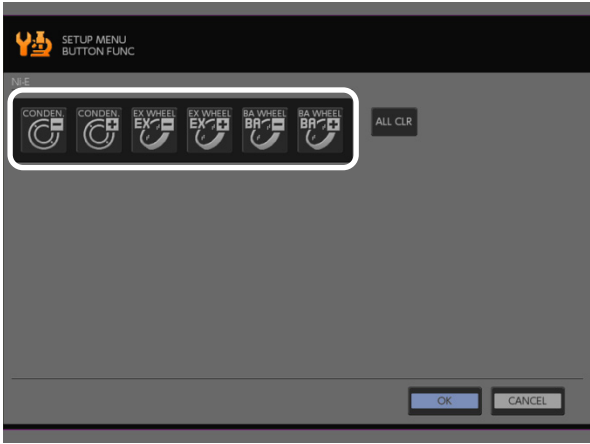
Current settings are displayed.



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

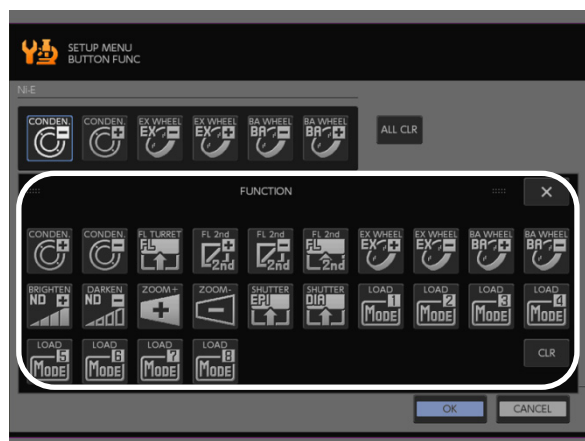
A sub screen to select a function appears. Pressing the [ALL CLR] button clears settings for all buttons.

To quit setting, press the [CANCEL] button.



(3) Select the function you want to assign.

The selected function is shown with blue frame.
Pressing the [CLR] button assigns no function to the button and the button display becomes blank.

**(4) Repeat steps (2) and (3) for all buttons of which you want to change the functions.****(5) Close the sub screen by pressing the [x] button at the upper-right corner of the sub screen.****(6) Press the [OK] button.**

[BUTTON FUNC] screen is displayed.



After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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.

4.2.2

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]

[SETUP MENU] → [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 press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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]

[SETUP MENU] → [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 press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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. Pressing 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]

[SETUP MENU] → [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 press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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]

[SETUP MENU] → [BUTTON FUNC]

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

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

(Following screens are for Ni-E)



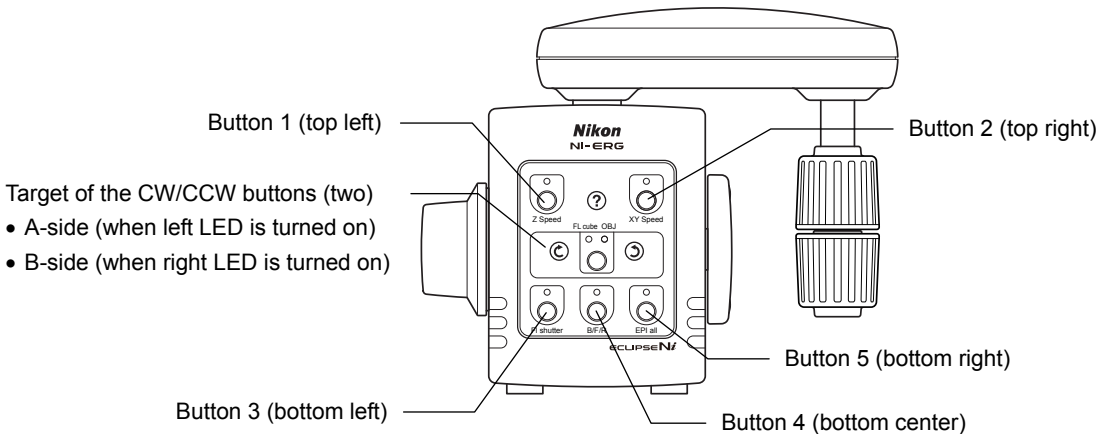
After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 is turned off without saving settings, previous values are restored. For more information on saving, see "1 Bulk Saving of Settings ([MAIN] Screen)" 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]

[SETUP MENU] → [BUTTON FUNC]

- (1) Press the [FUNC SET] button under the [ERGO CONTROLLER].

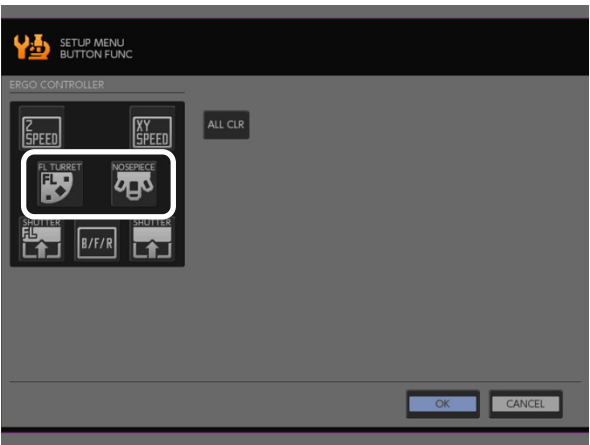
Current settings are displayed.



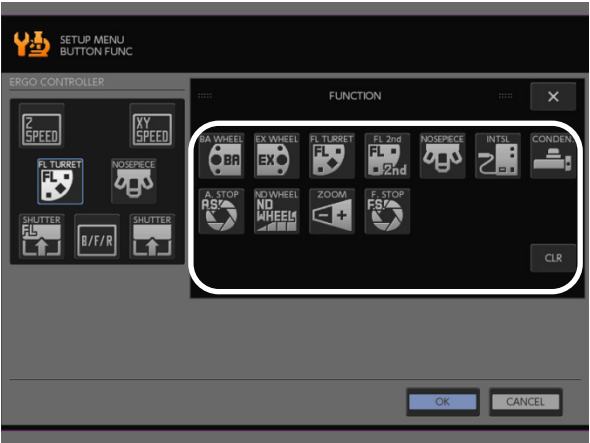
- (2) Press the button for which you want to change the motorized device assignment.
(Left: A, right: B)

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

To quit setting, press the [CANCEL] button.



- (3) Select the motorized device you want to assign.
The selected motorized device is shown with blue frame. Pressing the [CLR] 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) Close the sub screen by pressing the [x] button at the upper-right corner of the sub screen.














- (6) Press the [OK] button.
[BUTTON FUNC] screen is displayed.












After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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]	Switches the operation mode of the focus knobs between coarse, fine, and extra fine. LED off: coarse, LED on: fine, LED blinking: extra fine
 [XY SPEED]	Switches the operation mode of the stage knob between coarse, fine, and extra fine. LED off: coarse, LED on: fine, LED blinking: extra fine
 [BINO]	Switches the optical path of the motorized quadocular tilting tube to 100% light distribution to the binocular section. LED on: 100% to binocular, LED off: 100% to tube adapter, or 100% to rear port
 [FRONT]	Switches the optical path of the motorized quadocular tilting tube to 100% to the tube adapter. LED on: 100% to tube adapter, LED off: 100% to binocular or 100% to rear port
 [REAR]	Switches the optical path of the motorized quadocular tilting tube to 100% to rear port. LED on: 100% to rear port, LED off: 100% to binocular or 100% to tube adapter
 [B100/F100]	Switches the optical path in the motorized quadocular tilting tube between 100% to binocular and 100% to tube adapter. LED on: 100% to binocular, LED blinking: 100% to tube adapter, LED off: 100% to rear port
 [F100/R100]	Switches the optical path in the motorized quadocular tilting tube between 100% to tube adapter and 100% to rear port. LED on: 100% to binocular, LED blinking: 100% to tube adapter, LED off: 100% to rear port
 [R100/B100]	Switches the optical path in the motorized quadocular tilting tube between 100% to rear port and 100% to binocular. LED on: 100% to binocular, LED blinking: 100% to tube adapter, LED off: 100% to rear port
 [B/F/R]	Switches the optical path in the motorized quadocular tilting tube among 100% to binocular, 100% to tube adapter, and 100% to rear port. LED on: 100% to binocular, LED blinking: 100% to tube adapter, LED off: 100% to rear port
 [SHUTTER FL]	Opens/closes the motorized epi-fluorescence cube turret's built-in shutter. LED on: shutter closed, LED off: shutter open
 [SHUTTER FL2]	Opens/closes the second motorized epi-fluorescence cube turret's built-in shutter. LED on: shutter closed, LED off: shutter open

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

[Procedure]

[SETUP MENU] → [BUTTON FUNC]

- (1) Press the [FUNC SET] button under the [ERGO CONTROLLER].

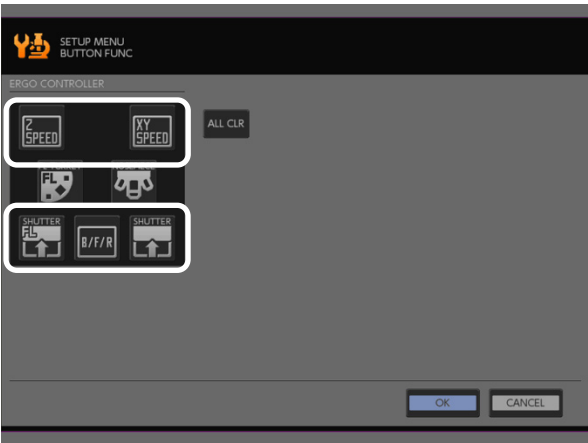
Current settings are displayed.



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

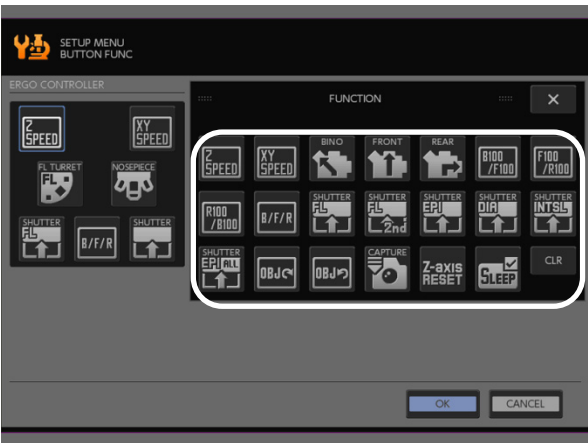
A sub screen to select a motorized device appears. Pressing the [ALL CLR] button clears settings for all buttons.

To quit setting, press the [CANCEL] button.



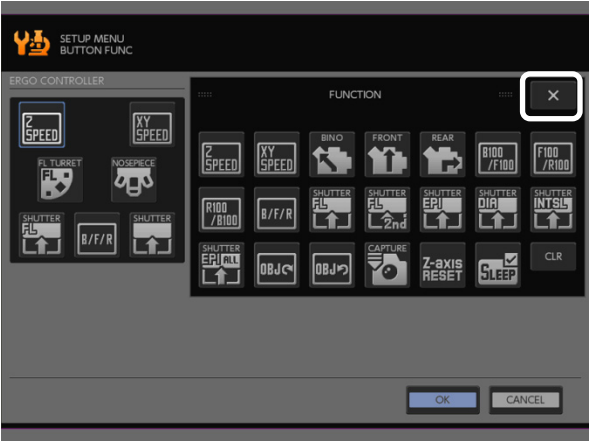
- (3) Select the function you want to assign.

The selected function is shown with blue frame. Pressing the [CLR] button assigns no function to the button and the button becomes disabled.

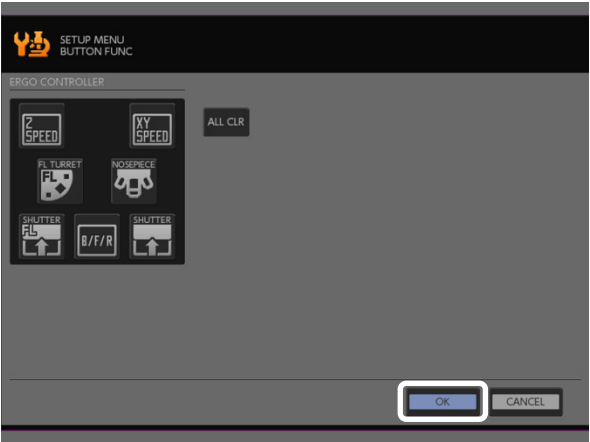


- (4) Repeat steps (2) and (3) if you want to change the assignment for other buttons.

- (5) Close the sub screen by pressing the [x] button at the upper-right corner of the sub screen.



- (6) Press the [OK] button.
[BUTTON FUNC] screen is displayed.



After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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]

[SETUP MENU] → [BUTTON FUNC]

- (1) Press the button on the [REMOTE CONTROL PAD] to enable or disable the button.

ON (enable)/OFF (disable) are toggled each time you press the 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 press the [LINK] button on the nosepiece sub screen on the [MICROSCOPE CONTROL] screen or [CAM-MIC CONTROL] screen, you can go directly to the [MOVEMENT] screen of the [SETUP MENU].



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

Setting Item	Device to Be Interlocked	Setting Value	Operation to Be Interlocked
[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 [CAM-MIC CONTROL] 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-L3, 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]

[SETUP MENU] → [MOVEMENT]

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

Current settings are displayed.

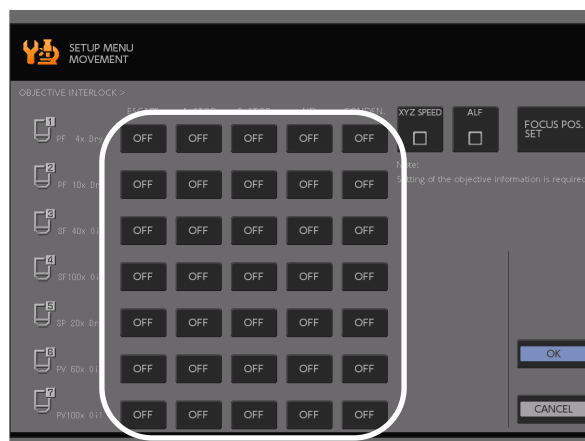


- (2) If any change is required, modify the settings for each objective.

Pressing the [ESCAPE] button toggles between [ON] and [OFF].

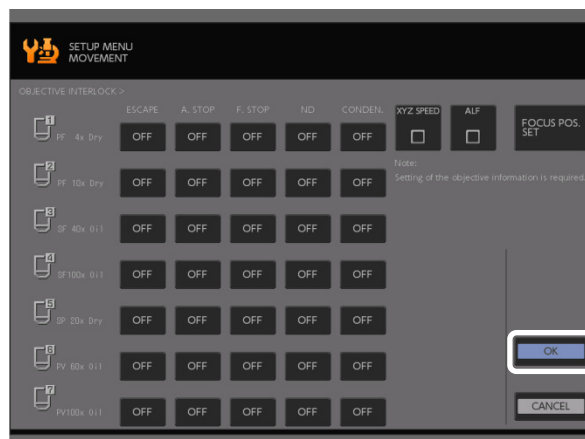
When you press the [A. STOP], [F. STOP], [ND], or [CONDEN.] button, a sub screen showing options appears. Select the desired interlocked operation.

To quit setting, press the [CANCEL] button.



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

[MOVEMENT] screen is displayed.



After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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-L3 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-L3 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-L3.

[Procedure]

[SETUP MENU] → [MOVEMENT]

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

A confirmation dialog box appears.

- (2) Press the [YES] button.

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

To cancel saving, press the [NO] 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]

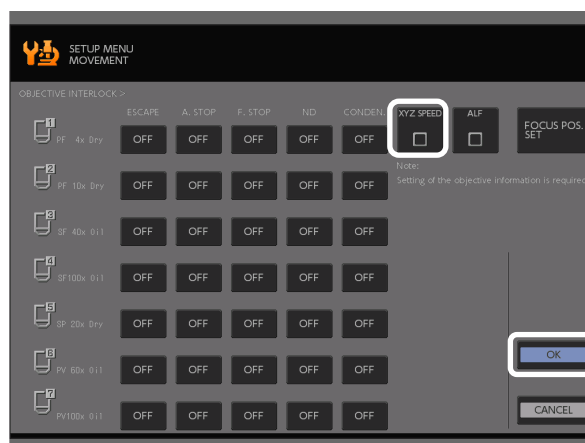
[SETUP MENU] → [MOVEMENT]

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



- (2) Press the [XYZ SPEED] button to change the setting.
ON (interlock)/OFF (do not interlock) toggles each time you press the button.

To quit setting, press the [CANCEL] button.



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

After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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

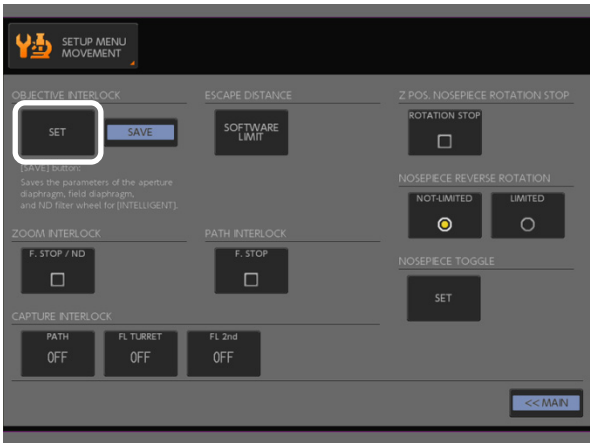
In order to perform this configuration, the motorized nosepiece must be attached.

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.

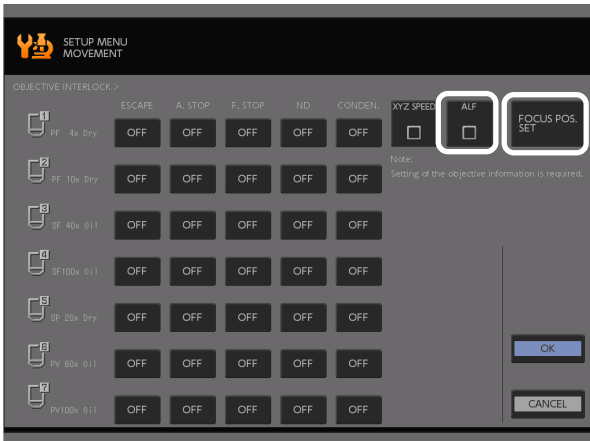
[SETUP MENU] → [MOVEMENT]

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



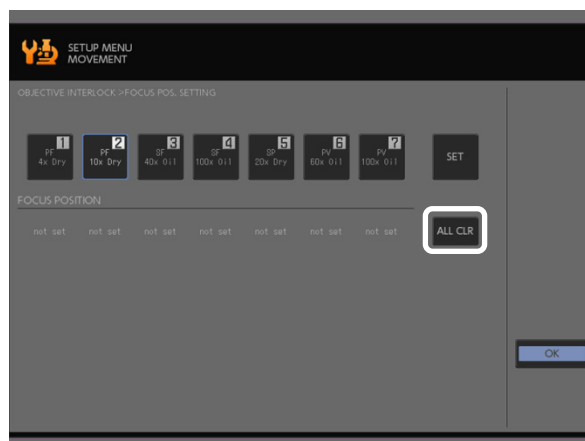
- (2) If the [ALF] button is ON, press the button to turn it off.
The focal point can be set only when parfocal correction is turned off.

- (3) Press the [FOCUS POS. SET] button.



(4) Press the [ALL CLR] button.

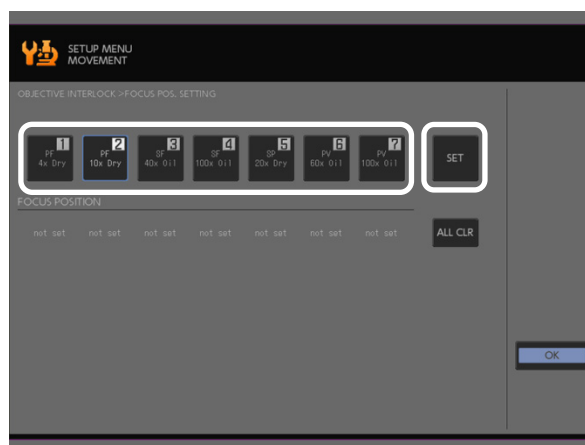
Previous settings are removed.

**(5) Press 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) Press the [SET] button to save the focal point of the address 1.**

The configuration status is shown in the [FOCUS POSITION] section at the bottom.

[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**

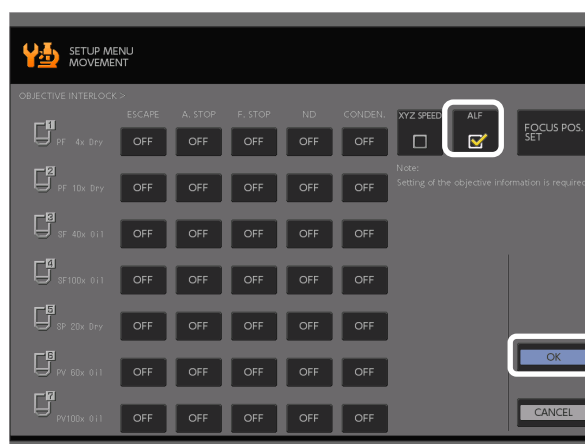
Be sure to set the focal points for all nosepiece addresses. For addresses where no objective is attached, save the focal point with the same status as the previous address. If you don't set the focal point, parfocal correction is not performed when the address is switched from the position without objective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

(9) When you have saved focal points for all addresses, press the [OK] button.**(10) Press the [ALF] button to turn on the function.**

The parfocal correction is turned on.

(11) Press the [OK] button.

[MOVEMENT] screen is displayed.



After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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
[ALF]	ON	Enables parfocal correction.
	OFF (default)	Disables parfocal correction.

[SETUP MENU] → [MOVEMENT]

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



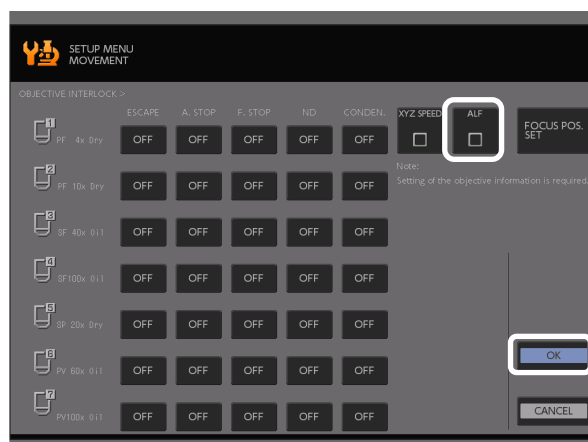
- (2) Press the [ALF] button to enable or disable the function.

The function toggles each time you press the button.

To quit setting, press the [CANCEL] button.

- (3) Press the [OK] button.

[MOVEMENT] screen is displayed.



After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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.

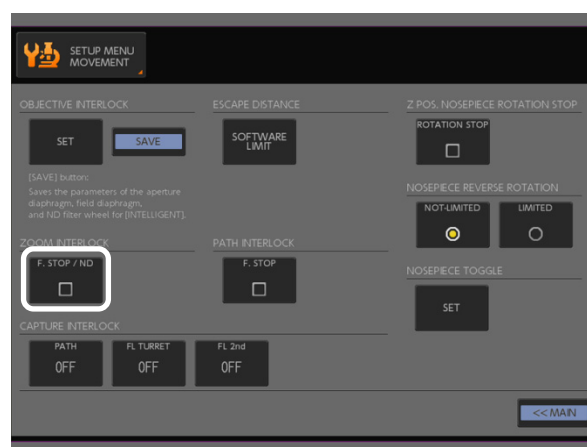
Setting Item	Device to Be Interlocked	Setting Value	Operation to Be Interlocked
[F. STOP / ND]	Ni-E Main Body (DIA field diaphragm), motorized ND filter wheel	ON	Adjusts the field diaphragm and motorized ND filter according to the interlock setting for objective switching. (For the settings, refer to “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]

[SETUP MENU] → [MOVEMENT]

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

The function is toggled each time you press the button.



After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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.

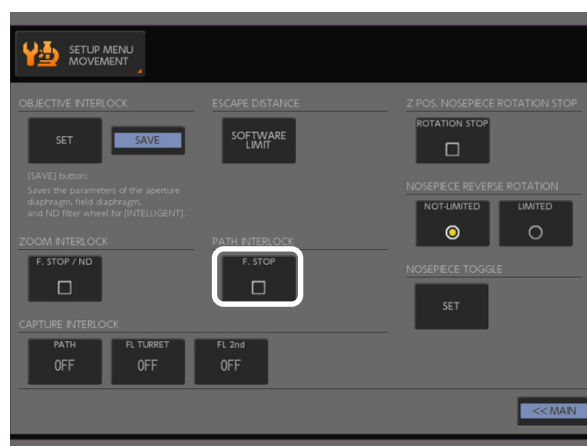
Setting Item	Device to Be Interlocked	Setting Value	Operation to Be Interlocked
[FIELD STOP]	Ni-E Main Body (DIA field diaphragm)	ON	Adjusts the field diaphragm according to the interlock setting for objective switching. (For the settings, refer to “5.1.1 Configuring the Interlocked Operation with Switching 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]

[SETUP MENU] → [MOVEMENT]

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

The function is toggled each time you press the button.



After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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 quadocular 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 pressing the [CAPTURE FRONT/LEFT/RIGHT/AUX] button on the [MICROSCOPE CONTROL] or [CAM-MIC CONTROL] screen or the [CAPTURE] button on the microscope. Interlocked operation is not performed when you capture the image using the camera head directly connected to the DS-L3 by pressing the [CAPTURE] button at the top of the [CAM-MIC CONTROL] screen or the [CAPTURE] button on the camera control screen.

Setting Item	Device to Be Interlocked	Setting Value	Operation to Be Interlocked
[PATH]	Motorized quadocular 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]

[SETUP MENU] → [MOVEMENT]

Press the [PATH], [FL TURRET], and [FL 2nd] button under the [CAPTURE INTERLOCK] to change the settings.

Pressing each button opens a sub screen showing options. Select the desired interlocked operation.



After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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 press the [ESCAPE] button on the DS-L3
- You press the [SAMPLE REMOVE POSITION] button on the DS-L3
- Retraction is interlocked with switching objectives

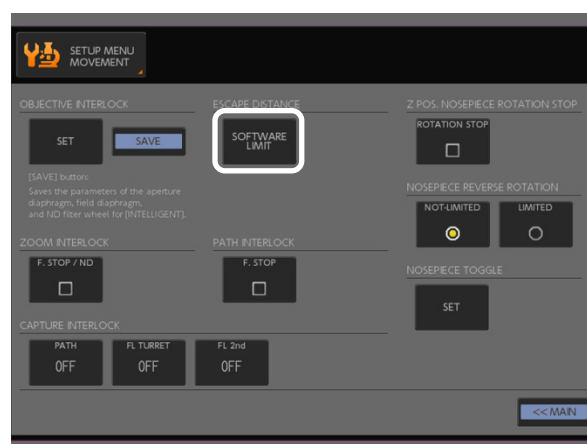
Setting Item	Setting Value	Retracting Amount
[ESCAPE DISTANCE]	[5 mm]	5 mm from the current position
	[10 mm]	10 mm from the current position
	[SOFTWARE LIMIT] (default)	Software limit position set on the [UTILITY] screen. For more information, see “6.4 Setting the Software Limits” in this chapter.

[Procedure]

[SETUP MENU] → [MOVEMENT]

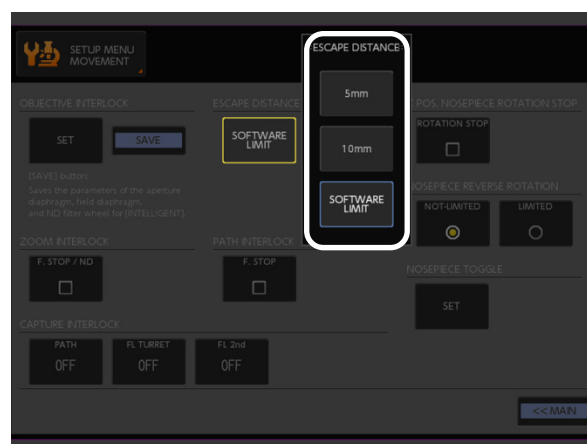
- (1) Press the [SOFTWARE LIMIT] button under the [ESCAPE DISTANCE].

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 press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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 pressing 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

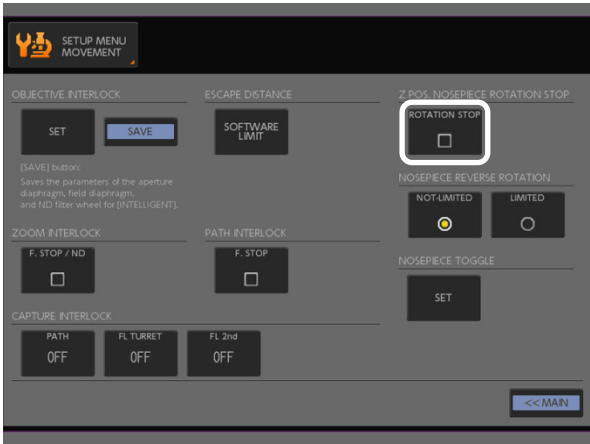
Near the configured value, vibration may move the elevating section and rotate the motorized nosepiece.

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]

[SETUP MENU] → [MOVEMENT]

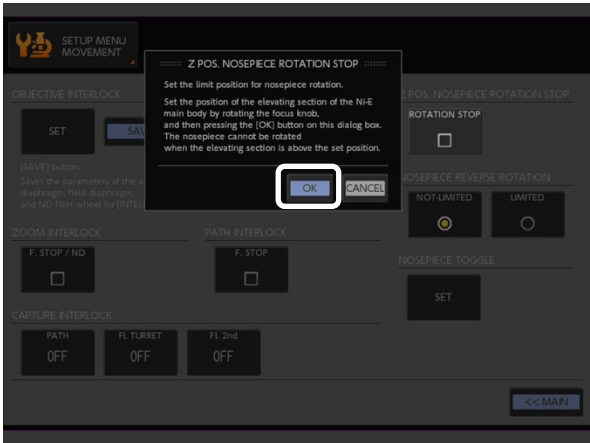
- (1) Switch between ON (limited) and OFF (not limited) by pressing the [ROTATION STOP] button under the [Z POS. NOSEPIECE ROTATION STOP].



- (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 press the [OK] button.

The nosepiece does not rotate if the elevating section is above the current position.

To quit setting, press 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, pressing 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]

[SETUP MENU] → [MOVEMENT]

Switch the setting by pressing the [NOT-LIMITED] or [LIMITED] button under the [NOSEPIECE REVERSE ROTATION].

(For Ni-E/Ni-U)



(For Ci-E)



After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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 Pressed
[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

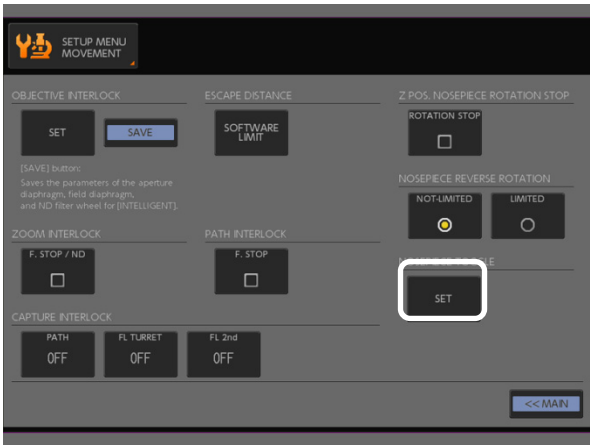
Enabling/Disabling the Toggle Function

[Procedure]

[SETUP MENU] → [MOVEMENT]

- (1) Press the [SET] button under the [NOSEPIECE TOGGLE] (this operation is not required for Ci-E. Go to the next step.)

(For Ni-E/Ni-U)



- (2) Press the [OFF], [PATTERN 1], or [PATTERN 2] button under [NOSEPIECE TOGGLE] to select the action when nosepiece rotation/reverse rotation button is pressed.

To quit setting, press the [CANCEL] button. (Ni-E only)

- (3) Press the [OK] button (this operation is not required for Ci-E).

[MOVEMENT] screen is displayed.

(For Ni-E/Ni-U)



(For Ci-E)



When using Ni-E or Ni-U, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory after making changes to the settings. If the DS-L3 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]

[SETUP MENU] → [MOVEMENT]

- (1) Press the [SET] button under the [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], press two buttons for addresses you want to use for toggle function.

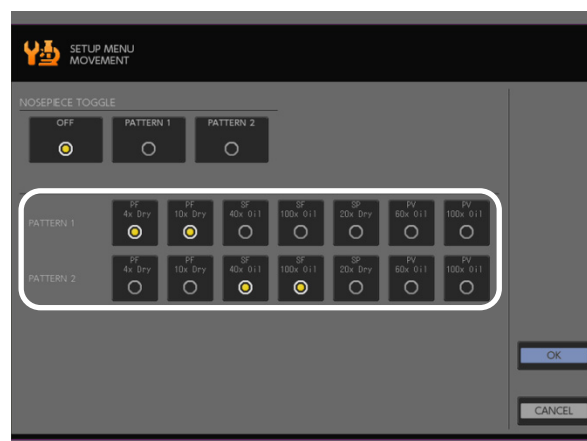
Two addresses can be specified for each toggle pattern. Specifying third address cancels the address you specified first.

To quit setting, press the [CANCEL] button. (Ni-E only)

- (3) Press 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 press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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.

5.6

Configuring Top Lens Swing-out of the Motorized Swing-out Condenser

Ci-E

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]

[SETUP MENU] → [MOVEMENT]

- (1) Press the [IN]/[OUT] button under the [CONDEN.] to enable or disable the top lens swing-out.

[IN] (bring into the optical path) and [OUT] (swing out) toggles each time you press the [IN]/[OUT] button.



After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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]

[SETUP MENU] → [UTILITY]

- (1) Press the [DISPLAY PATTERN SET] button under the [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.

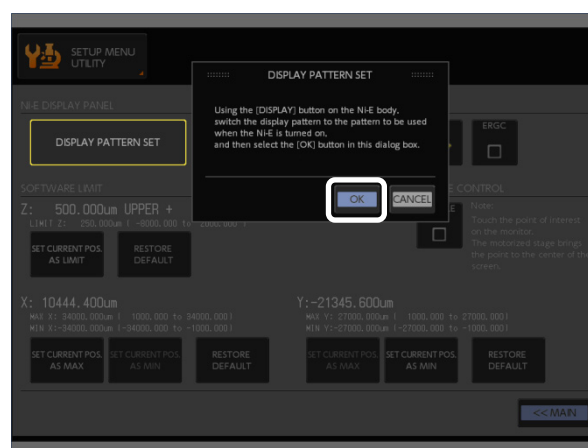
You can switch between status display and FUNCTION button's function display by pressing the microscope's DISPLAY toggle button. You can also set the FUNCTION button's function display as the pattern for startup.



- (3) Press the [OK] button.

The pattern selected in step (2) is set as the display pattern at startup.

To quit setting, press the [CANCEL] button.



After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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]

[SETUP MENU] → [UTILITY]

Enable or disable the function by pressing the [Ni-E] or [ERGC/JOY] button under the [FOCUS KNOB ENABLE].

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



After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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]

[SETUP MENU] → [UTILITY]

Press the [Ni-E] or [ERGC] button under the [BUZZER] to enable or disable the buzzer.

The buzzer ON/OFF is toggled each time you press the button.



After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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 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

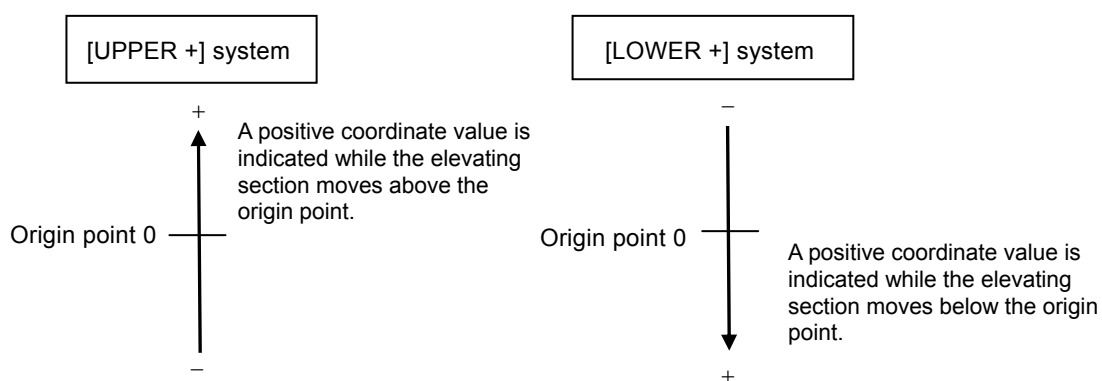
When controlling the elevating section with the focus knob, the actual stop position is up to 20 μm beyond the set limit position.

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 [SETUP MENU] → [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]

[SETUP MENU] → [UTILITY]

- (1) Use the focus knob to move the elevating section to a point that you want to set as a limit position.
- (2) Press the [SET CURRENT POS. AS LIMIT] button.

The limit position is defined based on the current position. Pressing 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 press 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 press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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

[SETUP MENU] → [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) Press the [SET CURRENT POS. AS MAX] or [SET CURRENT POS. AS MIN] button for X or Y-axis under the [SOFTWARE LIMIT].

The limit position is set based on the current position.

Pressing 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 press the [RESTORE DEFAULT] button once more.



After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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**

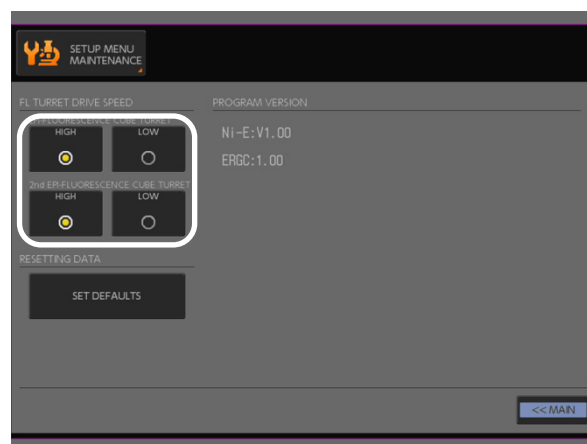
In order to perform this configuration, the motorized epi-fluorescence cube turret must be attached.

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 cube turrets)	[HIGH] (default)	When using only standard filter cube
	[LOW]	When using any filter cube which includes thick dichroic mirror

[Procedure]

[SETUP MENU] → [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 press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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.

6.6

Restoring the Factory Default Settings

Ni-E Ni-U Ci-E

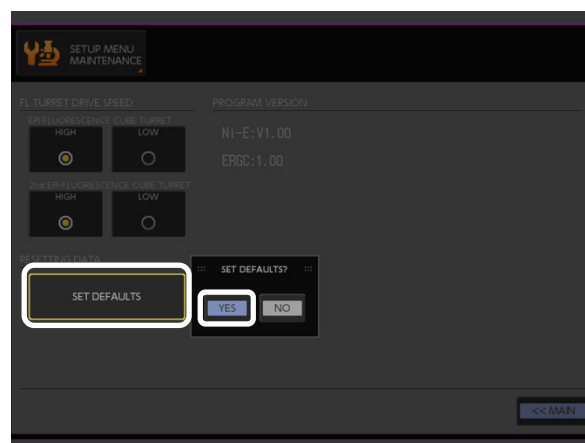
You can restore the factory default settings. Doing this operation restores all settings that can be configured in the [SETUP MENU] (including the information for attached optical elements, microscope settings saved as a mode, and initial value of interlock setting [INTELLIGENT]) to the factory default settings.

[Procedure]

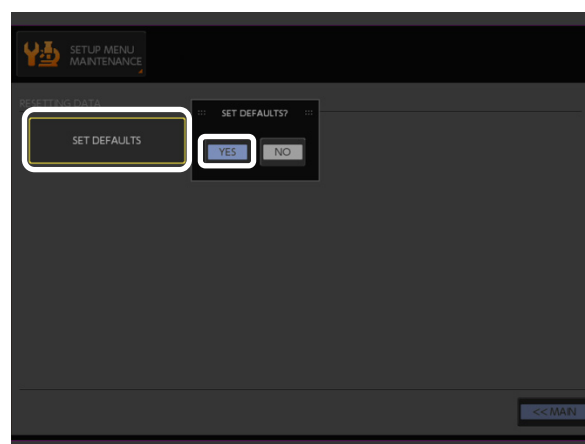
[SETUP MENU] → [MAINTENANCE]

- (1) **Press the [SET DEFAULTS] button under the [RESETTING DATA] section.**
A confirmation screen appears.
- (2) **Press the [YES] button.**
To cancel restoring to factory setting, press the [NO] 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.

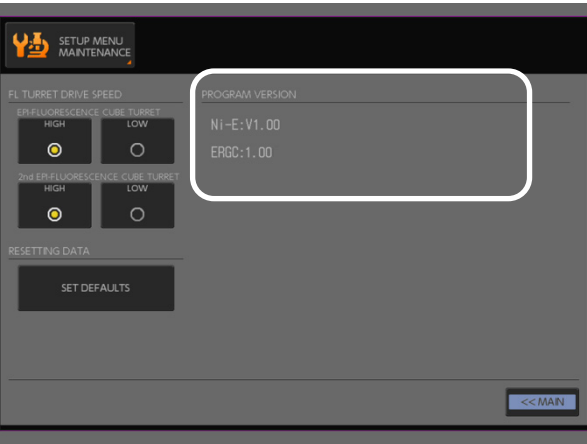
[Procedure]

[SETUP MENU] → [MAINTENANCE]

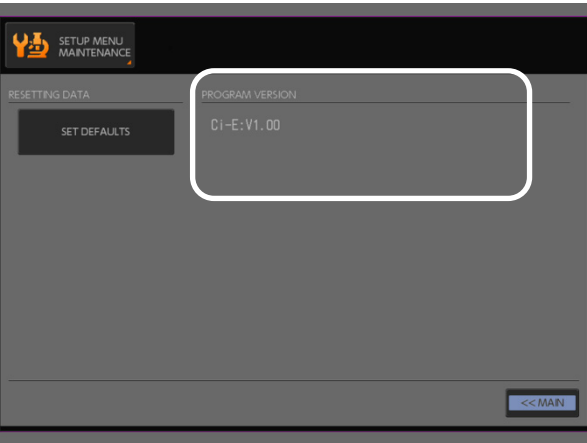
Check the information shown in the [PROGRAM VERSION] section.

- 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-L3 hardware related problems such as DS-L3 not turning on.

1

Display

Problem	Cause	Measure
Microscope operation screen does not appear.	DS-L3 is not connected properly.	Turn off the microscope, motorized accessory devices, and DS-L3, then reconnect DS-L3 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-L3, turn on the microscope (the control box A/B for Ni-E/Ni-U), then turn on DS-L3.
	Availability of the external monitor cannot be determined automatically because [DDC I/F] on the camera control screen is set to OFF. Also, no external monitor is connected, but the display mode is set to use only external monitor.	Perform the following operations: <ol style="list-style-type: none"> 1. Press the power supply button and turn on the power. 2. Immediately after power on, press the power supply button once more to turn off the power while the LED is blinking. 3. Press the power supply button once more to turn on the power. This changes the setting and changes the display mode to use the screen of DS-L3. For details, see the "Camera Operation" instruction manual.
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-L3, 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".

Problem	Cause	Measure
(Only in Ni-E/Ni-U) In the [CAPTURE] button in the [MICROSCOPE CONTROL] screen or [CAM-MIC CONTROL] 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 [SETUP MENU] → [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 pressed, an element different from the one on the button enters the optical path.	Information is not configured correctly.	Set the correct information in [SETUP MENU] → [COMPONENTS]. See Chapter 6, “2 Configuring Optical Elements Information ([COMPONENTS] Screen)”.
(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 [CAM-MIC CONTROL] screen.	The [SLEEP] button is not configured on the [BUTTON FUNC] screen to be placed on the [CAM-MIC CONTROL] 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 [CAM-MIC CONTROL] 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”.
(Ni-E only) No image is displayed on the image display area (large/small) in the Scan Large Image function.	The shutter is closed.	Open the shutter.

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 pressed.	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-L3. 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 [SETUP MENU].	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-L3 button. In this case, the selection status is not displayed on DS-L3. (This is not an error.)
(Ni-E only) The Scan Large Image function shuts down without pressing the [EXIT] button.	DS-L3 is not connected to the PC via an USB cable correctly.	Connect DS-L3 to the PC via an USB cable correctly.

■ 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.	Press 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.	Press 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-L3.	DS-L3 does not have control.	Give control to DS-L3. See Chapter 5, "1.14 Adjusting the Dia-illumination Lamp/LED".
---	------------------------------	--

■ Capture operation

Capturing with a digital camera cannot be started.	Camera trigger cable is not properly connected.	Turn off the microscope and DS-L3, 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 pressed. The epi-illumination shutter opens or closes each time the [SHUTTER DIA] button is pressed.	Motorized shutter is not connected properly.	Turn off the microscope and DS-L3, 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)”.
--	---	--

3

Saving Settings

Problem	Cause	Measure
Settings are restored to the previous value when DS-L3 is turned on.	Settings are not saved.	After configuring the settings, be sure to press the [SAVE] button on the [SETUP MENU] - [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-L3 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-L3 DS Camera Control Unit to an industrial microscope and display the status of the microscope on DS-L3.

Chapter 1 Devices Whose Status Is Viewable on DS-L3

Chapter 2 Viewing the Status of Microscope on DS-L3

Chapter 3 Settings

Chapter 4 Troubleshooting

Viewing the S

tatus of Microscope
on DS-L3

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-L3, and individual parts, refer to the instruction manual of your microscope and also the “Camera Operation” instruction manual of DS-L3.

By connecting the DS-L3 DS Camera Control Unit to the microscope, the status of the microscope and accessories can be displayed on DS-L3.

This chapter describes the microscopes and accessories whose statuses can be viewed on the DS-L3 DS Camera Control Unit and the required settings.

1

**Devices Whose Status Is Viewable on the DS-L3
Connected to ECLIPSE L200N/L200ND/L300N/L300ND**

When the DS-L3 is connected to ECLIPSE L200N/L200ND/L300N/L300ND, the status of the following devices is viewable on DS-L3.

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-L3	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-L3 Connected to ECLIPSE MA200

When the DS-L3 is connected to ECLIPSE MA200, the status of the following devices is viewable on the DS-L3. 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-L3	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-L3 Connected to MULTIZOOM AZ100M

When the DS-L3 is connected to MULTIZOOM AZ100M, the status of the following devices is viewable on the DS-L3. 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-L3	Required Configuration
MULTIZOOM AZ100M microscope	Zoom magnification	None
AZ-NPI Triple Nosepiece I	Address of nosepiece in optical path, objective lens information	Information on attached objectives (See Chapter 3, "2.1 Configuring the Objective Information")
AZ-FL Epi-Fluorescence 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 AZ100M and LV100DA-U)")
AZ-STDM Diascopic Stand M	(Condenser's low/high magnification information is shown in the current microscopy method display area)	None
AZ-ICI Coaxial Episcopic Illuminator	Connection status	None
-	Display magnification on DS-L3 monitor	Information on attached objectives (See Chapter 3, "2.1 Configuring the Objective Information")
	Current microscopy method	None

4

Devices Whose Status Is Viewable on the DS-L3 Connected to ECLIPSE LV100DA-U

When the DS-L3 is connected to ECLIPSE LV100DA-U, the status of the following devices is viewable on the DS-L3. 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-L3	Required Configuration
ECLIPSE LV100DA-U 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 AZ100M and LV100DA-U)”)
	EPI aperture diaphragm diameter	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

5

Devices that can be Controlled and Monitored from DS-L3 Connected to ECLIPSE LV150A/LV150NA/LV-NCNT2 Nosepiece Controller 2/ LV-NCNT-N Motorized Nosepiece Controller

When the DS-L3 is connected to ECLIPSE LV150A, LV150NA, LV-NCNT2 nosepiece controller 2, or LV-NCNT-N motorized nosepiece controller, following devices can be controlled on the DS-L3.

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-L3	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”)

6

Devices Whose Status Is Viewable on the DS-L3 Connected to LV-INAD Adapter for Intelligent Nosepiece

When the DS-L3 is connected to the LV-INAD Adapter for Intelligent Nosepiece, the status of the following devices is viewable on the DS-L3.

Refer to the following table to perform the required configuration.

Device	Information Viewable on DS-L3	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")

7

Devices Whose Status Is Viewable on the DS-L3 Connected to SMZ18/SMZ25 Stereo Microscope

When the DS-L3 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-L3.

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-L3	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 AZ100M, LV100DA-U, 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

8

Devices Whose Status Is Viewable on the DS-L3 Connected to SMZ1270i Stereo Microscope

When the DS-L3 is connected to SMZ1270i, the status of the following devices is viewable on the DS-L3.

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-L3	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")

This chapter describes the procedure to power on and off the DS-L3 and the configuration of screens that show the information on the microscope.

1

Powering On/Off the Devices

Powering ON the devices

1

Turn on the powers of the microscope main unit and motorized parts.

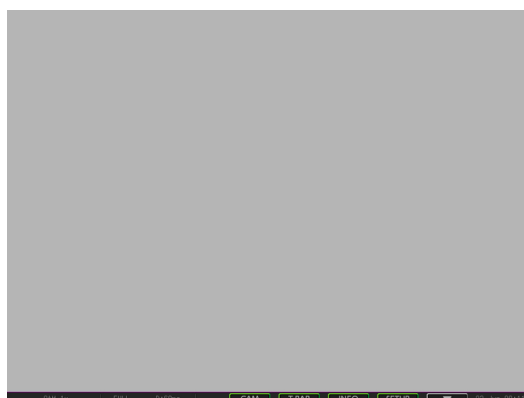
The motorized devices are initialized.

For details on turning on the power, refer to the instruction manual provided with your microscope.

2

Press the power switch of DS-L3 to turn on the unit.

The startup screen appears. The system configuration data and settings are acquired from the main unit, and then the following screen appears. The completion of the initial operations takes about 40 seconds, depending on the configuration of the microscope system. If you want to use an application software on the connected PC, start the application software last.



Shutdown

1

Press the power switch of DS-L3 to turn off the unit.

2

Turn off the powers of the microscope main unit and motorized parts.

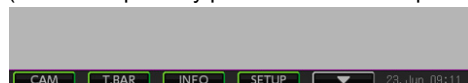
2

Switching between Camera Control Screen and MIC INFO Screen

Startup screen



Top screen for camera control
(See the separately provided "Camera Operation")

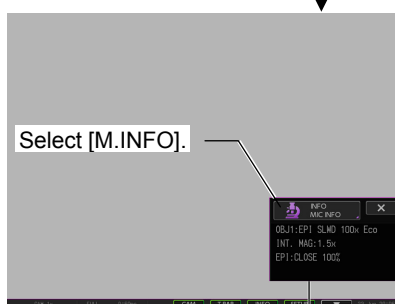


Top screen for microscope information

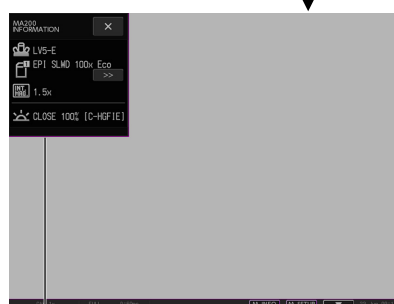


Task bar

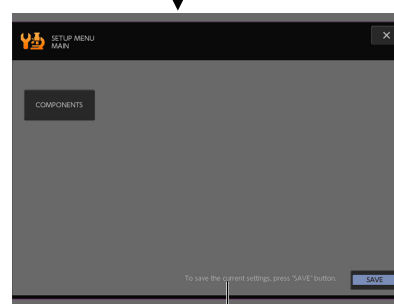
[▼] button



[MICROSCOPE INFORMATION]
screen on the camera control screen:
The screen for displaying the
information of the microscope.



[MICROSCOPE INFORMATION] screen:
The screen for displaying the information of
the microscope.



[SETUP MENU]:
The screen for setting up
the microscope.

When the power is turned on, the startup screen appears, followed by the camera control screen.

To display microscope information, press the [INFO] button to display the sub window of the histogram and then press the title of the sub window and select [M.INFO].

Or, press the [▼] button on the taskbar to switch from the camera control screen to the top screen of the microscope information, and then click the [INFORMATION] button.

Also, when you want to switch from the microscope information screen to the top screen of camera control, press the [▼] button on the taskbar.

✔ Displaying the [MIC INFO] screen directly from the [INFO] task bar button on the camera control screen

You can change the settings so that the [MIC INFO] screen is displayed as the default instead of the [HISTOGRAM] screen when the [INFO] button is pressed on the task bar of the camera control screen. Navigate to the [SETUP MENU: MAIN] screen via the [SETUP] task bar button of the camera control screen. For [INFO] setting under the [MENU SETTING] area, select [M.INFO] and save the setting. The DS-L3 must be restarted for the change effect.



✔ Menu size on the screen

Changing the display size of a menu on the camera control screen makes the [MICROSCOPE INFORMATION] screen smaller. For details, see Chapter 13 "13.2.1 (5) Configuring the position and size of the menu" in the "Camera Operation" instruction manual. (A bigger menu is used in this manual.)

3

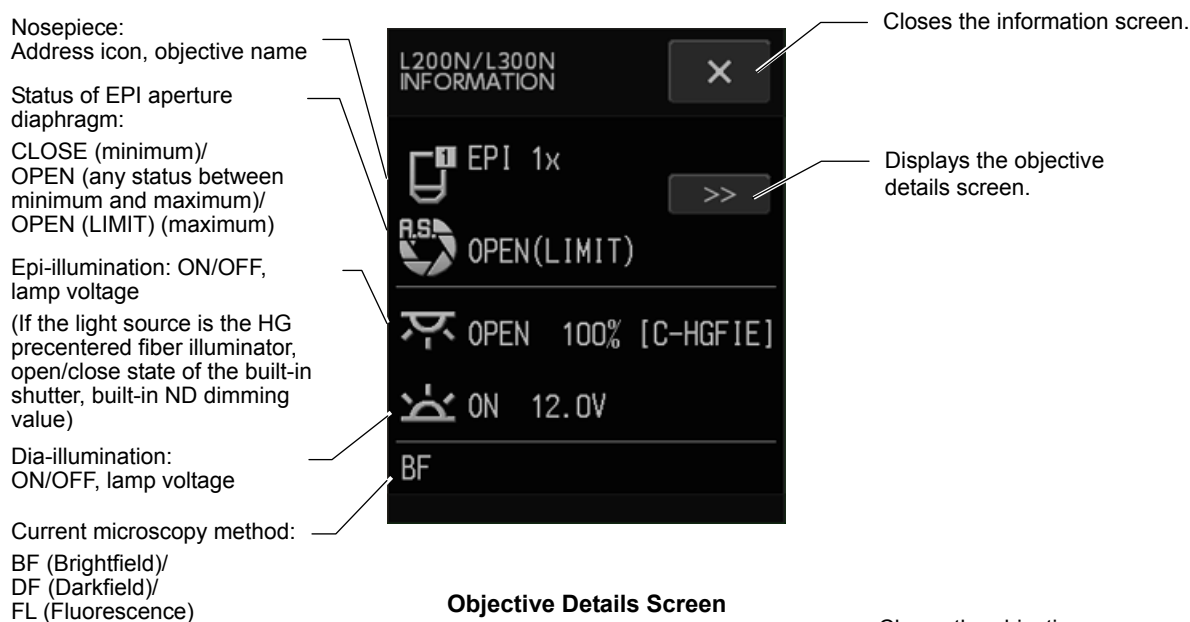
Information Screen for ECLIPSE L200N/L200ND/L300N/L300ND

✔ 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-L3. 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-L3, refer to Chapter 1, "Devices Whose Status Is Viewable on DS-L3".

The information screen displays the status of the microscope.

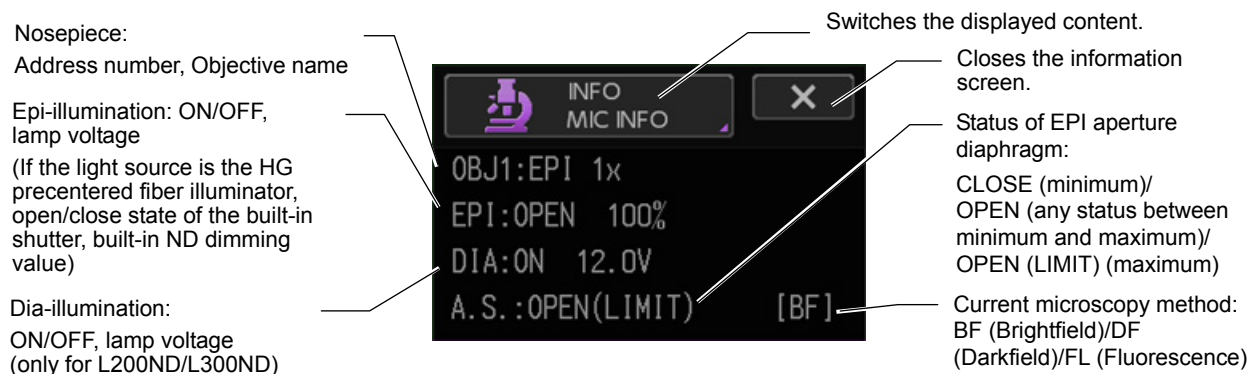
Microscope Information Screen



Objective Details Screen



Camera control screen



4

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-L3. 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-L3, refer to Chapter 1, "Devices Whose Status Is Viewable on DS-L3".

The information screen displays the status of the microscope.

Microscope Information Screen

Nosepiece type:

LV5 (Quintuple intelligent nosepiece for LV series)

LV5-E (Quintuple motorized nosepiece for LV series)

i6 (Sextuple intelligent nosepiece for i series)

i7 (Septuple intelligent nosepiece for i series)

NOT CONNECTED (Not connected)

Nosepiece:

Address icon, objective name

Magnification of the magnification module

Epi-illumination:

ON/OFF, lamp voltage

(If the light source is the HG precentered fiber illuminator, open/close state of the built-in shutter, built-in ND dimming value)



Closes the information screen.

Displays the objective details screen.

Objective Details Screen

Objective series name

Objective name

Numerical aperture

Working distance



Closes the objective details screen.

Camera control screen

Nosepiece:

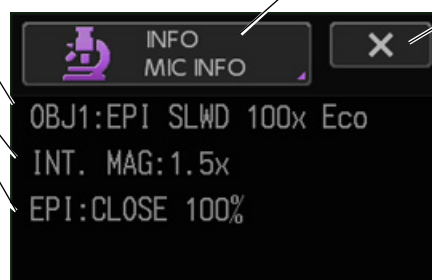
Address number, Objective name

Magnification of the variable magnification module

Epi-illumination:

ON/OFF, lamp voltage

(If the light source is the HG precentered fiber illuminator, open/close state of the built-in shutter, built-in ND dimming value)



Switches the displayed content.

Closes the information screen.

5

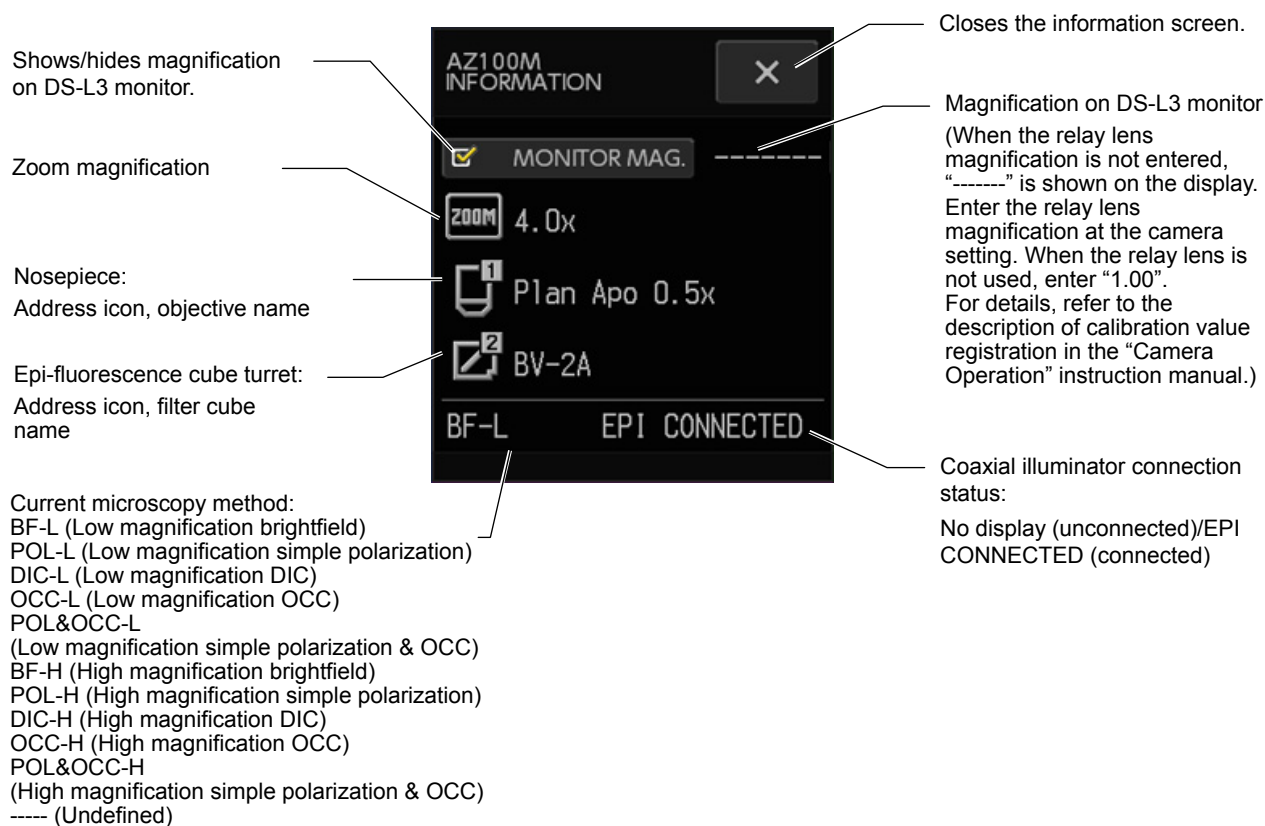
Information Screen for MULTIZOOM AZ100M

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

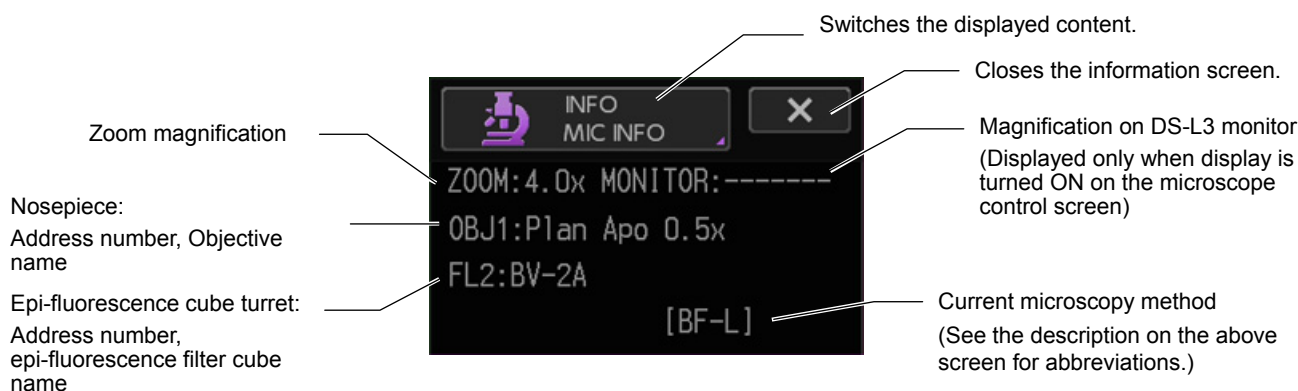
The screen will only show devices that are connected to the microscope and recognized by DS-L3. For this reason, the composition of the screen will differ depending on the configuration of the microscope. For information on microscopes and devices that can be recognized by DS-L3, refer to Chapter 1, "Devices Whose Status Is Viewable on DS-L3".

The information screen displays the status of the microscope.

Microscope Information Screen



Camera control screen



6

Information Screen for ECLIPSE LV100DA-U

✔ 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-L3. 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-L3, refer to Chapter 1, "Devices Whose Status Is Viewable on DS-L3".

The information screen displays the status of the microscope.

Microscope information screen

Nosepiece:

Address icon, objective name

Epi-fluorescence cube turret:

Address icon, filter cube name

EPI aperture

diaphragm diameter

Epi-illumination:

ON/OFF, lamp voltage
(If the light source is the HG
precentered fiber illuminator,
open/close state of the built-in
shutter, built-in ND dimming
value)

Dia-illumination:

ON/OFF, lamp voltage

Current microscopy method:

INIT. (Initializing)

BF (Brightfield)

DF (Darkfield)

DIC (Differential
interference)

FL (Fluorescence)



Displays the objective
details screen.

Objective Details Screen

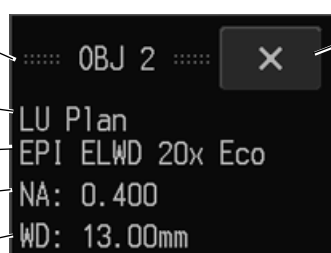
Address number

Objective series name

Objective name

Numerical aperture

Working distance



Closes the objective
details screen.

Camera control screen

Nosepiece:

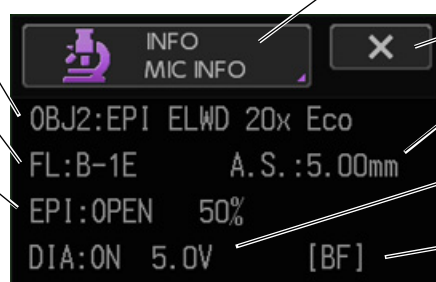
Address number, objective
name

Epi-fluorescence cube turret:

Epi-fluorescence filter cube name

Epi-illumination:

ON/OFF, lamp voltage
(If the light source is the HG
precentered fiber illuminator,
open/close state of the built-in
shutter, built-in ND dimming
value)



Switches the displayed content.

Closes the information screen.

EPI aperture diaphragm
diameter

Dia-illumination:
ON/OFF, lamp voltage

Current microscopy method
(See the description on the above
screen for abbreviations.)

7

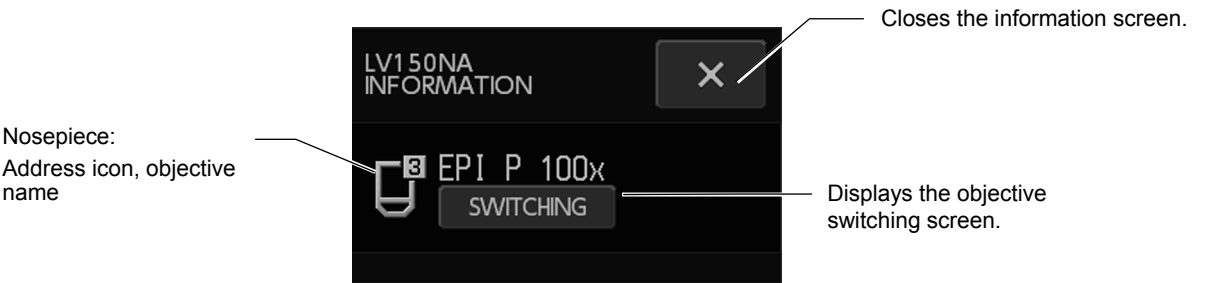
Information Screen for ECLIPSE LV150A/LV150NA/LV-NCNT2
Nosepiece Controller 2/LV-NCNT-N Motorized Nosepiece Controller

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

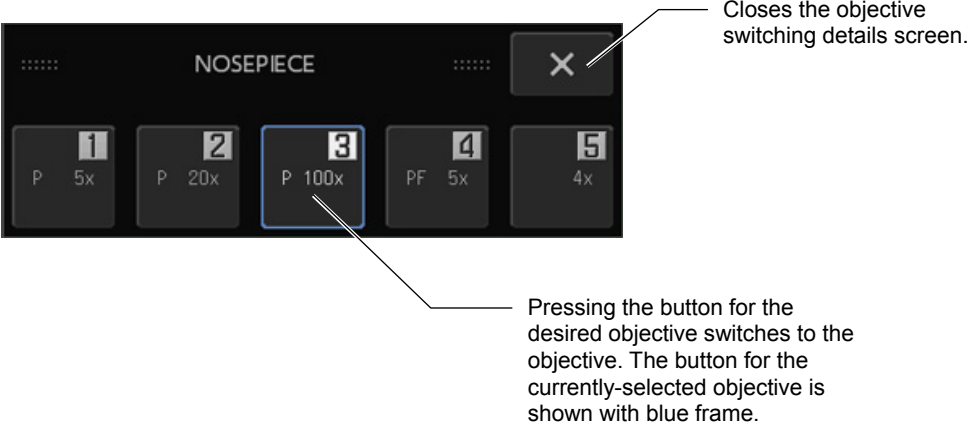
The screen will only show devices that are connected to the microscope and recognized by DS-L3. For this reason, the composition of the screen will differ depending on the configuration of the microscope. For information on microscopes and devices that can be recognized by DS-L3, refer to Chapter 1, “Devices Whose Status Is Viewable on DS-L3”.

The information screen displays the status of the microscope.

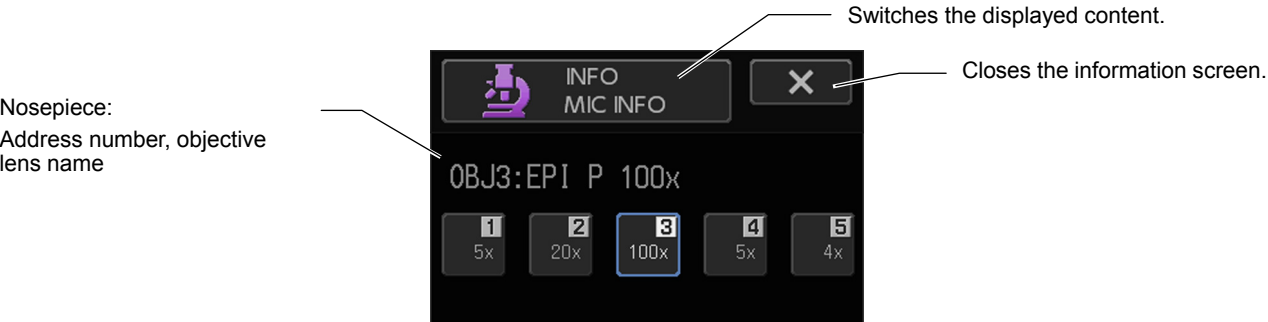
Microscope information screen



Objective switching screen



Camera control screen



8

Information Screen for LV-INAD Adapter for Intelligent Nosepiece

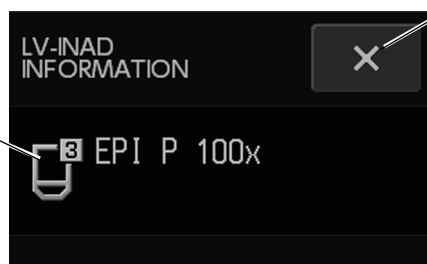
✓ **The display appearance depends on the configuration or setting of the microscope.**

On the window only devices that are connected to the microscope and detected by the DS-L3 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-L3” for the devices that can be detected by the DS-L3 from your microscope and accessories.

The Info window displays the status of the microscope.

Microscope Info window

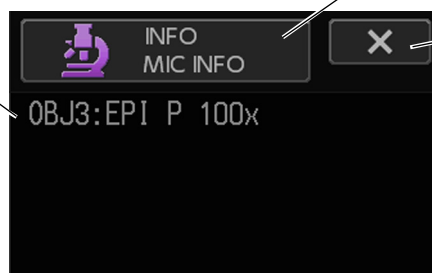
Nosepiece:
Address icon, objective
name



Closes the information screen.

Camera Control window

Nosepiece:
Address number, objective
name



Switches the displayed content.

Closes the information screen.

9

Information Screen for SMZ18/SMZ25 Stereo Microscope

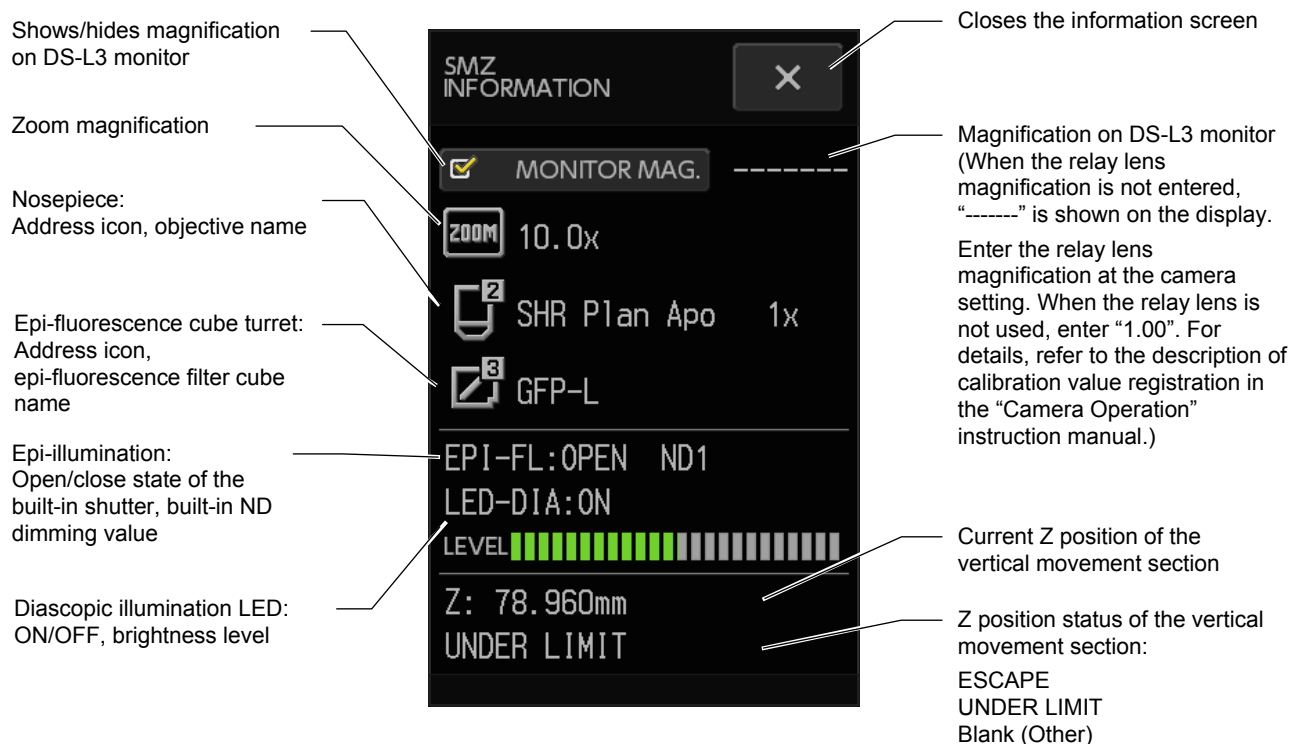
✓ **The display appearance depends on the configuration or setting of the microscope.**

On the window only devices that are connected to the microscope (P2-CTLA/P2-CTLB control box) and detected by the DS-L3 are displayed.

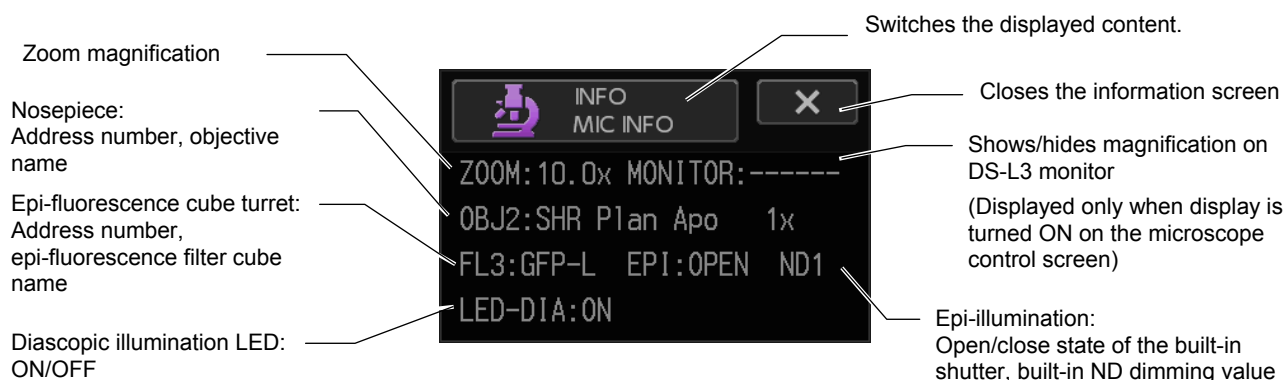
Therefore, the display appearance will depend on the configuration of the microscope. See Chapter 1 “Devices for Which Their Status Can be Detected by DS-L3” for the devices that can be detected by the DS-L3 from your microscope zooming body and accessories.

The Info window displays the status of the microscope.

Microscope Info window



Camera Control window



10

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-L3 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-L3” for the devices that can be detected by the DS-L3 from your microscope and accessories.

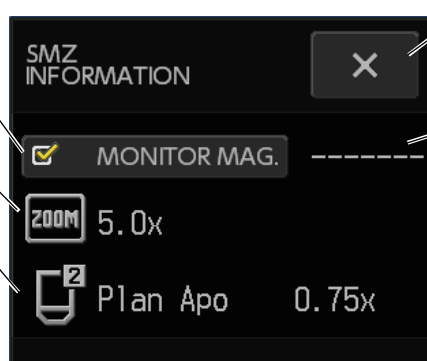
The Info window displays the status of the microscope.

Microscope Info window

Shows/hides magnification
on DS-L3 monitor

Zoom magnification

Nosepiece:
Address icon, objective name



Closes the information screen

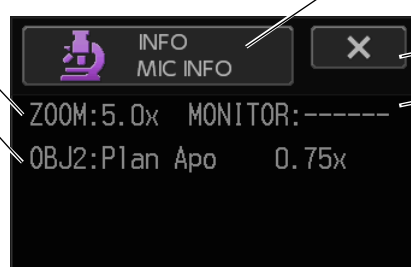
Magnification on DS-L3 monitor
(When the relay lens
magnification is not entered,
“-----” is shown on the display.)

Enter the relay lens
magnification at the camera
setting. When the relay lens
is not used, enter “1.00”. For
details, refer to the description of
calibration value registration in
the “Camera Operation”
instruction manual.)

Camera Control window

Zoom magnification

Nosepiece:
Address number, objective
name



Switches the displayed content.

Closes the information screen

Shows/hides magnification on
DS-L3 monitor
(Displayed only when display is
turned ON on the microscope
control screen)

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-L3 screen.

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

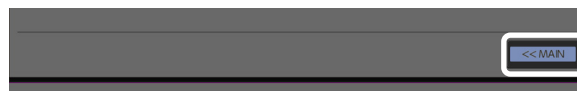
After making changes to the settings, be sure to press the [SAVE] button on the [SETUP MENU] - [MAIN] screen to save the settings to the microscope's memory (DS-L3's memory if LV150A or LV-NCNT2, or memory of nosepiece controller if LV-NCNT-N). If the DS-L3 is turned off without saving settings, previous 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 [SETUP MENU], be sure to press the [SAVE] button on the [SETUP MENU] - [MAIN] screen to save the settings to the microscope's memory (DS-L3's memory if LV150A or LV-NCNT2, or memory of nosepiece controller if LV-NCNT-N). If the DS-L3 is turned off without saving settings, previous values are restored.

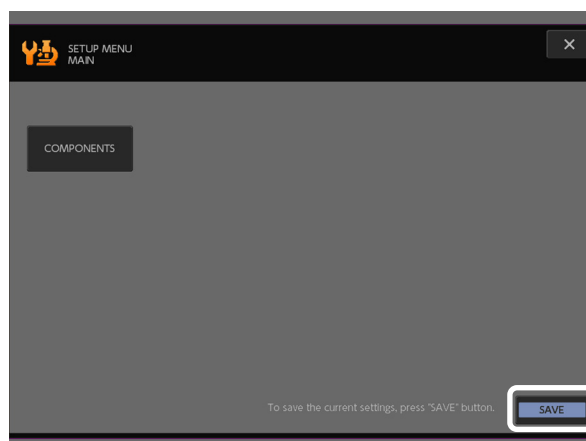
- (1) **After changing the settings, press the [<< MAIN] button to go back to the [SETUP MENU] - [MAIN] screen.**



- (2) **Press the [SAVE] button.**

A confirmation dialog box appears.

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

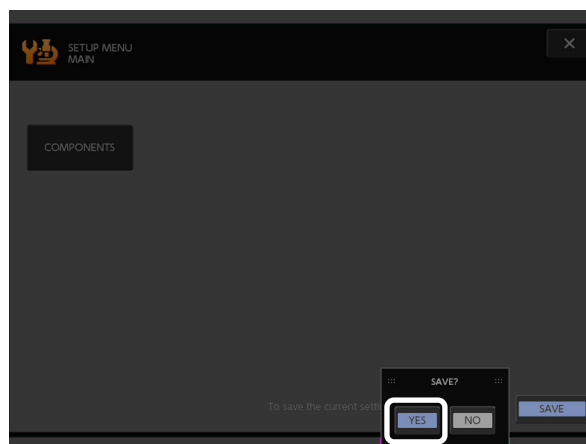


- (3) **Press the [YES] button.**

Settings are saved.

To cancel saving, press the [NO] button.

Pressing the [X] button on the upper-right of the screen closes the [SETUP MENU].



✓ Settings to be saved

Pressing 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.

✓ Registration of calibration settings is required to use DS-L3's scale/measurement function.

To use the DS-L3 scale/measurement function, make sure to register the calibration settings after configuring objective information. If the [X] button of the [SETUP MENU] screen is pressed after configuring the information of the objective, you are prompted to register the calibration setting. For the details of the registration of the calibration settings, see Chapter 11 "11.2.4 Registering the Calibration Settings" in the "Camera Operation" instruction manual.

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 pressing the [OPTIONAL] button (only for MA200, L200N/L200ND, L300N/L300ND, LV150A, LV-NCNT2, LV-NCNT-N, and LV100DA-U). For more information, see “2.1.2 Arbitrarily Configuring the Data of Objective”.

[Procedure]

[SETUP MENU] → [COMPONENTS]

(1) Select the [NOSEPIECE] tab.

The screens in the following procedure are for LV100DA-U. They vary depending on the model.

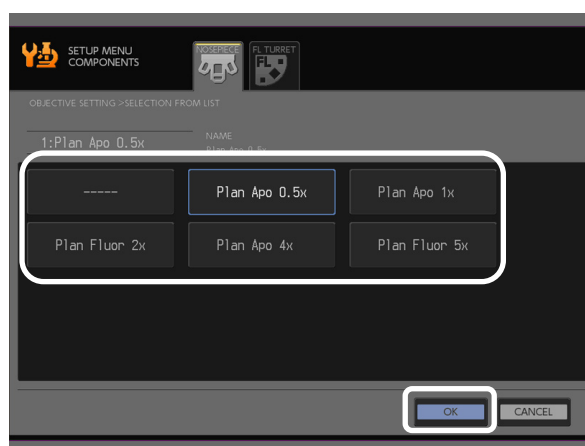
(2) Press the nosepiece address button to be configured.

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

**(3) (For AZ100M, SMZ18, SMZ25, and SMZ1270i) Select the objective attached to the microscope and press the [OK] button.**

Step (4) is not required. Go to step (5).

To quit setting, press the [CANCEL] button.

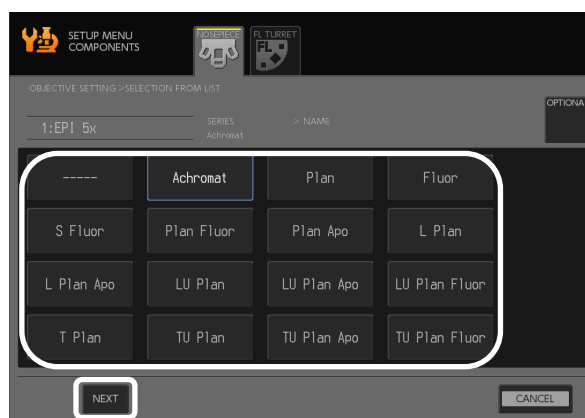


(For MA200, L200N/L200ND, L300N/L300ND, LV150A, LV-NCNT2, LV-NCNT-N, LV100DA-U)

Select the name of the series of the objective attached to the microscope and press the [NEXT] button.

When [▲] and [▼] buttons are shown at the right edge of the list, you can press [▲] or [▼] button to go to other pages.

To quit setting, press the [CANCEL] button.



- (4) (For MA200, L200N/L200ND, L300N/L300ND, LV150A, LV-NCNT2, LV-NCNT-N, LV100DA-U)
Select the attached objective and press 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 press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory (DS-L3's memory if LV150A or LV-NCNT2, or memory of nosepiece controller if LV-NCNT-N). If the DS-L3 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, LV150A, LV-NCNT2, LV-NCNT-N, and LV100DA-U)

[Procedure]

[SETUP MENU] → [COMPONENTS]

- (1) Select the [NOSEPIECE] tab.

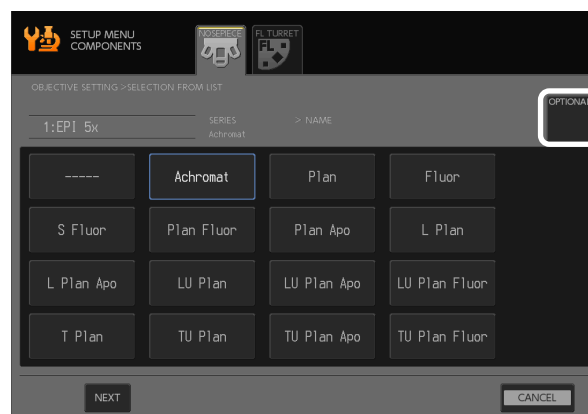
The screens in the following procedure are for LV100DA-U. They vary depending on the model.

- (2) Press the nosepiece address button to be configured.



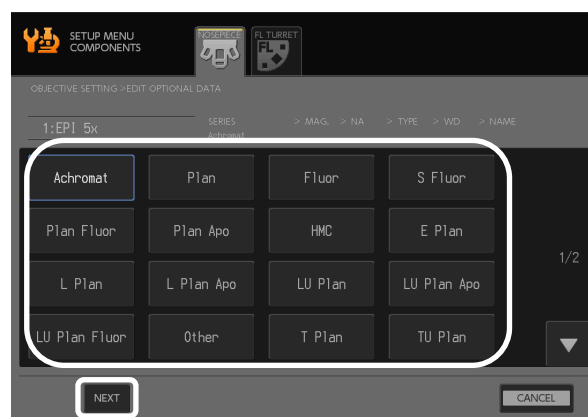
- (3) Press the [OPTIONAL] button on the objective configuration screen.

To quit setting, press the [CANCEL] button.



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

When [▲] and [▼] buttons are shown at the right edge of the list, you can press [▲] or [▼] button to go to other pages.



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

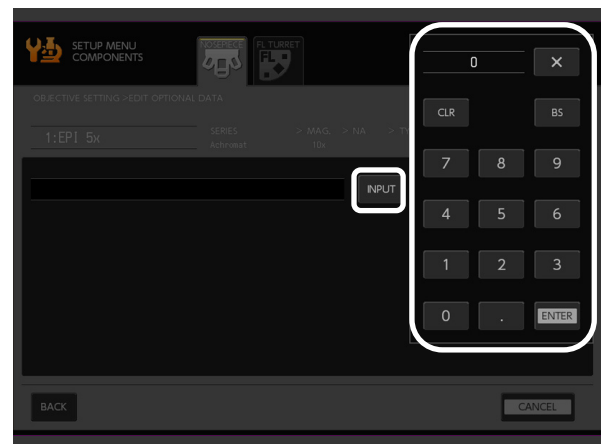
To return to the previous screen, press the [BACK] button.



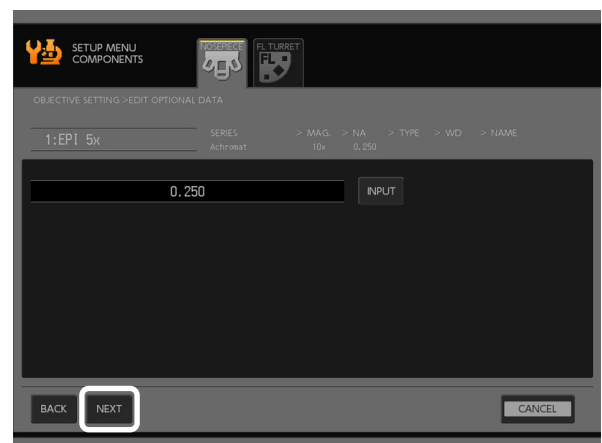
- (6) Press the [INPUT] button, enter the numerical aperture of the attached objective, and then press the [ENTER] button.

Pressing the [CLR] button clears the data you entered.

Pressing the [BS] button removes a character at the end of the data you entered.



- (7) Press the [NEXT] button.

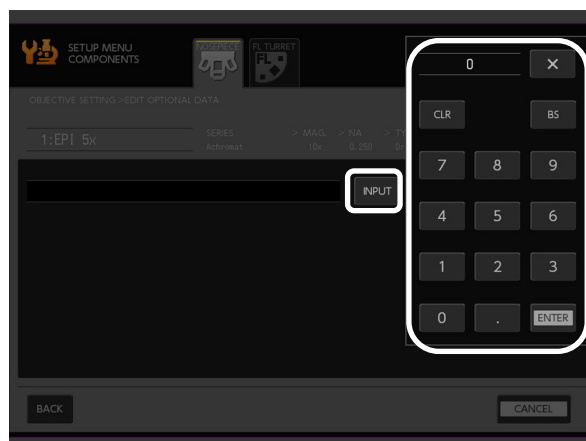


- (8) Select the immersion type of the objective attached to the microscope and press the [NEXT] button.

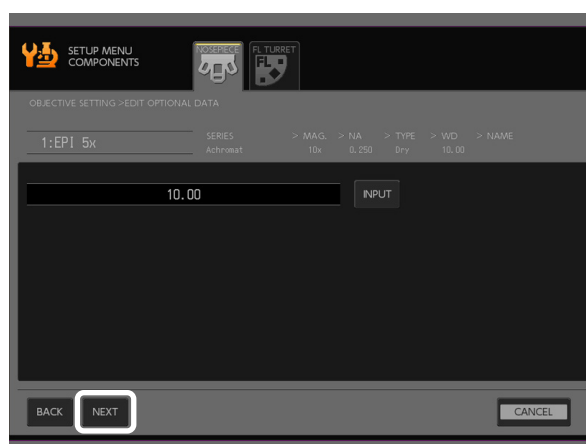


- (9) Press the [INPUT] button, enter the working distance of the attached objective, and then press the [ENTER] button.

Pressing the [CLR] button clears the data you entered.
Pressing the [BS] button removes a character at the end of the data you entered.

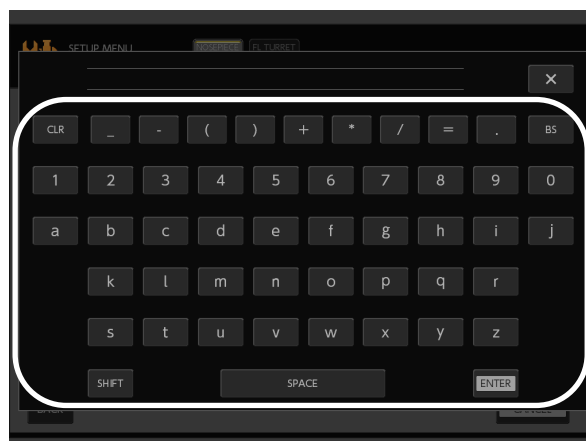
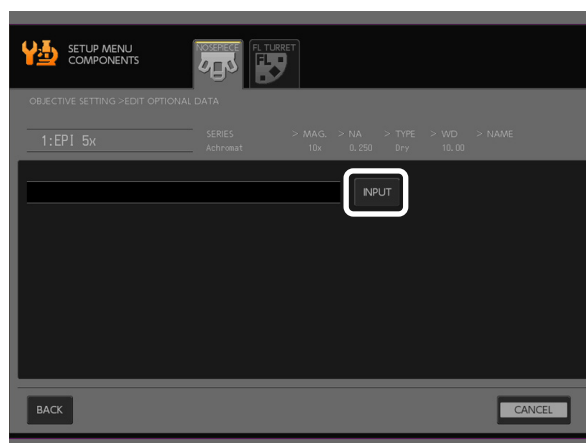


- (10) Press the [NEXT] button.



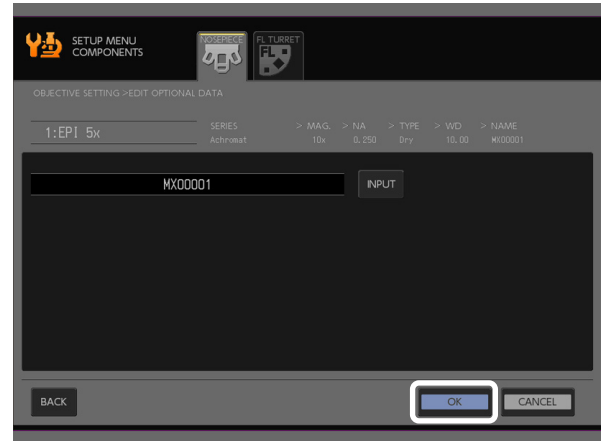
- (11) Press the [INPUT] button, enter the name of the attached objective (up to twenty characters), and then press the [ENTER] button.

Pressing the [CLR] button clears the data you entered.
Pressing the [BS] button removes a character at the end of the data you entered.
Pressing the [SHIFT] button toggles between upper and lower cases for alphabet letters.



(12) Press the [OK] button.

The objective is set to the nosepiece address.



After configuring, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory (DS-L3's memory if LV150A or LV-NCNT2, or memory of nosepiece controller if LV-NCNT-N). If the DS-L3 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 AZ100M, LV100DA-U, 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 pressing the [OPTIONAL] button (only in LV100DA-U). For more information, see “2.2.2 Arbitrarily Configuring the Name of Filter Cube (Only for LV100DA-U)” in this chapter.

[Procedure]

[SETUP MENU] → [COMPONENTS]

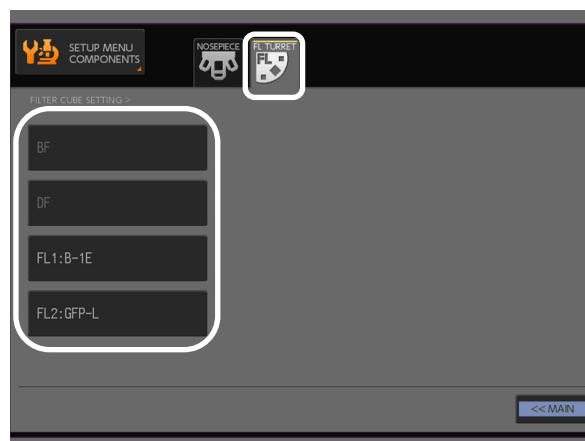
(1) Select the [FL TURRET] tab.

The screens in the following procedure are for LV100DA-U. They vary depending on the model.

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

In LV100DA-U, 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 press the [OK] button.

When [▲] and [▼] buttons are shown at the right edge of the list, you can press [▲] or [▼] button to go to other pages.

The selected filter cube is set to the turret address.

To quit setting, press the [CANCEL] button.



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

After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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, SMZ18, and SMZ25)

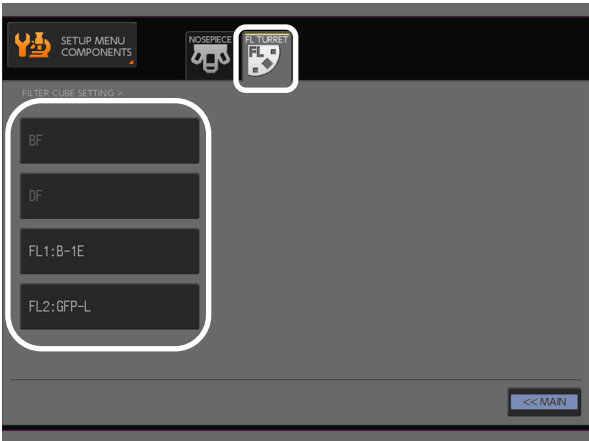
When the filter cube attached to the microscope is not on the list, you can configure any name.
Configuration procedures are described separately for LV100DA-U and SMZ18/SMZ25. See the relevant section.

For LV100DA-U

[Procedure]

[SETUP MENU] → [COMPONENTS]

- (1) Select the [FL TURRET] tab.
- (2) Press 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.

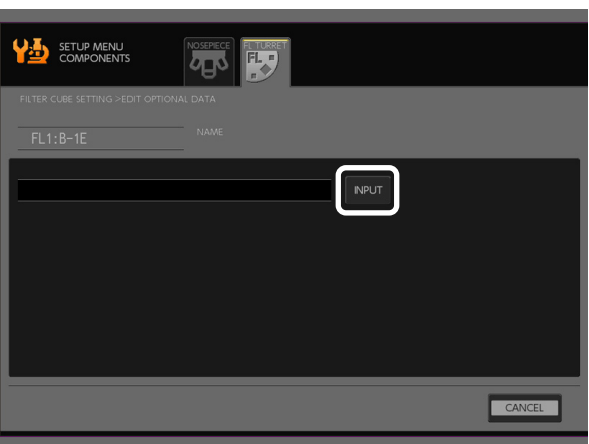


- (3) Press the [OPTIONAL] button on the filter cube configuration screen.

To quit setting, press the [CANCEL] button.

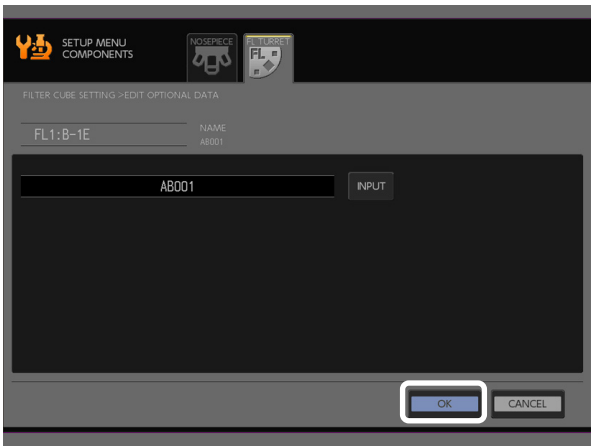


- (4) Press the [INPUT] button, enter the name of the attached filter cube (up to five characters), and then press the [ENTER] button.
Pressing the [CLR] button clears the data you entered.
Pressing the [BS] button removes a character at the end of the data you entered.
Pressing the [SHIFT] button toggles between upper and lower cases for alphabet letters.





- (5) Press the [OK] button.
Filter cube is set to the turret address.



After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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 and SMZ25)

This section describes the setup procedure for the eyepiece attached to the binocular section.

[Procedure]

[SETUP MENU] → [COMPONENTS]

(1) Select the [EYEPiece] tab.

(2) Press 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 press the [OK] button.

The eyepiece information is set.

To quit setting, press the [CANCEL] button.



After making changes to the settings, be sure to press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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]

[SETUP MENU] → [CONNECTION]

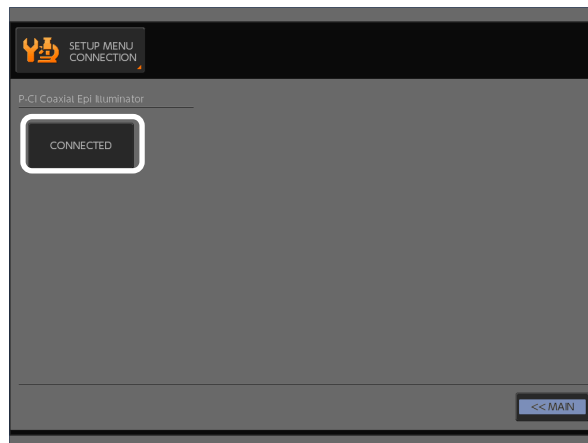
Press the [CONNECTED]/[NOT-CONNECTED] button.

The [CONNECTED]/[NOT-CONNECTED] indication toggles each time you press 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 press the [SAVE] button on the [MAIN] screen to save the settings to the microscope's memory. If the DS-L3 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-L3 hardware related problems such as DS-L3 not turning on.

1

Display

Problem	Cause	Measure
Microscope information screen does not appear.	DS-L3 is not connected to the microscope (or nosepiece controller) properly.	Turn off the microscope (or nosepiece controller), motorized accessory devices, and DS-L3, then reconnect DS-L3 to the microscope (or nosepiece controller) with a USB cable. To connect DS-L3 to LV150A or LV-NCNT2, use the Nikon-specified USB-232C conversion cable instead of 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-L3, turn on the microscope (or nosepiece controller), then turn on DS-L3.
	Availability of the external monitor cannot be detected automatically because [DDC I/F] on camera control screen is set to OFF. Also, no external monitor is connected, but the display mode is set to use only external monitor.	Perform the following operations: 1. Press the power supply button and turn on the power. 2. Immediately after power on, press the power supply button once more to turn off the power while the LED is blinking. 3. Press the power supply button once more to turn on the power. This changes the setting and changes the display mode to use the screen of DS-L3. For details, see the “Camera Operation” instruction manual.
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-L3, 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 [SETUP MENU] → [COMPONENTS] screen. See Chapter 3, “2 Configuring Optical Elements Information ([COMPONENTS] Screen)”.
(only in AZ100M, SMZ18, SMZ25, and SMZ1270i) “-----” is shown for the monitor magnification on the microscope information screen.	The magnification of the relay lens is not entered.	Enter the relay lens magnification at the camera setting. When the relay lens is not used, enter “1.00”. Refer to the description of calibration value registration in the “Camera Operation” instruction manual.

2

Operation

■ Button Operation

Problem	Cause	Measure
(Only with LV150A, LV150NA, LV-NCNT2, 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-L3, then connect or attach the motorized nosepiece correctly.

3

Setting

Problem	Cause	Measure
Settings are restored to the previous value when DS-L3 is turned on.	Settings are not saved.	After configuring, be sure to press the [SAVE] button on the [SETUP MENU] - [MAIN] screen to save settings. See Chapter 3, "1 Bulk Saving of Settings ([MAIN] Screen)".