



Nikon

Upright Microscope

ECLIPSE

***Ci*-L plus**

Instruction Manual

Introduction

Thank you for purchasing a Nikon product.

This instruction manual is written for users of the Nikon ECLIPSE Ci-L plus microscope.

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.
- ★ **Application software “NIS-Elements” is not intended to be used for medical purposes.**



WARNING

1 Do not disassemble.

Disassembling this product may result in electric shock or malfunction. Malfunction and damage due to disassembling or modification are unwarranted.

Do not disassemble parts other than those described in this manual. If you experience problems with this product, contact your nearest Nikon representative.

2 Input voltage, AC adapter, power cord

The AC adapter for supplying power to this product can be used with 100 to 240 VAC at 50 to 60 Hz. Use only the AC adapter and power cord specified in Chapter 6, "Specifications". Use of another AC adapter or power cord may result in malfunction or fire.

- Make sure that the power cord and the cable are not damaged.
- Avoid using the product in an environment where the supply voltage may fluctuate excessively.
- This product is classified as Class I for electrical shock protection. Be sure to connect it to a protective earth terminal.
- If the AC adapter is covered or items are placed on the AC adapter, heat dissipation may be hindered, causing it to become abnormally hot.

3 Fluorescence LED illumination system (for using the epi-fluorescence attachment)

The light source used for epi-fluorescence microscopy requires special care during handling because of its characteristics.

Be sure to use the specified D-LEDI fluorescence LED illumination system. Carefully read the manual supplied with the illumination system before operating the system.

Use of other light sources may result in unexpected accidents.

- **Ultraviolet light radiation:** When lit, the D-LEDI fluorescence LED illumination system radiates ultraviolet light that can damage the eyes and skin. Do not view light coming from the light source. Direct viewing of the light might result in blindness. When changing filter cubes, always turn off the LED illumination.
- **Heat:** When the fluorescence LED illumination system is lit, the LED house of the LED illumination system becomes hot. Do not touch the LED house with bare hands or place flammable materials near the LED house. Doing so might result in burns or fire.

4 Hazards of mercury lamps (for using the epi-fluorescence attachment)

A light source with a mercury lamp (C-HGFI/C-HGFIE HG precentered fiber illuminator) can be used for epi-fluorescence microscopy. The light source that uses a mercury lamp requires special care during handling because of its characteristics.

For safe and correct use of this system, carefully read the warnings below and keep in mind all potential hazards. Additionally, carefully read the manual for the light source and the manual from the lamp manufacturer (if provided), then follow the instructions given therein.

Failure to heed the warnings and cautions given in the manuals, subjecting the system to shock or impact, or attempting to disassemble the system may result in unexpected accidents and injury.

- **Ultraviolet light:** When lit, mercury lamps radiate ultraviolet light that can damage the eyes and skin. Do not view light coming from the lamp. Direct viewing of the light might result in blindness. When changing filter cubes, always turn off the light source of the epi-fluorescence attachment. Leaving the lamp turned on during filter cube replacement may result in ultraviolet exposure.
- **High-pressure gas:** The lamps contain sealed gas under very high pressure. The pressure increases when the lamp is on. If the lamp is scratched, fouled, subjected to high external pressure or physical impact, or used beyond its service life, the sealed gas may leak or the lamp may burst, resulting in gas inhalation, injury from glass, or other accidents.
- **Heat:** When the lamp is lit, the lamp and surroundings will become extremely hot. Do not touch the lamp with bare hands or place flammable materials near the lamp. Doing so might result in burns or fire.
- **Designated lamp:** Be sure to use the designated lamp. Using other types of lamps may result in accidents, including bursting of the lamp.



WARNING

5 Hazardous sample handling

This product is intended primarily for microscopic observations and image capture of cells and tissue set on glass slides.

Check to determine whether a sample is hazardous before handling. If sample is hazardous, handle it according to the standard procedure specified for your laboratory to avoid biohazards. Wear rubber gloves to avoid directly touching hazardous samples or any contaminated areas with the bare hands. If such a sample is spilled onto this product, the portion must be decontaminated in a safety manner.

6 Handling flammable solvents

The following flammable solvents are used with the product:

- Immersion oil (Nikon Immersion Oil for oil immersion objectives)
- Absolute alcohol (ethyl alcohol or methyl alcohol for cleaning optical parts)
- Petroleum benzene (for wiping off the immersion oil)
- Medical alcohol (for disinfecting the microscope)

Never hold a flame near these solvents. When using a solvent, thoroughly read the instructions provided by the manufacturer to ensure its correct usage.

Observe the following precautions when using a solvent with this product:

- Keep solvents away from the product and its surroundings when plugging/unplugging the AC adapter or power cord.
- Be careful not to spill the solvents.

7 Photobiological safety

This product is designed and manufactured in compliance with the "Photobiological Safety of lamps and lamp systems" (IEC 62471) specified by IEC.

Risk group for photobiological safety applicable to the product depends on the light source used. Follow the instructions according to the risk group classification.

A "RISK GROUP 3" label for the maximum risk is affixed on this product.

Light emitted from the built-in LED light source

Risk group classification for lights emitted from the dia-illumination section (the field lens), eyepiece, and camera port and their hazard distance* are as shown in the table below.

	Risk group classification	Hazard distance*
Retinal blue-light hazard	Risk group 1	2 m or more

* Hazard distance: the distance with which the classified risk group is regarded as Exempt Group (photobiologically safe)

Illumination light of the risk group 1 is potentially hazardous to the eyes. When using the built-in LED light source, do not stare at the condenser lens and its surrounding or do not look into the field lens or the camera port. Pay attention to brightness adjustment with the dia-illumination brightness control knob and avoid looking at a bright light for an extended period.

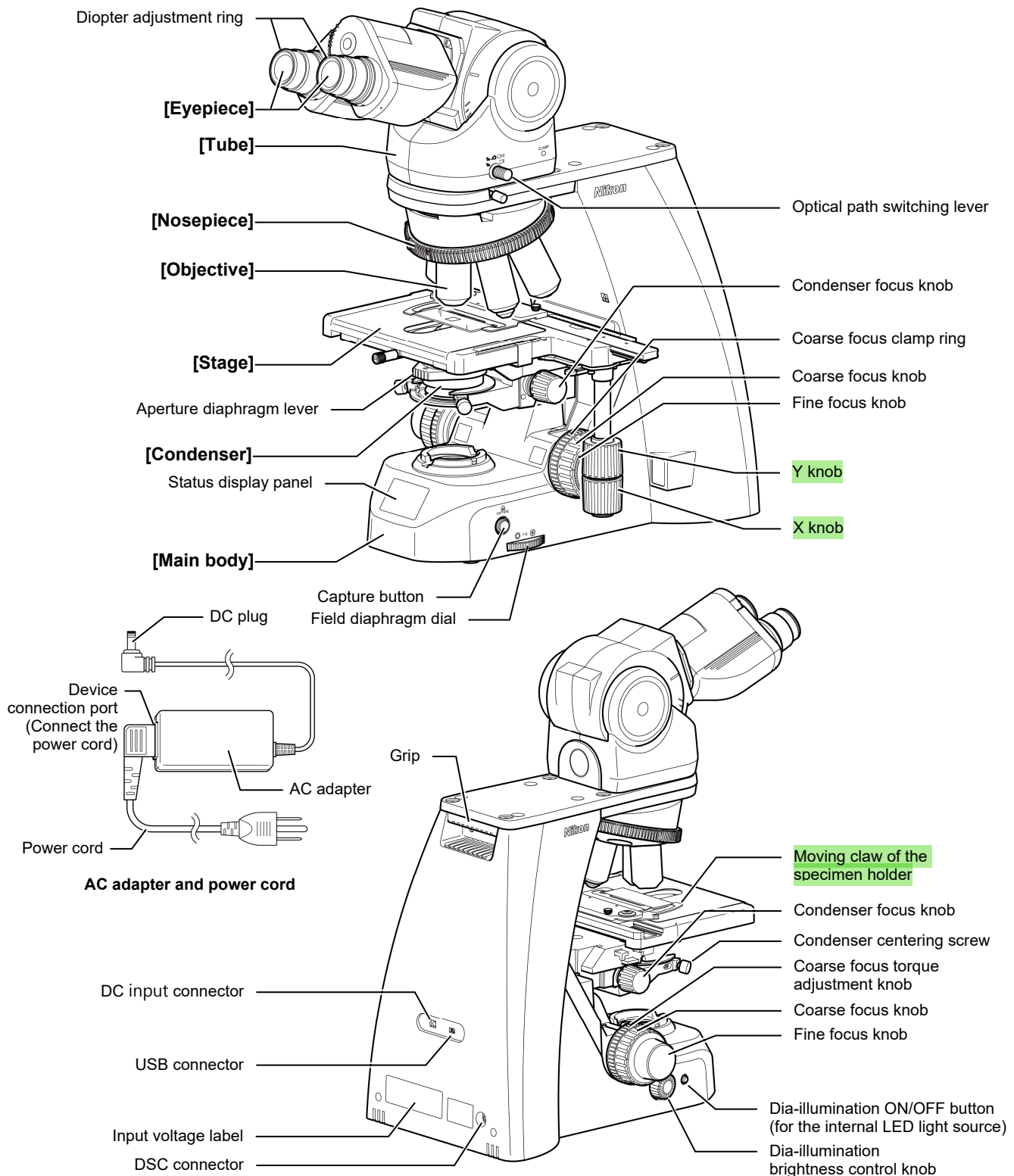
1

Microscopy Procedures

1.1 Bright-field Microscopy

1.1.1 System Configuration and Controls

This section explains an example system configuration and the controls required for bright-field microscopy using the ECLIPSE Ci-L plus. Names of components are denoted in the following manner: **[Eyepiece]**.



8 Adjust the diopter.

⇒ See “2.5 Adjusting the Diopter”.

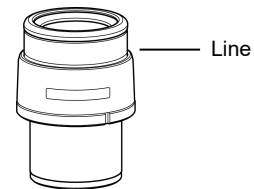
- (1) Turn the diopter adjustment ring on the right and left eyepieces to align the end face of the diopter adjustment ring with the line.

This is the diopter adjustment reference position.

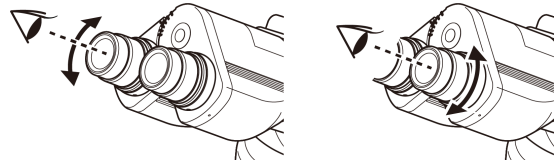
- (2) Focus on the specimen using the 40x objective.
- (3) Bring the 10x (or 4x) objective into the optical path.
- (4) Look into the right eyepiece with your right eye and the left eyepiece with your left eye. Turn the diopter adjustment ring of each eyepiece to focus on the specimen.

At this point no focus knobs are used.

- (5) Repeat Steps (2) through (4) to make sure the focus has been adjusted properly.



Reference position for diopter adjustment



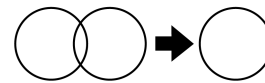
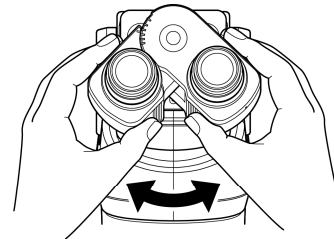
Adjusting the diopter

9 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.

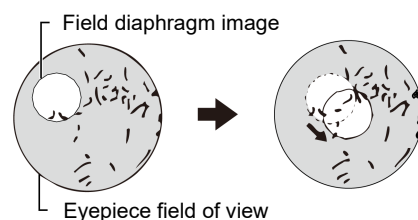
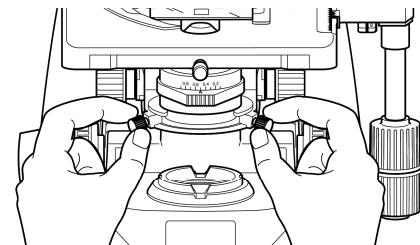


Adjusting interpupillary distance

10 Focus and center the condenser.

⇒ See “2.6 Focusing and Centering the Condenser”.

- (1) Look into the eyepiece with the field diaphragm stopped down to the minimum. 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) Bring the 40x objective into the optical path to check the focus and centering of the field diaphragm image. Make adjustments in the same way as step (1) as necessary.



Focusing and centering condenser

2.2 Controlling the Dia-illumination

2.2.1 Turning On/Off the Dia-illumination and Adjusting the Brightness

Turning the Dia-illumination On and Off

Use the dia-illumination ON/OFF button on the left side of the microscope to turn on or off the dia-illumination.

The illumination goes off and lights up each time the button is pressed. While the illumination is lit, lighting symbol is indicated on the status display panel.

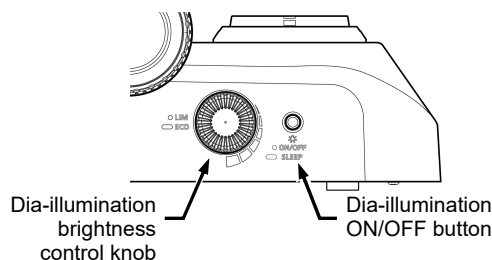
✓ Dia-illumination ON/OFF button

- Short-press: Turn the illumination on and off.
- Long-press: Enters into the Sleep mode.
(⇒ "2.1.2 ECO/SLEEP Mode")

Adjusting the Dia-illumination Brightness (Brightness Control)

Turn the brightness control knob to adjust the brightness level of the dia-illumination.

The brightness level (relative to the maximum intensity) is indicated by the bar on the status display panel.



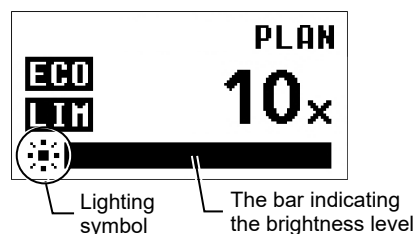
Turning On/Off the Dia-illumination and Adjusting the Brightness

Controlling the dia-illumination ON/OFF button

- **Press:** Turning the dia-illumination on and off

Controlling the brightness control knob

- **Rotate:** Changes dia-illumination brightness



Operation screen

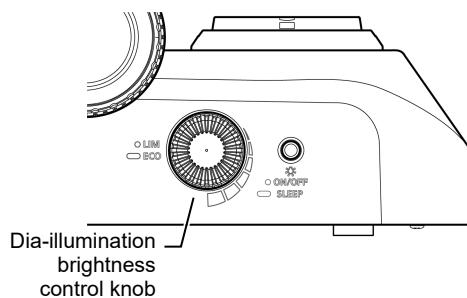
2.2.2 Using the Light Intensity Management (LIM) Function

The LIM function allows for the illumination brightness level used with each nosepiece address to be registered to the microscope memory and reproduced next time the registered address come into the optical path.

The LIM function can be set by short-pressing the dia-illumination brightness control knob.

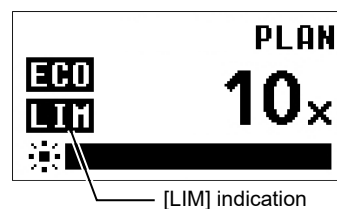
The LIM function is turned on and off each time the knob is pressed.

[LIM] is indicated on the status display panel while the LIM function is turned on. (turned on by default)



Controlling the brightness control knob

- **Short-pressing:** turns the light intensity management (LIM) function on and off.



Operation screen

2.5 Adjusting the Diopter

The diopter adjustment ring on an eyepiece can be adjusted to match the eyesight of your right and left eyes.

A properly adjusted diopter compensates for differences in visual acuity between the right and left eyes of a person, making binocular observation easier. It also minimizes focal deviations when switching magnification, optimizing the performance of the objective.

Adjust the diopter settings for both eyepieces.

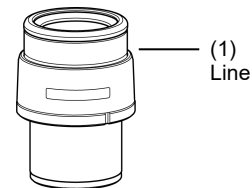
✓ Notch on eyepiece

The eyepiece has a notch to prevent the rotation. When attaching, match the notch with the protrusion on the eyepiece sleeve. Otherwise, eyepiece is not attached to the correct position.

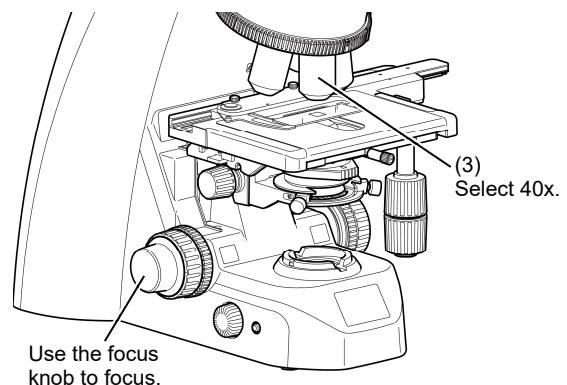
- (1) Turn the diopter adjustment ring on the right and left eyepieces to align the end face of the diopter adjustment ring with the line.

This is the diopter adjustment reference position.

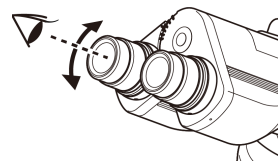
- (2) Follow Steps 1 through 6 in “1.1.2 Bright-field Microscopy Procedure” focus on the specimen using the 10x objective.
- (3) Turn the nosepiece to bring the 40x objective into the optical path, and turn the coarse focus knob and then the fine focus knob to focus on the specimen.
- (4) Bring the 10x (or 4x) objective into the optical path.
- (5) While looking into the left eyepiece with your left eye without touching the focus knob, focus on the specimen by turning the left diopter adjustment ring.
- (6) While looking into the right eyepiece with your right eye without touching the focus knob, focus on the specimen by turning the right diopter adjustment ring.
- (7) Repeat Steps (3) through (6) to make sure the focus has been adjusted properly.



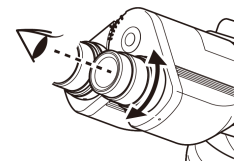
Reference position for diopter adjustment



- (4) Select 10x or 4x.



- (5) Look into the left eyepiece with your left eye to focus with the left diopter adjustment ring.



- (6) Also look into the right eyepiece with your right eye to focus with the right diopter adjustment ring.

Adjusting the diopter

7

Safety Principles

7.1 Test principle (Bright-field observation)

Light from the light source goes through the condenser, and illuminates the sample.

The transmitted light from the sample enters the objective, and the enlarged image can be observed through the eyepieces.

Aperture diaphragm lever equipped for the condenser adjusts the illumination brightness.

Observation magnification can be changed by switching the objective.

7.2 Intended purpose

This microscope and accessories are optical instruments used to enlarge images of specimens, preparations, and cultures for medical purposes.

7.3 Intended user

Medical professionals and those who work on experimentations in the field of pathology and cytology.

7.4 Applicable standards

- CE Marking
 - IVD Directive



This equipment complies with the emission and immunity requirements of IEC/EN 61326-2-6.

- Low Voltage Directive
 - EMC Directive
- C-UL-US Listed
- FCC Part 15 Subpart B Class A

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

- CAN ICES-003(A) / NMB-003(A)
- Australian EMI (AS/NZS CISPR11)