



# See the evolution

The ECLIPSE Ni series, the ultimate in upright biological microscope evolution, supports bioscience studies with enhanced basic performance and flexible system expandability.

The CFI Plan Apochromat Lambda series objectives are the key to the series' optical performance. Nano Crystal Coat, with its ultra-low refractive index, is employed for the first time in microscope objectives, providing brighter, high-resolution and high-contrast microscopy images.

Nikon's proprietary stratum structure allows various combinations of additional components to be installed. Applications using fluorescent proteins, such as Kaede and PA-GFP, are possible with the addition of a two-tiered fluorescent unit and a photoactivation unit.

The Ni series transcends the concept of conventional upright microscopes and expands the possibilities of advanced research in fields such as bioscience and medicine.

The ECLIPSE Ci series is a compact research microscope which has highly functional and user-friendly features. Nikon provides a wide variety of research microscopes, including for shared use at research facilities and for personal use at laboratories.



#### System expandability

- Nikon's proprietary stratum structure enables efficient system construction.
- The numerous accessories can be custom combined depending upon application.

## Optical performance

- CFI Plan Apochromat Lambda objectives with chromatic aberration correction and high transmission throughout a broad range of wavelengths
- Objectives with improved transmission in near-IR wavelength range for multiphoton excitation imaging

## Design

• 3D ergo design combines functionality with sophistication.

## Operability

- Ni-E: Motorized model with automatic change of observation conditions and adjustment of microscope accessories.
- Ni-U: Manual model with some motorized options.
- Most microscope controls can be operated with easy-to-reach buttons on the front of the Ni-E.



# **Expandable system broadens application possibilities**

## Multi-color fluorescent imaging (Ni-E)

Demand for multi-color fluorescent imaging that uses newly developed fluorescent proteins and fluorescent reagents is constantly increasing. Nikon meets such needs with diverse functions and optical technologies.



# Motorized epi-fluorescence illuminator capable of quick wavelength change

The motorized barrier filter wheel and the motorized epi-fluorescence cube turret with built-in motorized shutter enable quick wavelength changes, reducing photobleaching of the specimen. They can be operated via easily accessible control buttons, increasing efficiency of operation.

#### CFI Plan Apochromat Lambda series objectives

Transmission and chromatic aberration correction have been improved throughout the wide range of visible to near-IR wavelengths, allowing use of various fluorescent reagents. They provide bright, high-contrast, high S/N (signal-to-noise) ratio multi-color fluorescence images with almost no focus shift when used with any wavelength.



Multi-color fluorescent observation



# Photoactivation imaging (Ni-E/Ni-U)

Research into the reactions and changes of stimulated cells has become popular in recent years. Nikon has developed a photoactivation unit for upright microscopes, a first in microscopy.



#### Flexible stratum structure

This structure allows two-layer mounting of a photoactivation unit with an epi-fluorescence attachment.

#### Objectives for long-wavelength laser

With CFI Plan Apochromat Lambda objectives, chromatic aberration has been corrected up to near-IR wavelength range and transmission improved in the long wavelength range, increasing accuracy and efficiency of laser excitation at target site.



Photoactivation

FRAP



## Simultaneous multichannel imaging (Ni-E/Ni-U)

The Ni's back port and the quadrocular tilting tube allow the user to acquire simultaneous, two-channel images on separate cameras. This feature is invaluable for applications such as FRET.



#### Simultaneous imaging with two cameras

The Ni's flexible stratum structure enables incorporation of a back camera port unit, allowing simultaneous image acquisition of two different wavelengths with two different cameras mounted on the back port unit and the quadrocular tilting tube. This enables the capture of high-resolution images in the entire frame for each wavelength without dividing the CCD chip. The use of individual cameras for acquisition allows the user to tailor acquisition parameters for each channel independently, allowing acquisition of high-sensitivity FRET images.

\* For information about compatible cameras, contact Nikon or Nikon dealers.





## Multiphoton imaging (Ni-E)

Multiphoton microscopy in which long excitation wavelengths are used to allow less-invasive imaging of ever deeper areas of cells is gaining popularity. The design of the Ni-E model is optimized for multiphoton imaging in both optical and mechanical systems to meet the demands of today.



#### Objective dedicated to multiphoton imaging

CFI75 Apochromat 25XC W objective features chromatic aberration correction over a broad wavelength range from visible to near-IR, high NA (numerical aperture) (1.10) and longer working distance (2.00 mm), and compatibility with water immersion and water dipping.

#### High-sensitivity multiphoton detector (NDD)

This episcopic NDD (non-descanned detector) unit incorporates a detector that efficiently senses weak signals from deep areas of live specimens. In combination with a diascopic NDD unit, transmitted signals can be also detected.

#### Retrofittable focusing nosepiece mechanism

Microscopes can be modified by switching the focusing stage and focusing nosepiece, enabling fixed-stage configuration to meet demands of experiments such as *in vivo* imaging.



# Versatile microscopes meet all demands



## Manual and motorized models

To meet diverse user demands for operability, system expandability and motorized control, Nikon provides two Ni series models. The Ni-U, which has compatibility with some motorized accessories, is the manual model suitable for high-quality image observation and digital imaging. The Ni-E is a fully motorized model that is efficient for experiments requiring comprehensive control of various devices, such as photoactivation units and confocal systems.

#### Ni-U (manual model)

- Ergonomic tube and stage handle height adjustment mechanism allow comfortable viewing positions.
- Stratum structure and sturdy design improve expandability.
- Motorized nosepiece and motorized epi-fluorescence cube turret can be utilized.
- An optional LED light source for brightfield and phase contrast observation is also available.



The dedicated, simple remote control pad allows motorized changing of objectives and filter cubes, and operation of the shutter that is built into the cube turret.

#### Ni-E (motorized model)

- High-precision motorized focusing
- Broad range of motorized accessories that can be used in combination.
- Observation conditions can be changed at a simple push of a button.
- Stratum structure and sturdy design improve expandability.
- 3D ergo design buttons with improved operability are located close together for speedy operations.
- Microscope settings in use can be verified on the display.
- Optimized for multiphoton excitation imaging
- Two focusing mechanism options: focusing stage and focusing nosepiece

#### Automatic adjustment with objective changeover

Condenser, aperture and field diaphragm, and ND filter are automatically set to the optimal position during objective changeover. In addition, stage XYZ travel amount per handle rotation and parfocal distance deviation correction are automatically adjusted. Microscope settings can also be manually adjusted.

#### **Change of observation conditions**

Selected observation conditions can be designated to individual buttons, enabling changes to be made at the push of a button. This is particularly convenient when reproducing specific observation conditions.

#### **High-precision motorized focusing**

High-precision Z-focus incorporated by the Ni-E provides accurate Z-position information required for use with confocal laser microscopes. Individual coarse and fine focus knobs provide enhanced ease of operation.







Ni-E configured with a motorized epi-fluorescence cube turret and motorized universal condenser

# **Technologies supporting the Ni series**

## Supreme optical performance

As a light microscope manufacturer, Nikon has cultivated high technical capabilities and confidence. With its advanced technologies extending from optical glass production to lens design, fabrication, coating and processing, Nikon provides unsurpassed optical performance.

#### High-performance objective lens

#### • CFI Plan Apochromat Lambda series

With remarkably high NA, greatly improved transmission in the long wavelength range thanks to Nikon proprietary Nano Crystal Coat, and chromatic aberration correction extending from visible to near-IR wavelength range, these objectives are ideally suited not only for brightfield and DIC observations but also for fluorescent observations. These lenses allow acquisition of bright and clear images at any wavelength and multi-color fluorescence imaging. Because bright images can be captured even with a weak excitation light, damage to a specimen is minimized.



#### **Nano Crystal Coat**

This anti-reflective coating that consists of nanometer-size particles is based on semiconductor manufacturing technology and is also used for Nikon camera lenses. The coarse structure with particles arranged in a spongy construction with uniform spaces between them enables extremely low refractive indices.



#### • Water dipping objective lenses

With a long working distance and high NA, these objectives provide excellent transmission in near-IR wavelength range. The axial chromatic aberration of 40X and 60X objectives has been corrected up to near-IR range, allowing high-resolution images of minute structures in thick specimens during IR-DIC observation.

Both the 25XC W and 100X objectives feature high NA (1.10) and a long working distance (2.00 mm with 25XC W and 2.50 mm with 100XC W). With chromatic aberration corrected in the IR range, these objectives are ideal for multiphoton excitation observation. In addition, by employing a mechanism to compensate for changes in spherical aberration that occur at different temperatures and depths of observation points, clear images of areas deep within a thick specimen can be captured.





#### **Uniformly bright illumination**

The "fly-eye" lens is ideally suited to diascopic illumination optical systems. Uniform and bright illumination up to the viewfield periphery is provided at any magnification.



#### **Fluorescence noise elimination**

Nikon's proprietary noise terminator mechanism is employed in the epifluorescence cube turret and filter cubes. The S/N ratio has been dramatically improved by thoroughly eliminating stray light in the filter cubes, allowing images of weak fluorescent signals to be captured with high contrast and brightness.



#### Excellent image acquisition with all observation methods



Epi-fluorescence observation







DIC (Differential Interference Contrast) observation



Phase contrast observation



Brightfield observation



# Ultimate ease, speed and clarity in imaging

The Ni series can be controlled in conjunction with a Digital Sight series digital camera, facilitating effortless digital imaging. Images can be captured with a dedicated button on the microscope body. Camera control from the software GUI on a PC and the touchscreen on a tablet PC is also possible.

#### Image capture button

Images can be acquired by simply pressing the image capture button located on the microscope base.



#### **Digital cameras for microscopes**

The optimal camera for your specific imaging needs can be selected from the Digital Sight series of cameras, which offers various features such as high sensitivity, high resolution, high speed image acquisition, color reproducibility and a cooling system.

**F-mount cameras** 

#### Microscope Camera DS-Ri2

This 16.25-megapixel, high-definition camera is equipped with a Nikon FX-format CMOS sensor. The high frame rate of up to 45 fps (1636 x 1088 pixels) enables fast focusing. The image processing engine allows accurate color reproduction of microscopy images. Color fluorescent images can be clearly captured with its low-noise design.

#### Monochrome Microscope Camera DS-Qi2

Equipped with monochrome CMOS sensor (16.25-megapixel). High-speed image capture of up to 45 fps (1636 x 1088 pixels). High sensitivity and superb S/N ratio design. Moreover, mounting a Peltier cooling device provides bright fluorescent images. Reliable quantitative analysis with excellent linearity.





#### C-mount camera

#### Microscope Camera DS-Fi3

Equipped with a 5.9 megapixel CMOS image sensor. It provides high-definition imaging up to 2880 x 2048 pixels and up to 30 fps of fast imaging. With superior color reproduction and high sensitivity, images that are faithful to samples can be acquired during various observation methods, such as brightfield, DIC, phase contrast and epi-fluorescence.



#### **NIS-Elements imaging software**

Various packages are available to suit the user's imaging applications, including NIS-Elements L, which allows easy image acquisition, and NIS-Elements Ar, Br, and D, which enable advanced image acquisition through integrated control between a camera and microscope.

# NIS Elements Advanced Solutions for your Imaging Work

#### NIS-Elements L

NIS-Elements L imaging software, featuring simple and user-friendly GUI, allows easy camera setting and image capturing using DS-Ri2 and DS-Fi3 microscope cameras.

Enables image/movie acquisition and storage using a tablet PC\*, facilitating effective sharing of images and presentations. Also supports touch screen operation.

\*For information about compatible tablet PCs, contact Nikon.

#### Scene modes

The scene modes function enables the optimal camera setting for each sample and imaging technique by simply choosing the type of illumination or stain.



#### Split-screen display

The split-screen display function enables real-time comparisons between live and captured images by displaying them side-by-side and synchronizing zooming between both images.



#### Measurement

Simple measurement functions, such as distance measurement between two points, area measurement and angle measurement, are available.



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#### • NIS-Elements Ar, Br, D Ar Br D

The NIS-Elements Ar, Br and D packages seamlessly integrate cameras, peripheral devices, and the motorized functions and accessories of Ni, serving as a powerful yet easy-to-use interface for complex imaging experiments.

NIS-Elements D allows time-lapse, Z-series and multi-point acquisition, while Ar allows multi-dimensional image acquisition of up to 6D (x, y, z, t, multichannel and multipoint) and Br allows up to 4D.

Powerful tools for quick processing, measurement and acquired data management provide a one-step solution for acquisition and analysis.



Image stitching (large image)

Histogram

# **High-resolution confocal imaging systems**

Combining the Ni-E's high-precision Z-focus mechanism with a confocal scanner allows high-resolution, high-S/N-ratio imaging of 3D structures of organs and cells. The Ni-E can be configured with either a focusing stage or a focusing nosepiece, catering to specific imaging requirements.

• Confocal microscope AX/AX R AX incorporates a high-definition (up to 8192 x 8192 pixels) galvano scanner. AX R also incorporates a high-speed (up to 720 fps) resonant scanner, in addition to the galvano scanner, enabling true simultaneous photoactivation and confocal imaging.

#### Multiphoton confocal microscope A1 MP<sup>+</sup>/A1R MP<sup>+</sup>

High-sensitive deep imaging of living specimens is possible with A1 MP+'s high-resolution (up to 4096 x 4096 pixels) and A1R MP+'s high-speed (up to 720 fps) imaging capability. A combination of episcopic and diascopic GaAsP NDDs allow more efficient acquisition of emission signals. Simultaneous excitation imaging using dual beam 1300nm-compatible IR lasers is possible.



3 dimensional reconstruction Z series (color coded by Z depth) of microglial movement in developing zebrafish, obtained with high speed resonant imaging and piezo Z stepping. Courtesy of Dr. E. Burton, Department of Neurology, University of Pittsburgh



# **Enhanced system expandability provides the best solution**

Ni series accessories are segmented by function, allowing you to select required units and flexibly combine them to create lean and effective system configurations.

#### System configuration for acquiring multi-stained specimen images

The motorized epi-fluorescence cube turret shutter, which helps to reduce photobleaching of specimens, is easily operated with a convenient remote control pad.

Images are automatically acquired by controlling the motorized accessories, including the epi-fluorescence cube turret according to the camera settings such as exposure time, camera gain, and time interval.

This configuration is recommended for those who conduct mostly fluorescent observations rather than brightfield observations.



Configuration of manual microscope Ni-U with motorized epi-fluorescence cube turret, epi-fluorescence attachment, motorized septuple nosepiece, digital camera DS-Fi3, simple remote control pad, control box B

#### System configuration for acquiring pathological specimen imagess

Optimal brightness can be automatically adjusted with objective changeover, eliminating the need for manual adjustment. By controlling the optical zooming of the motorized DSC zooming port for quadrocular tube, it is possible to capture images with the desired angle of field while maintaining the image quality.

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Configuration of motorized microscope Ni-E with motorized quadrocular tilting tube, motorized DSC zooming port, motorized ND filter, digital camera DS-Fi3, motorized XY stage and joystick, control box A

# Wide array of accessories finely segmented by function



**Motorized quadrocular tilting tube (Ni-E)** Motorized changeover of optical paths is possible. Eyepiece inclination can be adjusted from 15° to 35°.



Motorized DSC zooming port (Ni-E) A digital camera can be mounted on the camera port. A motorized 0.6X - 2.0X zoom optical system is incorporated.



#### Motorized ND filter (Ni-E)

Brightness is automatically optimized with the changeover of the motorized nosepiece. Motorized adjustment of desired brightness is also possible.



Motorized XY stage (Ni-E) Effective for applications that require highly accurate positioning, such as photoactivation imaging and FISH.



Joystick for motorized stage (Ni-E) Makes control of motorized XY stage possible.



Ergo controller (Ni-E)

In addition to motorized microscope operation, XYZ control of stage is possible with similar operational ease as that of an actual microscope.



Motorized universal condenser Dry (Ni-E) High-speed motorized changeover of condenser modules for brightfield, phase contrast, DIC and simple darkfield observations is possible.



Motorized epi-fluorescence cube turret (Ni-E, Ni-U) Noise terminator provides high S/N ratio. Six filter cubes can be installed. Either an epi-fluorescence attachment or a photoactivation unit can be attached.



D-FL-2 U-EPI Fluorescence Attachment (Ni-E, Ni-U) The fully integrated epi-fluorescence cube turret can accept 6 filter cubes and the built-in noise terminator provides a high S/N ratio.



Motorized barrier filter wheel (Ni-E) Barrier filter positions (7 positions—using 25 mm filters) can be changed at a high speed of 0.2 sec. between adjacent positions.



Photoactivation unit (Ni-E, Ni-U) Laser light photoactivation and episcopic illumination are possible. Both the photoactivation unit and the confocal system can be used with a single laser source.



D-LEDI Fluorescence LED Illumination system (Ni-E, Ni-U)

An LED light source for fluorescence observation that can be directly attached to an epi-fluorescence attachment in the same way as a lamp house.



Motorized DIC sextuple nosepiece (Ni-E, Ni-U) Objective magnification is automatically saved along with the captured image. Built-in prism/analyzer plate slot.



**Back port unit (Ni-E, Ni-U)** Enables simultaneous acquisition of images with two different wavelengths using two cameras.



Simple remote control pad (Ni-U) Motorized operation of the nosepiece, epi-fluorescence cube turret and shutter is possible.

# Feel the evolution

Nikon has drawn on its proven optics and mechanical design technologies to develop the compact and high-performance ECLIPSE Ci series research microscope.

Ci-E/Ci-L adopts Nikon's unique, high-intensity LED as the light source for diascopic observation. High-quality objective lenses and high S/N epi-fluorescence attachments provide bright and high contrast fluorescence images. Image capture of specimens is easy and efficient when the microscope is configured with Nikon Digital Sight series cameras. With its high-optical performance and advanced easy control, the ECLIPSE Ci series supports research using a broad range of illumination techniques including phase contrast, darkfield and simple polarizing.



- High-intensity, uniform LED illumination (Eco-illumination)
- Epi-fluorescence attachments equipped with noise terminator mechanism
- Reliable high-performance objective lens
- Observation and image capture with comfortable posture
- Motorized magnification switching by the push of a button (Ci-E)
- Simple image capturing by the push of a button on the microscope
- Enables a wide variety of observations



# High quality images powered by Nikon's reputed optical technologies

Nikon's well-reputed optical technologies enable the capture of sharp and high quality images in a wide variety of techniques, including brightfield and epi-fluorescence observations.

The epi-fluorescence attachments of the ECLIPSE Ci series allow weakly fluorescent specimens to be captured with great clarity and brightness.

#### **Epi-fluorescence attachments**

The noise terminator is utilized in the epi-fluorescence attachments and this allows bright, highcontrast and high signal to noise (S/N) ratio fluorescence image capturing.

Two epi-fluorescence attachments are available: CI-FL-2 (four filter cubes mountable) and D-FL-2 (six filter cubes mountable). The name and position of the mounted filter cubes are displayed with phosphorescent labels for easy identification in darkened rooms. The filters or dichroic mirrors in the filter cubes can be easily replaced to create a more specific combination.



**High-optical performance objective lenses** • CFI Plan Apochromat Lambda series

With remarkably high NA, greatly improved transmission in the long wavelength range thanks to Nikon proprietary Nano Crystal Coat\*, and chromatic aberration correction over wide wavelength range, these objectives are ideally suited not only to brightfield observations but also to fluorescence observations. Bright images can be captured even with a weak excitation light, thereby reducing damage to the specimen.



#### • CFI Plan Fluor series

Featuring an extra-high transmission rate, especially in the ultraviolet wavelength, combined with flatness of field, this series is perfect for

fluorescence observation and imaging. These objectives can function as multi-purpose objectives for brightfield, fluorescence and simple/sensitive color polarizing observations.



Configuration of Ci-L with epi-fluorescence attachment and DS-Fi3 camera

# **Unparalleled basic performance**

### **Eco-illumination**

By combining a collimator lens, fly-eye optics and LED illumination, bright and uniform images up to the periphery can be obtained. The LED is a low power consumption unit that reduces lamp replacement frequency thanks to its long-life, and provides the same color temperature in every magnification.





\*These images are captured without using the shading compensation to emphasize the vignetting.

Remote control pad

easily changed with a one touch button.

By programming specific buttons to correspond

to specific objective lenses, magnification can be

#### Image capture button

Imaging with the Digital Sight series cameras is possible with the one touch button located on the microscope base.



### Motorized model Ci-E

#### Nosepiece rotating buttons

The nosepiece can be rotated with one-touch button control. In addition, your two favorite magnifications can be registered\*, and one press of the button alternates between these two objective lenses.

\* Using the remote control pad.



#### • Auto light intensity reproduction

The user-defined light intensity for each objective lens is automatically memorized and replicated when the objective is used again, eliminating the manual re-adjustment.



## Versatile diascopic observation techniques

#### Phase contrast

Eco-illumination has sufficient light intensity for phase contrast microscopy that is used in a wide range of applications including dermatological examinations.



#### Darkfield

Enables clear observation of blood or the minute structure of flagella. Dry- and oil-type condensers are available. The expander lens is used to obtain illumination with greater brightness.



Left: C-DD Dark Field Condenser Dry Right: C-DO Dark Field Condenser Oil

#### • Simple polarizing

This is ideal for observing bi-refringent samples such as collagen, amyloids and crystals. \*Two types of analyzer are available: intermediate tube type and nosepiece slider type.





# **Epi-fluorescence light sources for Ni/Ci D-LEDI Fluorescence LED illumination sysytem**

An eco-friendly light source optimized for fluorescence observation. It is a light source that can be directly mounted on the epifluorescence attachment in the same way as a lamp house, and provides sufficient light intensity for fluorescence observation.



D-LEDI Fluorescence LED Illumination system

#### Wavelength intensity control

Four types of LEDs (with main wavelengths of 385 nm, 475 nm, 550 nm and 621 nm) are equipped to support excitation wavelengths commonly used for fluorescence observation. Using the included controller, the user can simultaneously turn on/off individual, multiple or all wavelength lights. Adjusting the light intensity of each wavelength from 0 to 100% (in 1% step) is also possible.

#### **Control from NIS-Elements software**

With NIS-Elements imaging software, light intensity control of each wavelength is possible while keeping their intensity ratios. It also enables the emission of excitation light synchronized with image acquisition, and is effective for time-lapse imaging.

#### No vibration generation

The D-LEDI adopts a natural cooling system, which does not use cooling fans. This eliminates the generation of vibration and is suitable for high-magnification observation.

#### **Maintenance free**

The built-in LEDs have a long life of approximately 20,000-hours, and eliminate the need for frequent lamp replacement which was required with a mercury lamp light source.

#### **Alignment free**

With a mercury lamphouse, lamp centering adjustment was required. The LEDs in this light source are rigorously adjusted at the time of manufacture, and do not require a centering process.

#### **Recomended filter cubes**

Filter Cubes	Wavelength	Compatible LED			
C-LED385	EX400/40, DM425, BA478/85	385 nm			
C-LED470	EX470/40, DM495, BA525/50	470 nm			
C-LED525	EX531/40, DM562, BA593/40	525 nm			
C-LED625	EX620/60, DM660, BA700/75	625 nm			



HeLa cells captured with CFI Plan Apochromat Lambda 40XC objective



# **Objectives for Ni/Ci**

be	llee	Madal	Immention	NA	W.D.	Cover glass	Correction	Spring	Duluhatiala	Devictional	DIC	Phase	Delevision		Fluorescen	ce
Ţ	Use	woder	Immersion	NA	(mm)	thickness	ring	loaded	Brightheid	Darkfield	DIC	contrast	Polarizing	UV	Visible light	NR
Super Fluor		4X		0.20	15.50	—			0				$\bigtriangleup$	©340	O	
		10X		0.50	1.10	0.17		1	0	00	0		$\bigtriangleup$	©340	0	
	Brightfield	20X		0.75	1.00	0.17		1	0	00	0		$\bigtriangleup$	©340	0	
	(CFI Super Fluor)	40XC		0.90	0.34-0.26	0.11-0.23	1	1	0		0		$\bigtriangleup$	©340	0	
		40X Oil	Oil	1.30	0.19	0.17		√w/stopper	0		0		$\bigtriangleup$	©340	0	
		100XS Oil	Oil	0.50-1.30	0.20	0.17		1	0	00			$\bigtriangleup$	©340	O	
		4X		0.13	17.20	-			0				$\triangle$	0	0	
		10X		0.30	16.00	0.17			0	Δ	0		0	0	0	
		20X		0.50	2.10	0.17			0	00	0		0	0	0	
	Print+field	20XC MI	Oil, water, glycerin	0.75	0.51-0.35 0.51-0.34 0.49-0.33	0-0.17	1	1	0	0	0		0	0	O	
	(CFI Plan Fluor)	40X		0.75	0.66	0.17		1	0	00	0		0	0	0	
		40X Oil	Oil	1.30	0.24	0.17		√w/stopper	0		0		0	0	O	
luor		60XC		0.85	0.40-0.31	0.11-0.23	1	1	0		0		0	0	0	
lan I		60XS Oil	Oil	0.50-1.25	0.22	0.17		1	0	00	0		0	0	O	
٩		100X Oil	Oil	1.30	0.16	0.17		√w/stopper	0		0		0	0	O	
		100XS Oil	Oil	0.50-1.30	0.16	0.17		1	0	00	0		0	0	O	
		DLL 10X		0.30	16.00	0.17			0	$\bigtriangleup$		© PH1		0	0	
	Phase contrast	DLL 20X		0.50	2.10	0.17			0	00		O PH1		0	0	
	(CFI Plan Fluor)	DLL 40X		0.75	0.66	0.17		1	0	00		© PH2		0	0	
		DLL 100X Oil	Oil	1.30	0.16	0.17		√w/stopper	0			O PH3		0	0	
	Apodized phase contrast (CFI Plan Fluor)	ADH 100X Oil	Oil	1.30	0.16	0.17		√w/stopper	0			© PH3		0	0	
		Lambda 2X		0.10	8.50	-			0				0	$\triangle$	0	0
		Lambda 4X		0.20	20.00	-			0				0	$\triangle$	0	0
		Lambda 10X		0.45	4.00	0.17		1	0	$\bigtriangleup$	0		0	$\triangle$	0	0
		Lambda 20X		0.75	1.00	0.17		1	0	00	0		0	$\triangle$	0	0
		Lambda 40XC		0.95	0.25-0.17	0.11-0.23	1	1	0		0		0	$\triangle$	0	0
	Prightfield	Lambda 60XC		0.95	0.21-0.11	0.11-0.23	1	1	0		0		0	$\triangle$	0	0
÷	(CFI Plan Apo)	Lambda 60X Oil	Oil	1.40	0.13	0.17		1	0		0		0	$\triangle$	O	0
oma	(errian/po/	Lambda 100X Oil	Oil	1.45	0.13	0.17		1	0		0		0	$\triangle$	0	0
ochr		Lambda S 10X		0.45	4.00	0.17		1	0	$\triangle$	0		0	$\triangle$	0	0
Api		VC 20X		0.75	1.00	0.17		1	0	00	0		0	0	0	
Plar		VC 60XC WI	Water	1.20	0.31-0.28	0.15-0.18	1	1	0		0		0	0	0	
		VC 100X Oil	0il	1.40	0.13	0.17		1	0		0		0	$\triangle$	0	
		NCG 100X Oil	0il	1.40	0.16	0		1	0		0		0	$\triangle$	0	
		DM Lambda 20X		0.75	1.00	0.17		1	0	00		O PH2		$\triangle$	0	0
	Phase contract	DM Lambda 40XC		0.95	0.25-0.16	0.11-0.23	1	1	0			© PH2			0	0
	(CFI Plan Apo)	DM Lambda 60XC		0.95	0.21-0.11	0.11-0.23	1	1	0			O PH2		$\triangle$	0	0
		DM Lambda 60X Oil	Oil	1.40	0.13	0.17		1	0			© PH3			0	0
		DM Lambda 100X Oil	Oil	1.45	0.13	0.17		1	0			O PH3			0	0
Apochromat	Confocal (CFI Apo)	Lambda S 60X Oil	Oil	1.40	0.14	0.17		1	O		0		0	0	0	
Use: Clearing *3		Model	Immersion	NA	W.D. (mm)	Cover glass thickness	Correction ring	Spring loaded	Brightfield	Darkfield	DIC	Phase contrast	Polarizing	UV	Fluorescen Visible light	ce NIR
Multiphoton Confocal (CFI Plan Apo)		10XC Glyc	Water, Oil, Glycerin	0.50	5.50	0-0.17	√*1		0	•					0	0
Mul	tiphoton (CFI 90)	20XC Glyc	Glycerin	1.00	8.20	-	<b>√</b> *2		△ *4							0
Use: Water dipping *3		Model	Immersion	NA	W.D. (mm)	Cover glass thickness	Correction ring	Spring loaded	Brightfield	Darkfield	DIC	Phase contrast	Polarizing	Fluo UV	rescence Visible light	Near- infrared DIC
Multiphoton Confecal (CE175		25XC W	Water	1.10	2.00	0	1		0		0		0	0	0	0
Apo)		25XC W 1300	Water	1.10	2.00	0	1		0		0		0	0	0	0
DIC	(CFI Plan Fluor)	10X W	Water	0.30	3.50	0			0		Ő		0	0	0	0
		NIR 40X W	Water	0.80	3.50	0			0		0		0	$\triangle$	0	0
IR-D	DIC (CFI Apo)	NIR 60X W	Water	1.00	2.80	0			0		0		0		0	0
DIC (CFI Plan)		100XC W	Water	1.10	2.50	0	1		0		0		0		0	0
DIC (CFI75)		LWD 16X W	Water	0.80	3.00	0			0		0		0	0	0	0

Note 1. Model name The below letters, when included in the model names, indicate the respective features. C: with correction ring NGC: for use without cover glass S: with iris WI: water immersion type WI: water dipping type MI: multi immersion (oil, water, glycerin) type Note 3. Cover glass thistogram

Note 2. Cover glass thickness — : can be used without cover glass 0: use without cover glass

b. use whited cover glass
 Note 3. Darkfield microscopy
 Possible with the following
 ∴ universal condenser (dry) and darkfield ring
 C: above and darkfield condenser (dry)
 ∴ darkfield condenser (oil)

Note 4. Phase rings are classified by objective NA PHL, PH1, PH2, PH3: condenser cassette modules.

Prot, Prot, Prot, Prot, Concerse Cassette induces.
 Note 5. Fluorescence microscopy (UV)
 2: possible with visible light that has a longer wavelength than the excitation light used for DAPI
 3: suitable
 3: recommended for best results
 340: high transmittance with an ultraviolet wavelength range of up to 340nm

Note 6.

Note 7. Polarizing  $\triangle$  : possible but not recommended  $\bigcirc$  : suitable  $\square$  : retardation measurement is possible with a polarizing microscope

\*1 With correction for refractive index of immersion medium (1.33-1.51) \*2 With correction for refractive index of immersion medium (1.44-1.50) \*3 For Ni-E focusing nosepiece type \*4 Can only be used as a finder (chromatic aberration is corrected above 588 nm)

# **Ni Specifications**

		Ni-	Ni II							
		Focusing stage type	NI-0							
	Optical system	CFI60 infinity optical system	CFI60 and CFI75 infinity optical systems	CFI60 infinity optical system						
	Focusing	Via motorized stage Up/Down movement (Up 2 mm/Down 13 mm)	Via manual stage Up/Down movement							
	(stroke from focus point)	Built-in linear encoder, Resolution: 0.025 µm Motorized escape and refocus mechanism	(Up 3 mm/Down 26 mm)							
		Coaxial Coarse/Fine focusing	1							
		Halogen lamp (12V100W) · NI-ND-E Motorized ND Filter (option)	Halogen lamp (12V 100W) LED (option)							
Main body	Illumination	Built-in fly-eye lens Built-in NCB11, ND8, ND32 filters (detachable, one additional filter mountable) and diffuser (non-detachable) ND2 filter (option)								
		Transmitted light On/Off switch, Intensity control dial with preset function Image capture button								
	Controls	Built-in motorized control switches								
		· NI-ERG NI Ergo Controller (option)	NI-SRCP Simple Remote Control Pad     (option)							
	Power supply unit	External power supply NI-CTLA Control Box A for all	Built-in for halogen lamp NI-CTLB Control Box B is necessary when Motorized/Intelligent options are combined.							
Eyepieces (F.	0.V. mm)	· CFI 10X (22) · CFI 12.5X (16) · CFI 15X (14.5) · CFI UW10X (25)								
	F.O.V. 22 mm (Eyepiece/Port)	C-TB Binocular Tube     C-TE2 Ergonomic Binocular Tube (100/0, 50/50 via optional C-TEP2 DSC Port, C-TEP3 DSC Port C-0.55X or C-TEPF2.5 DSC Port F2.5X) Inclination angle: 10-30 degree, Extension up to 40 mm								
Tubes	F.O.V. 25 mm <sup>*1</sup> (Eyepiece/Port)	C-TF Trinocular Tube F (100/0, 0/100)     C-TT Trinocular Tube T (100/0, 20/80, 0/100)     C-TT-C Trinocular Tube (100/0, 0/100, for confocal)"     LV-TI3 Trinocular ESD Tube T (100/0, 0/100)     NI-TT Quadrocular Tilting Tube (Eyepiece/Upper por Inclination angle: 15-35 degree								
		· NI-TT-E Motorized Quadrocular Tilting Tube (Eyepiece/Upper port/Rear port: 100/0/0, 0/100/0, Inclination angle: 15-35 degree	_							
Ports (F.O.V. 11 mm)		C-TEP2 DSC Port for Ergonomic Binocular Tube (with C-TEP3 DSC Port C-0.55X for Ergonomic Binocular T C-TEPF2.5 DSC Port F2.5X for Ergonomic Binocular T NI-BPU Back Port Unit (with C-mount adapter, 1.0X) NI-RPZ DSC Zooming Port for Quadrocular Tube (with)	n C-mount adapter, 0.7X) ube (with C-mount adapter, 0.55X) fube (with F-mount adapter, 2.5X) ) th C-mount adapter, manual zoom, 0.6X - 2.0X)							
		• NI-RPZ-E Motorized DSC Zooming Port for Quadroct (with C-mount adapter, motorized zoom, 0.6X - 2.0X	-							
Arms		· NI-SAM Standard Arm								
		· NIE-CAM Contact Arm (for Motorized/Intelligent op	• NIU-CAM Contact Arm (for Motorized/Intelligent options)							
Nosepieces	Motorized	NI-N7-E Motorized Septuple Nosepiece		· NI-N7-E Motorized Septuple Nosepiece · NI-ND6-E Motorized DIC Sextuple Nosepiece						
	Intelligent	· NI-N7-I Intelligent Septuple Nosepiece     · NI-ND6-I Intelligent DIC Sextuple Nosepiece	_	NI-N7-I Intelligent Septuple Nosepiece     NI-ND6-I Intelligent DIC Sextuple     Nosepiece						
	Manual	D-ND6 DIC Sextuple Nosepiece     C-N6 ESD Sextuple Nosepiece ESD     C-N6A Sextuple Nosepiece with Analyzer Slot     LV-NUS Universal Quintuple Nosepiece ESD     LV-NBD5 BD Quintuple Nosepiece ESD	FN-S2N 2 Place Sliding Nosepiece (for CFI60 objectives) Changeover 2 objectives, DIC slider insertable FN-MN-H CFI 75 Holder (for CFI75 objective) DIC slider insertable - FN-MN-H2 CFI 90 Holder (for CFI90 objective)	O-ND6 DIC Sextuple Nosepiece     C-N6 ESD Sextuple Nosepiece ESD     C-N6A Sextuple Nosepiece with     Analyzer Slot     LV-NU5 Universal Quintuple     Nosepiece ESD     LV-NBD5 BD Quintuple Nosepiece ESD						

# Ni Dimensional diagram

#### **Ni-E** (for use with focusing nosepiece)

Configured with an Ni photoactivation unit, two-tiered motorized epi-fluorescence cube turret and motorized quadrocular tilting tube



		Ni-	NELL				
		Focusing stage type					
Stages		NIE-CSRR2 Right Handle Rotatable Ceramic- coated Stage with 2S Holder Cross travel 78(X) x 54(Y) mm Handle height and torque adjustable	· FN-3PS2 FN1 Standard Stage Cross travel 30(X) x 30(Y) mm	-C-SR2S Right Handle Stage with 2S Holder C-CSR1S Right Handle Ceramic-coated Stage with 1S Holder			
		· NI-S-E Motorized XY Stage Resolution: 0.1 μm · NI-SH-D Dish Holder (option)	<ul> <li>C-CSR Right Handle Ceramic-coated Stage</li> <li>NIU-CSRR2 Right Handle Rotatable Ceramic-coated Stage with 2S Holder Cross travel 78(X) x 54(Y) mm Handle height and torque adjustable</li> </ul>				
Substages		<ul> <li>NI-SSR Substage (for Motorized Universal Condenser and Rotatable/Motorized stages)</li> </ul>	<ul> <li>NI-SSF Substage for Focusing Nosepiece (for LWD condenser and FN1 Standard/ Motorized stages)</li> </ul>	· NI-SSR Substage (for Rotatable stage)     · NI-SS Substage (for Non-rotatable     stages)			
Condensers (NA)	Motorized	· NI-CUD-E Motorized Universal Condenser Dry (0.88) For DIC, phase contrast, darkfield observations Attached on NI-SSR Substage	_	_			
	Manual	NI-CUD Universal Condenser Dry (0.88)     C-AB Abbe Condenser (0.90)     C-AR Achromat Condenser (0.80)     C-DD Darkfield Condenser 0il (1.20-1.43)     C-DD Darkfield Condenser Dry (0.80-0.95)     C-AA Achromat Aplanatic Condenser (1.40)     C-SA Slide Achromat Condenser 2-100X (0.90)     C-SW Swing-out Achromat Condenser 1-100X     (0.90/0.11)     C-SWA Swing-out Achromat Condenser 2-100X     (0.90/0.22)     C-LAR LWD Achromat Condenser (0.65)     D-CUO DIC Condenser 0il (1.40)	• FN-C LWD Condenser (0.78) (for DIC and oblique light illumination)	NI-CUD Universal Condenser Dry (0.88)     -C-AB Abbe Condenser (0.90)     -C-AB Achromat Condenser (0.80)     -C-DD Darkfield Condenser Oil (1.20-1.43)     -C-DD Darkfield Condenser Dry (0.80-0.95)     -C-AA Achromat Aplanatic Condenser (1.40)     -C-SA Slide Achromat Condenser 2-100X (0.90)     -C-SW Swing-out Achromat Condenser 1-100X     (0.90/0.11)     -C-PH Phase Contrast Turret Condenser     (0.90)* <sup>3</sup> -C-SWA Swing-out Achromat Condenser     2-100X (0.90/0.22)     -C-LAR LWD Achromat Condenser (0.65)     -C-UO DIC Condenser Oil (1.40)			
Epi- fluorescence	Filter cube turret	6 filter cubes mountable, Noise Terminator mechanisr • NI-FLT6-E Motorized Epi-fluorescence Cube Turret Motorized shutter, Status check function <sup>4</sup> • NI-FLT6-I Intelligent Epi-fluorescence Cube Turret Manual shutter, Status check function <sup>4</sup> • NI-FLT6 Epi-fluorescence Cube Turret Manual shutter	n for all turrets				
illuminator	Light distribution device	NI-FLEI-2 Epi-fluorescence Attachment Aperture diaphragm and field diaphragm (Centerab NI-PAU Ni Photoactivation Unit (405 nm to 650 nm					
	Option	· NI-BAW-E Motorized Barrier Filter Wheel 7 filters mountable, 0.2 sec between adjacent posit · D-FL-2 U-EPI Fluorescence Attachment (6 filter cube	D-FL-2 U-EPI Fluorescence Attachment (6 filter cubes mountable, Noise Terminator mechanism)				
Epi-illumination light source		· D-LEDI Fluorescence LED Illumination system					
Power consumption		211W (with max. halogen lamp intensity and full motorized options)	96W (with max. halogen lamp intensity and full motorized options)	Main body: 133W (with max. halogen lamp intensity) Control Box B: 29W (with full motorized options)			
Weight (approx.)		29 kg (Epi-fluorescent configuration with motorized quadrocular tilting tube)	42 kg (Photoactivation configuration with motorized guadrocular tilting tube)	20 kg (Brightfield configuration with ergonomic binocular tube)			

\*1 Eyepiece F.O.V.: When used with an expanded configuration such as a double layer of fluorescent cube turrets, eyepiece F.O.V. is 22 mm.
F.O.V. to imaging ports vary depending on the model.
\*2 Cannot be used with the focusing nosepiece type.
\*3 Can only be mounted on the NI-SS Substage.
\*4 Status check function: Status of Filter/Nosepiece etc. can be recorded with captured images. Can be displayed on the PC operation screen.

#### Ni-U

Configured with an epi-fluorescence cube turret and quadrocular tilting tube





#### Ni-U

Configured with an ergonomic binocular tube and DSC port



Unit: mm

# System diagram: Ni-E focusing stage type





# System diagram: Ni-E focusing nosepiece type





# System diagram: Ni-U





# **Ci Specifications**

		Ci-E	Ci-L				
	Optical system	CFI60 Infinity Optical System					
	Illumin atom	High luminescent White LED Illuminator (Eco-illumination)					
	illumination	Automatic intensity reproduction function	_				
		Image capture button					
Main body	Controls	Nosepiece rotating buttons Remote control pad	-				
	Eyepieces (F.O.V. mm)	· CFI 10X (22) · CFI 12.5X (16) · CFI 15X (14.5) · CFI UW 10X (25)					
	Focusing	Coaxial Coarse/Fine focusing, Focusing stroke: 30 mm, Coarse: 9.33 mm/rotation, Fine: 0.1 mm/rotation Coarse motion torque adjustable, Refocusing function					
Tubes	F.O.V. 22 mm (Eyepiece/Port)	C-TB Binocular Tube     C-TE Binocular Tube     C-TE2 Ergonomic Binocular Tube (100/0, 50/50 via optional C-TEP2 DSC Port, C-TEP3 DSC Port C-0.55X or C-TEPF2.5 DSC Port F2.5X)     Inclination angle: 10-30 degree, Extension: up to 40 mm					
	F.O.V. 25 mm (Eyepiece/Port)	· C-TF Trinocular Tube F (100/0, 0/100) · C-TT Trinocular Tube T (100/0, 20/80, 0/100)					
Nosepieces		<ul> <li>Motorized Sextuple Nosepiece with Analyzer Slot (Within main body)</li> <li>Switching between two objectives function</li> </ul>	· C-N6 ESD Sextuple Nosepiece ESD · C-N6A Sextuple Nosepiece with Analyzer Slot				
Stages		Cross travel 78 (X) × 54 (Y) mm, with vernier calibrations, stage handle height and torque adjustable for all stages · C-SR2S Right Handle Stage with 2S Holder · C-CSR1S Right Handle Ceramic-coated Stage with 1S Holder · C-CSR Right Handle Ceramic-coated Stage (C-H2L Specimen Holder 2L can be attached)					
Condensers (NA)	Motorized	· CI-C-E Motorized Swing-out Condenser (0.90/0.22)     Focusing stroke: 27 mm	_				
	Manual	Focusing stroke: 27 mm         · C-AB Abbe Condenser (0.90) · C-AR Achromat Condenser (0.80) · C-DO Darkfield Condenser Oil (1.20-1.43)         · C-DD Darkfield Condenser Dry (0.80-0.95) · C-PH Phase Contrast Turret Condenser (0.90) · C-AA Achromat/ Aplanat Condenser (1.40)         · C-SA Slide Achromat Condenser 2-100X (0.90) · C-SW Swing-out Achromat Condenser 1-100X (0.90/0.11)         · C-SWA Swing-out Achromat Condenser 2-100X (0.90/0.22) · C-LAR LWD Achromat Condenser (0.65)					
Observation methods*		Brightfield, Epi-fluorescence, Darkfield, Phase contrast, Simple polarizing, Sensitive color polarizing					
Epi-fluorescence attachment		<ul> <li>CI-FL-2 Epi-fluorescence Attachment (4 filter cubes mountable, Noise Terminator mechanism)</li> <li>D-FL-2 U-EPI Fluorescence Attachment (6 filter cubes mountable, Noise Terminator mechanism)</li> </ul>					
Epi-fluorescence light source		· D-LEDI Fluorescence LED Illumination system					
Power consumption		13W (Brightfield configuration)	6W (Brightfield configuration)				
Weight (approx.)		15.4 kg (Binocular standard set)	13.4 kg (Binocular standard set)				

\*Observations except Brightfield require optional accessories.

# **Ci Dimensional Diagram**



# Ci System Diagram



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