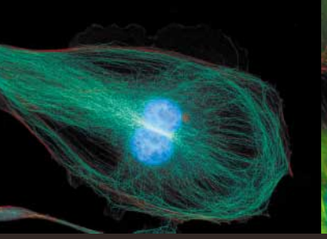
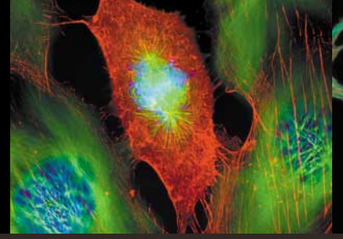
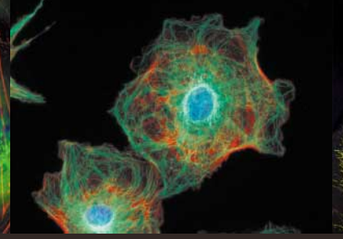
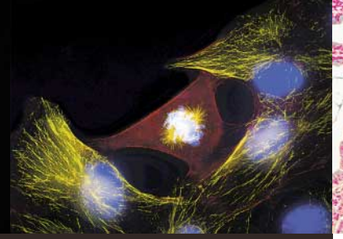
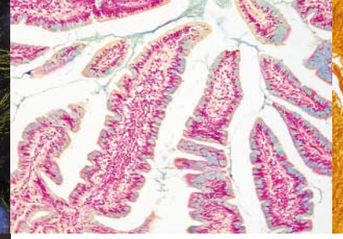
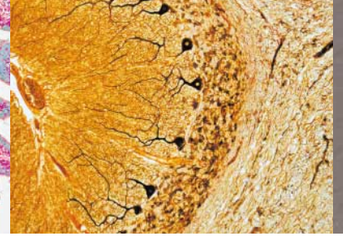
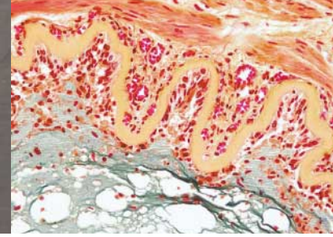
Digital Camera System for Microscopy

Digital Sight

The best choice in digital camera systems for microscopes



Nikon has developed an integrated imaging system for microscopy by creating both microscopes and digital cameras that work seamlessly together and with peripheral equipment. Now you can get the best combination of cameras and controllers to meet your observation needs.

DS-5Mc-U1

Cooled camera with USB interface controller

Even faint fluorescence and darkfield images are captured with high definition and low noise. Efficiently capture and manage images from your PC with the dedicated camera controlling software developed for microscopes. Ideal for research applications involving image analysis and processing.

DS-5Mc-L1

Cooled camera with stand-alone controller

The controller, which has a large, built-in 6.3-inch monitor, allows easy acquisition of clear, noiseless fluorescence images without having to connect to a PC. It's networking capabilities allow you to easily expand your system according to your research needs.

- The compact camera head houses a 5.0-megapixel CCD. Either color cooled type or standard type is selectable.
- The color cooled camera head minimizes thermal noise and creates ideal conditions for taking fluorescence images.
- A stand-alone controller for capturing images without a PC, or a USB interface controller for controlling the camera from a PC, can be selected.

DS-5M-U1

Standard camera with USB interface controller

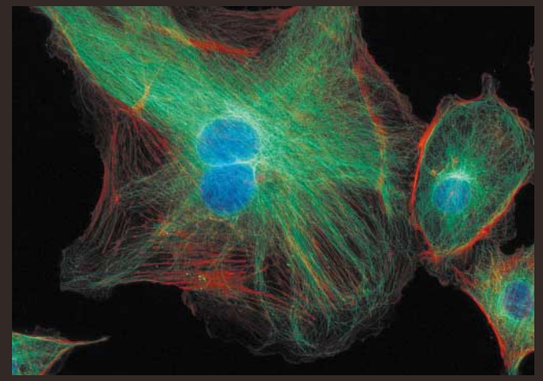
Transferring large volumes of photographed images to a PC is easy and fast thanks to the USB interface. Image analysis and database creation are also made easy with exclusive software for microscopic image observation.

DS-5M-L1

Standard camera with stand-alone controller

Optimum photography is realized with a single click by virtue of menus that itemize photographic conditions according to the observation method. The camera's stand-alone design allows photos to be taken without a PC.

An optimum high-definition, low-noise cooled camera head for fluorescence image photography

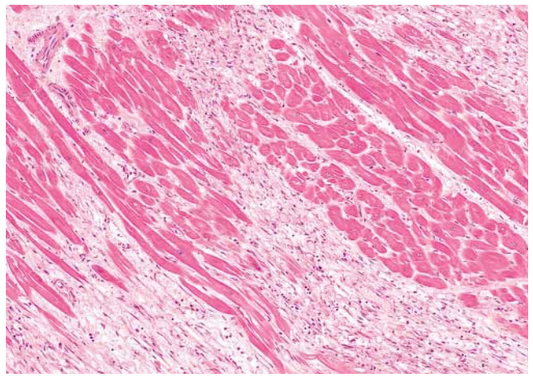


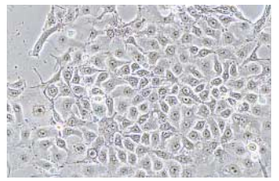
DS-5Mc
Cooled CCD Camera

The DS-5Mc's 5.0-megapixel 2/3-inch CCD attains high-definition, high-resolution pictures with a maximum of 2,560 x 1,920 pixels. And a Peltier cooling mechanism that maintains the temperature of the CD at -20˚C below ambient room temperature reduces the effects of thermal noise and the generation of hot pixels. Even when photographing weak fluorescence or darkfield specimens requiring prolonged exposures, it is able to acquire clear, low-noise images.

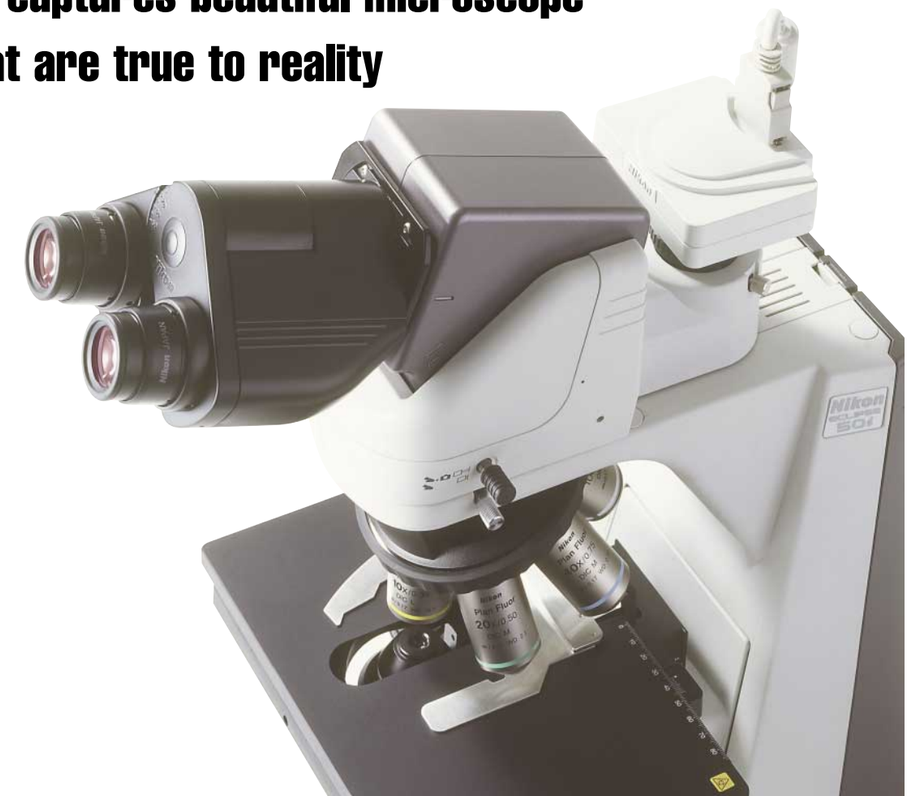
Its compact body is equipped with a high-definition, 5.0-megapixel 2/3-inch CCD. This standard-type camera head realizes high-resolution photomicrography with a maximum of 2,560 x 1,920 pixels. In all observation methods, including brightfield, phase difference, and differentiation interference, acquiring beautiful pictures faithful to the real specimen is possible.

DS-5M
Standard CCD Camera





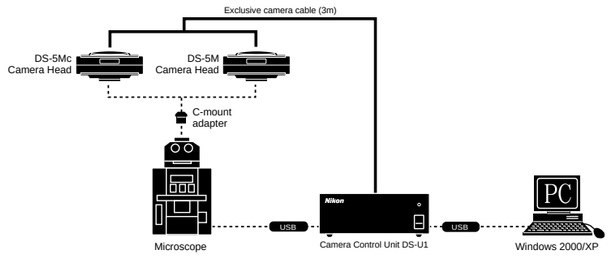
With 5.0 megapixels of high resolution, the DS-5M captures beautiful microscope images that are true to reality



DS-U1
PC Control type

One-touch connection to a PC via USB interface

This compact control unit can be connected quickly to any PC via its USB2.0 interface without the need for a dedicated board. Controlling the camera with a PC expands the user's system and allows the user to perform all work, including capturing, analyzing, and processing images, with only one piece of software (Act-2U). Both DS-5Mc and DS-5M camera heads are connectable.

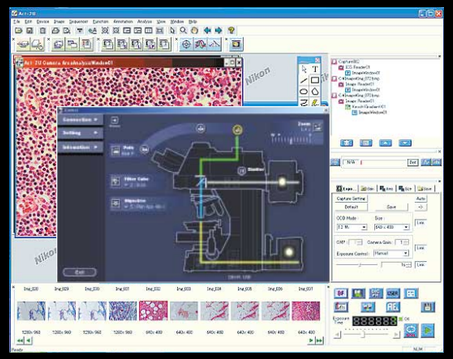


High-speed image transfer to a PC

With a high frame-per-second image transfer rate via the USB2.0 interface, VGA (640 x 480 pixels) image data (live images) can be viewed on a monitor at a speed of 15 frames-per-second, enabling users to perform focus adjustments and other tasks without strain.

Automatic detection of imaging status

In configuration with the ECLIPSE 80i microscope and DIH-M digital imaging head, DS-U1 automatically detects status data for objectives, zooming magnification, optical ports, or fluorescence filters and saves the data along with captured image files. It facilitates easy managing of the histories of images.

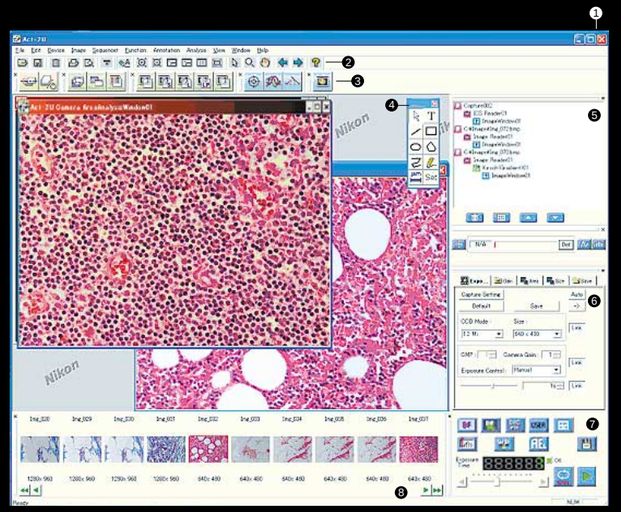


Configuration with the ECLIPSE 80i microscope and DS-5Mc camera head

Act-2U
Imaging Software

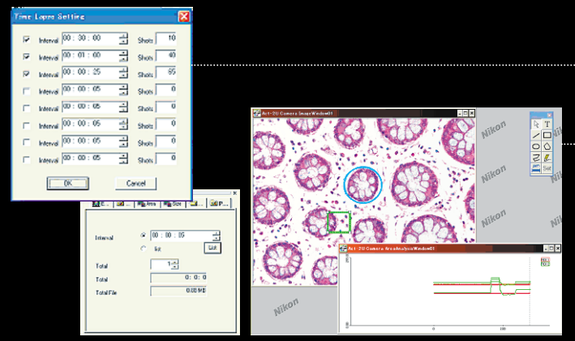
Application software for imaging, processing, and analyzing

The software developed specifically for capturing microscope images offers a rich array of functions for capturing large numbers of images easily and efficiently. It also provides various functions for managing image data to create image databases. This software features various image analyzing and image processing functions. Users can do all this and more with only a single piece of software.



Easy-to-use interface

1. Main frame
2. Main toolbar
3. Toolbox
4. Annotation toolbox
5. Process view window
   Shows the flow of image processing.
   You can easily alter the process while working.
   And you can set various modules,
   and insert or delete them as well.
6. Property view window
7. Capture control window
8. Thumbnail window



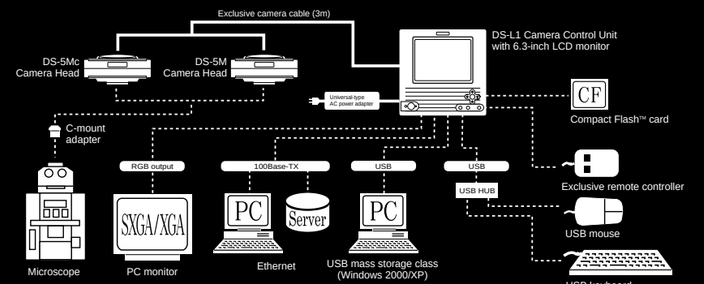
Main features

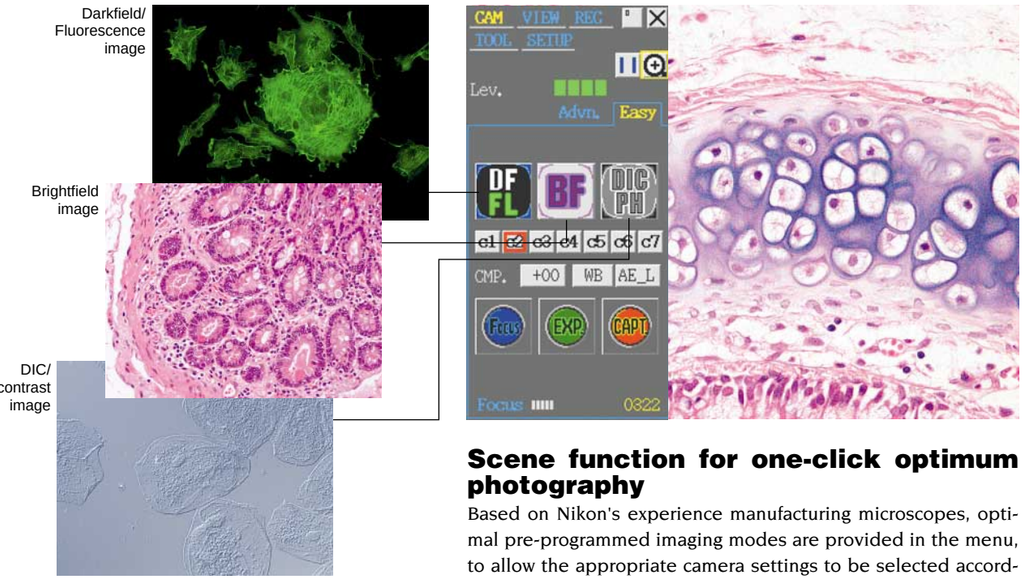
- Shading compensation
- Time lapse capturing
- Annotation
- Histogram
- ROI (Region of Interest) analysis
- Image filtering:
  Laplace (edge sharpner), Kirsh (gradient enhancer),
  Sobel (edge enhancer), Median (pixel balancer)
- Resolution changing
- Image cropping
- Image rotation
- Mirror effect

DS-L1
Stand-alone type

Easy capturing of digital images without a PC

Observation, photography, and networking are all possible with this single unit. There's no need to connect to a PC or external monitor. By equipping a large, 6.3-type LCD monitor in a compact body, focusing images on the monitor becomes possible. Both DS-5Mc and DS-5M camera heads are connectable.





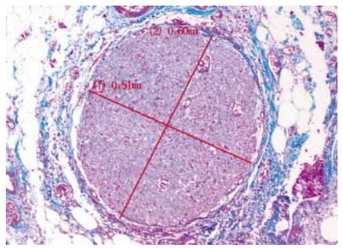
Scene function for one-click optimum photography

Based on Nikon's experience manufacturing microscopes, optimal pre-programmed imaging modes are provided in the menu, to allow the appropriate camera settings to be selected according to the desired observation method (bright, fluorescence, and DIC/phase contrast). Optimal images can be captured with a simple click. The user can also customize settings and save up to seven for quick retrieval.

Networking capabilities

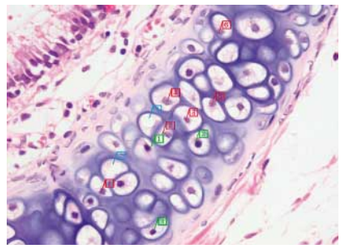
Sharing images with PCs is possible with its networking function.

Configuration with the TS100 microscope and DS-5M camera head



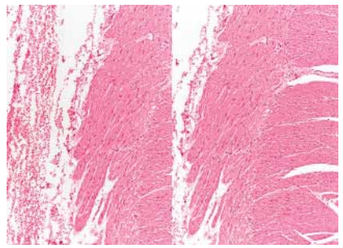
Distance measurement

Easily measures the distance between any two points specified by the user.
(not available during digital zoom)



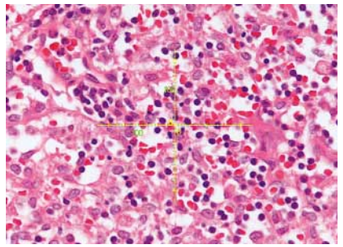
Count marking function

Up to 99 serial numbers can be marked to provide a convenient way to confirm the number of notes on-screen. They can also be easily saved and printed.



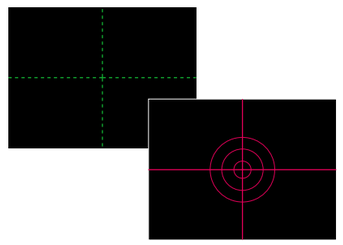
Two-screen split display

A frozen image can be displayed alongside the live image for easy comparison.



XY Scale Display

Independently movable scales with an X-axis and a Y-axis are included for measuring the size of samples, just like you would with a ruler.

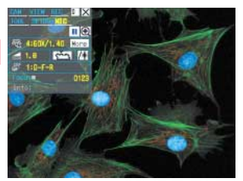


Screen Pattern

Grid or concentric circle patterns can be displayed. The center point can be moved, and dot/solid, line/center, and through/colors (seven colors are available) patterns can be selected.

Wide variety of other tools

Text and pen input: Input any character on the screen via a mouse or a USB-connected keyboard. Also, lines and figures can be drawn by hand using the pen tool.
Thumbnail display: Images stored on a CompactFlash™ card can be displayed together on-screen. File names and photographic information can also be displayed.
Superimpose function: Saved images can be superimposed over live images, for easy comparison.



Automatic detection of imaging status

In configuration with the ECLIPSE 80i microscope and DIH-M digital imaging head, DS-L1 automatically detects status data for objectives, zooming magnification, optical ports, or fluorescence filters and saves the data along with captured image files. It facilitates easy managing of the histories of images.

System Lineup

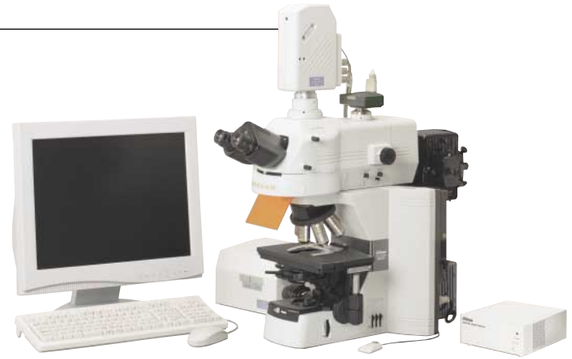
Flexibly fits your specific needs

The Digital Sight series is flexible and can be combined and freely incorporated into your observation system to optimize various applications.

DS-5Mc-U1

Comparing confocal images with fluorescence images

The DS-5Mc cooled camera is ideal for research that compares confocal and epi-fluorescence images, as it is capable of capturing clear, noiseless images even with weak fluorescent specimens. When configured with the ECLIPSE 80i microscope and DIH-M digital imaging head, DS-U1 automatically detects objectives or fluorescence filters and saves the data together with the image file.



Configuration with the ECLIPSE 80i microscope, DIH-M digital imaging head, and confocal C1 imaging attachment

Configuration with the ECLIPSE 80i microscope and DIH-M digital imaging head

DS-5Mc-L1

Capturing fluorescence images without a PC

Clear, noiseless fluorescence images can be taken with the simple GUI, without connecting to a PC or external monitor. With its networking capabilities, users can share images with PCs. Objectives or fluorescence filter data is automatically detected and can be attached to the image file.

DS-5Mc-U1

Capturing and analyzing fluorescence images

The high-speed image transfer capabilities of the USB interface enable users to easily focus images from their PCs. It is possible to capture noiseless fluorescence images and conduct a wide array of image analyses with the same software.

Configuration with the ECLIPSE TE2000-E microscope

Configuration with the ECLIPSE 80i microscope

DS-5M-U1

Creating a database of images

Capture high-definition, 5.0-megapixel images. The USB interface is useful for connecting your camera to a PC with just one-touch. It is suitable for researchers who need to take a large number of images to create a database.

DS-5M-L1

Handy for capturing digital images

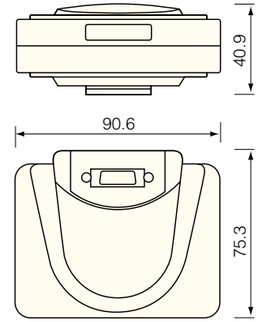
Easily capture high-definition images without a PC while saving space. You can capture and focus images on the large monitor built into the controller. Optimal camera settings for each observation method can be selected from the menu.

Configuration with the ECLIPSE 50i microscope

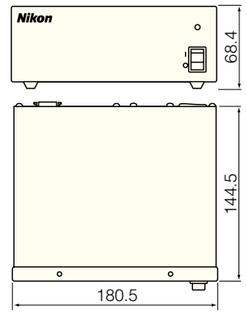
Specifications

(mm)

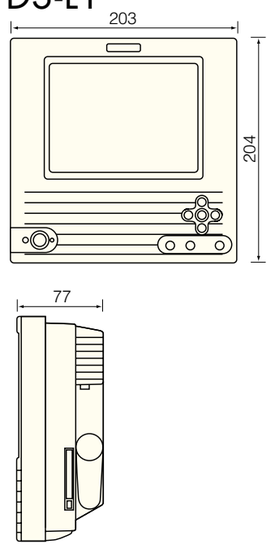
DS-5Mc/DS-5M



DS-U1



DS-L1



Camera Heads

	DS-5Mc (Cooled CCD Camera)	DS-5M (Standard CCD Camera)
CCD	2/3 in. high-density CCD: Total number of pixels: 5.24 million (effective 5.07 million)	
CCD cooling device	Peltier Device: Ambient temperature -20°C	—
Sensitivity	2400 lx, F5.6 or greater; equivalent to ISO 260	—
A/D conversion	12-bit	
Lens mount	C-mount	
Exposure time	1/1000 to 600 sec	1/1000 to 60 sec
Dimensions	Camera head: 90.6(W) x 40.9(H) x 75.3(D)mm	
Weight	Camera head: approx. 290g	Camera head: approx. 230g
System composition	Camera Cable (3m)	
Optional accessories	0.7x Relay lens (C-mount)	

DS-U1 Camera Control Unit (PC Control type)

Exposure control	Program AE, Shutter-priority AE, Focus AE, Manual with AE lock function
Exposure correction	Correction range: ±2.0EV, Step: 1/3EV
Digital zoom	5 to 2400%
Interval shooting	5 sec. - 12 hr. intervals
Exposure metering	Average metering, Peak hold metering
Exposure metering range	3 selectable sizes
White balance	Set method, Color balance adjustable
Compensation	Brightness, Contrast, Gamma correction, Rotation, Flip-flop, Crop, Shading correction, Monochrome, Nega/posi
Storable image size	2560 x 1920 pixels, 1280 x 960 pixels, 640 x 480 pixels
Storage format	BMP, TIFF, JPEG, JPEG2000
Live display mode	Center scan mode (15 frames/sec. max.), 1.3M interlace mode (6.8 frames/sec. max. 2x2 binning mode) 1.3M progressive mode (7.5 frames/sec. max), 5M interlace mode (3.75 frames/sec. max)
Interface	USB2.0 device port (computer control connector), USB1.1 host port (microscope connector)
Power supply	AC100-240V 50/60Hz
Power consumption	43VA
Dimensions	Control unit: 180.5 (W) x 68.4 (H) x 144.5 (D) mm
Weight	Control unit: approx. 1000g
Operating environment	0-40°C, 85% RH max. (without condensation)
System composition	Power cord

Act-2U Imaging Software System Requirements

Computer type	DOS PC supporting USB2.0
CPU	Pentium 4, 1.7GHz or faster (Pentium 4, 2.4GHz or faster recommended)
RAM	512MB or more (1GB or more recommended)
USB2.0	2 ports
Hard disk	100MB to install, 300MB or more free space to run (on launch disk)
Operating system	Windows 2000 Professional (SP4 or later, English or Japanese), Windows XP Professional (English or Japanese), pre-installed versions only
Graphics	1280 x 1024 pixels or more, 16-bit color or more (24-bit color recommended), DirectX 9.0b support
Others	CD-ROM drive (to install), Microsoft USB2.0 driver

The above system requirements list does not constitute a guarantee that all computers and systems meeting these criteria will be able to run the software.

DS-L1 Camera Control Unit (Stand-alone type)

Exposure control	Program AE, Shutter-priority AE, Focus AE, Manual with AE lock function
Exposure correction	Correction range: ±2.0EV, Step: 1/3EV
Digital zoom	Up to 16x (8 steps)
Interval shooting	10 sec. - 6 hr. intervals
Exposure metering	Average metering, Peak hold metering
Exposure metering range	3 selectable sizes
White balance	Set method, Color balance adjustable
Compensation	Gamma Compensation (9 types), Shading compensation (Auto: 5 step, Custom setting: 2 types), Color/Monochrome, Color enhancement, Hue rotation, Black level adjustment, Vertical and horizontal rotation
Image size	2560 x 1920 pixels, 1280 x 960 pixels, 640 x 480 pixels
Storage format	BMP, JPEG (4-step compression)
Live display mode	4 selectable modes : 5M interlace mode (3.75 frames/sec. max.) 1.3M progressive mode (7.5 frames/sec. max.), 1.3M interlace mode (6.8 frames/sec. max. 2x2 binning mode) Center scan mode (15 frames/sec. max. , displays 1/2 in center of V direction)
Interface	USB1.1 host port (USB mouse, USB keyboard connection) USB1.1/2.0 device port (Mass Storage Class support)
Power supply	AC100-240V 50/60Hz
Power consumption	138VA
Dimensions	Control unit: 203(W) x 204(H) x 77(D) mm
Weight	Camera control unit: approx. 1300g, AC adapter: approx. 350g
Operating environment	0-40°C, 85% RH max. (without condensation)
System composition	AC adapter, Power cord, CompactFlash card (64MB), Mouse
Networking	Ethernet (10/100Base-TX), DHCP compatible, HTTP, TELENET or FTP server, FTP client
LCD monitor	6.3-in. TFT color LCD XGA (1024 x 768, 60Hz)
External monitor output	Analog RGB: SXGA (1280x1024, 60Hz), XGA (1024x768, 60Hz)
Storage media	CompactFlash card (Type 1, Type II)
Optional accessories	Exclusive remote control unit

Highly flexible digital camera systems for microscopy can be selected for the optimum combination of units.

Digital Camera System for Microscopy

Digital Sight

WARNING	TO ENSURE CORRECT USAGE, READ THE CORRESPONDING MANUALS CAREFULLY BEFORE USING THE EQUIPMENT.

NIKON CORPORATION
Fuji Bldg., 2-3, Marunouchi 3-chome, Chiyoda-ku,
Tokyo 100-8331, Japan
www.nikon.com/

NIKON CORPORATION Instruments Company — ISO 9001

NIKON CORPORATION Yokohama Plant — ISO 14001

NIKON INSTECH CO., LTD.
Parale Mitsui Bldg.,8, Higashida-cho, Kawasaki-ku,
Kawasaki, Kanagawa 210-0005, Japan
phone: +81-44-223-2167 fax: +81-44-223-2182
www.nikon-instruments.jp/eng/

NIKON INSTRUMENTS (SHANGHAI) CO., LTD.
CHINA phone: +86-21-5058-5055 fax: +86-21-5058-5060
NIKON SINGAPORE PTE LTD
SINGAPORE phone: +65-6559-3618 fax: +65-6559-3668
NIKON MALAYSIA SDN. BHD.
MALAYSIA phone: +60-3-78763887 fax: +60-3-78763387

NIKON INSTRUMENTS EUROPE B.V.
Schipholweg 321, 1171PL Badhoevedorp, NL
phone: +31-20-44-96-222 fax: +31-20-44-96-298
www.nikon-instruments.com/

NIKON FRANCE S.A.
FRANCE phone: +33-1-45-16-45-16 fax: +33-1-45-16-00-33
NIKON GMBH
GERMANY phone: +49-211-9414-0 fax: +49-211-9414-322
NIKON INSTRUMENTS S.p.A.
ITALY phone: +39-55-3009601 fax: +39-55-300993
NIKON AG
SWITZERLAND phone: +41-43-277-2860 fax: +41-43-277-2861
NIKON UK LTD.
UNITED KINGDOM phone: +44-20-8541-4440 fax: +44-20-8541-4584

NIKON INSTRUMENTS INC.
1300 Walt Whitman Road, Melville, N.Y. 11747-3064, U.S.A.
phone: +1-631-547-8500; +1-800-52-NIKON (within the U.S.A. only) fax: +1-631-547-0306
www.nikonusa.com/

NIKON CANADA INC.
CANADA phone: +1-905-625-9910 fax: +1-905-625-0103

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