


# Digital Cameras for Microscopes

# The Nikon Digital Sight series enhances the quality of the observation, recording, and analysis.

Four camera options covering two computing platforms

### Digital Sight 100



➡ P.3

6.5 megapixel
Color
C-mount

Frame rate*
60 fps (1600×900)

Max recordable pixels*
2944×2208

### Digital Sight 1000



➡ P.4

2.0 megapixel
Color
C-mount

Frame rate
30 fps (1920×1080)

Max recordable pixels
1920×1080

### Digital Sight 10



➡ P.5

23.9 megapixel
Color/Monochrome
F-mount

Frame rate*
9 fps (6000×3984)
55 fps (2000×1328)

Max recordable pixels
6000×3984

### Digital Sight 50M



➡ P.5

60.0 megapixel
Monochrome
F-mount

Frame rate*
6 fps (9552×6336)
225.9 fps (640×480)

Max recordable pixels
9552×6336

### Using a desktop PC/tablet PC




➡ P.8

### Using a desktop PC




➡ P.6

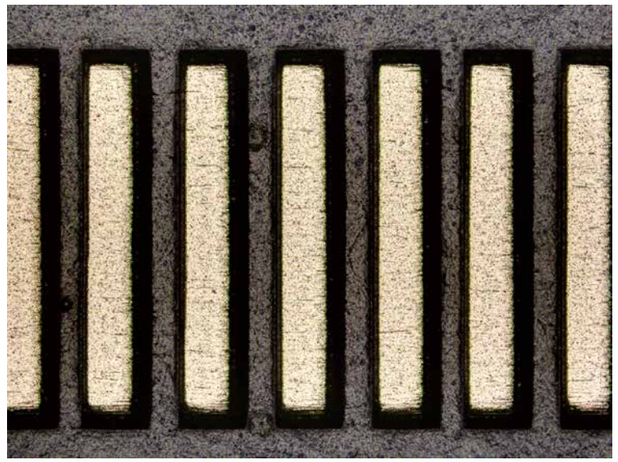
*Digital Sight 100 (standalone) delivers 17.7-megapixel resolution (4864 x 3648 pixels) and has maximum frame rate of 15 fps.



# Digital Sight 100



6.5 megapixel
Color
C mount



Printed circuit board (Objective: TU Plan Fluor BD 5x brightfield)

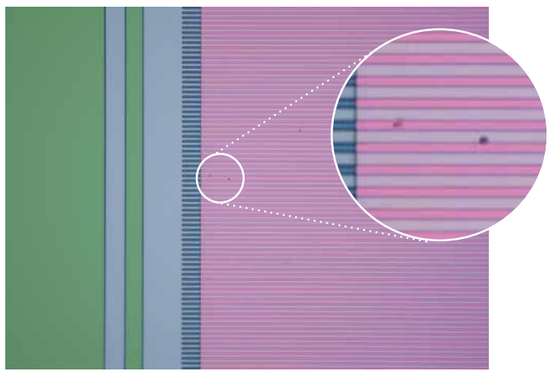
## High-definition / High-level color reproducibility / High frame rate

Used with industrial microscopes (FN 16), the Digital Sight 100 delivers 6.5-megapixel resolution (2944 x 2208 pixels), ensuring clear capture of fine structural details and rich color information.

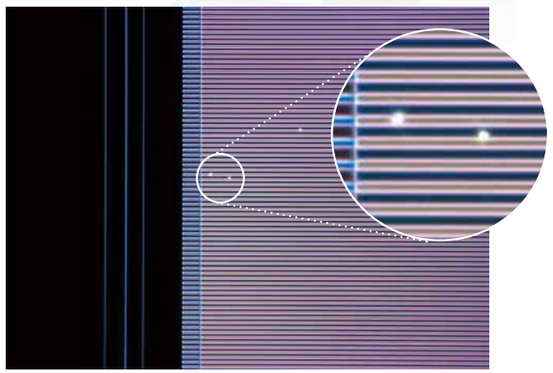


## Compatible with multiple device interfaces

Operators can utilize USB 3.2, HDMI, Wi-Fi, and/or Ethernet to share information taken with the Digital Sight 100. PC-free observation is available via HDMI monitor connection. Workloads can be reduced with easy operations by using the camera with Nikon's NIS-Elements LE software, as well as the NIS-Elements D/Ar/Br.



Semiconductor (IC wafer) (Objective: TU Plan Fluor BD 50x brightfield)

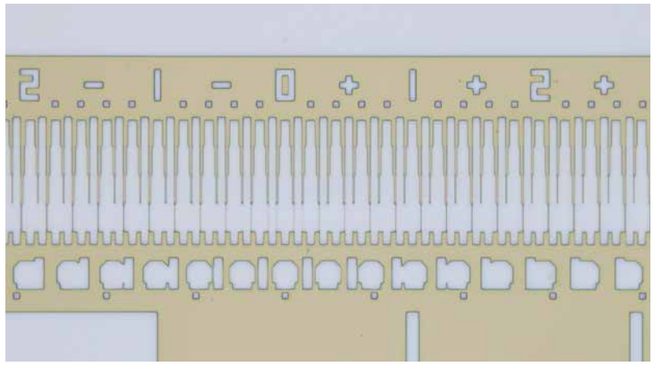


Semiconductor (IC wafer) (Objective: TU Plan Fluor BD 50x darkfield)

# Digital Sight 1000




2.0 megapixel | Color | C mount



Semiconductor (IC wafer)
(Objective: TU Plan Fluor 20x on Nikon ECLIPSE microscope)

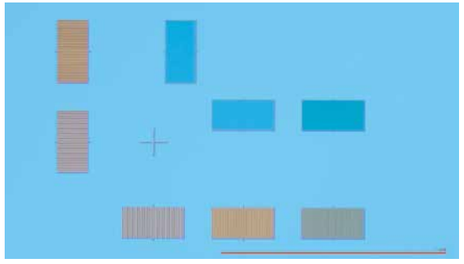
## Low cost, Full HD Camera

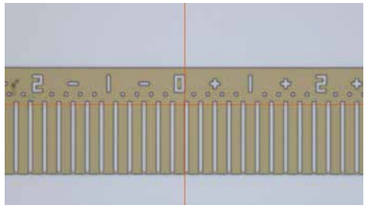
Equipped with a 2 megapixel CMOS image sensor, it can display, capture, and save full HD microscope images of 1920 x 1080 pixels at 30 frames/second.

## Easy operation on HDMI display

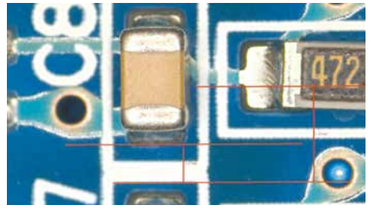
By connecting the microscope to a camera and HDMI monitor, movie and still images can be created, captured and data can be saved to an SD card. No PC connection is required to display scales and reticles, as well as to conduct simple measurements.



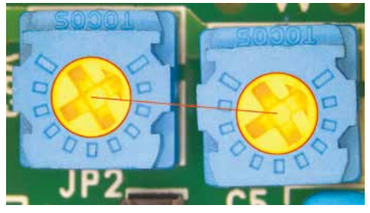





Cross Line (Line Display)




Perpendicular Distance Measurement




Circle Distance Measurement

**Main Features**

- Image Comparison
- Circle Distance Measurement
- Parallel Line Measurement
- Polygon Display
- Measurement Calibration
- Scale Bar Display
- Reticle Display
- Angle Measurement
- Concentric Circles Measurement
- Freehand Line Display
- Rectangle Display
- Coordinate Display
- Scale Reticle Display
- Saving Measurement Result
- Perpendicular Distance Measurement
- Circle Display
- Line Display



# Digital Sight 10




23.9 megapixel | Color/ Mono-chrome | F mount

## High-definition observation

Digital Sight 10 enables unprecedented 6K ultra-high definition, capturing microscopic images at up to 6000 x 3984 pixels (23.9 megapixels).

## Color and Monochrome shooting are both possible with one camera unit

**During manual operation**

**Color mode**

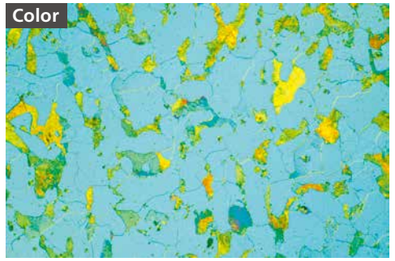
Inserting the color filter optimizes the image from 400 to 680 nm in color live display and capture modes

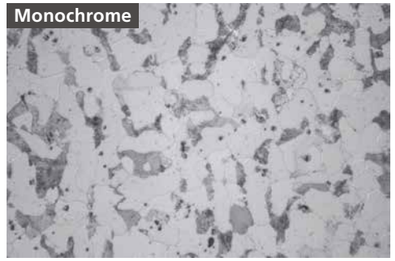


**Monochrome mode**

Inserting the IR filter in place of the color filter now extends the IR imaging range from 400 to 850 nm in both live and capture modes.






Metallic structure (aluminum)
(Objective: TU Plan Fluor 50x)

## High-speed display

Digital Sight 10 is able to output a standard or a user definable Region of Interest (ROI) directly from the sensor area.

(Position and size limits on ROI are present in the camera, but images are cropped using the SDK to provide an unrestricted ROI to the user.)

## Electric switching function

**During electronic operation (using the 1x electronic adapter)**

Easy switching between color and monochrome modes using the imaging software is possible by a motorized, hands-free process.

*A 1x electronic adapter and a separate PC equipped with specialized imaging software, NIS-Elements, are required forautomated filter change operation.

# Digital Sight 50M




60.0 megapixel | Mono-chrome | F mount

## 9K ultra-high resolution

The improved Digital Sight 50M boasts 3.8 times the number of pixels and 2.5 times the resolution of previous models. Even when using a low-magnification, high-NA objective lens, it fully demonstrates optical capabilities.

## Low noise

**Acquires dim fluorescent signals with ultra-low noise**

Both 6e- read noise coupled with a large full-well capacity and 1.0e-/p/s dark current allow the acquisition of 14bit fluorescence images with very little noise.

## High sensitivity

**Detects even faint fluorescent signals**

The Digital Sight 50M achieves quantum efficiency of 85%. Even faint fluorescence signals can be captured by the pixels on account of the broad 3.76 µm pixel pitch and high quantum efficiency.

## Numerous image acquisition modes

**Adjustable balance between quality and speed**

There are three operation modes, making it possible to select the required speed and quality. Maximum frame rate of 225.9 fps for high-speed photography.

Imaging software
NIS-Elements
Advanced Solutions for your Imaging World

for a desktop PC

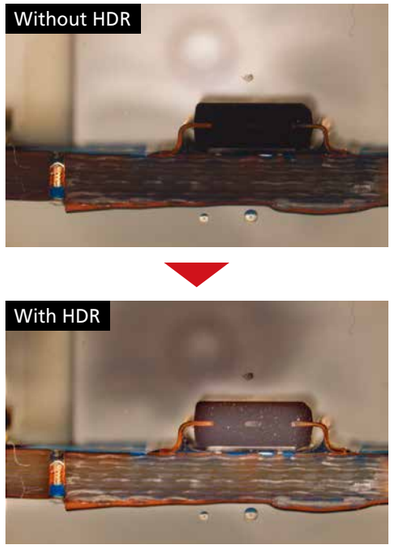
D Ar Br F

NIS-Elements D/Ar/Br/F offer image acquisition, analysis, visualization and data sharing tools. The software has a fully customizable user interface and can be seamlessly integrated with Nikon microscopes and cameras. The NIS-Elements platform features various packages and software modules to meet the needs of even the most challenging applications.

## HDR (High Dynamic Range) image acquisition

Ar Option D Br

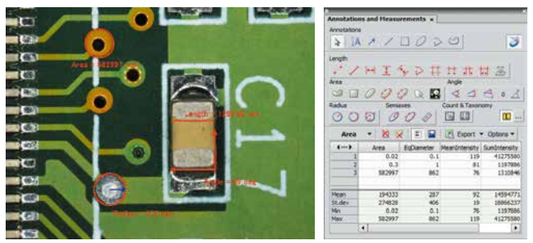
HDR creates an image with appropriate brightness in both the dark and bright regions in a sample by combining multiple images acquired with different exposure settings. It is also possible to create HDR image using multiple captured images.




## Manual measurement and image annotation

D Ar Br

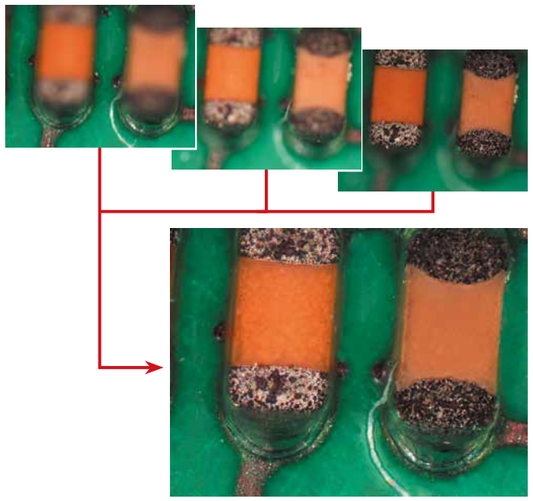
Manual Measurement allows easy measurement of length and area by drawing lines or an object directly on the image. The results can be attached to the image, and also exported as text or to an Excel spreadsheet.



## EDF (Extended Depth of Focus)

Option Ar Br D

Creates a single, all-in-focus image from images of differing focus. Such images can now be created by simply turning the focus knob.

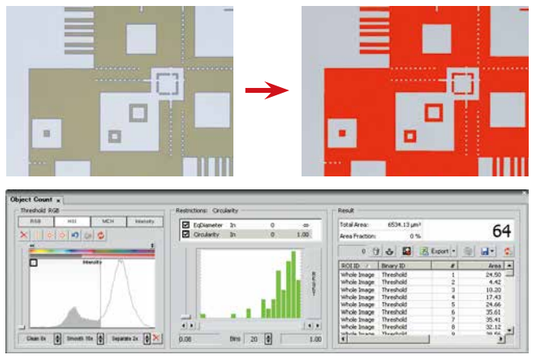


Selects the in-focus area and produces one all-in-focus image

## Auto measurement (Object Counting)

Ar Br Option D

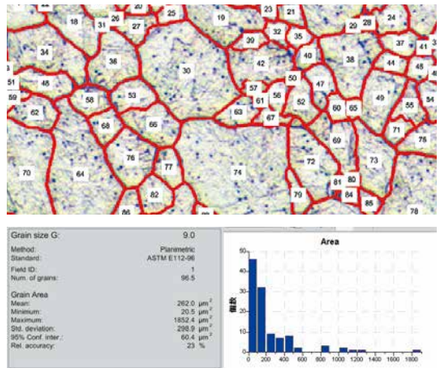
Performs binarization on images using previously set thresholds to measure the number, area, brightness, etc. of identified objects.



## Grain size analysis

Option Ar Br D

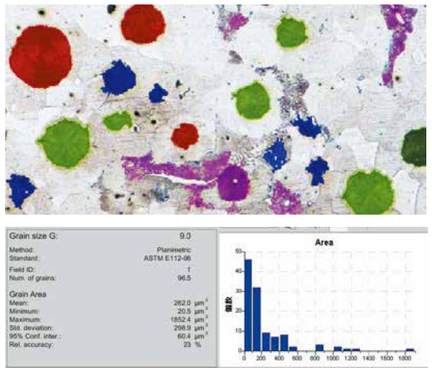
Detects and measures grains in one and two phase samples according to JIS G0551:2020, ASTM E112-13:2021/E1382-97:2023, ISO 643:2019 and GB/T 6394:2017 standards.



## Cast iron analysis

Option Ar Br D

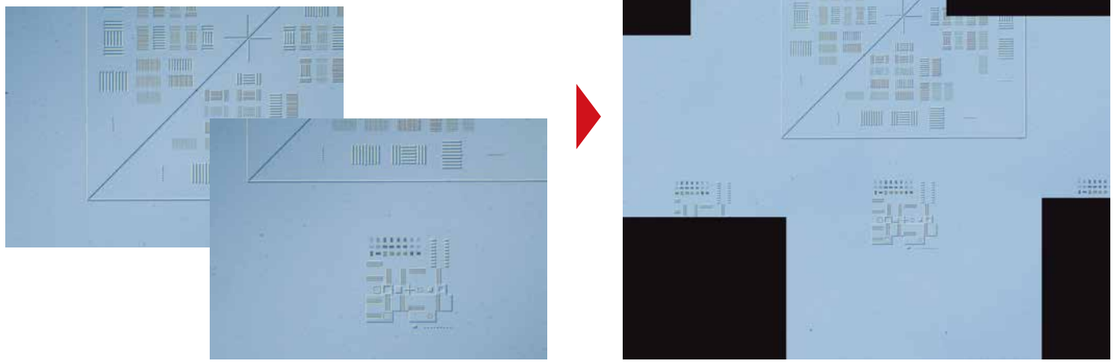
Detects, measures and classifies graphite content as well as ferrite content in graphite-corrected samples according to JIS G5502-JIS:2022/G5502-ISO:2022, ASTM A247-06:2019 and ISO 945-1:2019 standards.



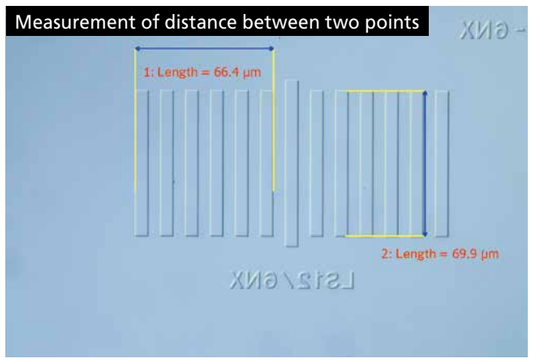
## Image stitching (Large Image)

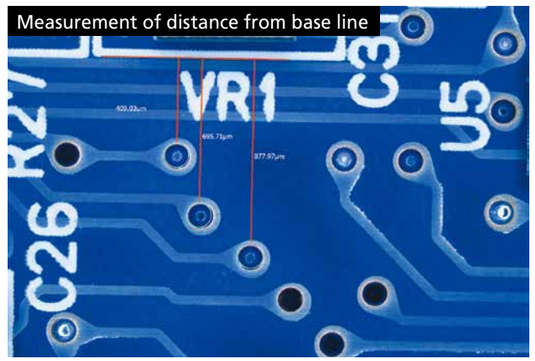
Option Ar Br D

Stitches together images acquired from multiple fields of view. This can occur from images as they are acquired or from previously captured images.



## Measuring Software



Imaging software
NIS-Elements
Advanced Solutions for your Imaging World

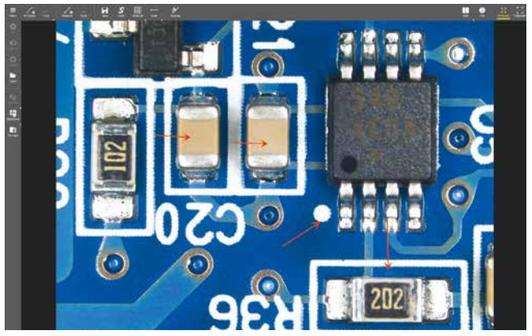
**Using a desktop PC / tablet PC** LE

NIS-Elements LE is a free software that allows intuitive control of microscope cameras from the PC. Supports Wi-Fi connectivity when used with the Digital Sight 100.

*For information about compatible tablet PCs, contact Nikon

## User Interface for naturally simple operation

Displays various menus for image capture, saving, display, measurement and annotations using intuitive icons. It also supports touch screen operation.



## Scene mode

Ten camera setting patterns for optimal color reproduction and contrast for each microscope light source, observation method and type of sample, as well as custom settings, can be selected.

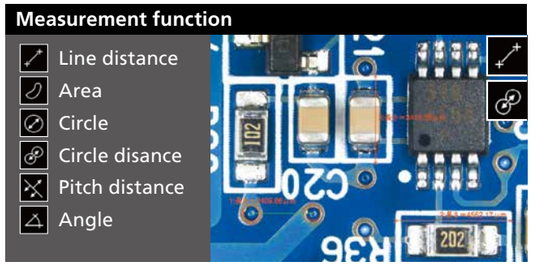
**Industrial Scene Mode**

- Wafer/IC
- Circuit board
- Metal
- Flat Panel Display

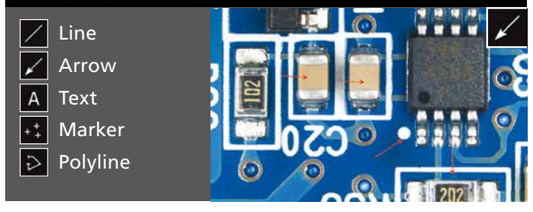
## A wide variety of tools

Enables the conducting of simple measurements on images, with input of lines and comments. These can also be written onto and saved with the image, and measurement data can be output.

**Measurement function**




**Annotate function**

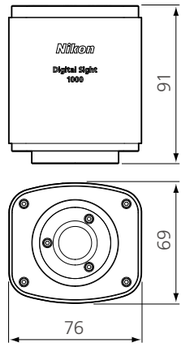



**Graticule/scale function**

- Crosshairs
- Simple crosshairs
- Circle
- Grid
- Horizontal scale
- Vertical scale

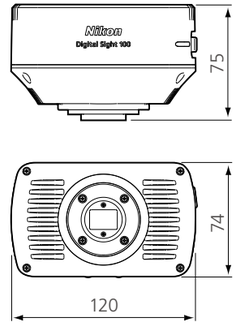
## Dimensions (Unit: mm)

### Digital Sight 1000



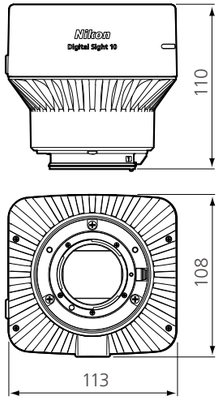

Weight: approx. 450 g

### Digital Sight 100



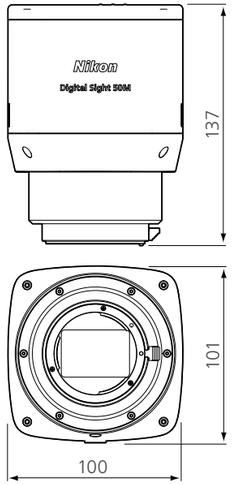

Weight: approx. 600 g

### Digital Sight 10



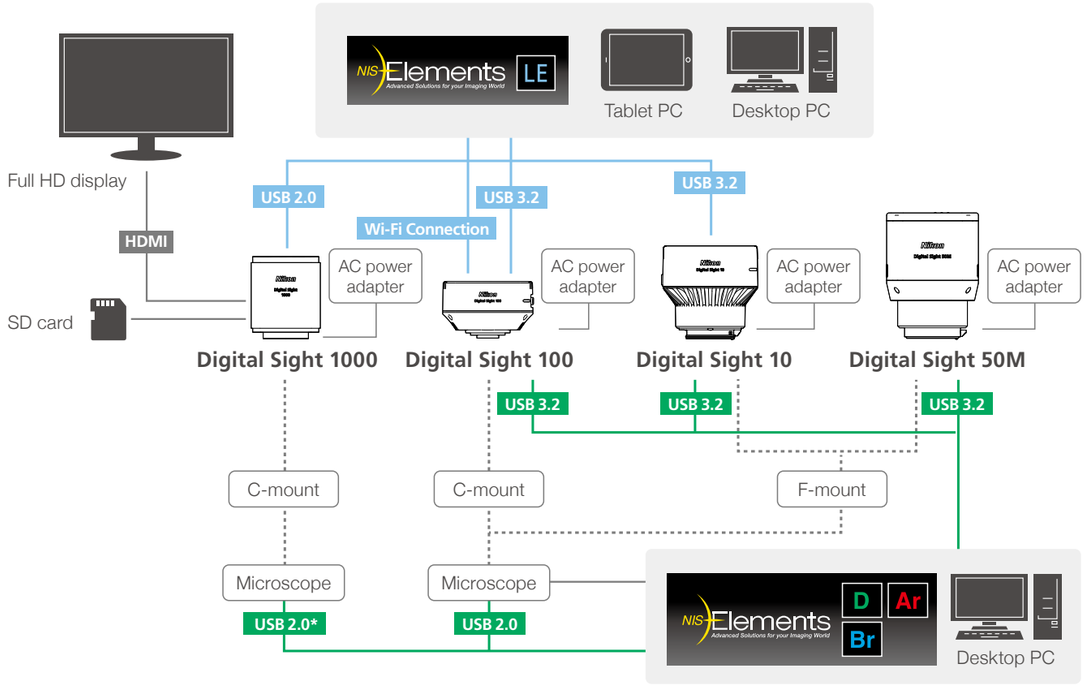

Weight: approx. 1,100 g

### Digital Sight 50M




Weight: approx. 1,300 g

## System Diagram



# Specifications

| Model name | Digital Sight 1000 | Digital Sight 100 | Digital Sight 10 | Digital Sight 50M |
|---|---|---|---|---|
| Image sensor | 1/2.8 inch<br>Color CMOS image sensor | 1 inch<br>Color CMOS image sensor | Nikon FX-format Color/<br>Monochrome CMOS image sensor | Nikon FX-format<br>Monochrome CMOS image sensor |
| Recordable pixels | 1920 × 1080 pixels | 2944 × 2208 pixels | 6000 × 3984 pixels | 9552 × 6336 pixels |
| Lens mount | C-mount | | F-mount | |
| Cooling method | — | | | Electronic cooling |
| Quantum efficiency | — | | | 85 % |
| Full well Capacity | — | | | 45000e- (typ.) |
| Readout noise | — | | | 6e- |
| Dark current | — | | | 1.0e-/p/s (Ta=25°C)(typ.) |
| Live display mode* (maximum fps) | 1920 × 1080 pixels: 30 fps | All pixels (4:3)<br>2944 x 2208 pixels: 30 fps<br>All pixels (16:9)<br>3200 x 1800 pixels: 30 fps<br>2x2 Pixels Average<br>1600 x 900 pixels: 60 fps<br>2x2 Pixels Average (when using Wi-Fi)<br>1600 x 900 pixels: 60 fps | All pixels (6000 x 3984): 9 fps<br>FullHD 3x3 pixels average<br>(2000x1328): 55 fps | All pixels (9552 × 6336):<br>6 fps@8 bit, 1.9 fps@16 bit<br>3 × 3 pixels average @ 8 bit<br>(ROI 640 × 480): 225.9 fps*** |
| Exposure time | 1 m sec–10 sec | 100 µsec–10 sec | 100 µsec–120 sec | 150 µsec–120 sec |
| Photometry mode | Average photometry<br>1920 × 1080 pixels (all area) | Average photometry: Average intensity within the photometry area<br>Peak photometry: Maximum intensity within the photometry area | | |
| Exposure control | Automatic exposure,<br>Manual exposure | One-time automatic exposure: Exposure time is adjusted automatically for one-time within the optimum range for the camera<br>Continuous automatic exposure: Automatic exposure adjustment is performed continuously to keep the exposure within the camera<br>Manual exposure: Exposure time and gain settings are made manually | | |
| Exposure correction | Available | Average metering: ±1EV Step:1/6EV (some restrictions according to tone)<br>Peak hold metering: -1 EV ~ ±0 EV | | Average metering: -1 EV ~ +1/2 EV<br>Peak hold metering: -1 EV ~ ±0 EV |
| Interface | USB2.0 (connect with<br>PC or USB mouse)× 1,<br>HDMI × 1, SD card slot x1** | USBPort1 (Device): USB3.2 Gen2x1<br>(USB2.0 not supported)<br>USBPort2 (Host): USB3.2 Gen1x1<br>HDMI1.4b<br>MSC communication | USB3.2GEN1,2<br>(connect with PC) × 1<br>External trigger × 1 | USB3.2GEN1<br>(connect with PC) × 1<br>External trigger × 1 |
| Power supply | AC100-240V 50Hz/60Hz | | | |
| Power consumption | 3 W | 7 W | 18 W | 27 W |
| Operating environment | 0-40°C, 60% RH max. (without condensation) | | | |

*Maximum frame rate depends on exposure time. **Both SD and SDHC memory cards are compatible with the Digital Sight 1000 camera.
***When using NIS-Elements, 16-bit mode can be selected for 1x1 and 2x2 digital binning, and 12-bit mode can be selected for 2x2, 3x3, 4x4 and 6x6. 8bit mode can be selected in all image size modes.

The Wi-Fi functionality of Digital Sight 100 is provided by external Wi-Fi dongles (sold separately) available in each country and region. In principle, Wi-Fi dongles should be purchased from local distributors or in-country representative, ensuring compliance with local laws and regulations in your region. We do not bundle them with the product nor export/import them across borders. Using dongles certified for other countries may violate local laws and regulations. Always use products that are legally sold in your local market. Warranty and support for Wi-Fi dongles are subject to the terms and conditions of your local distributors or in-country representative.

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*Products: Hardware and its technical information (including software)

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

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