



## Invenio 2EIII

Digital camera for microscopes  
**USB 3.0**  
 Windows Vista / XP / 7,8 and 10

### Features:

- 2.3 MPixels still image and video
- High speed video at up to 45 FPS
- Very high sensitivity and ultra low noise
- 1/1.9' Sony Exmor™ Back illuminated sensor
- Fast subsampled live video in combination with full resolution still image capture.
- Easy and flexible daily use with dynamic insertion and removal of the camera to PC and notebook via a single standard USB 3.0 high-speed interface
- Small compact camera with optical C-mount for easy attachment to a microscope
- Tripod receptable for mounting to stands for macro photography
- Automatic and manual exposure and sensitivity control
- Back focus adjustment
- Binning x2 with 4x increased sensitivit
- Free software upgrade (2 years guaranteed)
- 2 Years warranty
- Manufactured in Denmark

### Typical Applications:

- Live cell imaging and video
- Material science
- FISH, GFP, NIR
- Quality control
- Dark Field
- Bright Field
- Histology
- Pathology
- DIC
- Cytology
- Biology

## A new generation of high performance and affordable Microscope Cameras

### USB3.0 and Exmor Sensor Advantages: Real High Speed Readout

The new Exmor sensors combine the high-speed readout from CMOS sensors with the low noise, high sensitivity, large dynamic range and color precision of CCD sensors. In combination with USB3, it offers a new generation of microscope cameras with real live video performance combined with high quality still images.

### Ultra Low Noise

The Exmor sensors digitize the pixels before the column signals are multiplexed, thereby minimizing the noise signal significantly compared to standard CMOS sensors.

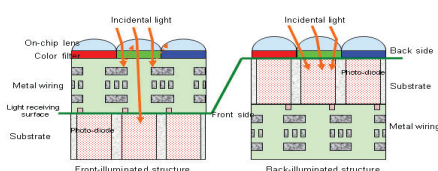


### Smear-free images.

The special construction of the Exmor sensor allows the sensor to produce smear-free images like other CMOS sensors, but without the limited dynamic range and contrast know from traditional CMOS sensors.

### Exmor back-illuminated structure

Sony Exmor back-illuminated structure sensor, is developed with the intention of capturing vivid images even in low light settings. "Exmor" sensor is approximately twice as sensitive as a conventional front illuminated CMOS sensor and also features low noise. This is due to back illuminated CMOS sensor, light is directed onto the silicon substrate from behind, allowing light to be used with a level of efficiency not possible with conventional front illuminated pixel structures.

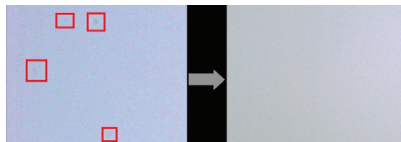


### Seiwa Advantages: Extreme Quality Assurance

All Seiwa cameras are thoroughly tested in order to ensure that all cameras meets the same high quality.

### Clean Sensors and Filters.

The way the light hits the camera sensor and filter on a microscope, dispense all particles on the sensor and IR-filter as illustrated on the image below the dark spots on the image are dust particles. Seiwa cameras are assembled, carefully cleaned and assembled in dust free clean chambers to ensure that such particles are removed.



### Extreme Performance

Cameras from different manufacturers often use the same sensors. To get the best performance out of these cameras, Seiwa uses optimal circuit design and components like ultra high quality capacitors, to ensure low noise and long life.

### Ultra High ESD Protection

An advanced ESD protection scheme has been designed to avoid camera freezes, and computer or USB - port errors.

### Professional Software

Enclosed with all Invenio III cameras is a comprehensive software package. Seiwa InSight, is based on 25 years of experience and user feedback, built especially for Invenio cameras. No need for poor integrated third party software. Modules for stage control, topography, image analysis and much more can be added as needed.



## Invenio 2EIII Specifications

### Imager

<b>Effective Size:</b>	1/1.9" format Exmor 7.20 mm x 4.5 mm
<b>Colour Filter:</b>	Red, green and blue in Bayer pattern
<b>Effective Pixels:</b>	1920 x 1200 pixels (2.3 million)
<b>Pixel Size:</b>	2.75 x 2.75 microns
<b>Dynamic Range:</b>	65 dB
<b>Signal to Noise:</b>	38dB / 50dB in binmode
<b>Dark Current Noise:</b>	20 electrons/pixel/second
<b>Exposure Time:</b>	0.244 milliseconds to 1000 milliseconds
<b>Sensitivity:</b>	0.31 V/Lux-s 1x1 and 2x2
<b>Binning:</b>	
<b>Exposure Sensitivity:</b>	Adjustable from 1 to 16 times
<b>Exposure Mode:</b>	Automatic, manual or converging
<b>Colour Balance:</b>	Automatic, manual or spot white balance
<b>Shutter:</b>	Electronic rolling shutter

### Digital Still Image

<b>Single exposure:</b>	1920 x 1200 pixels (2.3 million)
<b>Data Format &amp; Compression</b>	
<b>Digital output:</b>	24 bit uncompressed TIFF-RGB (8 bits per colour)
	24 bit loss-less compressed JPEG2000 (8 bits per colour)
	24 bit JPEG compressed (8 bits per colour)
	24 bit uncompressed DICOM (8 bits per colour)
	24 bit uncompressed video in AVI format (8 bits per colour)

### Computer & Software

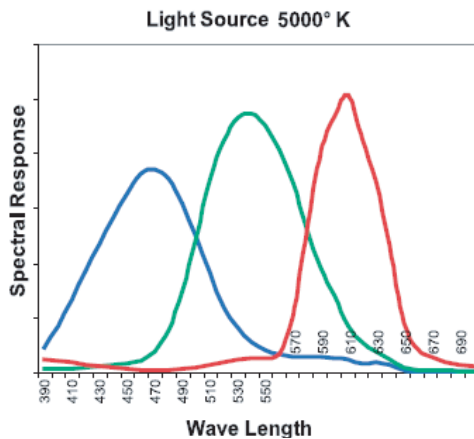
<b>Data interface:</b>	High-speed USB 3.0 architecture
<b>Cable:</b>	Standard USB 3.0 cable
<b>Power:</b>	USB
<b>Application interface:</b>	Intuitive, easy-to-use user application

### Operational Requirements

<b>Temperature:</b>	0°C to +50 °C
<b>Humidity:</b>	5% to 95% RH (non-condensing)

### Physical Data

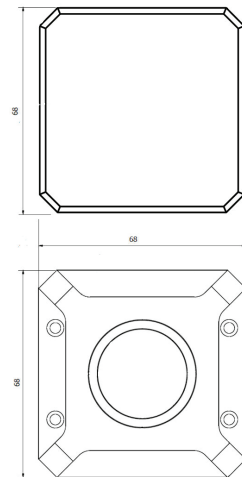
<b>Optical mount:</b>	Standard C-mount
<b>Mechanical mount:</b>	Tripod receptable for macro photography
<b>Enclosure:</b>	Blue/grey Aluminium with tripod mount
<b>Height:</b>	38 mm
<b>Width:</b>	68 mm
<b>Depth:</b>	68 mm
<b>Weight:</b>	270 g
<b>Compliance:</b>	CE



Response shown with IR-filter.

### Video Resolution:

1920 x 1200 pixels  
More than 45 fps in full resolution  
ROI can be freely selected



### Minimum Computer Platform

1 GB RAM  
15 GB free harddisk space  
USB 3.0 port  
Windows X P, Vista, 7,8 ,10, 32 and 64 bit

### Product Includes:

- Invenio 2EIII digital camera for USB 3.0
- 8GB USB Memory stick with "InSight LE". Free upgrade from website
- USB 3.0 cable

### Optional:

Software Developer Kit (SDK) for developing deep intergration with other software applications

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