**“Centering” is a camera function which aligns the positions of the color and monochrome CCD sensors.**

### DP80 Camera Head Specifications

<table>
<thead>
<tr>
<th>Camera Type</th>
<th>Image File Format</th>
<th>Binning</th>
<th>Metering Modes</th>
<th>Exposure Control</th>
<th>Exposure Time</th>
<th>Live Frame Rate</th>
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</tr>
</thead>
<tbody>
<tr>
<td>DP80 Camera Head</td>
<td>DP80</td>
<td>4x4</td>
<td>SFL-Auto</td>
<td>AdobeRGB (only for color CCD)</td>
<td>14 bit * Number of effective bit: 14 bits@16 bit mode image</td>
<td>[Centering OFF]</td>
<td>sRGB</td>
</tr>
</tbody>
</table>

### DP80 System Diagram

![Microscope Digital Camera DP80 System Diagram](https://example.com/dp80_system_diagram.jpg)

A cutting-edge digital microscopy camera equipped with dual CCD sensors, providing both high sensitivity monochrome and high-quality single-shot color images.

### DP80 System Requirement

- **OS:** Windows 7 Professional/Ultimate with SP1 (64 bit)
- **Graphics:** 32-bit video card with separate graphics memory
- **Power Supply:** Unoccupied FDD power cable, HDD power cable (pin 2 and 3), and Serial ATA power cable must be available.

### DP80 Camera Head Dimension

![DP80 Camera Head Dimension](https://example.com/dp80_dimension.jpg)

**Weight:** approx. 2.5 kg
Consider how convenient and easy it would be if both high resolution bright-field and high-sensitivity fluorescence images could be observed and acquired using a single microscope camera. The DP80 digital camera fulfills this simple yet unfulfilled requirement for two cameras in one.

Since it is possible to rapidly switch between the monochrome CCD sensor and color CCD sensor, it is possible to easily acquire high-quality bright-field and high-sensitivity fluorescence images of the same field. Without the need to switch camera ports with a prism, the time required to align the camera sensors is eliminated.

The DP80 assists you in your research activities from observation to documentation in a smooth and easy manner.
A simple switching operation allows the use of either a color or monochrome CCD sensor on the single camera unit.

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The DP80 assists you in your research activities from observation to documentation in a smooth and easy manner.
High quality images adapted to observation and imaging methods can be readily obtained.

A monochrome camera that detects and captures dim fluorescence images

Clearly observe weak fluorescence signals with the DP80’s high sensitivity

We significantly improved the DP80’s fluorescence imaging performance by incorporating a separate high dynamic range monochrome CCD sensor within the body of the camera. Combined with thermo-electric cooling and high resolution capture, the DP80 meets the demands for low-light fluorescence imaging. With a high quantum efficiency along a wide spectrum, the DP80 provides exceptional fluorescence signal detection.

High-sensitivity fluorescence imaging available up to Cy7 wavelengths

The DP80 responds to a wide range of wavelengths from visible to near infrared. New sensitivity to fluorescence signals with longer wavelengths, the DP80 captures near-IR wavelengths from samples stained with Cy7 (767 nm).

Color and monochrome images can be overlayed with pixel precision

Since the camera is equipped with a centering function, which minimizes positional differences between color images and monochrome images, a combined image can be produced by precisely superimposing the monochrome images and color images that are acquired for a given observation method. Since positions accurately fixed morphology and localization can be examined by, for example, superimposing a bright-field image and a fluorescence image.

Research workflow is improved through Olympus cellSens imaging software

Efficient support of observation and experimentation

High-quality color and multi-channel imaging is automated with the DP80’s switchable CCD sensors and the intuitive Olympus cellSens software interface. From complex image acquisition to image processing to report generation, the researcher can focus on research activities instead of routine labor-intensive acquisition setup and data preparation.

Color camera provides clear real-time live preview display

High definition uncompressed live images of 1360×1024 pixels

Live view display of high definition RGB 24-bit color images of 1360 × 1024 pixels at 15 frames per second. Distortion-free focusing or framing is provided because there is no deterioration of image quality due to non-compression, and so sample details are sharp and clear whether the sample is stationary or moving.

Fine-detail Processing that suppresses pseudo-colors and moiré artifacts

The DP80 is equipped with Fine Detail Processing, which reduces pseudo-colors and moiré artifacts and improves resolving power. Clear imaging of details is achieved by fully extracting the resolving power of objective lenses.

Superior color reproducibility captures fine differences in color

Subtle hue differences within colors such as brown, blue, and purple were difficult to distinguish in the past, but now, such slight differences in color can be reproduced by incorporating AdobeRGB color space which reproduces a wide range of color tones and a new algorithm of color reproduction. Color images faithful to the original samples can be acquired.

*Color reproduction fidelity depends on monitor specifications. Monitors supporting AdobeRGB are required to accurately reproduce images recorded in AdobeRGB mode.

High resolution imaging up to 12.5 megapixels

The DP80 uses pixel-shifting technology to reach a maximum recording image size of 4080 × 3072, a high resolution equivalent to 12.5 megapixels.

Faithful panoramic imaging, with high-quality in brightfield or fluorescence

Multiple-region capture of saved images can be easily recombined and restitched seamlessly into a single image. Numerous annotations and comments can be saved with images for later retrieval. These features are useful for standardization and accuracy control of inspection and research processes.
High quality bright-field and high-sensitivity multi-channel I fluorescence imaging
The DP80 alone can provide all of the images that are illustrated below.

In the dark field images we can see the borders of the lateral amygdala, a brain region important for fearful emotions. In the fluorescence image are cells and processes expressing a fusion protein of channelrhodopsin/EYFP. Channelrhodopsin is a blue light activated non-specific cation channel that is used in ‘optogenetics’ experiments. We can express channelrhodopsin in lateral amygdala neurons and produce emotional fear memories by activating the cells with blue light. These microscope images allow us to verify that expression of channelrhodopsin has occurred in the lateral amygdala.

Image data courtesy of: RIKEN BRAIN SCIENCE INSTITUTE Neural Circuitry of Memory Joshua P. Johansen, Ph.D.

Observation of Collagen type III and type I with multicolor immuno-fluorescence staining during wound healing process

Bright field image of total collagen with Sirius red/Gieson (GAG) staining (left), DFO (monochrome) and total fluorescent pseudo-color image of collagen type I (left) and type III (right). Location of the collagen type I and III is confirmed clearly by the high wavelength observation without auto-fluorescence noise such as erythrocytes and/or other tissue components.

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