IR-1000 Camera for Electrophysiology

The primary market for the IR-1000 camera is electrophysiology. The IR-1000 provides an excellent, cost-effective solution to the problems encountered in visualizing electrode/pipet placement in tissues and cells. Significant growth in this research market is projected due to continued emphasis on aging and continued study of the brain.

Electrophysiology in neuroscience allows for examination and patch clamp experiments on nerve cells and brain slides, through the use of cell cultures, living tissue sections, organs or entire animals. Patch clamping of cells is a technique requiring live imaging and sensitivity across the visible and near IR wavelengths.

IMAGING CHALLENGES

Imaging challenges include:

1.   Low contrast due to light scatter within tissue

2.   Little to no visible light in deeper imaging environments (e.g. Brain slice studies) so enhanced sensitivity in the near IR is essential to visualizing structure and/or cell membranes for electrode placement

3.   Real-time camera frame rates (30fps) to provide movement and position feedback so precise positioning can be achieved

INCREASED SENSITIVITY

The IR-1000 real-time camera offers enhanced sensitivity across the entire visible and near IR spectrum, with a 5X increase in sensitivity at 900nm – all at 30 fps. Its sensitivity is ideal for visible, IR-DIC and bright fluorescence modes of operation. The wavelength used by the operator determines tissue observation.

Visible Light DIC/Dodt gradient contrast imaging – Allows operator high resolution observation of the tissue surface.

775nm IR-DIC/Dodt gradient contrast imaging – Allows observation within the tissue slice

900nm Nomarski DIC/Dodt gradient contrast imaging – Allows observation deeper into the tissue

In addition, the IR-1000 series camera offers two important features: Automatic Contrast and Real-Time Edge Enhancement

- Automatic Contrast – When a scene changes, the electronics automatically and instantaneously readjust to achieve optimum contrast. The manual control of gain and black level is provided to achieve specified grey-scale contrast.

- The Enhance function provides an edge sharpening of soft IR images, resulting in a clearer image.

The IR-1000 utilizes a ½" sensor and is c-mount adaptable. Although this camera is widely used for electrophysiology in a live mode connected directly to a monitor, an optional computer interface is available for image capture.

For increased sensitivity, on-chip gating can be accomplished using a qualified frame grabber board *or* the Dage-MTI **Investigater** – a stand-alone controller providing real-time gating without the need for a computer.

The VU series LCD monitors offer the perfect complement to the IR-1000 camera. Features of the VU monitors include: horizontal and vertical edge enhancement for clarity, noise reduction, and selectable inputs between composite X2, VGA, HDMI.

Use of the IR-1000 camera is cited in many article from researchers at prominent facilities.

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