

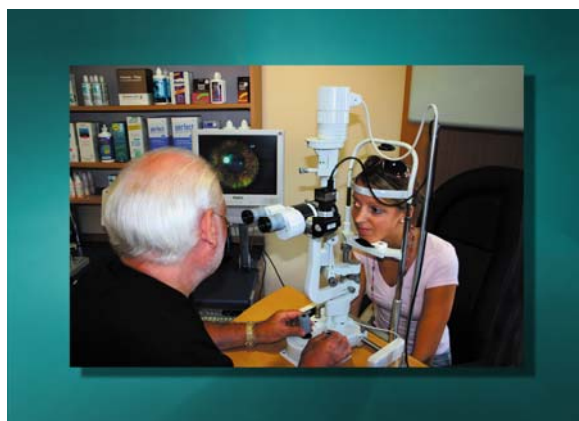
Here's looking at you, Kid

Ultra compact USB-camera documents

Examinations of the human eye

“Here's looking at you, kid” – who wouldn't remember the famous scene featuring Humphrey Bogart and Ingrid Bergman in the legendary film Casablanca. But nobody looks as deeply into eyes as an optometrist or ophthalmologist. This “penetrating” glance is possible with a slit lamp. The instrument allows a highly precise examination of the human eye. To document this examination and increase the possibility of detecting changes, Tomey GmbH has integrated a compact high-resolution color camera with USB connection from IDS.

The slit lamp is a kind of microscope with special lighting technology. It is probably the most important diagnostic tool in ophthalmology and is used for closely examining the front part of the eye, e.g. conjunctive, sclera, iris, cornea and anterior chamber, as well as the lens and the vitreous. Deeper-lying parts of the eye, such as retina and optic nerve head, can be analyzed by using adequate additional optics in the form of contact and ancillary lenses. The instrument not only shows the eye greatly magnified, but also allows looking right through it. Besides detecting eye diseases and disorders, the slit lamp is indispensable for fitting and adjusting contact lenses.



One of the distributors of slit lamps is Tomey GmbH in Erlangen, Germany. The company is specialized in the development and manufacture of high-tech instruments for ophthalmologists, hospitals and optometrists. Slit lamps from Tomey additionally feature a digital camera that captures and archives individual images of the eye at the push of a button. This allows optimally documenting the examination and provides an easier way to detect and diagnose changes in the eye. The detailed color images acquired by the camera are immediately transferred to a computer, analyzed by the doctor or optometrist and saved in a database, if required. They primarily support documenting the diagnostic findings and monitoring the course of a disease.

Tomey's slit lamps use a camera from the uEye® series of IDS Imaging Development Systems. The German machine vision specialist offers OEM customers not only a wide range of cameras, complete with the matching software and the necessary accessories, but also competent professional services. They include, for example, application consulting, support during system integration and the design-in phase, feasibility studies, product leasing, and software training. IDS has a staff of approx. 60 employees in the development, production, sales, marketing and support departments at its head office in Obersulm, Germany. The company is represented in almost all European countries as well as the USA and Asia through exclusive distributors.

From the comprehensive camera range Tomey selected the uEye® UI-1540-C. This model is only 34 x 32 x 27.4 mm in size and weighs 62 grams. It has a high resolution (1280 x 1024 pixels SXGA), a high-quality CMOS sensor with square pixels, a rolling shutter and a C-mount lens connection.

The ultra-compact design of the IDS cameras and the USB connection were key factors in Tomey's decision. Not only are data transmission and power supply thus possible via cable, but USB ports are also available on every computer, e.g. the optometrist's notebook. The quality seal "made in Germany" was another important aspect for Tomey, even though the company is a subsidiary of a Japanese corporate group.

Further points in favour of this camera were its easy installation and compatibility. Supported by a comprehensive free software package, it is quickly and smoothly implemented into the application. Tomey, for example, works with the DirectShow (WDM) driver. This configuration allows integrating the camera system into the existing software environment of the doctor's practice, clinic or hospital. The attending optometrist or ophthalmologist can easily access the data on the relevant network.



uEye Kamerapalette

IDS's product portfolio comprises over 100 USB 2.0 cameras. Be it industrial automation, medical technology or security technology—with its wide choice the uEye® series offers the matching solution for almost any application. The industrial cameras are available with CCD or CMOS sensors, monochrome or color technology, rolling or global shutters and, optionally, with an internal memory. The resolution ranges from 640 x 480 to 2048 x 1536 pixels.

Every uEye® camera also includes a TWAIN driver, an ActiveX component and a comprehensive software development kit (SDK). The SDK contains a demo program for image acquisition and the corresponding source code written in C/C++. It allows controlling all camera-related parameters and provides memory management and a DirectDraw interface. With this interface it is possible to achieve a flicker-free insertion of individual information (e.g. date, time, graphics) in the live video. The SDK is identical for all uEye camera models, thus eliminating the need for reprogramming if the model is changed. Interfaces for standard programs in the machine vision market, such as ActivisionTools, Common Vision Blox, HALCON and NeuroCheck, are also available.

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