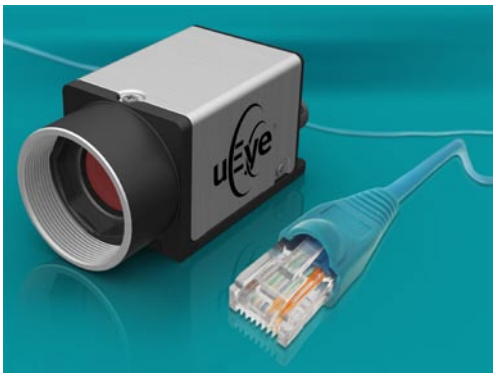
Wherever the Journey Goes

New CMOS Sensors Conquer CCD Applications

Easier to handle and more compact and powerful: These are the characteristics new camera models should have when introduced to the market. Thereby, the cameras' performance is pushed by the developments in the consumer market. One consequence is the availability of new CMOS sensors with a resolution of 1.3 megapixels and global shutter technology. According to first tests, these sensors exceed the light sensitivity of existing sensors. Does this mean that CCD cameras are now becoming redundant?

The camera specialist IDS is about to introduce its new series GigE uEye CP. The models are more compact, link the simplicity of USB with the performance of GigE and are based on innovative CMOS sensors.



The new uEye camera series GigE uEye CP offers plug-and-play comfort and needs only one cable: Power and data transmission can be supplied with the same cable

The "C" stands for compact and is the camera's most striking feature. With a cross section of 29 x 29 mm and a length of just over 4 cm, the tiny model is amongst the smallest in its range. The "P" stands for the technology Power over Ethernet. Thus, the camera's power can be supplied via the data cable.

"As a USB camera manufacturer, we wanted to link the simplicity of USB with the performance of GigE. This is what we have done with the GigE uEye CP: It is connected with just one cable and offers genuine plug-and-play convenience – that is to say it feels like USB with all the advantages of Gigabit Ethernet," explains Product Manager Daniel Diezemann.

And indeed, the camera behaves in exactly the same way as its USB sister models: It is connected to the PC with a single cable and, after a few seconds, the uEye camera manager displays the model. At IDS, however, plug-and-play means more than just being able to connect a camera quickly: "As an example: for us, industrial suitability means that cameras can be unplugged and plugged in again during operation – and the camera continues to work without any problems."

New CMOS Global Shutter

The manufacturer has fully equipped the first three models with CMOS sensors, which can cover a broad application spectrum. This includes a high-resolution model with a 5 megapixel image capturing device from Aptina and a fast camera, whose WVGA sensor transmits up to 100 full frames per second. However, it is the third model which promises the greatest success: The UI-5240CP has a brand new CMOS sensor, which offers a 1.3 megapixel resolution as well as

a global shutter as a special feature – a first for this type of sensor.

The new sensor is not just fast – it offers 50 frames/second in the GigE uEye CP model – but according to tests at IDS, it also exceeds the light sensitivity of previous CCD sensors.

"We are currently seeing great progress and interesting developments in CMOS sensors," explains Diezemann. "They are increasingly penetrating fields of application which were previously reserved for CCD cameras. This market is naturally strongly influenced by products in the consumer sector – however, industrial camera manufacturers can benefit from this. For example, the resolution of CMOS sensors is currently rising rapidly – the pixels are becoming smaller and at the same time manufacturers are developing new methods of increasing light yield. All cameras include video functions as standard, which means that sensors are becoming faster. The CMOS technology also enables simple image pre-processing functions to be carried out directly at the sensor."

A Single Flexible Solution

The 1.3 megapixel sensor from e2v, recently introduced in industrial cameras for the first time by IDS, combines many of these features. Thanks to the global shutter mode, the affordable CMOS sensor is suitable for many applications which were previously reserved for more expensive CCD models or required powerful flashes. The maximum frame rate of 60 frames/second in high end GigE uEye HE camera models and a fast 12 kHz line mode will find many applications in the fields of automation and inspection. The exceptionally high light sensitivity and good color reproduction open up further possible uses, for example in microscopy.

Many users will also appreciate the flexible additional functions of cameras with the e2v sensor: multiple areas of interest (AOI) within one capture, integrated hot pixel correction, and virtually stepless digital scaling offer genuine added value.

These examples also illustrate how the camera market is developing, in particular for CMOS models: the individual camera gains increasingly more options and functions. Where previously several different models were required – for example, for high-resolution area and fast line applications – these different tasks will in future often be carried out by a single flexible CMOS camera.

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