

One for all

Universal camera driver allows easy machine vision integration

Many automation processes would be impossible without machine vision systems. Almost every machine has built-in cameras. They are needed, for example, to precisely position tools or grippers or to check the visual quality of components. As every application area places different requirements on a camera, one model will hardly be sufficient to cover the entire spectrum. Machine manufacturers and system integrators therefore often face a significant amount of engineering effort if the software needs to be adapted or reprogrammed every time a camera model is changed. That is why IDS, the German machine vision specialist, provides a “one size fits all” camera software for its complete range of cameras, whether they are USB or GigE based. So, whatever the model or interface – integrating, exchanging or upgrading the cameras saves precious time, money and nerves.



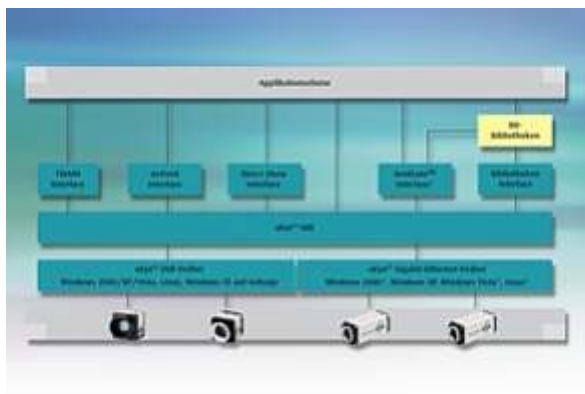
This advantage is particularly important for OEMs and system integrators, e.g. for three innovative German companies who have teamed up to offer customized machine vision integration for a wide variety of applications. isbo-tec GmbH, located in Niefern-Öschelbronn, is responsible for machine vision engineering, while the Nagold-based company MartinMechanic designs and builds the special machinery, and protech GmbH from Maulbronn develops the software. For over ten years these three companies have combined their know-how in machine vision, special machine construction and feed technology to create tailor-made solutions for the most diverse application areas and industries. The spectrum includes optical metrology in the μm range, surface inspection as well as packaging and completeness checks, to name just a few. Regarding camera technology and integration the engineering specialists favor the uEye camera series from IDS Imaging Development Systems.

With way over 100 different models in a vast variety of configurations this camera series offers the ideal solution for almost any application. The product portfolio features cameras with USB or Gigabit Ethernet interface, plastic or metal housing, CCD or CMOS sensor, and resolutions from VGA to 5 Mpixels!

Though the wide choice of uEye models is an advantage in itself, it is rather their excellent

software support that takes top priority for application software developer protech. All camera models – whether USB or GigE – have the same driver kit. Consequently, integrating the cameras with the existing application uses the same easy procedure no matter which camera model or interface. Changing from a USB camera to a powerful Gigabit Ethernet camera, for example, is possible without problems. Instead of reprogramming the application, all that needs to be done is an adjustment of a few camera-specific parameters.

The drivers and the software development kit (SDK) are included with every uEye camera. The SDK also comprises demo programs for camera integration and image acquisition, which come complete with the corresponding source code in C, C++ and VB. To allow quick implementation, developers can integrate these demos in their own applications and customize them as required. The SDK supports all the current Windows operating systems. SDK versions 3.30 and higher also run on Windows Vista. The USB models of the uEye series are additionally available with a Linux driver. Besides a TWAIN driver, an ActiveX component and a Direct Show/WDM driver for the users of standard software solutions, direct interfaces for many other current machine vision programs are also available, e.g. ActivVisionTools, Common Vision Blox, HALCON, NeuroCheck, pt2D or LabVIEW.



All USB and GigE cameras from IDS use the same software development kit (SDK).

The extensive software support and flexible integration of the uEye cameras offers tangible benefits for customers. The machine manufacturer MartinMechanic has been designing and building complex custom machinery and equipment for over 35 years. Their excellent technical expertise combined with the uEye cameras and the powerful image processing software form the basis for innovative special machines such as the flexible MFB 2446 feeder or compact systems for automatic component inspection.

The flexible feeder, for example, detects different parts in bulk material via image processing. It then picks up the part and deposits it at a defined position, e.g. for subsequent assembly. The information where exactly the required part is located (X/Y coordinates and orientation) is supplied by a uEye camera, which transmits the data to the robot control for further processing. The ingenious thing about it is that the image processing feature not only recognizes the shape of the parts from the camera images, but also detects if and how they can be picked up. Interfering contours of other parts or structural conditions that obstruct the gripper are taken into account to ensure that the process runs smoothly. The system is suitable for detecting all types of different parts made of all types of materials, including even high-gloss parts.

The uEye cameras are equally efficient and reliable for inspecting investment castings. In a testing facility developed by MartinMechanic, seven high-resolution 2 Mpixel cameras with CCD sensors examine the surfaces of investment castings. The special challenge in this application is that some of the surfaces to be examined are ground and some are not.



Particularly in special machine construction, system integrators benefit from cameras that are easy to integrate independently of model or interface type.

The system reliably inspects both surface types for casting defects and scratches. It also checks the dimensions of the investment castings with μm precision. This is done by moving the parts with an oscillating conveyor through different test stations, which are each equipped with up to three uEye cameras.

Each station conducts different tests and analyzes the results from different perspectives. Under infrared illumination that is specially adapted for the individual tests, the software detects defects by blob analysis, for example, and displays them as high-contrast images. Integrated sorting stations then sort the investment castings directly according to defined quality criteria, e.g. usable, repairable and scrap. Thus equipped, the facility not only achieves a significantly higher accuracy and throughput than manual inspection, but also saves time and costs.

Speaking about time and costs: In their fields of industry the three companies isbo-tec, MartinMechanic and protech need to be able to respond to different customer requirements quickly, flexibly and cost-effectively. With a comprehensive product range and a universal driver software to ensure minimal engineering and programming effort, the uEye cameras provide the perfect means to this end.

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