Cable testing

Efficient Check of Automotive Electronics with High-Resolution USB Cameras

Product quality and its quick and cost-effective control is today more important than ever in order to survive in the global competition. This applies especially to the automotive industry, whose solutions have everyday life while faced with an intense pressure of competition. Manufacturing defects not only cause high warranty and good-will repair costs, but eventually also affect the manufacturer's image. It is therefore essential to reliably detect defects already during production. Modern image processing systems in combination with powerful cameras allow efficient inspection and testing. A specialist in quality assurance systems for the automotive industry, Otte Elektronik GmbH relies on high-resolution cameras with USB interface.

Whether ABS, navigation systems, air conditioning or airbags—every car is today equipped with a variety of complex electronic systems. These assistants make driving safer, more comfortable and more economical. But the triumphant success of automotive electronics also has its drawbacks: According to the latest car breakdown statistics issued by the major motoring organizations, more than half of all breakdowns are caused by defects in the automobile's electric or electronic system. The car manufacturers' main focus in quality assurance is thus on the electronics, with the aim to detect defects already in the development and production stages.

Up to 15 high-resolution color cameras check the installed plugs, fuses and relays on the wiring harnesses

Defects "detected" later on by the customer are costly, let alone damaging to the image. Otte Elektronik GmbH, based in Braunschweig, Germany, offers powerful quality assurance systems for the automotive industry, including solutions for testing car body press lines and wiring harnesses. The wiring of the networked electronic systems is one of the most critical points in the automobile. The wiring harness testers from Otte Elektronik work semiauto-matically. The required equipment for each make and model is predefined. The tester then checks whether all components, such as fuses, relays, cable sleeves and locks, are provided and correct. Additional devices such as industrial screwdrivers can also be monitored and controlled. The system of course also meets the requirements for a textual and graphical result documentation.
Within the wiring harness test system up to 15 color cameras from the uEye® series from IDS act as the scrutinizing “eyes.” The uEye® series consists of particularly compact cameras with USB port, which are available in more than 100 variants for industrial and non-industrial use (for example, in security technology, medical technology or microscopy). The resolution ranges from 640 x 480 pixels through to the 5-megapixel version with 2560 x 1950 pixels. The wide choice includes cameras with CCD or CMOS sensors, with monochrome or

color technology, and with rolling or global shutters. Models with internal memory are also available to allow synchronous triggering and asynchronous reading of data in multi-camera applications.

As the cameras are implemented in various machines and systems, IDS provides different housing and design versions, depending on the preferences regarding price, compactness and durability. OEM customers can choose between models with plastic or aluminium housing, including housings with protection class IP65/67 and screw-mounted connectors, as well as various board-level variants with or without lens adapters. Special project-specific designs can also be developed and manufactured on request.

Otte Elektronik primarily uses a 1.3 mega pixel uEye® color camera that not only recognizes the color codes of the fuses to be checked, but also provides a high enough resolution for this task. The high resolution was an essential requirement that made Otte Elektronik replace the previous PAL video cameras by a modern solution. The choice of a camera with USB port was additionally influenced by the better price/performance ratio compared to other alternatives such as Firewire. The easy connection of the camera with the existing software and the smooth integration into the wiring harness tester's overall system also played a key role.

Among the most important advantages of the uEye® camera series is the extensive software support. Every camera comes with a free software development kit (SDK) for Windows and Linux, complete with demo programs for image processing and analysis as well as the corresponding source code written in C/C++.

The choice of USB cameras ranges from low-cost versions in a plastic housing through to sturdy industrial cameras in an IP65/67 enclosure with screw-mounted USB connectors.

This SDK allows control of all camera-related parameters and is the same for all uEye® camera models. For OEM customers, system integrators and end users this means that the application does not have to be reprogrammed if the camera model is changed some time later on!

The included software package also contains a TWAIN driver, an ActiveX component and a Direct Show (WDM) driver. Interfaces for many current machine vision programs are additionally available. Besides the Common Vision Blox image processing library used at Otte Elektronik, the cameras also support HALCON, LabVIEW and Neurocheck, for example.

The system from Otte Elektronik and the high-resolution uEye® camera from IDS provide a powerful combination that achieves superior quality assurance in automobile production. High-class workmanship is a matter of course for the customers—and quality assurance must guarantee this in the end. A reliable, quick quality control, which modern industrial image processing makes possible nowadays, gives manufacturers a decisive competitive edge through a more cost-effective production, increased delivery reliability and a high, guaranteed quality level of their products.

Contact:

IDS Imaging Development Systems GmbH
Dimbacher Strasse 6
D-74182 Obersulm
info@ids-imaging.com
www.ids-imaging.com