

Camera manufacturer IDS applies app principle to industrial image processing

Novel vision app-based sensors and cameras: Customized, highly flexible vision solutions

Apps turn smartphones into intelligent assistants with a wide range of tasks. They can also be used to improve and simplify image processing. IDS NXT turns cameras and sensors into customized vision sensors.

In a typical vision application, camera images are only means to an end. The large amount of image data can be transferred from the camera to a PC for evaluation, but only the subsequent image processing generates application-relevant information from the images. On the other hand, "smart" devices evaluate the states or characteristics of their environment themselves and transmit only a few relevant result data to PCs or process controllers. Traditional vision sensors, such as barcode readers for example, often provide only a few predefined tasks and their functionality cannot usually be extended.

In view of the current reorientation in many markets towards the Internet of Things (IoT), there is a great interest in versatile, autonomous image processing devices.

New device generation for industrial image processing

IDS NXT is a new generation of vision app based cameras and sensors. They process image information completely independently to final results or support a PC application with preprocessed data. With the app-based approach, recurring vision tasks can be set up and changed easily in a very short time. This eliminates the need to hold several vision sensors in stock for different application types.

The IDS NXT platform kicks off with the IDS NXT vegas sensor. It autonomously reports application-relevant events via its GPIOs. Continuous polling or sending commands is therefore not necessary. For data exchange, the sensor is equipped with generic interfaces.



The RS-232 interface can be configured according to individual requirements. An app determines which data are transferred and defines the way to interpret them. The IDS NXT vegas communicates with any machine controller that also uses this interface. Available gateways allow even systems with alternative protocols such as CAN-Bus, Modbus-RTU, Profibus, KNX, or PROFINET to be addressed.

The RESTful (Representational State Transfer) web service provides a TCP/IP communication to configure all device parameters including the apps. It works both via HTTP protocol and the secured HTTPS variant using standard methods such as GET, POST, PUT, PATCH, etc. Due to the wide distribution of the REST infrastructure, the sensor device is platform-independent and can be used in a wide variety of applications.

The app-based system makes the IDS NXT Vegas as versatile as a smartphone. With a light-sensitive 1.3 MP CMOS sensor, an integrated liquid lens, LED illumination and a ToF sensor (Time of Flight) for distance measurement, it is fully equipped for many different image processing tasks.



It can neither be classified as a standard industrial camera nor as a highly specialized smart camera or a traditional vision sensor. It is suitable for applications that require highly versatile devices. The board-level option is interesting for OEM equipment manufacturers. As a complete embedded vision component, it simplifies integrated design into custom device hardware and software.

App-based image processing

The unique feature of the IDS NXT device generation is that new functions can be installed as easily as apps on a smartphone. The foundation is the plug-in-capable device firmware. In addition to predefined standard tasks, individual tasks can be created with the help of an app development kit. More complex tasks are divided into several apps: vision apps process the image data to generate results; the device communication and data transmission is handled by another app. The inputs and outputs of the apps are linked with each other. This results in a modular system of reusable app building components.

Vision apps can be flexibly programmed in C++. App developers get valuable support from the extensive IDS NXT libraries. This allows them to concentrate fully on the actual task of the vision app: image processing. The device firmware is delivered with a pre-installed HALCON Embedded Runtime License. The integration of the HALCON image processing takes place as usual via the C++ interface or through complete scripts using the HDevEngine. The latter guarantees that image processing can be made and tested completely platform-independently on a desktop PC with the HALCON development environment (HDevelop) before it is used in a vision app. The transition from a HALCON script to a complete app-based image processing solution takes just a few steps.

Ready-made vision apps are installed and activated via the IDS NXT Cockpit. During the development process, the build tools also support remote debugging of the coded vision apps. With optional manufacturer-specific SSL key pairs (private/public key) in custom vision apps and the IDS NXT firmware, their execution can be restricted to protect your "own expertise" against misuse.

Summary

With the IDS NXT vegas, IDS Imaging Development Systems GmbH launches a new generation of devices that handle image processing tasks autonomously and support a PC application with pre-processed data. The freely programmable platform is not restricted to specific tasks. The possibility to install any vision apps offers universal possibilities in numerous fields of application, e.g. in optical quality assurance, as an analytical instrument in medical technology, for monitoring tasks by facial recognition or vehicle and person counting. With the HTTP-based RESTful web service, the sensor can also be used in industrial PLC environments to support the expansion of industry 4.0 and by using various RS-232 gateways, it can find many more communication partners.

Learn more: www.ids-nxt.com

Description:

In view of the current reorientation in many markets towards the Internet of Things (IoT), there is a great interest in versatile, autonomous image processing devices. This white paper explains the app-based approach of IDS NXT, a new generation of highly flexible devices that handle image processing tasks autonomously and support a PC application with pre-processed data. The freely programmable platform is not restricted to specific tasks. The possibility to develop and install any vision apps offers universal possibilities in numerous fields of application.

Main takeaway points:

- App-based approach transforms cameras and sensors into customized, smart vision sensors
- Traditional vision sensors often provide only a few predefined tasks
- IDS NXT is suitable for applications that require highly versatile devices
- Individual vision tasks can be realized with the help of the app development kit
- New functions can be installed as easily as apps on a smartphone

About IDS Imaging Development Systems GmbH:

We develop high-performance, easy-to-use USB, GigE and 3D cameras with a wide spectrum of sensors and variants. The almost unlimited range of applications of our industrial cameras covers multiple non-industrial and industrial sectors in the field of equipment, plant and mechanical engineering. In addition to the successful CMOS cameras, IDS expands its portfolio with vision app-based sensors and cameras. The novel image processing platform IDS NXT is freely programmable and extremely versatile. Our visionary thinking and modular concepts enable our customers to develop innovative and individual applications. Professional machine vision camera components are developed by us exclusively in Germany, produced in a sustainable way, and sold all over the world.