Off the leash

IDS NXT industrial camera communicates via WLAN and Bluetooth

These days, wireless communication is standard in the consumer environment, but it is still rather a rare technology in the field of industrial image processing. The temporal behavior and transmission stability of WLANs are associated with certain inconvenient idiosyncrasies. Does this mean that the "wireless network" is entirely unsuitable for industrial image processing? With a concept study based on the vision app-based IDS NXT devices, IDS demonstrates the advantages of wireless communication and practical options for use.

WLAN - Unstable and slow or just too demanding?

Wireless networks based on IEEE 802.11-compliant Wireless Local Area Network (WLAN) are the medium for transporting Ethernet through the air. Compared with cable-connected Ethernet transmission, the limitations of wireless technology in the industrial environment are evident. For example, despite the current WLAN-N and WLAN-AC standards, claims of possible data rates up to almost 7Gbit/s are little more than wishful thinking, since they depend to a large degree on the devices used and their environment. This also negatively impacts the transmission range. Not truly comparable with the stable transmission rates that can be achieved with an Ethernet cable. Since the non-deterministic wireless medium is more susceptible to interruption, loss of data and incalculable latency periods must also be expected. Applications with hard realtime requirements cannot be executed wirelessly anyway. Are the

requirements set by the industrial sector unreasonable, or is industry being "more cautious" than the consumer sector when it comes to implementing new technologies?

Time to reconsider

The reason for the success of WLAN in the consumer environment is the "mobility" of wireless technology. Surely no user wants to install meters of cable and countless LAN outlets all over the house so that he can network all of the LAN devices he uses. Within the WLAN transmission ranged, any number of devices can access the network regardless of their location. Once authorized, the devices change transmission areas entirely automatically. User-friendliness, simplicity, supporting assistants, high-level languages - all these convenience features make for simple operation, uncomplicated setup, less maintenance effort, less need for technical knowledge, and ultimately time and cost savings for system integrators and users. These are decisive advantages for the industrial environment as well.

Further development of the IDS NXT device concept

With its new range of vision app-based IDS NXT devices, IDS already offers a flexible platform which opens up countless application possibilities and thus also supports the industry 4.0 and IoT in breaking new ground. Through simple operability and the use of apps, these enormously versatile devices can also be configured and put into operation very quickly. Unlike conventional industrial cameras, they can evaluate states or features of their environment themselves and send only the small amounts of data that are application-relevant to PCs or process controllers as results. Thus, IDS NXT devices are already compatible with applications in which machines operate largely autonomously and only occasionally need to communicate results or status data. So the use of wireless communication channels in the IDS NXT series of devices is simply the logical progression of the concept.

Equipped with an additional wireless module, in addition to its IP65-protected LAN port the "IDS NXT vegas WiFi" concept study also offers IEEE802.11-compliant 2.4GHz and 5GHz WLAN frequencies as well as Bluetooth for transmission purposes. An internal antenna enables the vision app-based sensor (in the same room with line-of-sight connection) to maintain the protection class IP65 and supports short-range wireless connections. Alternatively, a second variant of the concept study has a certified external antenna which lends the camera a wireless transmission range typically associated with other WLAN devices. As long as it has access to a power supply, the IDS NXT vegas WiFi can process images and transmit results anywhere, even without a network infrastructure. Since the integrated WLAN module may function as both network client and access point, it also allows direct access via mobile devices without being tied to a local network. This makes initial setup, configuration and maintenance of the devices easier, because these activities can be carried out anywhere using the "Mobile App" on a Tablet. Solar or buffered battery operation is also possible, with an operating output of about 5 Watt, enabling the devices to be used entirely wirelessly - that is to say fully mobile operation - for several hours.

Possible uses

In general, all mobile applications which satisfy the "soft" and "solid" realtime requirements and only exchange small volumes of data benefit from the capability of wireless communication with the image processing device. In the factory of the future (Industry 4.0), process optimization and enhancement of overall plant efficiency with simultaneous reduction of costs will be among the most important priorities.

Robotic applications in which the working space is captured visually with cameras mounted on the robot arm and evaluated by image processing achieve greater reliability and accuracy. However, forwarding camera images to a remote evaluation unit via a cable system can severely restrict the robot arm's range of movement. "On-camera" image processing with wireless transmission of results as featured in the IDS NXT vegas WiFi platform enables greater deployment flexibility while simplifying and reducing the cost of the cable network infrastructure. Driverless transportation systems (DTS) also depend on a largely autonomous mode of operation. There are no cable connections to the DTS. Control commands in the form of numeric codes along the travel paths or at path intersections can be evaluated optically by a IDS NXT vegas WiFi and relayed to a centralized primary controller for the DTS via wireless communication. Error and status reports from a DTS can be received from anywhere, and in addition a mobile service access is provided for the smart camera. The wirelessly communicating WiFi devices do not need a LAN while the IDS NXT vision apps are being developed and set up. The integrated WLAN access point enables mobile access to all device functions without the need to put any additional peripherals in place. It's so easy!

Seize the advantages

Wireless networks via WLAN or Bluetooth technology are undoubtedly "more vulnerable to interruption" and "less stable", or even "slower" than a LAN. But on the other hand their mobile capabilities enable images to be processed in places where cable networks and power supply points are not available or not possible. This makes it easier and simpler for you to set up, operate and maintain your devices. Reconsider the cable-less alternative. Unleash your image processing capabilities!

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