

» Application Story «

Q.VITEC



High-speed vision systems – made-to-measure

Customized image processing solutions with CompactPCI® Serial

A high degree of customization is required for image processing systems – both in terms of compiling the hardware and the software. This leads to large accounts and system integrators more frequently requesting modular system platforms, in which all the components combine to match perfectly. Kontron and Q.VITEC have developed a platform based on the CompactPCI® Serial standard to meet just these needs. It will be premiered at the SPS/IPC/Drives show at the end of November.

Image processing systems are deployed in a large range of industrial applications. They are used to identify, count and measure objects or to read product codes and labels.

They may also inspect the product quality of, for example, meter goods, in order to constantly control and document the quality throughout the production process. To achieve this one or more matrix or line cameras are installed and connected to a computer to carry out video data analysis.

Finding a suitable solution off-the-shelf is a difficult mission, as the optimal design of an image processing system has to perfectly fit the application. Even if identical jobs are being carried out, the circumstances or environment can be totally different, whether it be the speed with which inspection has to be carried out or changing color parameters, surface structure or contours of the part to be tested – or whether it

is quite simply the amount of space available for installing the system. The sum of these things has an impact on the actual solution that is required. As a result, flexibility is a must.

Clear stipulations from the industry

Compatible components, perfectly in tune with one another, are the key to guaranteeing that systems are reproducible for identical tasks or in case of replacement. Additionally, error sources have to be ruled out over different generations of components and software. Long-term stable system configurations are therefore required. And only with industrial-grade embedded computer platforms is this possible. These are designed for long-term availability and their software status can be frozen, so that identical configurations can always be obtained. Besides the selection of the right components, other important facets of optimal configurations are the specific settings of the image processing software, the operating system with the corresponding configuration and the best-suited drivers with the appropriate settings.

System configuration with potential pitfalls

If end-users or solution providers wanted to assemble this type of vision system themselves, they would have to become experts in this field and also have to carry out component selection themselves. On the path to an optimally configured image processing platform numerous potential pitfalls lurk along the way. One missing tick in the submenu during configuration can quickly lead to a system not working as required. A lack of know-how can result in nerve-racking trial & error processes, which also cost time and money. As the number of system components that are required for the individual configuration increases, the potential number of configuration errors increase. Plus, the sheer number of potential suppliers goes to make system configuration even more complex. The effort and the high probability of possible consequential problems are usually completely out of proportion to any potential additional costs which might be incurred with the purchase of an application-ready pre-configured system. This especially holds true if the system is to go into production and is required on different sites around the world.

Various platforms fit the bill

Manufacturers of image processing software, such as Q.VITEC, have begun offering system integration services to their customers. For this, they not only need the right cameras and lighting systems, they also need a suitable, scalable computing platform to meet individual demands. Depending on the application in question, different systems may be suitable for an image processing system. The spectrum ranges from simple, compact box PCs to high-performance industrial servers for 19-inch cabinets. Where both the power density and

the scalability play a role, systems based on the CompactPCI® Serial standards prove interesting.

Owing to the modular system structure, components can be assembled according to specific requirements. They can easily be adapted to fit the required performance level and also be extended at any given time. The system configuration can be carried out very flexibly based on the standard components, which can be assembled building block-style. The system concept is so plausible, easy and precisely specified that realizing a system configuration is a fast and easy process.

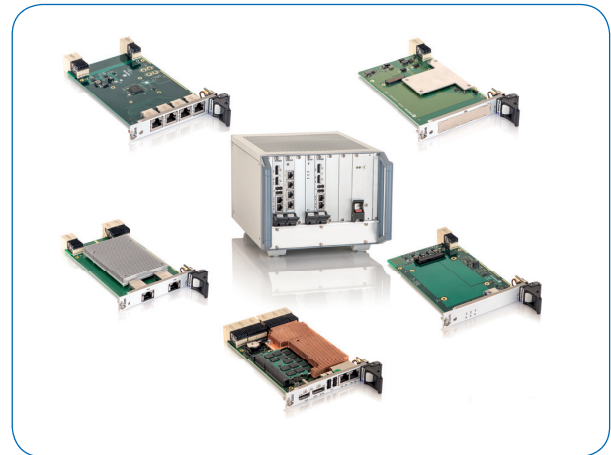


Image 1: Flexible hardware: Whether processor boards, network controllers, XMC or HDD / SSD carriers, all CompactPCI® Serial components are modular and also available as complete pre-integrated system configurations.

CompactPCI® Serial – the high-performance platform

Over the backplane, CompactPCI® Serial systems are fitted with state-of-the-art, high performance interfaces such as Gigabit Ethernet, USB, PCI Express® and even SATA. Particularly noteworthy, is the fact that the latest interface versions of USB 3.0, SATA 6Gb/s and PCI Express® 3.0 are already supported. In accordance with the CompactPCI® Serial standard, each system provides 8x Gigabit Ethernet, 8x USB3.0 as well as 40x PCI Express® lanes via the backplane. By using these high-speed interfaces it is now easy to hook Gigabit Ethernet- or USB 3.0-based cameras up to the system. The appropriate connecting cards are already available. Cards for additional PoE power supply for camera are planned for the future. Via appropriate carrier cards, PCI-Express-based CameraLink framegrabbers can also be integrated into the system. CompactPCI® Serial is even suitable for integrating additional controls as there is a vast range of industrial I/O components available for this standard. This makes CompactPCI® Serial an ideal solution for machine builders, who want to integrate the right vision hardware into their industrial computer platforms for machine and plant control. Integrating several vision systems into one chassis in order to create solutions for parallel processing in the smallest of spaces is also possible.

CompactPCI® Serial also allows systems to be realized in which multiple processor boards execute the parallel processing of the most demanding algorithms. Compared to the classic CompactPCI® standard, CompactPCI® Serial enables completely new, flexible and ,above all, more powerful system configurations.

Modular system from one source

The CompactPCI® Serial-based, application-ready vision system from Q.VITEC and Kontron will premiere at the SPS/IPC/Drives show at the end of November. Users have access to an optimized system configuration without having to pay the initial expenses for the optimized design of hard- and software. Ready-for-operation evaluation systems can immediately be provided by Q.VITEC, which can serve to dramatically reduce the system solution's time-to-market. For customer-specific optimization of the hard- and software configuration, Q.VITEC collaborates closely with Kontron. Specifically for this purpose, a joint team of experts was created specifically for this project and has compiled the current demo. Customers can therefore get the complete backup of a hardware supplier even, if required, including 2nd level support on system-specific hardware issues.

The system based on CompactPCI® Serial ideally corresponds to Q.VITEC's modular software Vision Q.400 which is available in Basic, Advanced and Professional versions and can work with up to 12 cameras in parallel. In addition, users can implement highly individual extensions extremely quickly and conveniently. To serve this purpose, Q.VITEC offers an integrated HDevelop script engine, so that application designers gain access to HALCON, the convenient image processing library from MVTec. In sum, a complete service package for individual vision system designs. Target customer groups are machine and plant engineers as well as large industrial end-users and independent system integrators.

Modular hard- and software

At the SPS/IPC/Drives show, for the first time Q.VITEC and Kontron will be presenting an application-ready, configured image processing system based on the modular industry computer standard CompactPCI® Serial and the modular image processing software Vision Q.400. The powerful performance of this image processing system will be demonstrated in a configuration which detects glass ampoules and AA batteries, using four GigE Vision cameras from different perspectives. Contour recognition and overprint comparison using OCR on constantly rotating test specimens will be shown. The measured data is compiled on a protocol which is displayed on a screen. Storing in a data base is possible at any given time. Just how flexible the hardware design is can be exemplified by connecting cameras to two different CompactPCI® Serial systems with different network cards and a different testing scenario.

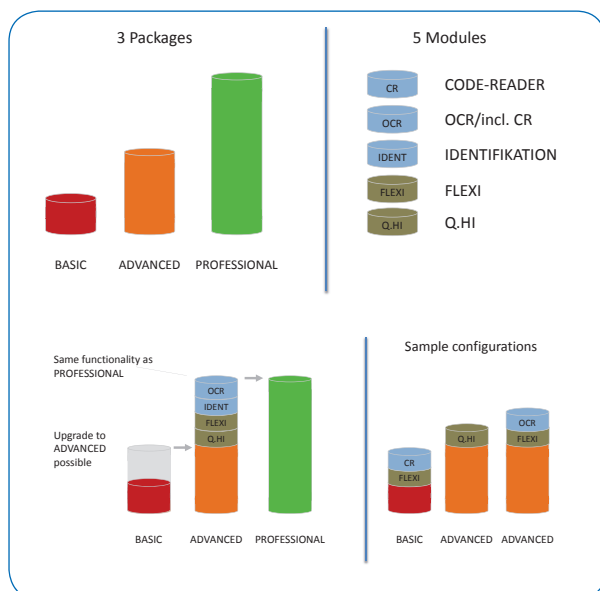


Image 2: Flexible software: Q.VITEC's software Vision Q.400 is modular and can be adapted to meet the applications' tasks.



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About Kontron

Kontron is a global leader in embedded computing technology. With more than 40% of its employees in research and development, Kontron creates many of the standards that drive the world's embedded computing platforms. Kontron's product longevity, local engineering and support, and value-added services, helps create a sustainable and viable embedded solution for OEMs and system integrators.

Kontron works closely with its customers on their embedded application-ready platforms and custom solutions, enabling them to focus on their core competencies. The result is an accelerated time-to-market, reduced total-cost-of-ownership and an improved overall application with leading-edge, highly-reliable embedded technology.

Kontron is listed on the German TecDAX stock exchanges under the symbol "KBC". For more information, please visit: www.kontron.com

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