Development in the fast lane

In 6 weeks to the near production-ready embedded

vision prototypes

Cameras are the sensors of the future. More and more industrial applications benefit from their data depth, flexibility and broad evaluation capabilities. At the same time, the integration of image processing sets significantly higher requirements on electronics design compared to the use of conventional sensors - longer development times and higher costs are often the result. This does not have to be the case, as hema electronic shows: with a modular design for hardware and software, the company drastically shortens development times and makes upgrades easily possible. Individuality, industrial suitability and series optimization of the solution are the top priorities.

Customized processor power, interfaces and software: the hema construction kit for individual electronics.

Whether for detecting specific shapes and characteristics in quality assurance, traffic applications, security technology, agricultural industry or sports: image processing is omnipresent and offers the user the greatest possible depth of data and wide-ranging options for analysis - machine vision is booming. Cameras are also being used in more and more applications in the automotive and consumer markets, driving the development of small, powerful sensors and corresponding applications. Industries, which adapt these innovative solutions benefit. Combined with rapid technological progress, the pressure to innovate is also increasing here and development cycles are becoming shorter and shorter. "This confronts companies with great challenges because projects with image processing usually require longer development times due to their complexity", says Oliver Helzle, CEO of hema electronic. "In addition, the current corona crisis, which increases the backlog in the development departments through short-time work and postponed projects, is a further factor. How can we effectively support companies so that they can get their products ready for series production faster? - This question led us to develop our modular design platform."

Quick start to software development

The hema design platform is specifically designed to meet the requirements of embedded vision applications. It includes hardware as well as middleware and a sophisticated software framework. Within only about six weeks, customers receive a customized solution with which they can quickly and easily develop, implement and test their own applications. Oliver Helzle: "Our goal was to accelerate the development in the initial phase and to provide customers very quickly with a hardware environment for their embedded vision projects. This creates ideal conditions for further software development. In the main phase, there will then be more time and capacity for further development to achieve production readiness". Thanks to proven and industrially suitable circuits and components, hema's prototype is already very close to the later

series hardware, so that series optimization and production start can also take place within a few weeks.

45 building blocks for freely configurable hardware
A special feature of the design platform is its modular concept. It consists of FPGA-based system on modules (SoM) and individual mainboards, which can be freely configured from currently more than 45 building blocks. Users simply select the required interfaces from the hardware building block library. Standard interfaces such as Ethernet, USB, CAN and Wi-Fi / Bluetooth are available as well as the common video interfaces. hema's hardware design department provides appropriate templates for each building block for circuit diagram and layout. Only the routing has to be adapted individually. Advantage for the customer: They receive their customized electronics within the shortest time and at manageable development costs. Contrary to a completely new development, only proven circuits suited for industrial use are chosen. Customer-specific circuits or functions not yet available in the hema library can be easily integrated. Hardware development and production takes place under one roof at the company's location in Aalen, Swabia. This ensures short distances, speed and flexibility in development, production and delivery.

Future-proof: SoMs with scalable performance
The computing power for the embedded vision platform is provided by Enclustra's System on Modules. They are available with different performance classes, processors and memory expansions. A standardized interface ensures compatibility and makes upgrades and product variations possible without the costly development of new electronics. A further advantage of the module concept: EMC-critical components around the processor are already integrated; this reduces complexity in the development of the mainboard - and thus again reduces effort and costs. As exclusive trading partner of the Swiss SoM manufacturer Enclustra, hema knows these modules in detail and uses them successfully in numerous customer projects.

An ideal software basis for applications
Software development makes up an increasing part of the development effort for image processing systems. The modular structure and scalable performance of the hema design system enable optimal reusability. In addition, the company supports its customers with wide-ranging software libraries, which can be selected just as easily as circuits in hardware layout. "Our embedded vision experts have developed a broad software framework that includes the operating system and classic middleware for image and video processing," says Oliver Helzle. "We also integrate frameworks such as MVTech's Halcon or PYNQ, algorithms for evaluating specific sensors or software for processing image and video data. Our aim is to make it as quick and easy as possible for customers to program and implement their own applications."

Performance, interfaces, software: simply select and order
With its embedded vision design platform, hema makes the development of image processing solutions easy, fast and cost-efficient. Customers select the required computing power and memory of the FPGA-based system-on-module, specify their required interfaces and the software as a basis for their own application development. Within a few weeks, they receive a custom and close-to-production prototype of their electronics, which can be developed quickly and efficiently to production readiness. "We focus on individual consulting for each customer and offer them the perfect complement to their core competencies - from development and production to series qualification and project and lifecycle management," says Oliver Helzle. "With the hema design platform,

we are now taking a big step towards our customers at the earliest stage of their project and are helping to accelerate the development process. Our team here in Aalen is ready to prove it".

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About hema electronic

hema electronic GmbH – the embedded vision expert

hema is a leading development service provider in the electrical industry, providing hardware and software design for embedded vision boards and systems for applications in industrial automation, defence and security. From consulting and conception to design (FPGAs, DSPs, embedded processors), qualifications, rapid prototyping and small series production up to lifecycle management – hema offers everything from one source. hema supports their customers effectively in being the world market leaders of tomorrow.

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