

EMBEDDED VISION ELECTRONICS

Design and Production



industrial
automation
transportation
avionics
medical
defence



LEADING TECHNOLOGIES FOR THE INNOVATORS OF EMBEDDED VISION

hema electronic – a leading company in electronic design specialized on embedded hardware and software solutions based on FPGA and embedded processors.

Our core competences are the design and production of customized vision and sensor boards.

Innovative leaders choose hema electronic for realizing next generation video, control and feedback systems. We provide design services for industrial, security and medical applications.

Our clients are using our consistent services starting with consulting, design and verification up to long-term availability over the complete product life cycle to achieve and keep their unique market position.

hema electronic is a family owned company with over 40 years experience in electronics and related services. We combine the strength of the German Mittelstand with a strong future oriented strategy of technological leadership.

The hema mission:
**Make your vision sensor data available.
Everywhere and anytime!**



HEMA VISIONEERS YOUR EMBEDDED VISION EXPERTS

Designing and delivering high end customer specific vision applications and systems like:

- Videostreaming h.264 and h.265
- Analog and digital video
- Low latency video transmission
- Video multiplexing up to 4K
- Realtime graphic overlay
- Digital videorecording
- Intelligent video management unit:
image acquisition | image processing | image transmission
- CMOS sensor technology with HDR imaging up
to 170 dB dynamic range
- Sensor fusion
- Rugged designs for mobile applications
- Long-term availability by system design
- Obsolescence management

Furthermore we support you with corresponding certifications, special approvals, acceptance tests and longterm availability.

Fastlane Boardservice

You think about the next big idea on video electronics. Your vision system uses several sensors and data receivers. For your groundbreaking application you want to combine these data in a flexible way.

The hema fastlane boardservice combines engineering and production services to turn your ideas within 30 days into a fully developed industrial PCB solution.



Working Day 20 PCB production

Via express service, the PCB is available quickly and ready for assembly. In parallel, we take a look into the necessary software and special components.

- Network of professional partners
- Procurement und material planning skills
- Software building blocks



Working Day 30 Start up and functional test

The assembled pcb is ready for testing. Firmware is installed and functions are verified.

- Approved test environment
- Skilled engineers
- Proven software setup



Ready for take off Application

After 30 days of Fastlane service, the PCB is available for you to start up. Rarely have prototype electronics been available in such a short time and in industrial quality.

- Satisfied customers
- Reliable PCB units
- Ensured success of your project



Working Day 5 Circuit diagram

Starting point for the customization of the circuit diagram are the hema hardware building blocks.

- 45+ building blocks
- Large selection of FPGA SoMs
- Predefined bill of material



Working Day 25 PCB assembly

PCB and components are delivered to the hema-owned assembly line. The production facility is fully optimized to fit the fastlane process.

- Components in stock
- Established production process
- Guaranteed quality



Working Day 0 Preparations

We define the planned mainboard and select the FPGA SoM based on the product idea, together with the customer.

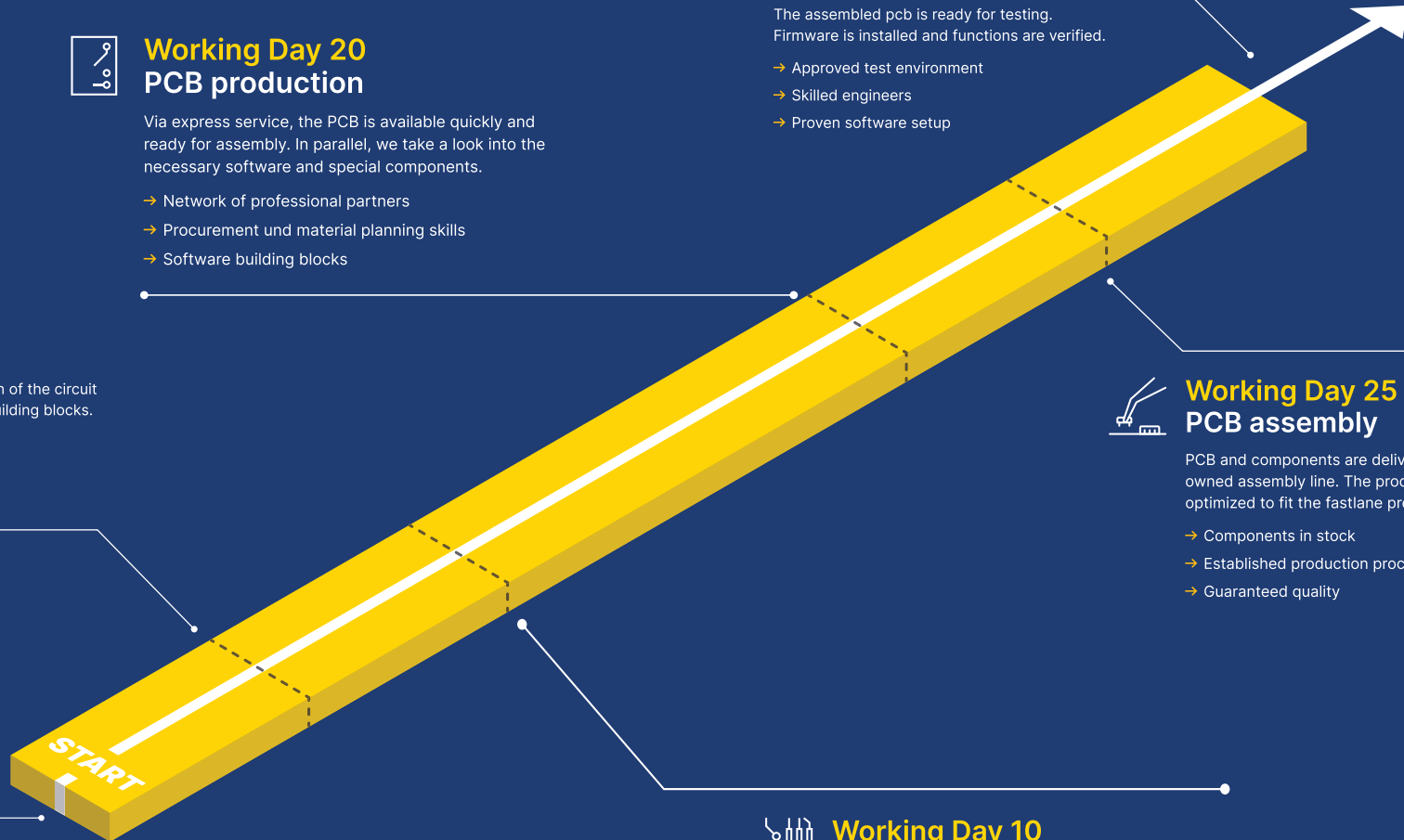
- Customer workshop and configurator
- FPGA SoM selection
- Firmware selection



Working Day 10 PCB layout

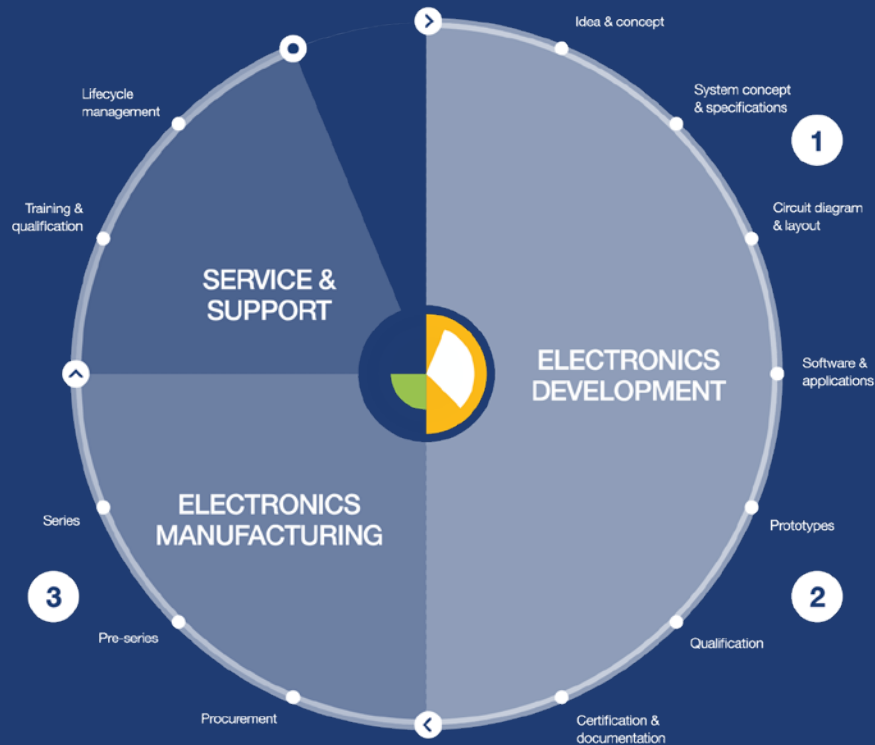
With the customer approved circuit diagram, we move to the layout stage. Form and function are designed to fit customer requirements.

- 45+ building blocks
- Approved layout elements
- Customized to requirements



The experts for Embedded Vision

The hema design process



1

Design strategy

Understanding customers, planning well, and deeply addressing the task at hand is an essential part of the design strategy. The hema design process is geared towards recording, understanding and shaping your requirements, and those of your customers, into a holistic concept. We determine the development strategy in collaboration with you. Whether it's modular platforms or product-specific implementations, each approach offers special advantages that must be used with intent.

2

Implementation

We implement your projects with know-how and enthusiasm and ensure the necessary capacities, always in collaboration with you and your specialized teams.

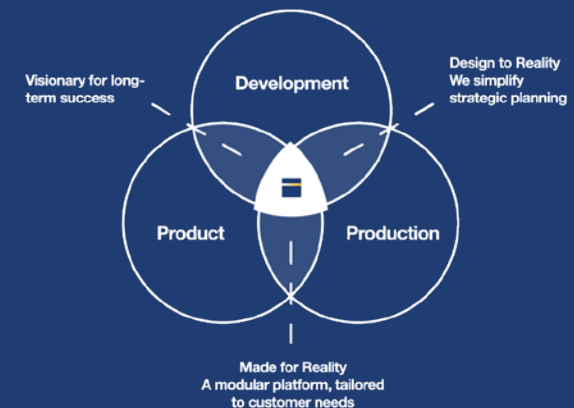
Hardware development, procurement and production planning are closely interlinked for optimal product outcomes. Software development for firmware and applications is done hand in hand with your specialists. We implement your projects effectively.

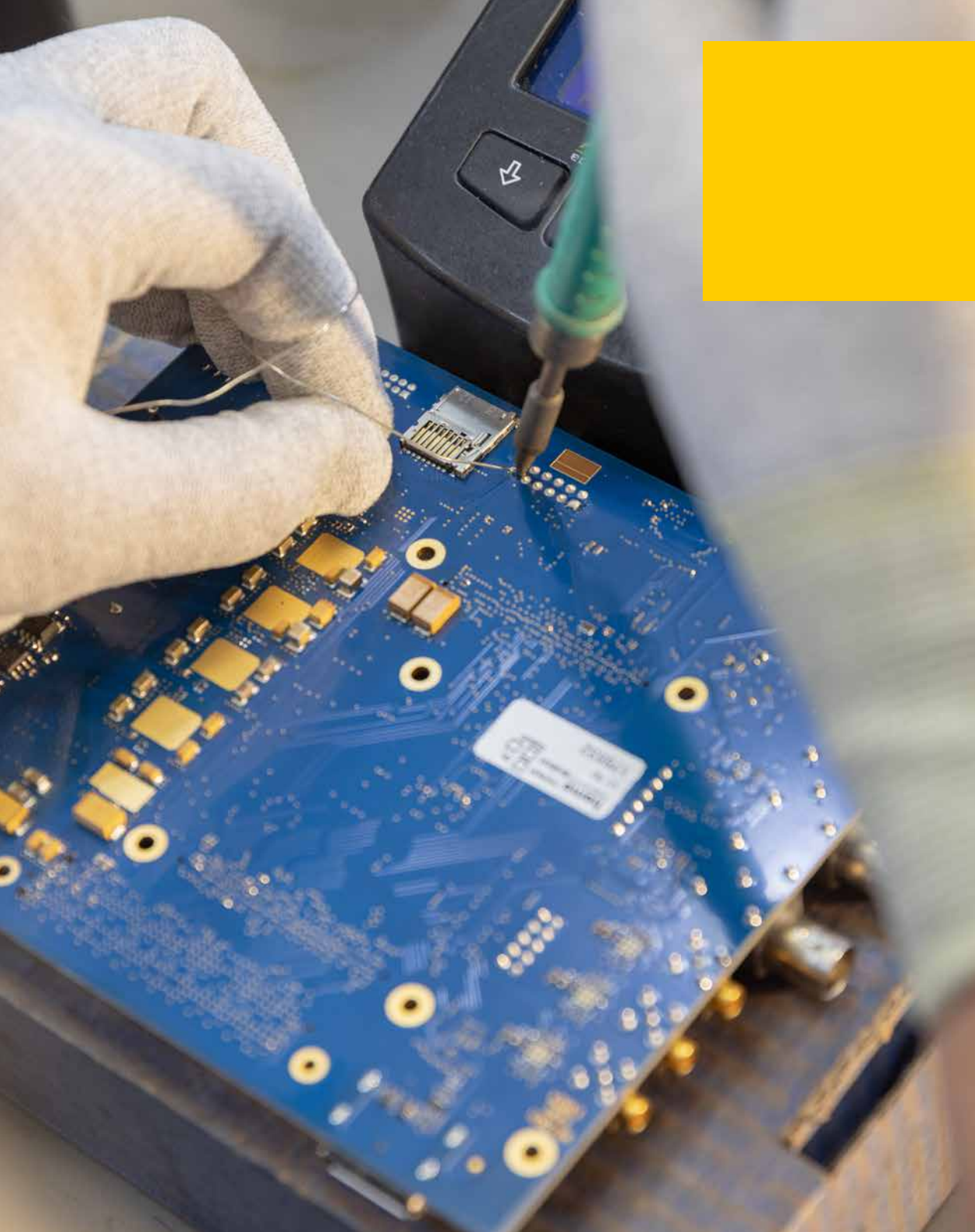
3

Connected by passion

Your bottleneck is our motivation to support you, and a shared opportunity to create great things. Our services go far beyond the provision of people and knowledge. With us, you get a team of effective thinkers. We combine the competence of specialists and the availability of extensive services with the enthusiasm for electronics development, for you.

Three areas – one partner





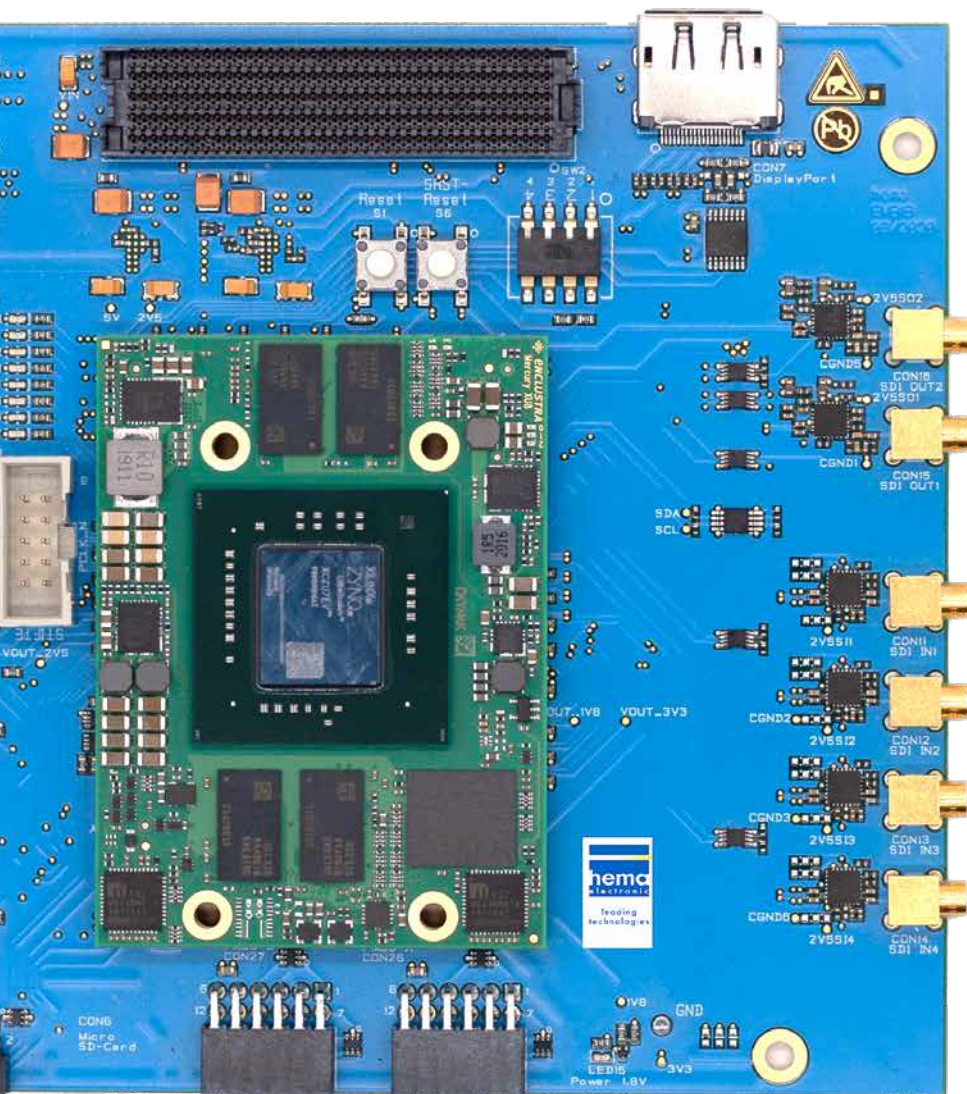
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References

AIRBUS | AREVA | BMW
MERCEDES-BENZ GROUP AG
DEKRA | HENSOLDT | KUKA
SIEMENS | STEMMER IMAGING
THYSSENKRUPP | ZEISS

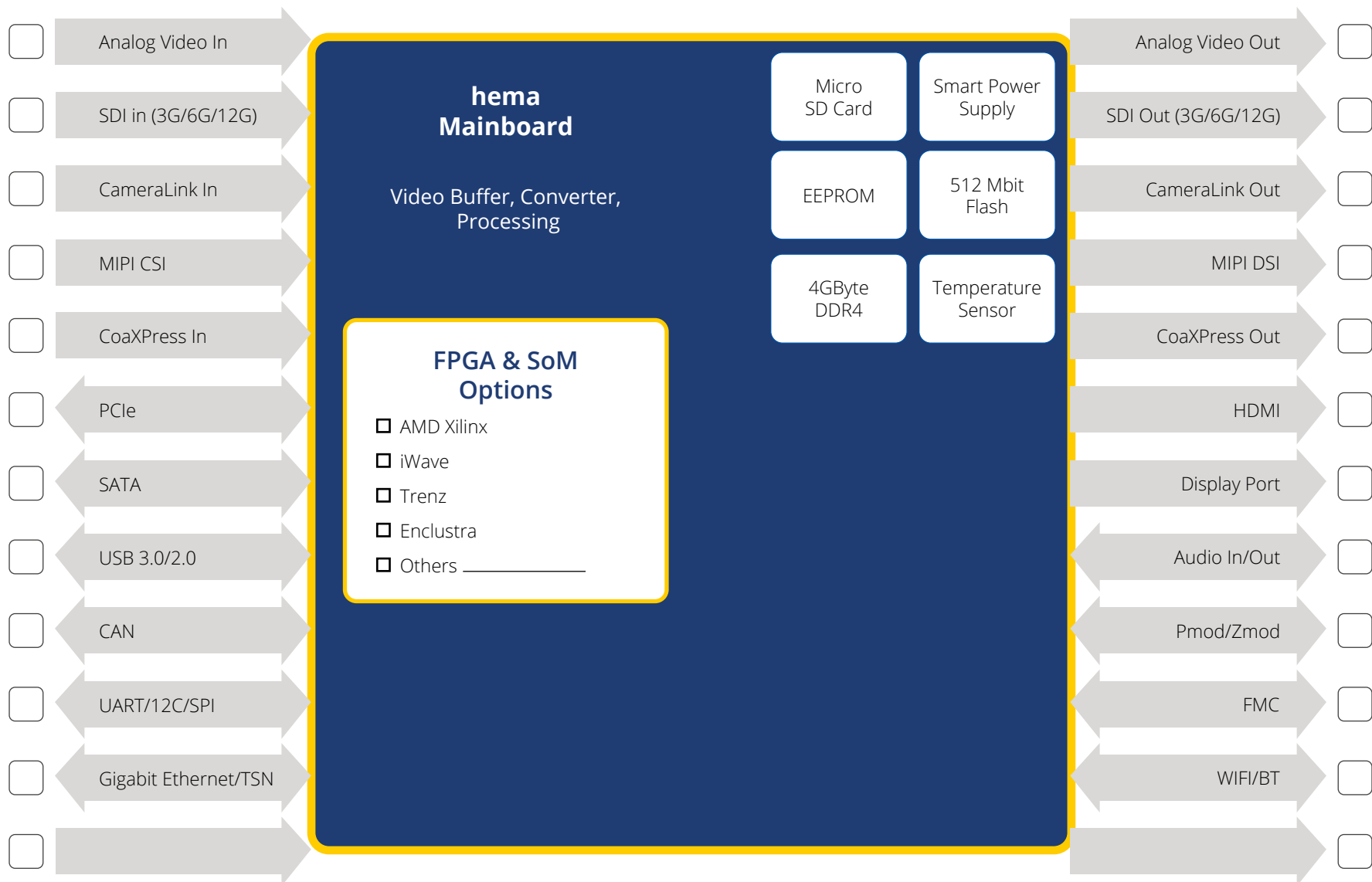


Embedded Vision Platform

Application	Creating product families with optimized features by modular design. Image processing components, optical measuring systems, measurement technology, surveillance.
Sector	Defence, Security, Automation
Requirements	Mainboards with scalable performance in hardware and software. Optional interfaces, standard software, test and start up concept.
Solution	Mainboard with FPGA module, design blocks library for for hard- & software
Customer benefit	Long-term available of mainboards with expansion options. FPGA modules with integrated software.
Core competence used	Hardware and software design, partner network, inhouse production

Speed up your product development!

Company: _____ Project: _____



**Make your vision sensor data available.
Everywhere and anytime!**

Contact your hema visioneer:
sales@hema.de
www.hema.de



Medical Imaging

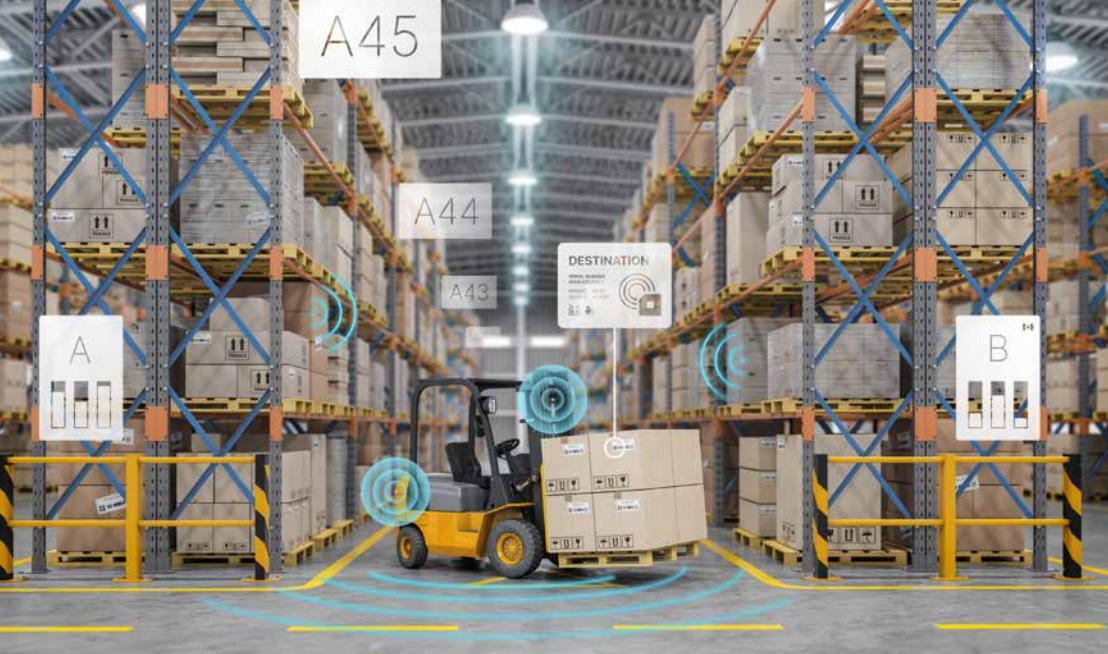
Application	Integrated video management system, control unit for multiple sensors and cameras.
Sector	Medical imaging, Endoscopy
Requirements	Integration and combination of multiple camera systems. Main unit with scalable performance in hardware and software. Video management, real-time imaging and processing.

Solution	Mainboard with digital video interfaces. High performance FPGA video processing unit, interchangeable modules.
Customer benefit	Longterm availability, modular futureproof design, FPGA modules with integrated software, interconnection with other industrial components
Core competence used	Hardware design, video management, prototyping, PCB assembly

A large, dark-colored military tank is positioned on a gravel path in a dense forest. The tank's turret is raised, and its main gun barrel is visible. The surrounding environment is lush with green trees and foliage. A semi-transparent blue rectangle is overlaid on the left side of the image, containing the word 'Defence' in white text.

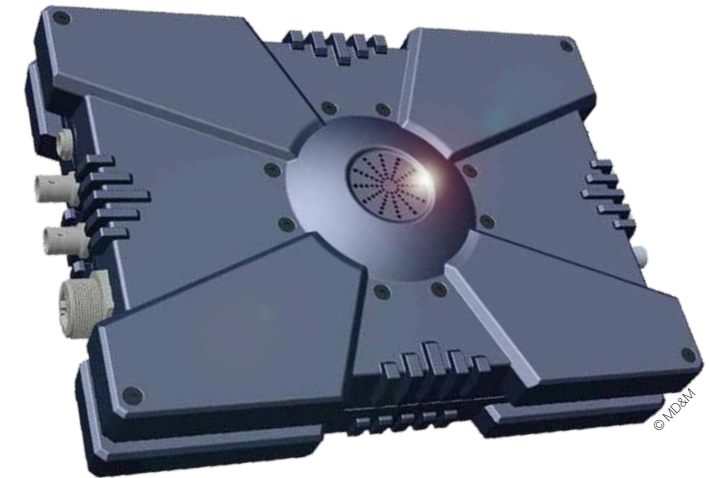
Defence

Application	Integrated video management system, control unit for various sensors and cameras, mobile platforms	Solution	Mainboard with digital and analog video interfaces. High performance FPGA video processing unit, interchangeable modules.
Sector	Defence and Security	Customer benefit	Longterm availability with options for additional demands in the future, FPGA modules with integrated software, interconnection with other industrial components
Requirements	Integration and combination of multiple camera systems. Main unit with scalable performance in hardware and software. Video management IP, real-time imaging and processing.	Core competence used	Hardware design, video management, optronics, prototyping, PCB assembly



Multi-Signal Processing

Application	Video and sensordata management in mobile logistics
Sector	Indoor logistics, AGV, mobile Applications
Requirements	Manage 3x different video sensors plus radar and identification sensors, FPGA for AI application, output for driver and remote operation, power sensitive
Solution	Mainboard with FPGA SoM, BSP programming for customer application and AI IP Cores.
Customer benefit	Fast prototyping for design and verification, modular platform for customization and longterm availability.
Core competence used	Design experience in data management and FPGA hardware, embedded vision platform for fast prototyping, mainboard with SoMs for scalable solution.

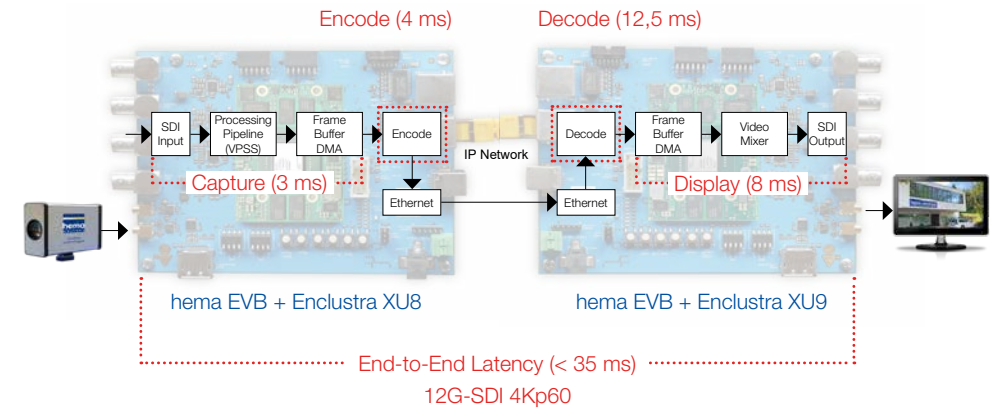
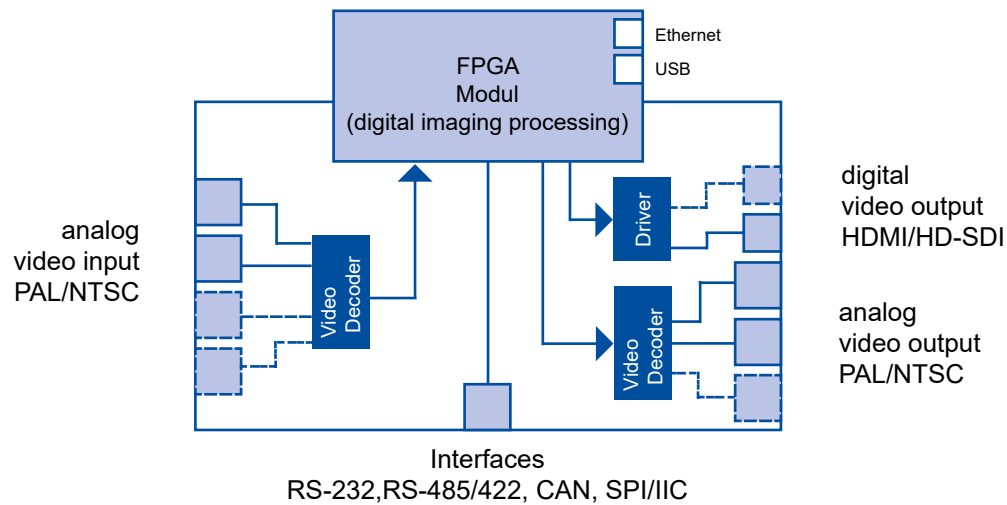


Rugged Vision Box

Application	Ultra low latency video distribution unit, ultra low latency video streaming unit
Sector	Defense, Security, Transportation, Surveillance
Requirements	Many video data in, video data processing, many video data out. Ultra Low Latency, different interfaces in and out.
Solution	Mainboard with different video in/out (digital and/or analog), with one or more FPGA modules, rugged vision box
Customer benefit	Rugged vision box according customer needs, extended temperature range. Easy to upgrade with FPGA module technology, long term availability.
Core competence used	"Fast lane" engineering by using hema hardware and software design blocks, box design with partner, rapid prototyping.

Time Sensitive Networking (TSN)

Application	Deterministic and high quality video transmission over Ethernet	Solution	TSN Network IP from SoCe on hema FPGA Hardware platform
Sector	Defence and realtime industrial applications	Customer benefit	Deterministic and high quality video service for communication over Ethernet
Requirements	Network traffic with deterministic latencies and bandwidth to ensure the quality of service of time sensitive video transmission	Core competence used	Hardware design, embedded video experience, partner network



Video-Multiplexer/-Distribution

Application	Technology upgrade for infrastructure installations e.g. video surveillance in public space in the railway technology sector
Sector	Defence, Security, Building, Automation, Transportation, Surveillance, Communication audio/video
Requirements	Distribution and multiplexing of analog and digital video channels in real-time, backward compatible integrable into the stock, latest digital interfaces, use of new software features.
Solution	Embedded vision board with FPGA module and analog and digital (video-) interfaces, 8-channel video distribution.
Customer benefit	Existing analog (PAL/NTSC) infrastructure can be retained, upgrading existing systems with new functionalities, state of the art FPGA solution, modular and scalable in performance and functions, fast implementation through predefined design blocks.
Core competence used	FPGA programming, IP cores, Hardware platform

Ultra Low Latency Streaming

Application	Vehicle control, machine control, video surveillance, real-time video conferencing
Sector	Defence, Security, Industrial automation
Requirements	Ultra low latency applications (from capture to display in less than 35 msec) multi-streaming, multi-view, video distribution
Solution	Mainboard with FPGA modules, h.264/h.265 compressing, 3G-SDI 1080p60, 12G-SDI 4Kp60, SDI capture + output, OSD
Customer benefit	Fast development by using predefined hardware and software. Design blocks for very short time to market, easy to upgrade.
Core competence used	Hardware and software design, rapid prototyping and production by using inhouse facility



High Dynamic Range Camera

Application	Inline weld inspection, robot guidance
Sector	Industrial automation
Requirements	100% real-time inspections
Solution	HDR CMOS sensor 170 dB dynamic range, FPGA + DSP signal processing units
Customer benefit	High dynamic range, high brightness/low light capability, rugged design
Core competence used	HDR sensor, embedded system design



WHY YOU SHOULD WORK WITH US!
BECAUSE YOU'RE GOING ON A
SPACE MISSION WITH HEMA!

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