hema
electronic

leading
technologies

Embedded Vision Electronics
Design and Production

industrial
automation
transportation
avionics
security

Leading technologies for market leaders

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 to the defense and security, transportation, avionics and industrial automation market.

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.
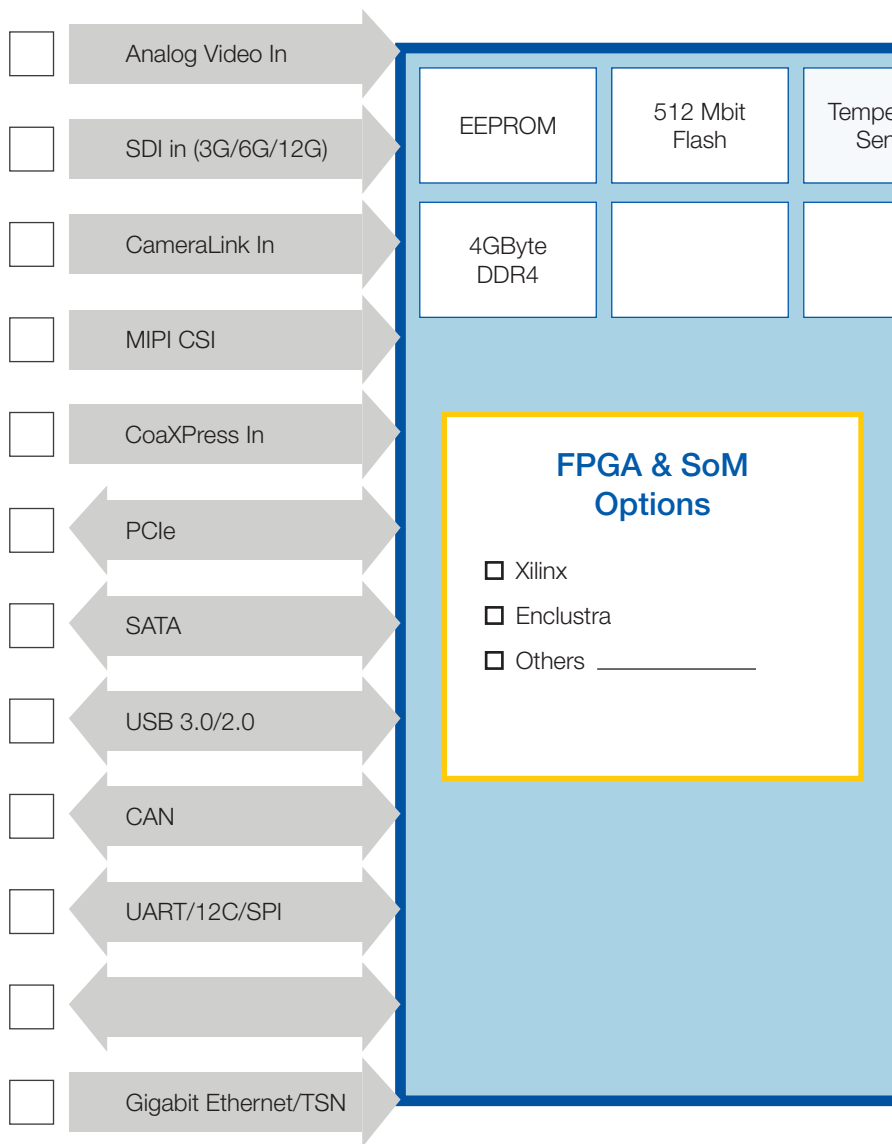
The hema mission:
Push embedded vision technology and faster personal growth.

Why you should work with us!
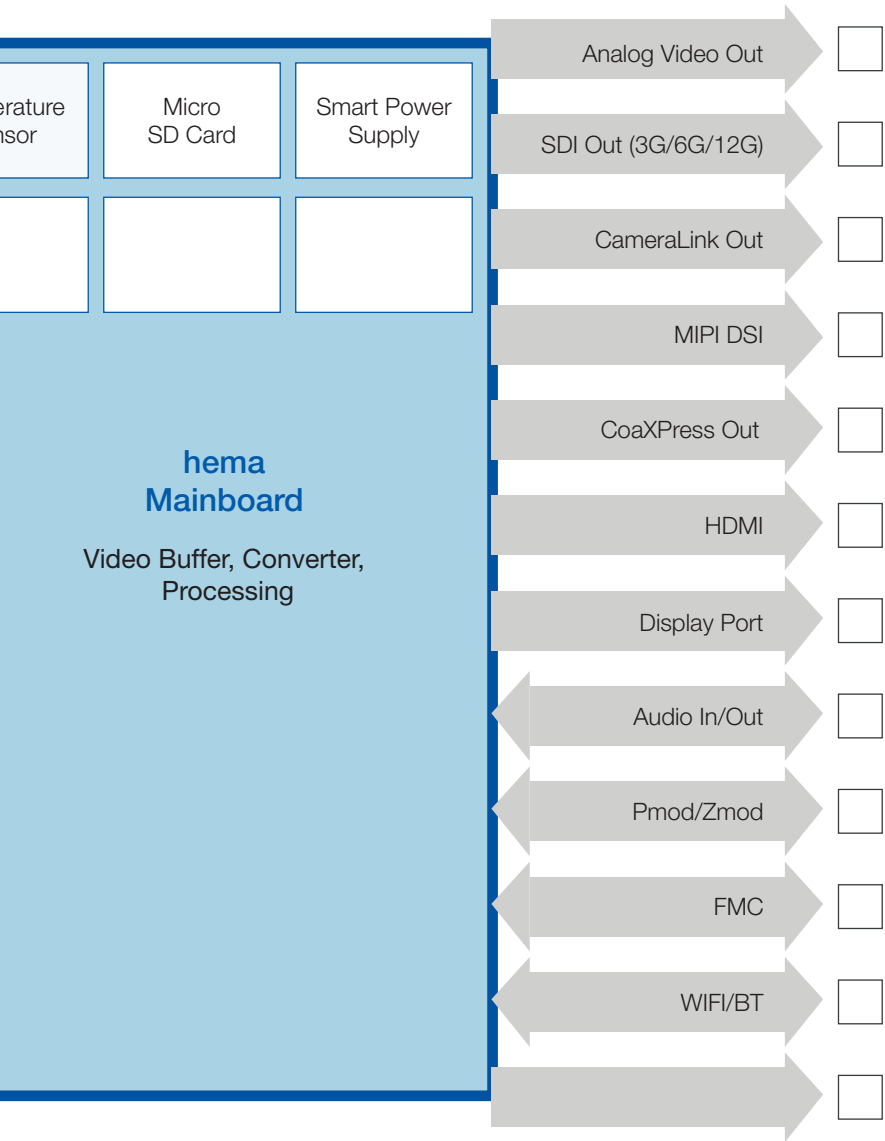**Because you sail the seven seas with hema!**

https://karriere.hema.de

Speed up your product development!

☐	Analog Video In
☐	SDI in (3G/6G/12G)
☐	CameraLink In
☐	MIPI CSI
☐	CoaXPress In
☐	PCIe
☐	SATA
☐	USB 3.0/2.0
☐	CAN
☐	UART/12C/SPI
☐	
☐	Gigabit Ethernet/TSN

EEPROM	512 Mbit Flash	Tempe Ser
4GByte DDR4		

FPGA & SoM Options

☐ Xilinx
☐ Enclustra
☐ Others _____

XILINX®

Company:_____ Project:_____

	Micro SD Card	Smart Power Supply
erature nsor		

hema
Mainboard

Video Buffer, Converter,
Processing

Analog Video Out ☐

SDI Out (3G/6G/12G) ☐

CameraLink Out ☐

MIPI DSI ☐

CoaXPress Out ☐

HDMI ☐

Display Port ☐

Audio In/Out ☐

Pmod/Zmod ☐

FMC ☐

WIFI/BT ☐

☐

Contact person @ hema:
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www.hema.de

hema electronic – the embedded vision expert

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 and acceptance tests.

Contents

Project design examples

- Medical Imaging
- High dynamic range camera
- Ultra Low Latency Streaming
- Rugged Vision Box Video Multiplexer/-Distribution
- Digital Videorecorder
- Embedded Vision Platform
- Video Multiplexer/-Distribution

References:

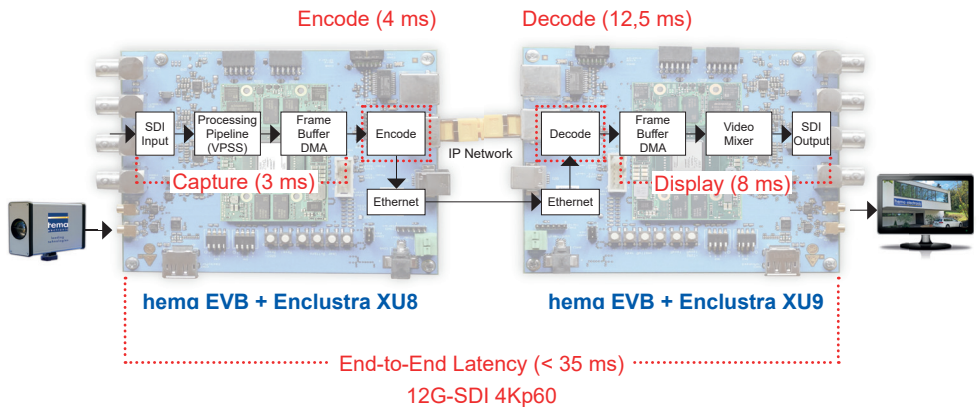|		
AIRBUS	DAIMLER	SIEMENS
AREVA	DEKRA	STEMMER IMAGING
BMW	HENSOLDT	ThyssenKrupp
CASSIDIAN	KUKA	ZEISS

Medical Imaging

|	
Application	Integrated video management system, Control unit for various sensors and cameras
Sector	Medical imaging, Endoscopy
Requirements	Integration and combination of multiple camera systems Main unit with scalable performance in Hard- and Software Interacting video management, real-time imaging and processing
Solution	Mainboard with digital and analog videointerfaces High performance FPGA video processing unit, Interchangeable modules
Customer benefit	Longterm availability with options for additional demands in the future, FPGA modules with integrated software, Interconnection with other industrial components
Core competence used	Hardware design, Video management, Optronics, Assembly production

High Dynamic Range Camera

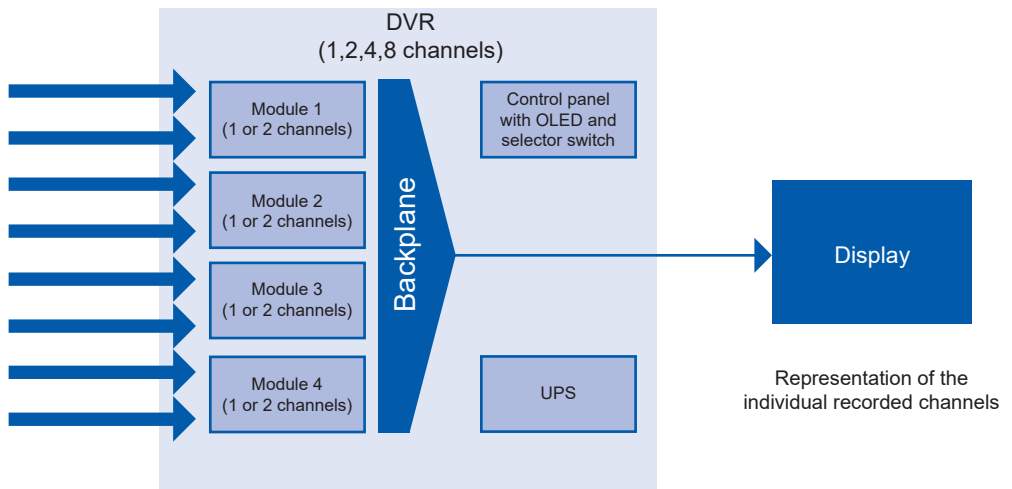|	
Application	Inline weld inspection, Robot Conidance
Sector	Industrial Automation
Requirements	100% real-time inspections
Solution	HDR CMOS sensor 170 dB dynamic range, FPGA + DSP signal processing units
Customer benefit	High dynamic range, High brightness/low light capability, Rugged design
Core competence used	HDR sensor, Embedded system design

Encode (4 ms)   Decode (12,5 ms)

| SDI Input | Processing Pipeline (VPSS) | Frame Buffer DMA | Encode | IP Network | Decode | Frame Buffer DMA | Video Mixer | SDI Output |

Capture (3 ms)   Display (8 ms)

Ethernet   Ethernet

hema EVB + Enclustra XU8   **hema EVB + Enclustra XU9**

End-to-End Latency (< 35 ms)
12G-SDI 4Kp60

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 HW+SW Design Blocks for very short time to market, easy to upgrade
Core competence used	Hard- and software design Rapid prototyping and production by using inhouse facility
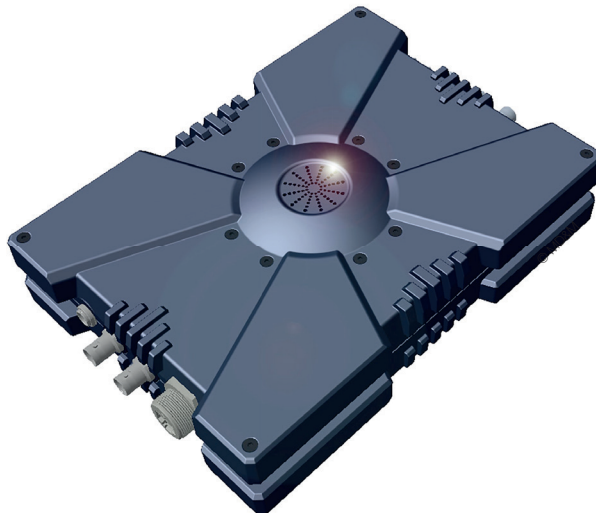
Rugged Vision Box

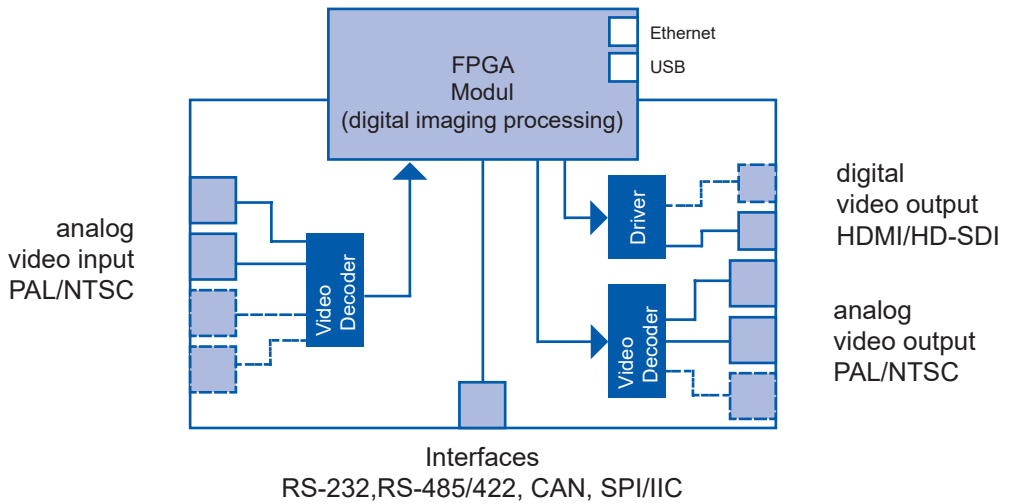|	
Application	Ultra Low Latency Video Distribution Unit, Ultra Low Latency Video Streaming Unit
Sector	Defense, Security, Transportation, Surveillance
Requirements	Many video data in, video data processing, many video data out Ultra Low Latency, different interfaces in and out
Solution	Mainboard with 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 HW and SW design blocks, Box design with partner, rapid prototyping

DVR
(1,2,4,8 channels)

| Module 1 (1 or 2 channels) |
| Module 2 (1 or 2 channels) |
| Module 3 (1 or 2 channels) |
| Module 4 (1 or 2 channels) |

Backplane

Control panel with OLED and selector switch

UPS

Display

Representation of the individual recorded channels

Digital Videorecorder

Application	Recording video data for monitoring
Sector	Security, Medical, Outdoor use
Requirements	Record and play up to 8 video channels in HD
Solution	Digital video electronics with compression and video management software
Customer benefit	Flexible video recording, Full-HD video with h.264 codec Rugged design with long-term availability, Industrial temperature range
Core competence used	Customization of hardware and software, Experience with video systems
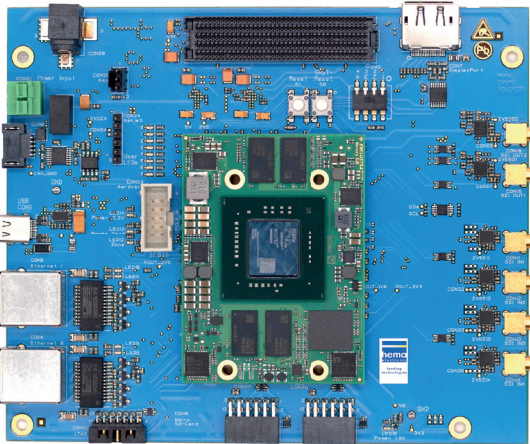
Embedded Vision Plattform

Application	Creating product families with optimized basic features by modular design. Image processing components, optical measuring systems manufacturing of devices, measurement technology
Sector	Defence, Security, Automation
Requirements	Basic model with scalable performance in Hard- and Software. Optional interfaces, Standard software, Test and start up concept.
Solution	Mainboard with FPGA modules, Design blocks for easy extension
Customer benefit	Long-term available of basic modules with expansion options. FPGA modules with integrated software.
Core competence used	Hard- and software design, Partner network, inhouse production

Ethernet
USB

FPGA
Modul
(digital imaging processing)

analog
video input
PAL/NTSC

Video Decoder

Driver

Video Decoder

digital
video output
HDMI/HD-SDI

analog
video output
PAL/NTSC

Interfaces
RS-232,RS-485/422, CAN, SPI/IIC

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

Notes