TOPIC EMBEDDED SYSTEMS

software development
to application design covers
up of expertise include: and
areas of expertise include: and
operating systems: Windows
platforms: PC, ARM Cortex AIRIN
platforming languages: C.C.

8 Tech





Hardware platform for

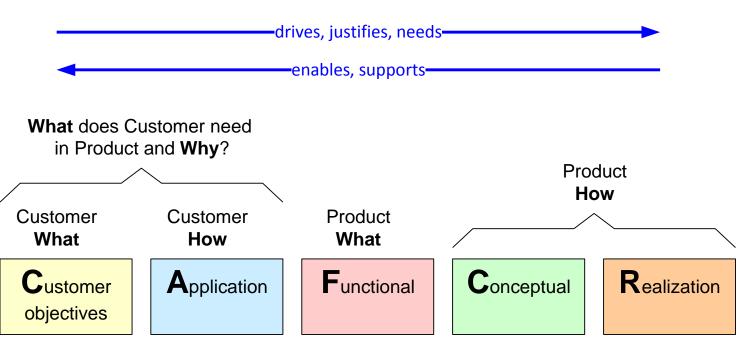
ULTRASOUND INSPECTION

Herman Kuster, Topic Embedded Systems









More details on www.gaudisite.nl







Customer objectives











- Strong in Ultrasound inspection of steel
- Using third party hardware and software for years
- Wish to supply whole system including own hardware and software

















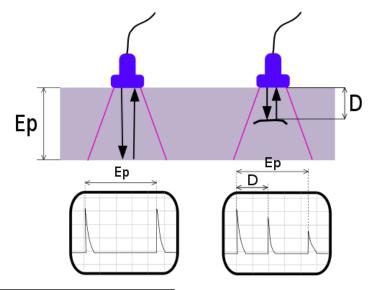


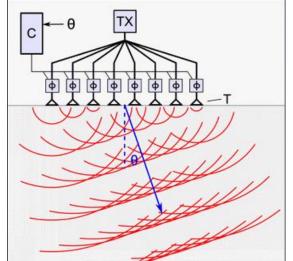






- Ultrasound inspection
- Detection of cracks and bubbles
- Sensor consists of piezo actuator and piezo sensor
- Different types of sensors:
 - Phased-array
 - Multiple single-probes









Application



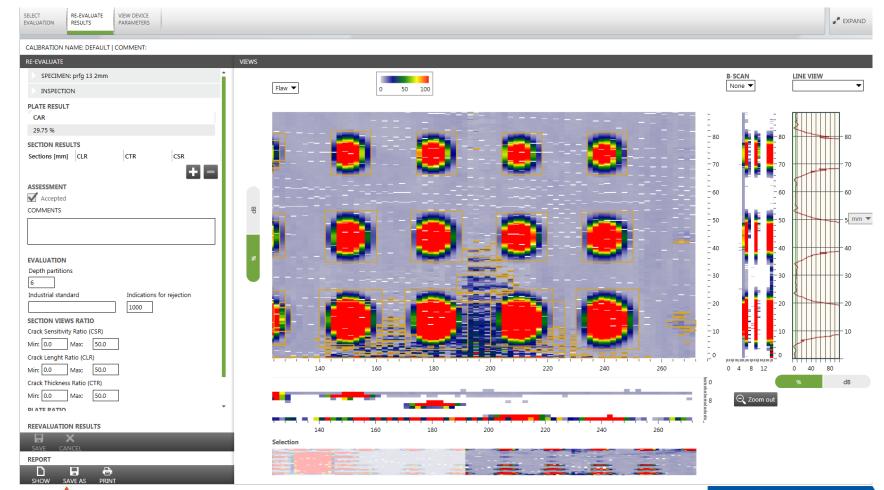














Functional (requirements)













Interfaces:

- Max 64 Probe connections
- Piezo UT, EMAT Probe connections
- External clock and trigger input/output
- 1G and 10G ethernet
- Several low-speed interfaces like:
 - ▲ Encoders (RS-485)
 - Fieldbus to machine control
 - ▲ LVDS and HDMI display output
 - ▲ SPI and I2C interfaces

Processing platform:

- FPGA fabric for high-speed parallel processing
- ▲ CPU cores for feedback loops and management tasks
- Modular and scalable















- Industrial PC or Single board computer
- ▲ CPU-SOM, FPGA-SOM, Zynq-SOM
- Full custom built system
- Miami+, SOM with Xilinx Zynq





Realization











- Miami+ SOM
- System overview
- Data processing
- Backplane board
- Frontend board
- Backend board





Miami+ Zynq-SOM TOPIC 1 GB DDR3 Clocks **Ethernet SDIO** Clocks **JTAG UART** Zynq-PS Clocks Flash 12C HP-IO Power 1GB DDR3 HP-IO HP-IO 200 pins HR-IO GTX HP & HR-IO GTX 16-lanes

HR-IO

HR-IO

Zynq-PL

On-board IO

GTX

GTX



HR IO

Zynq-SOM

Embedded in your future

GTX

Standalone system overview



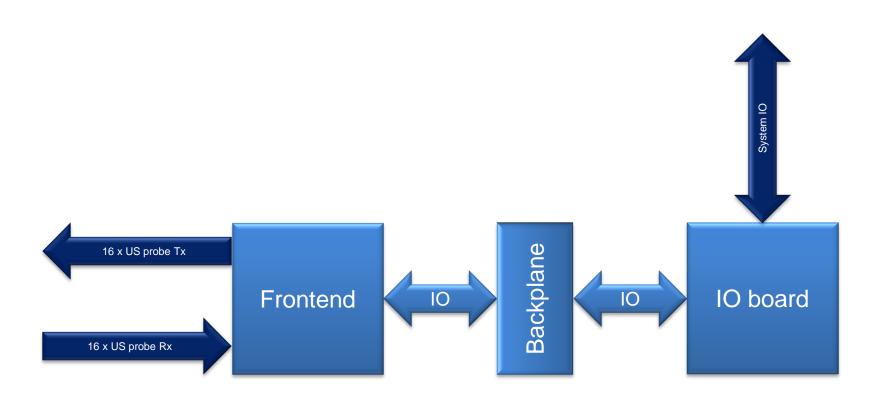














Full system overview



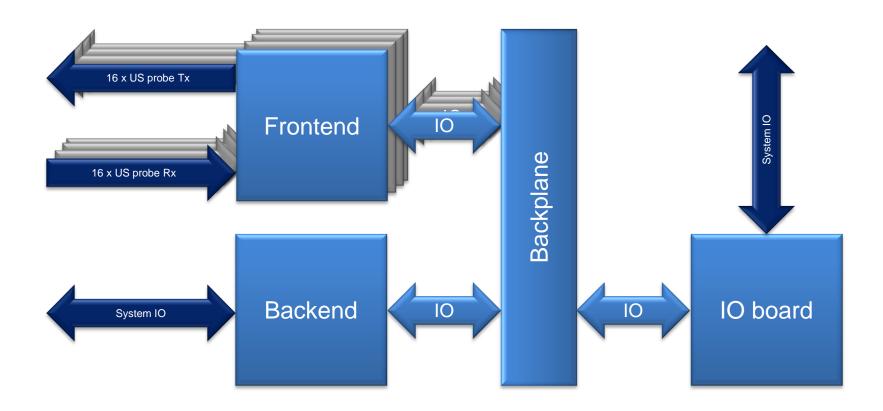














Data processing for US Data



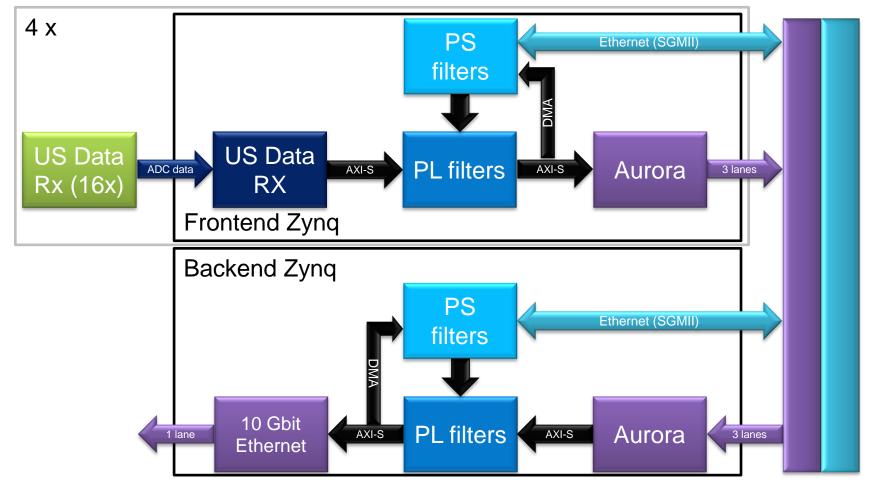




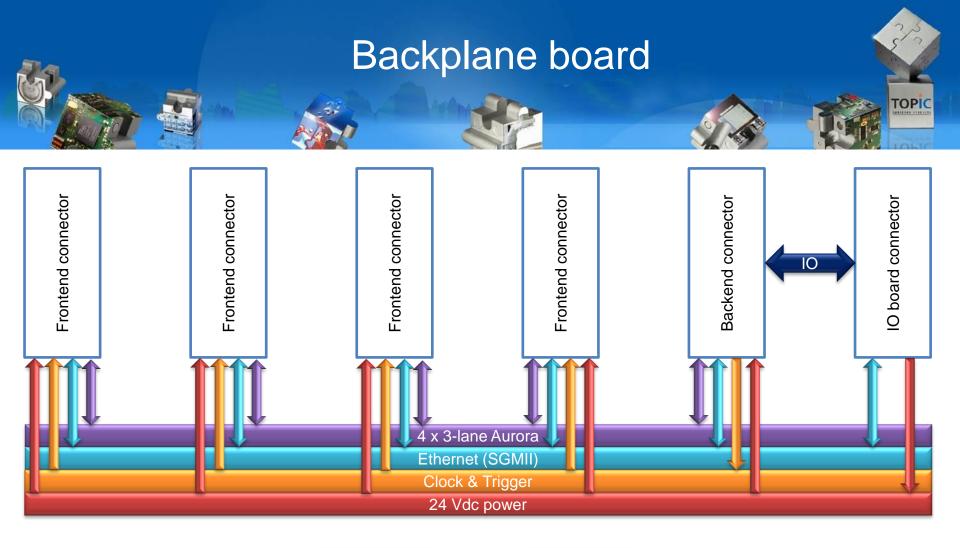












Gb Ethernet switch Clock & Trigger distribution



Frontend board

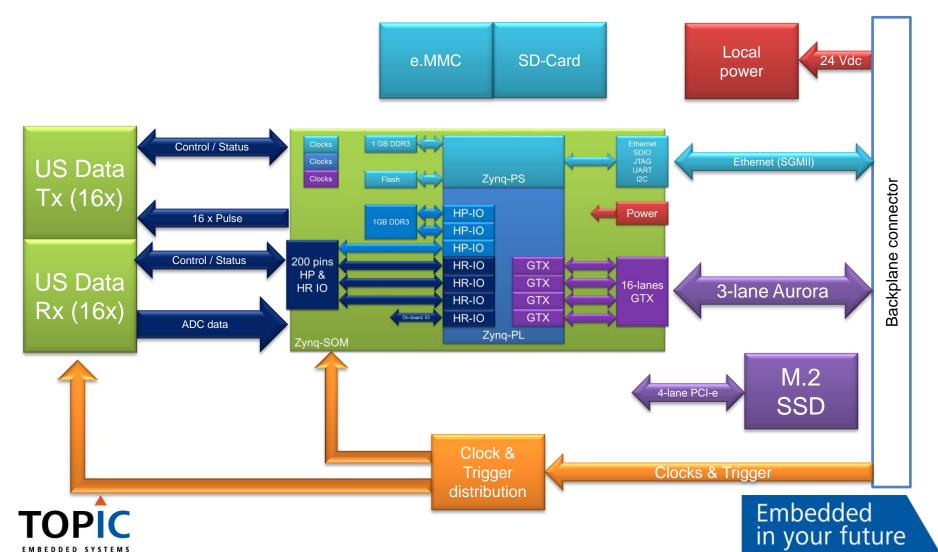












Backend board





HR IO

Zynq-SOM

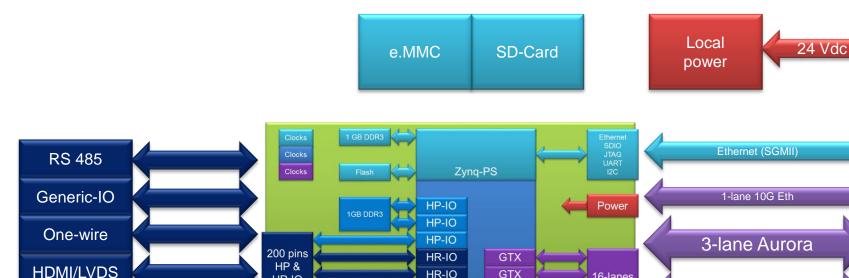








Backplane connector



HR-IO

HR-IO

HR-IO

Zynq-PL

GTX

GTX

GTX



3-lane Aurora Clock &

16-lanes

GTX

Trigger distribution Clocks & Trigger

3-lane Aurora

3-lane Aurora

Embedded in your future



AnyBus

Standalone system























