mSYS-8300 Custom System Platform

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Highlights

mSYS-8300 Custom System Platform
Our customer, the European Spallation Source (ESS), needed a rugged and high-performance computer system designed for advanced data acquisition where precision, stability and continuous operation are critical. The system is built to handle continuous high load data streams so they can operate with full confidence in environments where downtime and data loss are not an option.

The customer, European Spallation Source (ESS), operates a large scale scientific facility where thousands of sensors and systems must be controlled and monitored in real time.

The challenge was to design a compact and robust computing platform capable of supporting advanced data acquisition, precise timing and complex system level control. At the same time, the solution needed to integrate seamlessly into the facility wide EPICS based control infrastructure while supporting long term scalability and operational reliability.

In close collaboration with ESS, a modular mTCA.4 based system was developed to support advanced data acquisition and control system integration across the facility.

The solution combines redundant power supply, FPGA based processing and flexible compute modules into a unified architecture designed for high availability and continuous operation.

The platform supports EPICS and TANGO integration, enabling seamless interaction with ESS control systems. Up to four high performance digitizers are integrated with precise timing and ultra low jitter performance, ensuring

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accurate and synchronized data capture across distributed systems.

The result is a robust and scalable computing backbone that supports the demanding requirements of a large scale scientific infrastructure.

A collaboration focused on quality and technical precision between ESS and Blue Line has defined the development of the mSYS-8300 Custom System Platform.

The project was driven by high technical requirements and a close and continuous dialogue, ensuring alignment throughout the entire development process.

The collaboration demonstrates how specialized system solutions can meet the demands of some of the world’s most advanced research facilities.

Brian Ulskov Sørensen, who led the collaboration from Blue Line’s side, highlights that the close partnership with ESS, built on many years of shared experience, was key to achieving a strong and reliable final result.

- mTCA.4 open standard with branch standard
- MCH / Carrier Hub architecture
- EPICS system level support with IOC integration
- TANGO software support
- Redundant modular PSU for high reliability
- Flexible payload: x86 CPU, µRTM, solid state storage
- High performance FPGA with RTM / FMC digitizer adaptation
- Up to 4 digitizers with precise timing (50 to 125 MHz, <25 ps jitter)
- Management and switching: 6 AMCs, front and rear cooling, GbE and PCIe Gen3
- Operating range: -25 °C to +55 °C
- 5 to 95% humidity tolerance
- Power input: 110 to 265 VAC
- Weight: 10 to 12 kg

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Specifications

Model Type

System Platform

Form Factor

Advanced MicroTCA.4 platform

Supports up to 6 AMCs

Construction

Integrated MCH / Carrier Hub

Cooling

Front and rear cooling

Environment

Operating temperature	-25 °C to +55 °C
Humidity	5 to 95%

Standard

mTCA.4 open standard

EPICS and TANGO support

Processor

x86 CPU support

Chipset

FPGA based processing

RTM / FMC digitizer support

Security

Redundant power supply

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Dimension and Weight

Weight: 10 to 12kg

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