2nd Online Round Table 2021

Analog Devices – MESCO – TÜV NORD

Functional safety | Safe Ethernet interfaces | Ethernet in hazardous areas (Ethernet APL)

- **Date: September 30, 2021**
- **Organizer: MESCO**
- **Guests: TÜV, Analog Devices**

The webinar focuses on the practical needs of hardware and software developers who are planning or already implementing a project with Functional Safety and Safety Protocols.
The goal of the webinar is to provide you with valuable information on ways to conscientiously but pragmatically implement safety-related requirements in the electronics development of components for factory and process automation.

Benefit from concrete examples, news and solutions for frequently occurring tasks in the field of functional safety and industrial communication.

…where ideas turn into success!

THE PRESENTERS

MESCO Engineering provides you with know-how in the field of Functional Safety and Safety-Related Communication. As a reliable development expert for industrial automation components, we present practical knowledge and development platforms.

TÜV North presents the view of an inspection and certification body regarding safety-relevant industrial communication including normative requirements to be fulfilled in this area.

Analog Devices as a technology provider presents current solutions, PHYS and designs for industrial communication with Ethernet-APL.

AGENDA

8:30 a.m.	WELCOME	Peter Bernhardt, MESCO / Bianca Pfuff, TÜV Nord / Volker Goller, AD
8:45 a.m.	LECTURE 1	Data Communication Buses – Safe Communication
9:45 a.m.	LECTURE 2	Developer Practice: Safe fieldbus = black channel Is Functional Safety that simple?
10:45 a.m.	BREAK	
11:00 a.m.	LECTURE 3	Platform Concepts and Electronics Development with Design Packages
11:30 a.m.	LECTURE 4	Ethernet communication with Ethernet-APL Technology, PHYS and System Design
12:00 p.m.	LECTURE 5	Development of safety-related process devices in hazardous areas with Ethernet-APL interfaces
12:45 p.m.	CONCLUSION Q&A	MESCO / TÜV / Analog Devices

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Data Communication Buses – Safe Communication

Description

Regardless of the industry, in modern embedded and IoT systems, communication between different subsystems is becoming increasingly important for embedded products. This means that the share of safety-relevant communication is also increasing. Failures or communication errors can lead to critical impairment. Accordingly, measures must be taken to safeguard communication. What these measures are or which concepts are behind the safeguarding will be discussed in this presentation. The impact on quantitative safety metrics will also be explained, as well as their calculations.

Key Takeaways

- Requirements for the management of functional safety
- Impact on hardware and software development
- Requirements for verification, validation, assessment and audit

SPEAKER

Dipl.-Ing. Hermann Kränzle is an expert for functional safety and cyber security in the automotive sector. He holds a degree in computer science and mathematics from the University of Augsburg.

He supports companies in the development of security and cyber security relevant embedded and software based systems. In doing so, he also works for semiconductor and tool manufacturers.

He is also a speaker in seminars on system design, architecture and software development for integrated electronic systems. As an expert, he travels worldwide in industry and automotive.

Developer Practice: *Safe fieldbus = black channel*
Is Functional Safety that simple?

Description

Most industrial Ethernet fieldbuses implement safety using the black channel approach. While this technique eliminates most fieldbus components from the safety chain, there are still a lot of things left to get the safety product implemented. This presentation will show some *dos and don't*s for implementing a safe industrial fieldbus. It will explain the mechanism of a black channel and the essential design criteria for a suitable hardware and software design.

Using an example application, you will gain insight into the decoupling and separation of safe and non-safe building blocks. With the help of a two-channel architecture, a high diagnostic coverage is achieved while reducing the computational effort. From a developer's point of view, we try to give an answer to why the question „What can go wrong?" is not a losing question, but a safety engineers enjoyable day work.

SPEAKERS

Dr. rer. nat. Bernd Kukuk is a graduate physicist and Team Leader *MESCO Embedded Hardware*.

He is a system architect and has been certified by TÜV Nord as *FSCED* (Functional Safety Certified Engineer Development). He has many years of experience in the field of safety design developments.

Martin Tschöpe is a graduate physicist and Team Leader *MESCO Embedded Software*.

He is a specialist for architectures concepts and goals of Functional Safety Management, was certified by TÜV Nord as *FSCED* and has many years of experience in international Safe Drive projects and the requirements of our customers. At the same time, he has been instrumental in the architecture of the solutions presented.

Platform Concepts and Electronics Development with Design Packages

Description

Based on many years of experience in product development, MESCO has designed Safety Design Packages. These are reusable, proven circuits and software components. With these we develop customized solutions for individual requirements. Reference designs and software libraries support, simplify and accelerate developments in both safe and non-safety relevant environments.

This presentation will introduce you to our thoughts on platform concepts and structured implementation of projects in the field of sensors, actuators, motion control and I/O modules.

Key Takeaways

- Modularization and abstraction of function groups in component development for factory automation
- Cost reduction by using proven circuits and software
- Platform concepts
- Simpler communication protocol implementation

SPEAKER

Dipl.-Ing. Peter Bernhardt is Head of Sales & Marketing at MESCO.

His background is embedded software development for process instruments. He joint MESCO sales 20 years ago and took over the marketing department shortly after.

His focus is strategic developments of the company and he is responsible for MESCO's top customers as head of sales.

Ethernet communication with Ethernet-APL Technology, PHYs and System design

Description

APL – what do you need for it? In any case new Ethernet PHYs! Analog Devices has accompanied the development of 10BASET1L, the IEEE standard on which APL is based, from the very beginning.

Already in 2019, Analog presented a prototype based on a SIP Technology. This enabled early system testing and reliable development of a PHY family for 10BASET1L/APL. The PHYs and their possibilities are presented and the possible system designs are discussed.

SPEAKER

Volker E. Goller is Systems Applications Engineer at Analog Devices and has more than 30 years of experience in industrial applications.

He has worked on complex drive technology, embedded systems up to time sensitive networking solutions.

As a software engineer, he has developed communication protocols for wired and wireless applications during this time. He accompanies the development of new communication standards through his dedicated work in many standardization committees.

Development of safety-related process devices in hazardous areas with Ethernet-APL interfaces

Description

The change in process automation begins with Industrial Ethernet and its way into the production plant without distance limitations. With the standardization activities around IEEE802.3cg, the first Ethernet phys for Single Pair Ethernet (SPE) are now available. However, there is another challenge: the additional explosive atmospheres that occur here, which require an ATEX-compliant design. In order to achieve intrinsic safety, extremely low energy budgets are necessary.

The lecture shows how a standard-compliant communication via Ethernet-APL and PoDL can be established with lowest energy consumption, and also exemplarily an IEC61508-SIL2 compliant and ATEX intrinsically safe sensor. This uses a low-cost 1oo1D architecture, which is monitored with a test facility. PROFINET is used via a black channel to route PROFIsafe packets to a safety CPU to close the safety chain to the higher-level application.

Key Takeaways

- Design Constrains Ethernet-APL
- ATEX, Intrinsic Safety aspects
- Ethernet fieldbus like PROFINET, PROFIsafe on Ethernet-APL
- Relevant standards IEC61511, IEC61508
- Low Power, Sensor, IEEE 802.3cg, PoDL

SPEAKER

Dipl.-Inform. Gerhard Weiß has been managing the office of MESCO Engineering GmbH in Freiburg for two years.

He has been working in the field of functional safety for over 10 years and is a Functional Safety Engineer (TÜV Rheinland). His focus at MESCO is process automation and safe sensor and actuator systems.
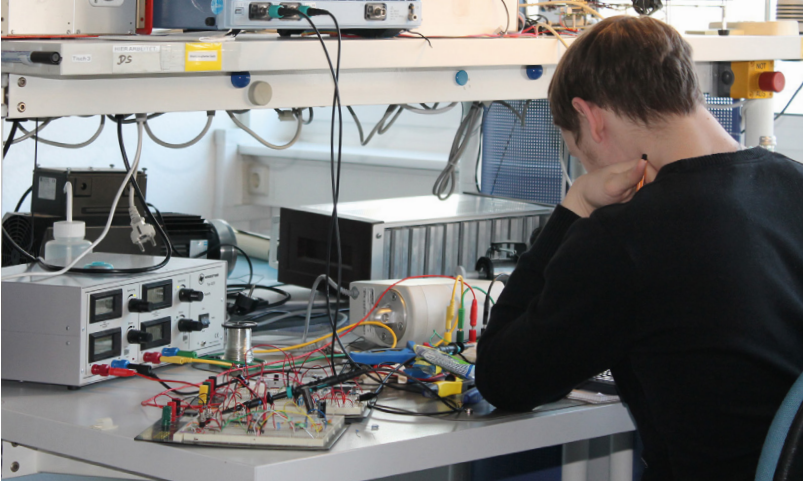
SAVE VALUABLE TIME WITH TIPS AND TRICKS FROM EXPERIENCED EXPERTS!

Of course we are also happy to answer your questions either by phone or by mail

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Contact us to participate in this free event.

About MESCO

MESCO is your partner for innovative product development in the area of process automation and factory automation. Our core competence is the development of industrial communication hardware and software. Functional safety and explosion protection are our strengths.

Through the active membership in organisations like the HART Communication Foundation, the Fieldbus Foundation and IO-Link Working Group we are engineering-wise always a step ahead.

Since 1990 we are offering to our customers – worldwide – up-to-date interbranch know-how, integrated solutions and a comprehensive service. Here an honest, transparent and partnership-like cooperation comes first.

Benefit from our many years of expert know-how and our expertise in the development of customer-specific solutions from concept to approval.

We develop for you!

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