

# PRESS RELEASE

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Security of 5G/6G backbone components and networks

## **Strengthening the security of broadband 5G/6G communication networks**

**The security of communication networks is becoming more and more important with increasing digitalization. The "RealSec5G" project aims at testing the requirements for data security in communication devices for 5G/6G infrastructures in a deterministic time-sensitive network (TSN). For this purpose, the Fraunhofer Institute for Photonic Microsystems IPMS is designing a TSN-MACsec function block that will be tested as part of a demonstrator. The final implementation and performance analysis will be done in cooperation with the industrial company albis-elcon system Germany GmbH.**

As wireless technologies continue to evolve, especially with the introduction of 5G and considerations for 6G, the security of telecommunications networks is becoming increasingly important. These new generations promise significant increases in speed, capacity, and connectivity. At the same time, however, they pose data security challenges. Reliable and secure networks are critical for critical applications such as the monitoring and control of rail and energy networks, as well as autonomous vehicles and robots. Special cases such as closed-loop applications already meet these requirements, but open architectures such as 5G/6G networks generally do not.

In the "RealSec5G" project, Fraunhofer IPMS and the consortium leader albis-elcon system Germany GmbH aim to develop and test a communication solution that increases data reliability and security for 5G/6G applications. The project aims to combine deterministic requirements in the form of real-time capability, redundancy and transmission guarantees as well as data security in a cost-effective and easy-to-integrate system. To this end, Fraunhofer IPMS is designing a TSN-MACsec function block that will be tested as part of a demonstrator.

"MACsec stands for Media Access Control Security and is a security standard specified by the IEEE for the protection of Ethernet-based networks. It guarantees the confidentiality and integrity of Ethernet frames," explains Dr. Frank Deicke, head of the Data Communication and Computing department at Fraunhofer IPMS. "Time-Sensitive Networking (TSN) adds time synchronization and deterministic communication to a number of Ethernet specifications.

The final implementation and performance analysis will be done in cooperation with albis-elcon.

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**FRAUNHOFER INSTITUTE FOR PHOTONIC MICROSYSTEMS IPMS**

The goal of the project is to support high data rates in the multigigabit range and to test and evaluate them on a practical, comparatively inexpensive FPGA platform (off-the-shelf module) in a realistic test environment.

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Together with albis-elcon, the project strengthens the innovative power in the core area of the value chain in Germany.

Both project partners believe that the successful completion of the project will result in a large number of relevant exploitation opportunities which, despite technological risks, can be expected to be exploited quickly and effectively due to the wide range of safety-critical applications in Germany. In addition to the focused sectors of energy and transportation, the project solution can be scaled to other critical infrastructure application scenarios. These include applications in government and administration, healthcare, information technology and telecommunications.

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**About Fraunhofer IPMS**

The Fraunhofer Institute for Photonic Microsystems IPMS stands for applied research and development in the fields of smart industrial solutions and manufacturing, medical technology and health, and mobility. Research focuses on miniaturized sensors and actuators, integrated circuits, wireless and wired data communication, and customized MEMS systems.

The institute has more than 20 years of experience in the design and licensing of IP cores with several hundred users worldwide in a wide range of applications in the automotive, aerospace and automation industries. Fraunhofer IPMS offers platform-independent IP core modules that can be implemented in all FPGA types and ASIC technologies. With IP cores, designers can quickly incorporate complete functional areas into standard products such as SoCs, microcontrollers, FPGAs and ASICs, significantly reducing development time and cost. In addition to standard IP cores, Fraunhofer IPMS also offers customized design adaptations or develops systems based on specific customer requirements.

**About albis-elcon system Germany GmbH**

albis-elcon develops hardware and software for devices, systems, complete networks and services that help communications service providers and large enterprises better deploy and operate nationwide and international gigabit networks and reduce energy requirements. With more than 15 million systems installed in over 40 countries, the company has a proven track record in the telecommunications industry for highly reliable and secure gigabit networks for fixed and mobile 5G networks, software-defined and virtualized network architectures, cloud and edge computing, enterprise connectivity and the Internet of Things.

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## Images

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„RealSec5G“ project logo

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