

We are pleased to introduce you to Fraunhofer TechFlash - Fraunhofer's Flash News on latest and exciting technologies.

This week's TechFlash is about new technologies in **Autonomous Driving and Smart Solutions for Production and AI**:

1. Vehicle in cabin monitoring: More safety in the car through contactless, AI-supported vital signs recording
2. One-shot image collection: New 3072-pixel LiDAR camera for fast image capture improves safety and autonomy in vehicles and production by providing high accuracy under harsh weather conditions or machine-induced vibration
3. Efficient Charging and Fail-Safe Monitoring of Machine Tools and Robots with our RISC-V Processors
4. »ASIL-D ready«: Certification-Ready Safety Module for Microcontrollers to Monitor Machines and Unmanned Aerial Objects

[Fraunhofer Institute for Microelectronic Circuits and Systems \(IMS\)](#) carries out research, development and pilot fabrication of microelectronic solutions for industrial and public clients, the majority of which are from the semiconductor industry.

Vehicle in cabin monitoring: More safety in the car through contactless, AI-supported vital signs recording



Fraunhofer IMS has developed a new demonstrator that simulates real driving behaviour and can measure important vital parameters of the person driving. Based on optical camera systems, vital parameters such as heart rate and respiration rate can be recorded contactlessly in the vehicle interior and analyzed directly. With the help of specially adapted algorithms, various disturbances can be taken into account, such as:

- Vibrations of the vehicle
- Movements of the person driving
- Changes in light, over- and underexposure and reflections
- People in the background

The demonstrator is ready for integration in cabin.

We look forward to hearing of your interest to discuss your requirement.

[Yes, I am interested](#)

One-shot image collection: New 3072-pixel LiDAR camera for fast image capture improves safety and autonomy in vehicles and production by providing high accuracy under harsh weather conditions or machine-induced vibration



Fraunhofer IMS has upgraded its LiDAR (Light Detection and Ranging) camera TinyOwl to 3072 pixels. A 3D integration has been technologically enhanced by Fraunhofer IMS for the SPAD-based (Single-Photon-Avalanche-Diode) camera demo. The advanced camera is particularly robust and can ensure accurate image capture even under harsh weather conditions or machine-induced vibration.

The TinyOwl 3072 Pixel captures its environment in 3D enormously fast through sensitive, optical components and separately manufactured and then stacked, connected readout electronics. Due to the powerful LiDAR sensor technology without moving components (»solid-state«), the TinyOwl beats many other systems in accuracy, even in harsh environments. The solid-state design allows the system to address applications in the mobility, industrial, aerospace and aviation sectors, helping them to detect their environment despite strong vibrations and motion. Thus, irritations and dangerous situations can be detected faster, and incidents can be prevented.

We look forward to hearing of your interest to discuss your requirement.

[Yes, I am interested](#)

Efficient Charging and Fail-Safe Monitoring of Machine Tools and Robots with our RISC-V Processors



AIRISC-POWER designed for »Traction Inverter« (drive converter) in machine tools, conveyor belts, transport robots and many more. The fast switching and flexibility provided by the programmable RISC-V processor makes this chip an advanced solution to predict failures by continuously measuring motor currents using AI.

This programmable controller IC with integrated single-channel high resolution PWM is developed for optimized control of next-generation gallium nitride and silicon carbide power devices with high switching frequencies, such as in:

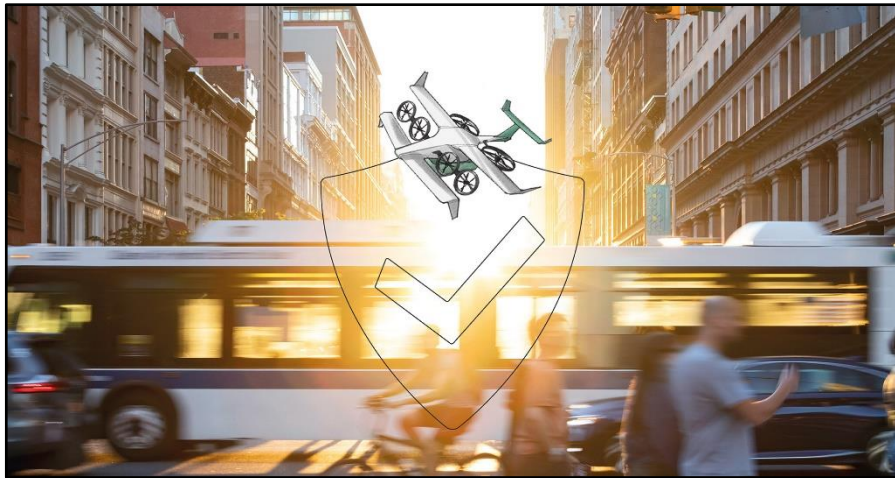
- Lighting
- PV inverters
- E-mobility (powertrain and charging)
- Power factor correction
- Datacentre Point-of-Load converters

It is ready to be integrated in industrial drives.

We look forward to hearing of your interest to discuss your requirement.

[Yes, I am interested](#)

»ASIL-D ready«: Certification-Ready Safety Module for Microcontrollers to Monitor Machines and Unmanned Aerial Objects



Fraunhofer IMS welcomes a new member to its RISC-V processor product family AIRISC - the AIRISC-SAFETY. The AIRISC-SAFETY has been successfully certified as »ASIL-D ready« (automotive safety integrity level) by TÜV SGS according to ISO 26262 and is now ready for the market. The certification means that industrial customers directly receive a safety element including a manual and can thus incorporate the AIRISC-SAFETY into their own chips as a basic element for functional safety.

The Fraunhofer IMS offers customized services for ASIC and FPGA integration around the AIRISC-SAFETY. You can contact us for license enquiry.

We look forward to hearing of your interest to discuss your requirement.

[Yes, I am interested](#)

About Fraunhofer-Gesellschaft:

The Fraunhofer-Gesellschaft, headquartered in Germany, is the world's leading applied research organization. With its focus on developing key technologies that are vital for the future and enabling the commercial exploitation of this work by business and industry, Fraunhofer plays a central role in the innovation process. As a pioneer and catalyst for ground-breaking developments and scientific excellence, Fraunhofer helps shape society now and in the future. Founded in 1949, the Fraunhofer-Gesellschaft currently operates 76 institutes and research institutions throughout Germany. The majority of the organization's 30,800 employees are qualified scientists and engineers, who work with an annual research budget of 3 billion euros. Of this sum, 2.6 billion euros is generated through contract research. Our global footprint is very strong, with offices and research centres in the USA, Europe and Asia. Some of our renowned innovations are the MP3 software, white LED's and the smallest of cameras.

Fraunhofer has been a long-time trusted innovation partner in India, collaborating with some of the major players in the field of Material Science, Energy, Environment, Automotive, Electro-mobility, Production Technology and Smart Cities, working with Industry, Government and Public Sector.

Kindly contact Mr. Aditya Fuke, Senior Manager – Strategic Projects, Smart Cities & IoT at Fraunhofer Office India for further details.

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