



(Source: Smart Eye)

It integrates camera, image sensor, and processing hardware as well as software into one device. Martin Krantz, CEO (chief executive officer) and founder of Smart Eye, stated: "The combination of quality and high performance with such a small footprint simply hasn't been done before." There is no external ECU (electronic control unit) or domain controller required.

The DMS is especially suited for vehicle platforms with limited space and constrained processing resources. It also enables direct integration with ADAS (advanced driver assistance systems) by means of the CAN interface, supporting real-time coordination between driver state detection and safety-critical systems. The CAN transceivers provide sleep and wake-up capability.

The DMS is based on the OAX8000 processor with an on-chip stack DRAM (dynamic random-access memory). The processor runs the embedded AI (artificial intelligence) algorithms, tracking the driver's eyes and evaluating the values of the bio-sensors. The integrated 60-MHz image sensor features 1.5 million pixels. The product consumes 2 W and is specified for a temperature range from -40 °C to +85 °C. It meets Euro NCAP, GSR standards, and supports other global regulatory requirements, according to the supplier.

The DMS is used by several customers (e.g., BMW, Boeing, Geely, GM, Honeywell, NASA, Nissan, Polestar, and Volvo). Recently, two truck OEMs (original equipment manufacturers) decided to adapt the AI-based sensor system. The commercial vehicles are planned to be on road in 2028. In total, the Swedish supplier has now received a total of 368 design wins from 23 OEMs.

### Cooperating with Renesas and Green Hills

In Las Vegas, Smart Eye and Renesas, a Japanese chipmaker, announced to integrate the DMS into the R-Car X5H system-on-chip (SoC) family. This pre-integration enables Smart Eye's safety-critical software to operate alongside infotainment and other high-performance workloads on a single compute unit, supporting the shift toward centralized architectures in software-defined vehicles (SDV).

As part of this integration, Smart Eye's software is included in the Renesas RoX Whitebox SDK (software

development kit), giving OEMs and Tier-1 suppliers access to a ready-to-run in-cabin sensing stack during the platform evaluation. With pre-validated camera support and a lightweight compute footprint, the DMS software can be activated out of the box. "OEMs are moving rapidly toward centralized compute, and Renesas' R-Car Gen 5 platform shows how safety and infotainment domains can coexist without compromise," said Detlef Wilke, Vice President Innovations & Strategic Partnerships at Smart Eye. "Pre-integration enables OEMs to deploy driver and occupant monitoring quickly and securely, without adding hardware or creating integration bottlenecks. It shortens the path from concept to production and reduces the friction that typically slows new vehicle programs." Aish Dubey, Vice President of the High-performance Computing SoC Business Division at Renesas, added: "With the R-Car X5H, we're enabling partners like Smart Eye to run safety-critical applications alongside advanced cockpit and AI workloads on a unified architecture. This approach reduces system complexity for our customers and speeds the deployment of new vehicle features."

On the CES trade show, Smart Eye and Green Hills demonstrated the DMS software running alongside a digital instrument cluster on a single ECU powered by Green Hills Software's ASIL-certified Integrity real-time operating system (RTOS). "We're proud to collaborate with Green Hills Software to demonstrate a truly production-focused approach to integrating driver monitoring into modern vehicle architectures," said Martin Krantz. "This joint solution shows how OEMs can bring safety-critical driver monitoring to market faster by combining our proven DMS software with a secure, consolidated compute platform designed for the challenging demands of today's vehicles." Dan Mender, Vice President of Business Development at Green Hills Software, added: "By pairing Smart Eye's industry-leading driver monitoring software with our Integrity RTOS and development tools, we're delivering OEMs and Tier-1s a clear path to deploy mixed-criticality applications safely and efficiently. This demo underscores how our combined technologies help customers accelerate the development of next-generation in-cabin safety systems, reduce integration efforts, and ensure freedom from interference."

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