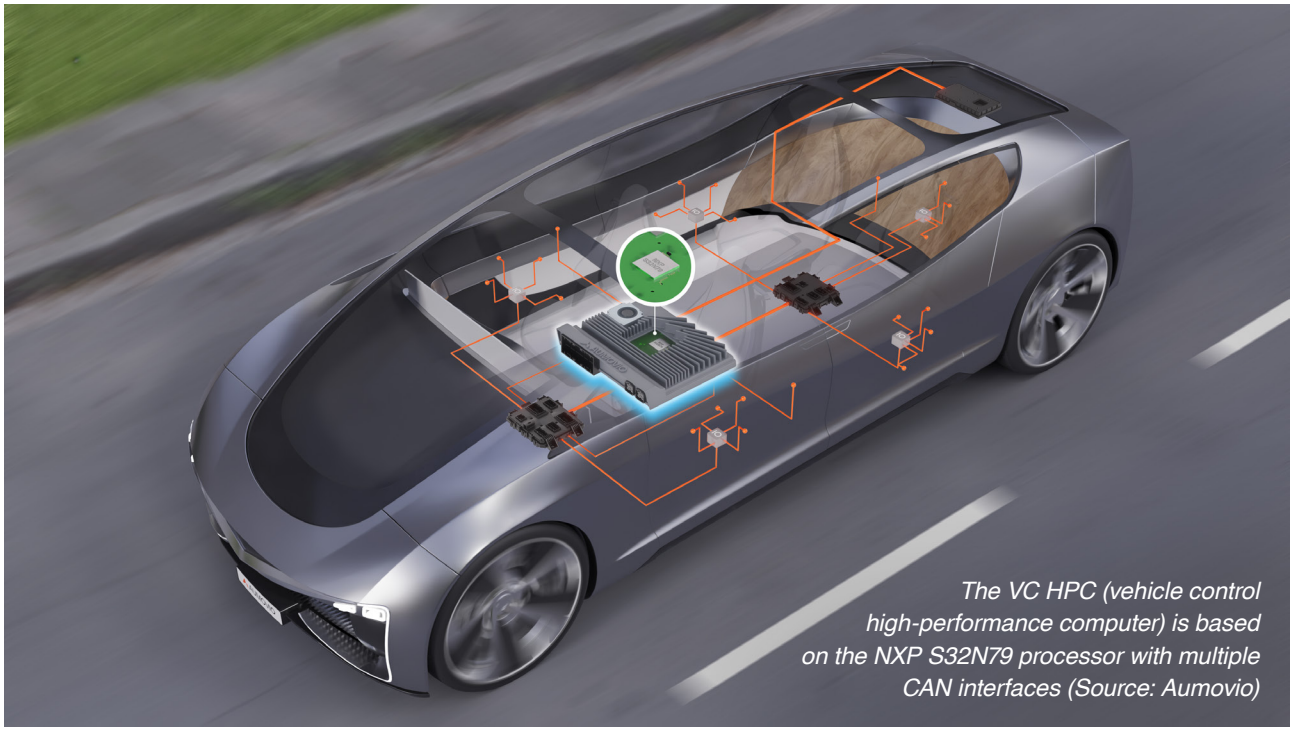
Central ECU for next-generation passenger cars

Aumovio (Germany) has introduced an electronic control unit (ECU) based on the S32N79 processor by NXP (Netherlands). This product is intended to be used as a central unit in future passenger cars. It features multiple CAN FD and CAN XL ports as well as dedicated CAN router functions.



The VC HPC (vehicle control high-performance computer) is based on the NXP S32N79 processor with multiple CAN interfaces (Source: Aumovio)

Aumovio and NXP continue their long-standing collaboration in system and chip development. In Las Vegas on the CES 2026 trade show, a high-performance ECU was demonstrated. The controller bundles functions from areas such as chassis, motion, and body subsystems. It is built on the S32N79 processor series, implementing multiple hardware-isolated cores and featuring security measures.

"Our goal is to make compute performance in vehicles safer, more efficient, and more flexible," explained Jean-François Tarabbia, Member of the Executive Board and Head of the Architecture and Network Solutions business area at Aumovio. "Our VC HPC (vehicle control high-performance computer) solution with the integrated new NXP chip provides the technological foundation for vehicles to receive new and enhanced software functions seamlessly throughout their entire lifecycle." By virtualizing the entire development and test environment, NXP was able to create and validate the software in a digital twin long before the physical chip was available. As a result, once the first S32N79 sample was received, Aumovio was able to build a functional VC HPC prototype.

Traditional ECU architectures separate domains and map them to dedicated microcontrollers. In contrast, the VC HPC integrates these functions centrally on a single chip while still isolating them to avoid redundancies. For example, a safety-related braking function can run on the same chip as a comfort or chassis module – without the systems influencing one another.

This "cross-domain integration" reduces the number of ECUs, saves weight, and enables a more flexible vehicle architecture. For automakers, this means less complexity, lower costs, and greater potential to deliver software updates or new functions throughout the vehicle's lifecycle. At the same time, lifetime update and upgrade capability are key to long-term value retention – for both OEMs (original equipment manufacturers) and end users. The launched ECU can be flexibly customized to customer requirements and integrated into different vehicle architectures, whether domain-based or server-zone-based.

The NXP processor comprises up to eight split-lock Cortex-A78AE cores operating at up to 1,8 GHz, up to twelve split-lock Cortex-R52 cores operating at up to 1,4 GHz, one RISC-V-based accelerator for networking, mathematical, and data-intensive tasks. Additionally, the chip integrates one eIQ Neutron neural processing unit (NPU) as well as independent safety and safe communication managers. The product is developed according to processes that are ▷

certified to ISO 26262 for ASIL D functional safety and complies with cybersecurity processes according to ISO/SAE 21434, UN R155, targeting SESIP Level 2 certification. Up to two asymmetric crypto accelerators support secure communications and secure OTA (over-the-air) updates. There is also an independent housekeeping controller on the chip.

The onchip communication subsystem manages low-speed communication interfaces. The CAN hub virtualizes CAN I/Os and allows applications to share CAN I/O pins, allows CAN frames to be routed to multiple CAN controllers and offloads CAN-to-CAN routing from the host core. There are multiple CAN FD and CAN XL protocol controllers implemented. Additionally, the processor provides seven Ethernet ports with TSN (time-sensitive networking) capability, supporting bit rates from 10 Mbit/s to 10 Gbit/s. Of course, there are additional LIN (local interconnect network) and Flexray ports.

The launched ECU by Aumovio can process sensor information in real-time. Designed not only for powerful performance but also for efficiency, it uses a power modeling to precisely adapt energy consumption to different operating states – whether during charging, in energy-saving standby mode, when parked, or during power-intensive driving.

A long history in working together

"Our close collaboration with Aumovio underscores how crucial it is to consider hardware and software together from the beginning – from system architecture to integration in real vehicle environments," said Jens Hinrichsen, Executive Vice President and General Manager, Analog and Automotive Embedded Systems at NXP. "Our solutions give OEMs a clear advantage in implementing software-defined vehicle concepts – with a platform that is scalable, safe, secure, energy-efficient, and software-compatible across the entire S32N family." Since its spin-off in September 2025, Aumovio continues the business of the former Continental group sector Automotive as an independent company. This includes the development of the launched central ECU for the next-generation of passenger cars. Aumovio also offers sensor solutions, displays, braking, and comfort systems. The company, headquartered in Frankfurt (Germany), provides also expertise in software, architecture platforms, and assistance systems for software-defined vehicles (SDV). In the fiscal year 2024, the business areas, which now belong to Aumovio, generated sales of 19,6 billion Euro. The company has over 86000 employees in more than 100 locations worldwide.

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