

# Solutions for Automotive Ethernet

## Tools, Basic Software and Services

### Ethernet in Motor Vehicles

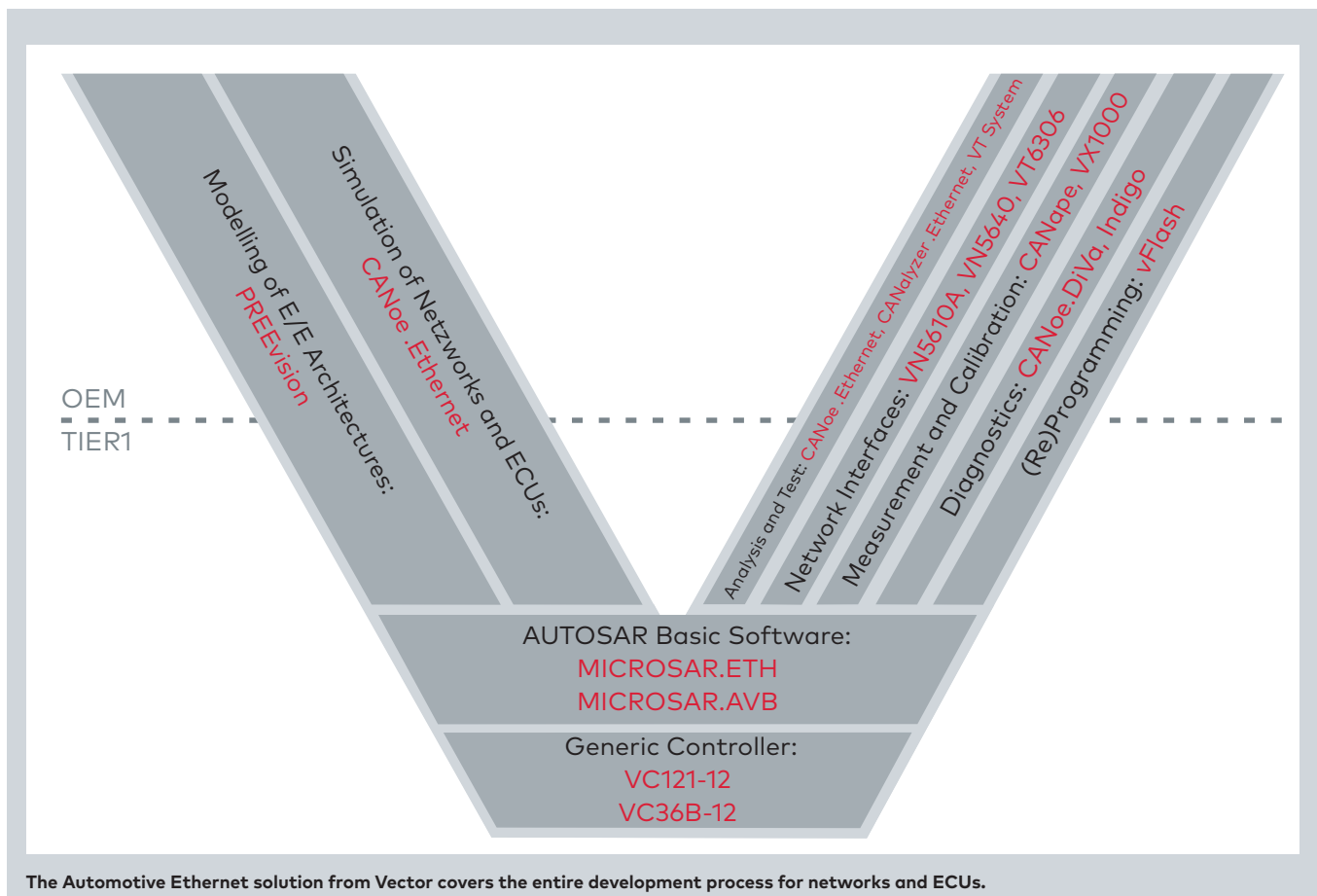
The Ethernet technology is used in many areas of the vehicle:

- > Data network and backbone, e.g. for ADAS applications
- > Audio and video data transfer
- > ECU calibration
- > Diagnostics and flashing

New communication technologies and new physical layers such as IEEE 100BASE-T1 (BroadR-Reach) and 1000BASE-T1 are used with Ethernet. Vector offers comprehensive solutions for your Ethernet projects and supports you with professional tools, basic software and services.

### Overview of Advantages

- > Practice-proven products and competent services based on Vector's many years of experience in automotive networking
- > Universal multibus tool chain
- > Support / implementation of the latest AUTOSAR 4.3 specification
- > Practice-oriented solutions through participation in standardization committees such as OPEN Alliance SIG and AUTOSAR as well as intensive cooperation with users
- > Support for AUTOSAR Adaptive



### Tools

- > **PREEvision** – Model-based engineering environment for developing E/E architectures. PREEvision supports AUTOSAR system, software and communication design according to AUTOSAR Classic and AUTOSAR Adaptive and enables both signal- and service-oriented architectures. The Ethernet support includes all relevant configurations for end nodes, switches and VLANs as well as protocols such as SOME/IP, Service Discovery, DoIP and Global Time Synchronization.
- > **CANoe .Ethernet** – Cross-network remaining bus simulation and testing of ECUs and entire networks with one tool. The .Ethernet option contains functions for analyzing and stimulating Ethernet, SOME/IP and AVB as well as OEM-specific protocols.
- > **CANalyzer .Ethernet** – Analysis of the whole vehicle communication beyond bus and protocol boundaries. The .Ethernet option contains functions for analyzing and stimulating Ethernet, SOME/IP and AVB as well as OEM-specific protocols.
- > **VT System** – Modular test environment for efficient ECU and function tests as well as for the injection of errors. Together with CANoe, the VT System forms a powerful and flexible solution for test benches and HIL test systems. In addition, the Ethernet module VT6306 enables stress tests on Layer 1 (Physical Layer).
- > **CANape** and **VX1000** – Measurement, calibration and flashing over XCP with high data throughput resulting in minimal runtime effects on the ECU
- > **CANoe.DiVa** – Automated validation of the diagnostic software, e.g. via DoIP.
- > **Indigo** – Easy to use diagnostic tester, e.g. via DoIP.
- > **vFlash** – Easy to use tool for flashing one or more ECUs, e.g. via DoIP and SoAd (Socket Adapter).

### AUTOSAR Basic Software

**MICROSAR.ETH** – Ethernet-based communication:

- > Service-oriented communication using Service Discovery and SOME/IP
- > Secure communication via SecOC, IPsec and TLS
- > PDU- and signal-based communication
- > Fast and parallel diagnostics and re-programming of ECUs according to ISO 13400-2 (DoIP)
- > Measurement and calibration via XCP-on-Ethernet

**MICROSAR.AVB** – Audio/Video Bridging:

- > Audio video streaming
- > Selection of the most accurate timer
- > Displaying a synchronous system clock
- > Guaranteed Latency

In addition, the MICROSAR basic software offers comprehensive hardware support of Ethernet controllers, switches and transceivers.

### Network Interface

Vector offers you a whole family of Automotive Ethernet interfaces – e.g. **VN5610A** and **VN5640** – with different features. They are used as media converters, switches or interfaces and support the Automotive Ethernet Physical Layer IEEE 100BASE-T1 (BroadR-Reach) and 1000BASE-T1 as well as 10BASE-T, 100BASE-TX and 1000BASE-T.

### Universal ECUs

**VC121-12** and **VC36B-12** – Universal ECUs for gateways and I/O applications. They are ideal for quickly developing functional samples and for use in small production runs. The VC121-12 supports CAN, FlexRay, LIN and IEEE 100BASE-T1 (BroadR-Reach). The VC36B-12 contains interfaces for CAN (FD), LIN, IEEE 100BASE-T1 (BroadR-Reach) und 100BASE-TX.

### Services

Vector offers you services with know-how:

- > **Seminars and Workshops**
- > **Technical consultation**
- > **Project support**

The knowledge of our experienced employees is your advantage for efficient and customer-specific Automotive Ethernet solutions.

**More information:** [www.vector.com/ethernet](http://www.vector.com/ethernet)