

Basic Information

2014

Short Version

AUTOSAR – Enabling technology for advanced Automotive Electronics

Over the last decade, software development for automotive applications has become increasingly important. Currently, software controls a vast number of functions that communicate via linked networks. The complex interaction of these functions requires a standard, controlled software environment. The accelerating pace of development and the increasing integration of functions and electronic control units (ECU) pose a challenge for vehicle manufacturers and their suppliers. An industry standard for development of ECU Basic Software and Interfaces offers an effective way to manage growing system-level complexity, keep costs affordable and protect for future innovation.

AUTOSAR (AUTomotive Open System ARchitecture) is a standardized and open software architecture for automotive electronic control units (ECUs). AUTOSAR is a cooperation of automotive manufacturers, automotive suppliers, tool vendors and semiconductor vendors. The AUTOSAR development partnership is focused on managing the growing complexity in the development of automotive electric/electronic (E/E) architectures, with the aim to enable new technologies and improve development efficiency – without making compromises on quality.

AUTOSAR – The Idea

The AUTOSAR standard consists of a set of specifications that describe a software architecture, application interfaces and a methodology. The AUTOSAR layered software architecture enables the application of independent software components. These can be used in vehicles of different manufacturers, and in electronic components of different suppliers that can span multiple product generations. It results in a high reliability of the overall system with significant cost and capacity benefits. The AUTOSAR motto “Cooperate on standards, compete on implementation” offers various benefits to automotive manufacturers, automotive suppliers, tool providers, and even new market entrants.

AUTOSAR development partnership

More than 180 companies participate in the AUTOSAR development partnership as of January 2014. They are organized as Core Partners, Premium Partners, Associated Partners and Development Partners. The Core Partners drive AUTOSAR having organizational, administrative and control responsibilities. Within this core, the Executive Board is AUTOSAR's ultimate decision making board defining the overall strategy and roadmap of the cooperation. The Steering Committee is AUTOSAR's top level acting board, coordinating the day-to-day non-technical operations of the cooperation, and is commissioned to map out AUTOSAR's long term objectives. The Project Leader Team is responsible for coordinating the Technical working packages and monitoring their statuses. All of these teams meet on a regular basis. Work on the AUTOSAR specifications is divided into a number of work packages (WPs), which may be divided into sub-work packages as necessary. Along with the Core Partners, the Premium and Development Partners participate in and actively contribute to the work packages. Any company can become a partner of the AUTOSAR development partnership, and this partnership is a precondition for exploiting the specifications for commercial purposes. The contribution of partners varies depending on the type of partnership.

From Phase I to just AUTOSAR

The AUTOSAR development partnership published its first set of its specifications in May 2006 with Release 2.0. Release 2.0 defined 42 of the 46 Basic Software components that have been completed, and comprises more than 90 documents. Starting with Release 2.1 at the end of Phase I in 2006 and Release 3.0/3.1, the majority of partners started their series roll-out of AUTOSAR. Many production vehicles with AUTOSAR compliant ECUs are already on the road, as more AUTOSAR compliant products enter the market. Tool solutions that cover the essential parts of the AUTOSAR standard help make the implementation easier. With the logical further development of Release 3.0 and the publication of Release 4.0, which integrates several new features including many related to functional safety or communication, the development partnership successfully finished Phase II in 2009 and with it the basic development of the standard.

During Phase III (2010-2012) AUTOSAR was on the one hand dealing with the selective enhancement of Release 3.x and Release 4.0 to ensure a reliable and future-oriented architecture and methodology. On the other hand, the maintenance of current releases used for series development and production played an important role in supporting the implementation of the standard. During this process, AUTOSAR focuses on backward compatibility

at all times. Phase III delivered the advanced Release 4.0.3, which consists of 176 documents. Another major result of Phase III was the publication of Release 3.2, which is backwards compatible to Release 3.1. Concept development for AUTOSAR Phase III centered on Release 4.1, which was published in early 2013. Due to the continuing success in the market and the increasing penetration, the partnership decided not to use the word 'Phase' anymore – it's just AUTOSAR now.

AUTOSAR – Future Outlook

The partnership has fully incorporated a 'Concept Development' phase into the mainstream AUTOSAR specification process by continually evaluating and developing new concepts and validating them before integration into the standard. The next minor Release 4.2.1 is planned for October 2014 and will incorporate new concepts already required by AUTOSAR partners.

Technology drivers such as functional safety, Ethernet TCP/IP communication, multi-core, security and new diagnostics regulations as well as support for specific regional market needs will continue to be the focal point of development for the next few years.

The partnership is actively collaborating with other standardization bodies in areas such as GENIVI, Car-to-X, and Ethernet to ensure AUTOSAR will provide an infrastructure that supports many standards.

AUTOSAR (AUTomotive Open System ARchitecture) is a worldwide development partnership of car manufacturers, suppliers and other companies from the electronics, semiconductor and software industry. Since 2003 they have been working on the development and introduction of an open, standardized software architecture for the automotive industry. By simplifying the exchange and update options for software and hardware with the AUTOSAR approach, it forms the basis for reliably controlling the growing complexity of the electrical and electronic systems in motor vehicles. AUTOSAR also improves cost efficiency without compromising quality. The "core partners" of AUTOSAR are the BMW Group, Bosch, Continental, Daimler AG, Ford, General Motors, PSA Peugeot Citroën, Toyota and the Volkswagen Group. In addition to these companies, more than 180 partners play an important role in the success of the partnership. Companies which join the AUTOSAR Development Partnership can use the specifications free of charge.

Additional information is available at:

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