R-Car S4 AUTOSAR Classic Solution

Solution Summary

Green Hills Software and Tata Elxsi offer a pre-integrated AUTOSAR Classic software solution for Renesas R-Car S4 allowing OEMs and Tier-1s to build AUTOSAR-based safety critical system, like braking systems, x-by-wire systems, or battery management systems.

The pre-integrated package for AUTOSAR Classic includes:

- ASIL-D qualified toolchain, incl. Green Hills' MULTI® integrated development environment (IDE)
- ASIL-D certified RTOS µ-velOSity™ (certification in progress)
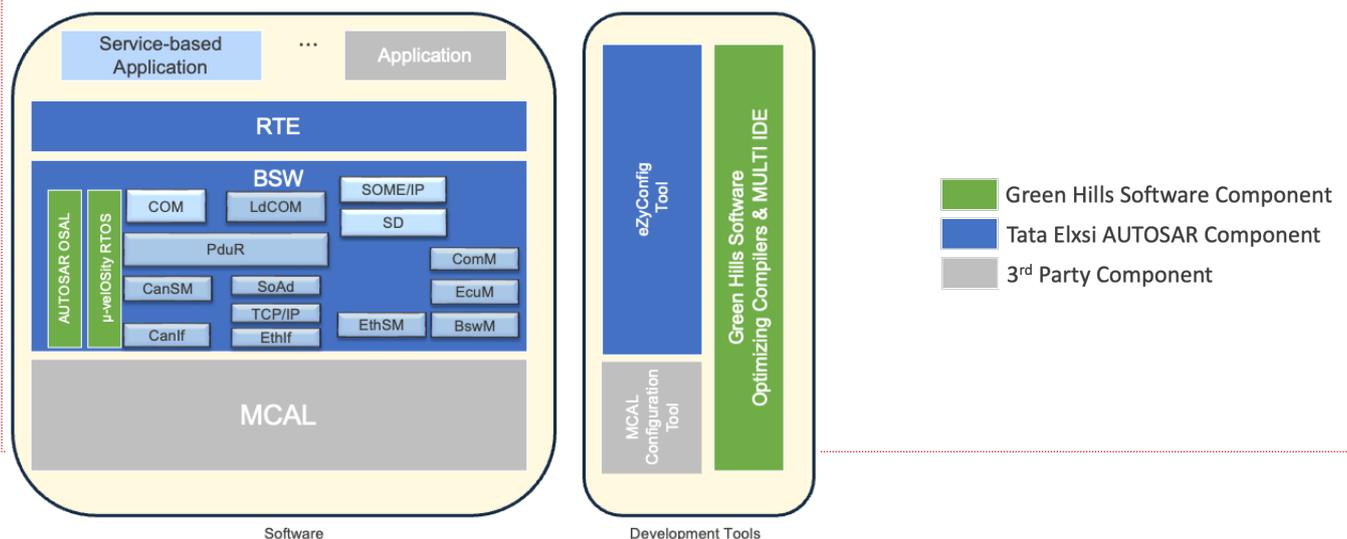- ASIL-D qualified AUTOSAR Classic 4.2/4.3 software stack

This solution allows for system architects and software developers to focus on the higher-level application by providing a ready-for-production AUTOSAR foundation with proven functional safety capabilities.

Features/Benefits

The R-Car S4 AUTOSAR Classic Solution by Tata Elxsi and Green Hills Software eases the development of AUTOSAR-based ECUs with increased safety and/or security requirements by offering:

- Extended hardware including support for RISC-V-based MCUs and MCUs featuring a memory protection unit (MPU), e.g. based on the Arm Cortex-R52
- Full functional safety enablement up to ASIL D covering tools, operating system and AUTOSAR stack
- A safe and secure RTOS offering up/downscaling options and additional security features
- Out-of-the box tool integration with Green Hills' MULTI IDE and Tata Elxsi's AUTOSAR configuration tool eZyConfig
- Single configuration tool for both application design and BSW (Basic Software) configuration
- Possible customization of the stack at optimal cost
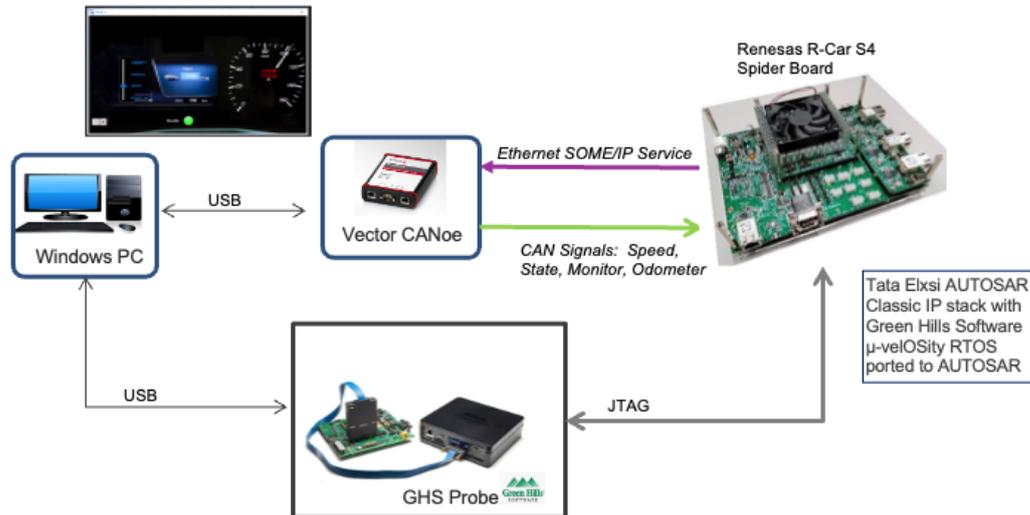- Flexible licensing model

Diagrams/Graphics

Software

Development Tools

Legend:
- Green Hills Software Component
- Tata Elxsi AUTOSAR Component
- 3rd Party Component

Gateway demo with the following main components:
- Tata Elxsi's AUTOSAR Classic platform & Green Hills Software's μ-velOSity have been integrated on the R-Car S4, to develop a Software-Defined Vehicle (SDV) gateway platform.
- This demo shows the forwarding of CAN data to an Ethernet service-based communication by using SOME/IP (Scalable Service-Oriented Middleware over IP) and Service Discovery protocol.
- The gateway enables the communication between traditional CAN-based networks and the new service-based Ethernet networks.

To achieve the above, Tata Elxsi AUTOSAR Classic has been integrated with Green Hills Software's μ-velOSity running on the R52 of the R-Car S4:
- Configuration & integration of AUTOSAR BSW comprising of CAN, Ethernet, Mode Management, SOME/IP, SD (Service Discovery), RTE (Run-Time Environment) modules
- Configuration & integration of μ-velOSity as an AUTOSAR compliant operating system in the BSW via the eZyConfig tool
- Configuration & integration of Renesas SDK for R52 MCAL (Microcontroller Abstraction Layer) drivers
- Sample service-based applications running over the RTE

Deployment and debugging with Green Hills Software's MULTI IDE on a R-Car S4 Cortex-R52

More Information

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