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## TR-Electronic uses the Axivion Bauhaus Suite with architecture analysis and MISRA checker for firmware development

Manage firmware variants in automation solutions while ensuring secure, long-term further development: Introducing the Axivion Bauhaus Suite has enabled TR-Electronic GmbH in Trossingen to ensure that custom software requirements are implemented consistently and its proven architecture models are respected. Static analyses, as well as MISRA and CERT® checks provided by the tool in order to prevent systematic safety and security errors, ensure compliance with TR-Electronic's stringent safety standards for sensors and actuators. At the same time, the checks and reports provided by the Axivion Bauhaus Suite are largely automated, which has greatly reduced the amount of time and money spent on verification and validation during firmware development.

### Reviewing programming standards and detecting violations

TR-Electronic's industrial product portfolio includes rotary encoders, linear encoders, intelligent compact drives, as well as control and measuring modules.

The firmware used in its automation solutions relies on proven architecture models, which also provide the foundation for further and new developments. The Axivion Bauhaus Suite will be responsible for automated checking of the firmware C-language and architecture after every single build. In addition, its integrated MISRA checker covers all the automatically checkable

MISRA rules from programming standard MISRA C:2012, as well as the CERT® programming rules, which are crucial for software security.

The Axivion Bauhaus Suite analyses reliably check for compliance with metric threshold values, as well as company-specific and general programming rules. They also indicate any violations of the pre-defined software architecture. Architecture verification by the tool suite ensures that interface requirements are consistently respected and supports the encapsulation of modules.

### Comprehensive feedback improves programming quality

The short feedback cycles, particularly for architectural violations during ongoing code development, are rapidly having a positive impact on programming quality. This is thanks to regular and meaningful feedback, which enables prompt corrections to be made to the code.

Overall, TR-Electronic has significantly reduced the amount of human effort required in order to verify and validate software architectures and codes. At the same time, the Axivion Bauhaus Suite rounds off the development team's existing toolchain when it comes to security aspects of firmware development.



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Christoph Kuner, M.Sc., FS Director, TR-Electronic GmbH: "The Axivion Bauhaus Suite is another crucial building block for quality assurance in our firmware development, particularly in terms of the increasingly strict safety and security requirements within an industrial environment."

For more information on the Axivion Bauhaus Suite and the functions it offers for architecture and code analysis, see [www.axivion.com](http://www.axivion.com).

#### About Axivion

Axivion, based in Stuttgart, Germany, is a provider for innovative software solutions for static code analysis and for protection from software erosion. The core product of Axivion is the Axivion Bauhaus Suite, a tool suite for the improvement of software quality and maintainability of software systems implemented in the programming languages Ada, C, C++, C#, and Java. In addition to static code analysis, the tool suite includes innovative software tools for architecture verification and clone management. Moreover, the tool suite detects software erosion factors such as cycles, dead code and violations of programming rules. Axivion's MISRA checker covers 100% of all automatically testable MISRA rules for the standards MISRA C:2004, MISRA C:2012, and MISRA C++:2008. Furthermore, the AUTOSAR C++14 styleguide as well as the CERT® programming rules for secure software development are supported.

The Professional Services Team of Axivion offers methods and training concepts as well as service and consulting to support customers to assure an effective and efficient rollout of the tools.

Axivion's customers are companies that develop innovative technical software across different industries, e.g. industrial automation, automotive, railway, electronics, information and telecommunication, avionics, medical, mechanical engineering, as well as measurement, control and regulation technology.

Since its foundation in 2006, Axivion maintains close research links to the University of Stuttgart, Germany, and to the University of Bremen, Germany to keep up with the newest trends in programming and code analysis research.

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