Qt Group

OVERVIEW

Axivion Suite

Axivion Static Code Analysis

Axivion Architecture Verification

Axivion Suite

- A single tool for holistic static code analysis and architecture verification with detailed delta-analysis.
- Automated software quality checks for increased productivity and return on investment.
- Follows industry-leading standards and guidelines (e.g. MISRA) and ensuring software compliance.
- Fully customizable and easy to integrate into existing development environments.
- Ready for AI-powered workflows to augment developers' daily work.
- A scalable tool that adapts to changing requirements and evolves with your development needs.
- Supports CRA compliance efforts by identifying security-relevant weaknesses (secure-by-design principle).
- Unmatched service and support to ensure productivity right from the start.

What is Software Erosion?

Software erosion (also known as technical debt) is the root cause of most issues during software development. Over time, it makes maintainability, extensibility and reusability of software more difficult, or even impossible.

Source code is continuously modified to enhance the functionality of the software and to adapt to new or changed requirements. Although this might not impair the function of the software, it potentially introduces additional burden on future tasks.

As a consequence, software erosion can also degrade the observable operation of a system and compromises its functional safety and security. The result: relevant criteria (e.g. according to ISO norms, DO-330, MISRA), may not be met anymore, thus delaying or even preventing the successful certification in certain application domains.

Detect Bugs Early

Save time and money by detecting bugs early. Fix them before they cause damage.

Maximize Efficiency

Save up to 15% in **development costs** by making sure your software architecture is easy to understand.

Ensure Compliance

Comply with leading **coding guidelines and industry standards**.

Reduce Your Team's Workload

Let your developers **focus on building features** instead of fixing bugs.

Faster Time to Market

Surpass your competitors, by going to market faster with a higher-quality product.

Enhance Maintainability

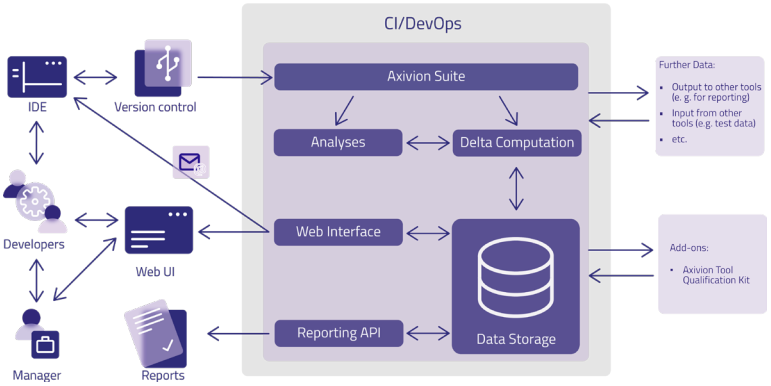
Reduce time needed to fix **technical debt** by 33% and keep your code maintainable.

Your Needs. Your Rules.

Axivion Suite combines Axivion Static Code Analysis and Axivion Architecture Verification and will provide you with an industry-leading, in-depth analysis of your code.

It seamlessly integrates into your existing development environment and is highly customizable, allowing you to add your company-specific rules or other rulesets to the already extremely comprehensive list of coding guidelines.

Our experts will support the entire roll-out process to ensure you can enjoy the benefits right from the start.



If you want Axivion to be part of your AI-powered workflows, simply activate our Model Context Protocol (MCP) Connector and use your preferred large language model (LLM). Your AI agent can now access the Axivion documentation and the findings from the analysis to help developers understand and fix bugs faster. Connecting the agent to other sources (e.g. the internet, internal servers) is up to your discretion.

By using the plugin for VS Code, developers can not only apply AI to understand the code, but also to make changes to the code with the help of AI.

AI-augmented, not AI-dependent: Axivion does not use AI for the analysis, thus making it suitable for developing software for safety-critical environments and compliance verification.

Stopping Software Erosion

Axivion checks software projects for style and coding violations and also verifies if the code matches the intended architecture. Detecting architecture violations, clones, dead code, division by zero and other defects in the code at an early stage drastically reduces the time and costs involved fixing these issues at a later stage.

Axivion also supports a vast number of metrics and coding guidelines. Especially safety-relevant software can therefore be easily monitored. Furthermore, individual rules, configuration options and coding guidelines can be added, ensuring high quality standards are maintained right from the start.

New violations can easily be identified thanks to the delta-analysis. This way, baselining is made easy. Violations are displayed on the user-friendly dashboard. These results can also include findings from third-party tools.

More Than the Sum of its Parts

Axivion Static Code Analysis

High Code Quality for Safe Software

The automated analysis of your software projects identifies violations of coding guidelines according to e.g. MISRA, CUDA C++ Guidelines, and AUTOSAR C++14.

Security-relevant violations are analyzed with coding guidelines according to CERT, C Secure Coding, and CWE.

Metric violations (e.g. according to HIS or Halstead) are displayed and documented, as are clones, cycles or unreachable code.

Ideal for Developing Safety-Critical Software

SGS-TÜV Saar GmbH has certified that Axivion's Static Code Analysis is suitable for use in the development of safety systems up to the highest level of the safety requirement contained in the respective standard:

- EN 50716 (up to SIL 4)
- IEC 61508 (up to SIL 4)
- IEC 62304 (up to Class C)
- ISO 26262 (up to ASIL-D)

Download the certificate:

Axivion Architecture Verification

Software architecture and design need to match with the code for you to have a reliable guide and baseline for discussing the impact of new features. Only then is a long-term targeted and planned development of your products possible.

Architecture Checks

Axivion Architecture Verification ensures your code complies with your architecture. In addition to the functional architecture, the tool also reviews and checks safety and security architecture specifications for compliance, e.g. Freedom from Interference.

Architecture Recovery

Besides the continous, automated architecture checks, Axivion also allows you to recover the software's architecture, even if no documentation is available. This feature is particularly useful when dealing with legacy and third party code.

Architecture Export

Axivion also offers the possibility to export the architecture. All necessary elements (e.g. components, functions, information flow, dependencies) are extracted from the code and can be opened and modified in Enterprise Architect.

Made for You

Axivion Suite is used in a wide range of industries and is suitable for mid-sized companies and large corporations alike.

Whether you are developing embedded software for small sensors or large machinery, aiming for improved usability, or looking to meet guidelines and standards: Axivion will help you achieve your goals faster, better and with fewer resources; all thanks to a tool tailored to your needs.

Request a free demo:

Axivion Architecture Verification
Build a strong foundation and ensure your code matches your architecture

Static Code Analysis
Dead Code Analysis, Coding Guidelines, Metrics Monitoring

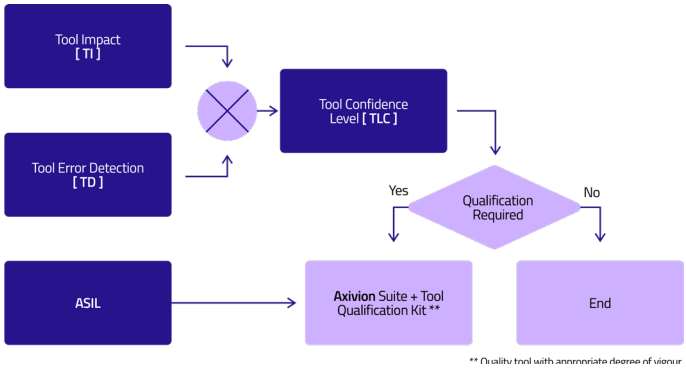
Static Code Analysis PRO
Dead Code Analysis, Coding Guidelines, Metrics Monitoring, Cycle Detection, Clone Detection and Management

Axivion Suite
The truly holistic approach including all the above features

Axivion for CUDA
The Axivion Suite to stop software erosion in CUDA projects and to comply with NVIDIA's CUDA C++ Guidelines

Axivion Tool Qualification Kit

The Axivion Tool Qualification Kit helps to achieve the tool confidence level (TCL) required by the respective safety regulation. By automatically carrying out validation test it ensures that new code always meets the set safety standards.



The Tool Qualification Kit supports classification and qualification of your tool chain. It comprises prefabricated test suites (for HIS metrics, as well as for MISRA, AUTOSAR C++14, CUDA C++ Guidelines, CWE, C Secure Coding and CERT rules) with execution and results evaluation processes that can be automated.

It also includes tests to check and validate your architecture verification.

The Axivion Tool Qualification Kit can verify the suitability of Axivion Static Code Analysis, Axivion Architecture Verification and Axivion for CUDA in environments with functional safety requirements.

Available Test Files for Static Code Analysis

- AUTOSAR
- CERT C/C++
- CWE
- Error checks
- HIS Metrics
- MISRA-C:2012/2019/2023/2025
- MISRA-C++:2008/2023
- NVIDIA CUDA C++ Guidelines
  - Including test files for running MISRA C++:2023 rules on CUDA code
- Secure Coding

Available Test Files for Architecture Verification

- Architecture_Analyses
  - architecture analyses, sanity checks, and model transformation
- Dependencies
  - enhancing the RFG with types and access information
- Exporters
  - GXL exports and RFG storage
- Graph_Based_Analyses
  - additional RFG-based analyses, such as cycle detection, dead code detection, or RFG schema checks
- Importers
  - importers targeting various sources, such as Enterprise Architect or PlantUML
- Legacy
  - legacy rules
- Transformations
  - graph transformations

Supporting Your CRA-Compliance Efforts

The CRA mandates that manufacturers apply secure-by-design principles and actively manage vulnerabilities throughout a product's lifecycle. Axivion's static analysis checkers for CWE (Common Weakness Enumeration) and CERT Secure Coding standards help development teams identify security-relevant weaknesses (e.g. buffer overflows and race conditions) early in the development cycle. Its architecture verification capabilities also support the structural integrity and maintainability of the codebase over time, which is relevant to the CRA's requirement to sustain security across a product's supported lifetime. These capabilities position Axivion as a useful tool for the secure development process that the CRA requires.

Key Features

Architecture verification

- Integrated modeler
- Interfaces to UML tools
- AUTOSAR XML import (ARXML)
- Freedom from Interference
- Architecture reconstruction
- Architecture views for safety and security
- Architecture Export
- Architecture as Code

Coding guidelines

- NVIDIA CUDA C++ Guidelines
- MISRA C/C++
- AUTOSAR C++14
- SEI CERT® C/C++
- C Secure Coding
- CWE
- Qt-specific rule sets
- Best practice (e.g. CQM)
- Customized checks

Metrics monitoring

- HIS
- OO Design metrics
- Complexity metrics
- Best practice and customized checks

Dead code analysis

- Reachability analysis
- Analysis of libraries

Clone detection & management

- Type I (1:1)
- Type II (Parametrizations)
- Type III (Parametrizations + Add/Delete)

Cycle detection

- Calls
- Module dependencies
- Includes/Imports
- Customized checks

Defect detection

Memory and Pointers

- NULL dereferences
- Escaping addresses of local variables
- Memory leaks from new/malloc without delete/free
- Mismatched resource allocations/releases
- Resources used for reading/writing at the same time
- Forbidden operations on resources
- Double free/use after free
- Comparison/subtraction of unrelated pointers
- Array access out of bounds
- Buffer overflow
- Side effects
- Taint analysis
- Race condition analysis

Exceptions

- Exceptions during stack unwinding
- Violations of exception specifications
- Uncaught exceptions
- Dead catch blocks

Numerical errors

- Divisions by zero
- Overflow in arithmetic computation
- Assignment of bad values to enum-typed variables

Logical errors and customized rules

- Forbidden argument values
- Uninitialized variables
- Unused definitions
- Constant conditions

Note

For Axivion, “defects” focus on run time errors. But the tools, of course, also cover API usage, syntax errors etc.

Please contact us for further details.

Basic Technical Specifications

Note: This is just a rough overview and refers to Axivion 7.12. Please contact us for a complete list of specifications.

Supported languages and compilers

Languages	C, C++, CUDA C++, C#[1], RUST[1]
Compilers	Blackfin, Clang, Codevision, CodeWarrior®, Cosmic, Green Hills Software®, GNU, IAR™, Keil™, Microchip®, Microsoft®, NVIDIA® nvcc, Renesas, Tasking, TI, Windriver, Others

Supported operating systems

Host OS	Windows® 10/11 or Windows® Server®2016/2019/2022/2025 in 64bit x86_64 GNU/Linux® (minimum requirement is glibc2.28 or later), Linux ARM64 macOS® ARM64

Plugins

IDE	Qt Creator, CLion, Eclipse™, Eclipse-based (e.g. e² studio, Atollic TrueSTUDIO®, CodeWarrior®, DAVE™, STM32CubeIDE, TI Code Composer Studio™), Microsoft® Visual Studio®, Microsoft® Visual Studio Code®, Generic plugins
CI/DevOps	Azure® DevOps, Jenkins®, Integration for e.g. Bitbucket®, GitLab®, GitHub

Supported version control systems

Version Control System	Borland®/Inprise®/MicroFocus® StarTeam®, CVS, Fossil, Git™, IBM® Rational® ClearCase®, IBM® Rational®, Team Concert®, Mercurial, Microsoft® Team Foundation Server®, Microsoft® Visual SourceSafe®, MKS Source Integrity®, Perforce®, Perforce®/Seapine® Surround®, Plastic, PTC Integrity®, Serena® Dimensions®, Serena®, PVCS®, Subversion®

Supported UML® tools

UML® Tools	IBM Rational Rhapsody, Sparx Enterprise Architect (via XMI or .qea-files), PlantUML

Supported standards and guidelines

Coding Guidelines	NVIDIA CUDA C++ Guidelines, MISRA C:2004/2012/2019/2023/2025, MISRA C++:2008/2023, AUTOSAR C++14, CERT C Rules, CERT C Recommendations, CERT C++ Rules, CWE, ISO / IEC TS 17961, Qt Framework, Customized checks and other
Quality Guidelines[2]	EN 50716 (up to SIL 4) IEC 61508 (up to SIL 4) IEC 62304 (up to Class C) ISO 26262 (up to ASIL-D)

Other

Supported browsers	Microsoft® Edge, Mozilla Firefox®, Google Chrome™
Requirements	Java® Runtime (17,21,25)
Add-on	Axivion Tool Qualification Kits for C/C++/CUDA C++ for static code analysis and architecture verification

[1] Limited support
[2] Certified by SGS-TÜV Saar

Qt Group

Qt Group (Nasdaq Helsinki: QTCOM) is a global software company, trusted by industry leaders and over 1.5 million developers worldwide to create applications and smart devices that users love. We help our customers increase productivity through the entire product development journey: from UI design to software development, optimizing embedded systems, and quality management. Our customers are in more than 70 different industries in over 180 countries. Qt Group employs some 1100 people, and its net sales in 2025 were 216.3 MEUR. To learn more, visit www.qt.io.

www.qt.io/axivion