

WHITEPAPER

RaimaDB Cert

The Only Certified Embedded Database for Functional Safety

Certified to ISO 26262 (ASIL D) by SGS-TÜV Saar, with DO-178C (DAL A), EN 61508, IEC 62304, IEC 60880, and EN 50128 (CENELEC) certifications soon to follow.

Ships with full traceability, 100% MC/DC coverage evidence, MISRA C:2023-aligned code, and an audit-ready Safety Kit—so you can focus certification effort on your system, not the database layer.

1. Executive Summary

RaimaDB Cert is the only certified embedded database for functional safety. Certified to ISO 26262 (ASIL D) by SGS-TÜV Saar—with DO-178C (DAL A), EN 61508, IEC 62304, IEC 60880, and EN 50128 (CENELEC) certifications soon to follow—it ships as a complete, audit-ready package: source code, safety documentation, traceability evidence, and 100% MC/DC coverage reports.

Certification programs are routinely delayed by evidence generation—traceability, coverage, reviews, and audit packages. RaimaDB Cert reduces that burden by delivering a certified database component plus the safety artifacts teams need to integrate it as a Safety Element out of Context (SEooC). The result: engineering teams building safety-critical systems can certify their system, not their database layer.

This whitepaper is for embedded software engineers, functional safety managers, and technical evaluators who need to understand what RaimaDB Cert delivers, how it fits into a certification program, and why a pre-certified database component changes the economics of safety-critical development.



2. The Growing Cost of Safety Certification

Safety-critical industries are hitting a complexity wall. As systems become more software-defined—vehicles running millions of lines of code, medical devices relying on real-time data management, industrial controllers orchestrating autonomous operations—the burden of certifying every component has scaled proportionally.

Standards like ISO 26262 and DO-178C require rigorous bidirectional traceability: every safety requirement must map to a design element, through implementation, and into a verification test case. At the highest integrity levels (ASIL D, DAL A), achieving 100% Modified Condition/Decision Coverage (MC/DC) is mandatory. Hand-writing these test cases for a single module can take weeks. Maintaining the full traceability chain across an entire system can take months.

For engineering teams, this creates a difficult reality: documentation and verification now routinely consume more time and budget than the actual software development. Every software component in the safety-critical path must carry its own certification evidence. If the database layer lacks that evidence, the integration team inherits the full burden of qualifying it—a process that is expensive, time-consuming, and risky.

The core question for any embedded team evaluating a database: do you want to certify your database layer yourself, or start with one that is already certified?

3. The Solution: A Pre-Certified Database Layer

Certiably Safe

RaimaDB Cert 16.1 is independently certified by SGS-TÜV Saar to meet the highest functional safety and cybersecurity standards. The current certification covers ISO 26262-6 up to ASIL D—the highest automotive safety integrity level. Certification programs for DO-178C (DAL A), EN 61508, IEC 62304, IEC 60880, and EN 50128 (CENELEC) are in progress, with supporting documentation from TÜV/SGS partners.

This is not a self-assessment or a compliance checklist. It is an independent, third-party certification confirming that RaimaDB meets the requirements of the applicable safety standards. When you integrate RaimaDB Cert into your system, you receive a fully documented component with audit-ready evidence—ready to present to your certification assessor as part of your system’s safety case.

Safety Element out of Context (SEooC)

RaimaDB Cert is designed to function as a Safety Element out of Context (SEooC) under ISO 26262. This means it has been developed and certified with documented Assumptions of Use (AoUs)—explicit conditions under which the database operates safely. Your integration team reviews these assumptions, verifies they hold in your target environment, and integrates the component with confidence that the safety evidence transfers.

This approach is how the automotive and aerospace industries have handled certified components for decades: reusable, pre-qualified building blocks that accelerate system-level certification rather than bottleneck it.



4. The RaimaDB Cert Safety Kit

RaimaDB Cert ships with an audit-ready Safety Kit—a complete package of certification artifacts so your team starts with reusable certification assets instead of building documentation from scratch. The kit is tailored per standard, so as additional certifications come online, teams working under DO-178C will receive different documentation than those working under ISO 26262, each structured to match what assessors expect.







Deliverable	Description
Software Development Kit (SDK)	Full source code and libraries for integration into your embedded platform
Safety Manual	Standard-specific guidance tailored for each certification (ISO 26262 available now; DO-178C, EN 61508, IEC 62304, IEC 60880, and EN 50128 manuals to follow)
Requirements Traceability Matrix	End-to-end mapping from safety requirements through design, implementation, and test evidence
Test Plan & Reports	Verification strategy and results, including 100% MC/DC coverage evidence
Software Design Artifacts	FMEA, HARA, and TARA documentation for your safety case
Certification Reports	Standard-specific compliance reports prepared for assessor review
Assumptions of Use (AoUs)	Documented constraints and integration guidelines for safe deployment
Safety Requirements (TSRs/FSRs)	Technical and Functional Safety Requirements for the database layer
Target Verification Suite	Executable test suite for verification on your target RTOS (VxWorks, QNX, Green Hills INTEGRITY)
SEooC Guidance	Documentation supporting use of RaimaDB Cert as a Safety Element out of Context

For the ISO 26262 certification, every artifact in the Safety Kit has been reviewed and accepted as part of the SGS-TÜV Saar certification process. These are not templates or guidelines—they are delivered, completed evidence packages. The same rigorous approach will apply as additional certifications are completed.



5. Standards Coverage

RaimaDB Cert is positioned to become the only embedded database certified across DO-178C, ISO 26262, EN 61508, IEC 62304, IEC 60880, and EN 50128 (CENELEC)—covering automotive, aerospace, industrial, medical, nuclear, and rail domains. ISO 26262 (ASIL D) certification is achieved, with additional standard certifications soon to follow.

					
Automotive	Aerospace & Avionics	Industrial Automation & Energy	Medical Devices	Nuclear & Power Systems	Rail & Transportalton
ISO 26262 (ASIL)	DO-178C (DAL A)	EN 61508	IEC 62304	IEC 60880	EN 50128 (CENELEC), SIL 3/4
ECUs for powertrain, ADAS, and vehicle control systems	Cockpit systems, navigation modules, flight-critical systems	PLCs, robotics, high-reliability systems in manufacturing and processing plants	Surgical robots, patient monitoring, life-support systems	Safety-critical software for nuclear plant instrumentation and control	Railway control, signalling, safety-related systems
TIME-TO-MARKET & COST PRESSURES					
HIGHER QUALITY & PRODUTIVITY EPECTED					

Standard	Industry	Typical Applications
ISO 26262 (ASIL D)	Automotive	Powertrain ECUs, ADAS, vehicle control systems, autonomous driving platforms
DO-178C (DAL A)	Aerospace & Avionics	Cockpit systems, navigation modules, flight-critical data management
EN 61508 (SIL 3/4)	Industrial Automation	PLCs, robotics, process control, manufacturing safety systems
IEC 62304 (Class C)	Medical Devices	Surgical robots, patient monitoring, life-support software
IEC 60880	Nuclear & Power	Nuclear plant instrumentation and control systems
EN 50128 (CENELEC)	Rail & Transport	Railway signaling, train control, safety-related transport systems

As each certification is completed, it will include standard-specific safety manuals, certification reports, and verification evidence structured to meet the expectations of domain assessors. Teams working across multiple regulated industries will be able to use the same database engine with the appropriate certification package for each project.

6. Use Cases by Industry

Automotive

Integrate RaimaDB Cert into ECUs for powertrain, ADAS, or vehicle control systems where ASIL-level compliance is essential. With ISO 26262 (ASIL D) certification already in place, RaimaDB Cert is ready for integration into automotive safety-critical deployments today.

Aerospace & Avionics

A DO-178C (DAL A) certified database for cockpit systems, navigation modules, and flight-critical functions. Certification for DO-178C is in progress, enabling teams to begin planning integration ahead of formal certification completion.

Industrial Automation & Energy

Built with EN 61508 compliance at its core—ideal for PLCs, robotics, and high-reliability systems in manufacturing or processing plants.

Medical Devices

Designed to support IEC 62304 lifecycle processes—suitable for surgical robots, patient monitoring systems, and life-support software.

Nuclear & Power Systems

Targeting IEC 60880 certification—optimized for safety-critical software in nuclear plant instrumentation and control systems.

Rail & Transportation

Targeting EN 50128 (CENELEC) certification—RaimaDB Cert will support compliance for railway control, signaling, and safety-related systems where SIL 3/4 software reliability is mandatory.

7. Technical Profile

RaimaDB Cert carries the same embedded DNA that has made RaimaDB a trusted database in mission-critical deployments for over three decades. It is designed for constrained environments where footprint, determinism, and runtime reliability are non-negotiable.

Specification	Detail
Footprint	< 500 KB
Architecture	In-process embedded engine (no server required)
RTOS Support	VxWorks, QNX, Green Hills INTEGRITY, Linux, Windows
Code Standard	MISRA C:2023 aligned
APIs	C/C++ native, SQL and cursor-based access
Data Models	Relational, network (graph), and hybrid
Replication	Built-in data replication for distributed embedded architectures
Storage	In-memory, on-disk, or hybrid configurations

MISRA C:2023 Compliance

RaimaDB Cert is aligned with MISRA C:2023 coding guidelines, designed for static analysis and certified toolchains. This alignment supports smoother integration into safety-qualified codebases and reduces the effort required to meet coding standard requirements during system-level certification.

Built for Embedded Systems

Optimized for constrained environments with a minimal footprint under 500 KB, RaimaDB Cert is designed for RTOS platforms and AUTOSAR Classic deployments. As an in-process embedded engine, it eliminates the overhead of client-server communication. Data access happens directly in your application's memory space, delivering deterministic read/write performance suited to real-time constraints. The engine supports in-memory, on-disk, or hybrid storage configurations.

8. Designed for Functional Safety Roles

For Functional Safety Managers

Reduce certification effort and audit risk with pre-qualified artifacts and safety documentation. For ISO 26262 projects, the Safety Kit provides completed FMEA, HARA, TARA, traceability matrices, and certification reports—all reviewed and accepted by SGS-TÜV Saar. Instead of generating evidence from scratch for the database layer, you receive audit-ready documentation that removes an entire component from your verification workload.

For Embedded Software Architects

Gain a robust, certified data engine with traceability, performance, and easy integration. RaimaDB Cert integrates as a native C/C++ library with a footprint under 500 KB. It runs on

VxWorks, QNX, and Green Hills INTEGRITY without requiring an external server process. The MISRA C:2023 alignment means it fits cleanly into codebases already subject to static analysis.

For Program Managers

Accelerate project timelines and cut certification costs with proven, reusable assets. When the database layer arrives with completed certification evidence, your team spends less time on qualification activities and more time on application-level development. Multi-standard coverage also simplifies programs that span multiple regulated domains—one database engine, multiple certification packages, reusable across projects.

9. Accelerating Certification with TimeZero

TimeZero is an independent spin-off from Raima that automates functional safety certification end-to-end—designed to accelerate certification workflows for DO-178C, ISO 26262, EN 61508, IEC 62304, IEC 60880, and EN 50128 (CENELEC). By combining AI-driven automation with Raima’s safety-critical domain expertise, TimeZero reduces certification effort, speeds compliance, and helps teams produce auditor-ready outputs—continuously, as your code evolves.

Key capabilities that TimeZero brings to RaimaDB Cert deployments:

- **Automated test generation** with 100% MC/DC coverage evidence and fault injection
- **Coverage gap analysis** and end-to-end traceability across requirements, design, code, and tests
- **Certification-ready artifacts**, including AoUs, TSRs, FSRs, and verification reports
- **Multi-platform support** — verify on target environments such as VxWorks, QNX, and Green Hills
- **Professional services support** to certify applications using RaimaDB as a Safety Element out of Context (SEooC)

100% Code Coverage	90% Time Reduction	20% Time-to-Certification	50% Cost Reduction
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10. Next Steps

RaimaDB Cert removes the database layer from your certification critical path. Instead of spending months qualifying a database component, your team starts with independently certified evidence and focuses engineering effort where it matters most: your application.

Whether you are building automotive ECUs today or planning avionics, medical, industrial, nuclear, or rail deployments—RaimaDB Cert provides a single embedded database platform designed for safety certification across all of these domains.

Download the whitepaper: raima.com/raimadb-cert

Book a demo: raima.com/contact-us

Download a trial: raima.com/download-trial

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