

# 通过RISC-V预认证解决方案应对功能安全挑战



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# 功能安全标准

- 不同行业都有对应的功能安全标准
- 所有功能安全标准都对开发过程(development process)提出了要求:
  - Requirements gathering, implementation, testing, verification and validation of relevant safety functionality, programming language selection, etc, ...
- 所有标准, 都对开发工具(development tools)提出了要求:
  - 例如: 在ISO 26262中编译器的工具置信等级是最高级别的TCL3





# 功能安全挑战

- 具有功能安全要求的嵌入式系统需求增加
- 功能安全标准对工具同样提出了高要求
- 工具验证成本和挑战很高

More human-machine  
interactions than ever

Autonomous technology is  
everywhere

Maintain a safe state and  
protect human life



# 如何处理工具的验证和论证

- **方法一：自己做验证**
  - 时间和资源的消耗
  - 工具不是用户的核心能力
  - 验证经验很难重用：项目非常类似（硬件，功能安全需求，参与者等），才能重用之前验证的经验
  - ...
- **方法二：使用预认证的工具**
  - 通过权威机构的认证，比如TÜV SÜD
  - 经独立测试机构测试
  - IAR 提供全面的功能安全预认证的解决方案



# IAR Embedded Workbench and IAR Build Tools

## 第一款通过功能安全认证的RISC-V软件开发工具

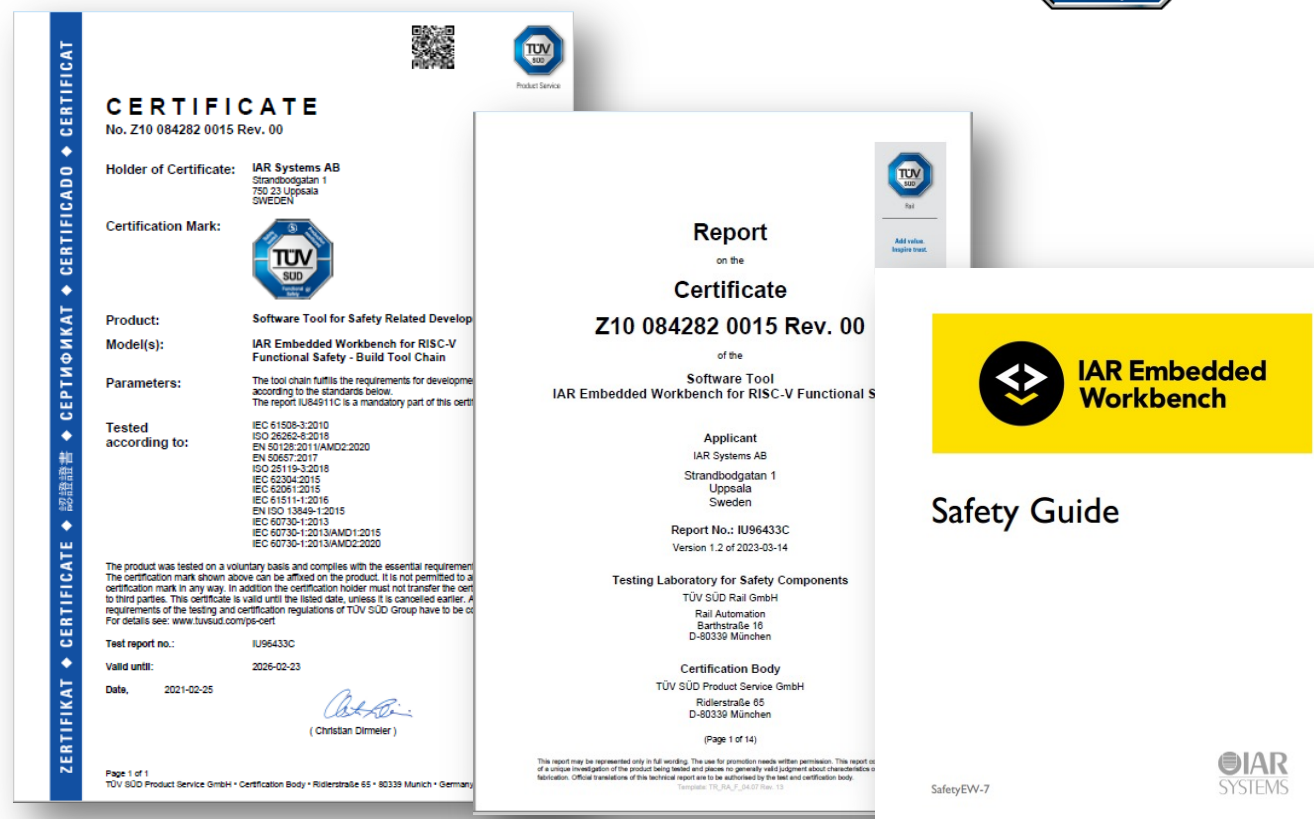


### 功能安全文档：简化验证(Validation)

- 功能安全证书
- 功能安全报告
- 安全指南

### 全生命周期的技术支持

- 优先的技术支持服务
- 补丁也通过认证
- 问题报告





# IAR Embedded Workbench and IAR Build Tools

功能安全认证覆盖多种功能安全标准

	Industrial IEC 61508	Automotive ISO 26262	Railway EN 50128 EN 50657	Medical IEC 62304	Agriculture & forestry ISO 25119	Machinery control ISO 13849 IEC 62061	Process industry IEC 61511	Household appliances IEC 60730
Arm	•	•	•	•	•	•	•	•
RISC-V	•	•	•	•	•	•	•	•
Renesas RX	•	•	•	•				
Renesas RL78	•	•	•	•				
Renesas RH850	•	•	•	•				
STM8	•	•	•	•				

# RISC-V功能安全应用案例

## IAR Systems' Functional Safety Certified Development Tools for RISC-V support the latest SiFive Automotive Solutions

IAR Embedded Workbench for RISC-V provides full core support for the recently introduced SiFive Automotive E6-A and S7-A products

Uppsala, Sweden – October 17, 2022 – IAR Systems®, the world leader in software and services for embedded development, continues their support for SiFive's RISC-V Automotive CPU IP. The IAR Embedded Workbench™ for RISC-V aims at the latest SiFive Automotive E6-A and S7-A product series which address the needs of automotive applications like infotainment, connectivity, and ADAS. IAR's complete development solution helps embedded software developers at OEMs and suppliers to maximize the energy efficiency, simplicity, security, and flexibility upsides that RISC-V offers.

RISC-V uses a single instruction set architecture (ISA) across all product offerings, increases code portability, and significantly reduces cost and time-to-market for automotive applications. The SiFive Automotive processor families offer a high level of flexibility, with options that enable both area and performance optimization for different integrity levels like ASIL B, ASIL D, or

## IAR Systems and CAES improve embedded tech in space

Developers working on mission-critical applications for the space environment based on the NOEL-V processor will benefit from IAR's leading optimization technology to improve performance.

Uppsala, Sweden – December 15, 2022 – IAR Systems®, world leader in software and services for embedded development, and Gaisler, the fault-tolerant processor design center of CAES, are pleased to announce the start of a new partnership. IAR Systems will soon release a new version of the IAR Embedded Workbench for RISC-V. The new version will have support for NOEL-V, the RISC-V space grade processor from Gaisler.

The NOEL-V is a synthesizable VHDL model of a processor implementing the RISC-V architecture. It is highly configurable, and it offers profiles going from high-performance Linux-capable architectures to area-optimized micro-controller solutions. The NOEL-V is also designed to include fault tolerant features that allow it to run software without interruptions, correcting automatically faults due to the radiation naturally present in the space environment.

The IAR Embedded Workbench for RISC-V is a complete development toolchain that provides developers with everything they need in one easy-to-use integrated development environment. The toolchain offers extensive debugging capabilities, including multi-core debugging and

## IAR Embedded Workbench for RISC-V功能安全版将全面支持芯来科技NA系列车规级处理器内核



Press release | 26 July 2023

## Andes晶心科技与IAR的整合功能安全解决方案，协助奕力科技开发其高性能的触控与显示驱动整合 (TDDI) 芯片



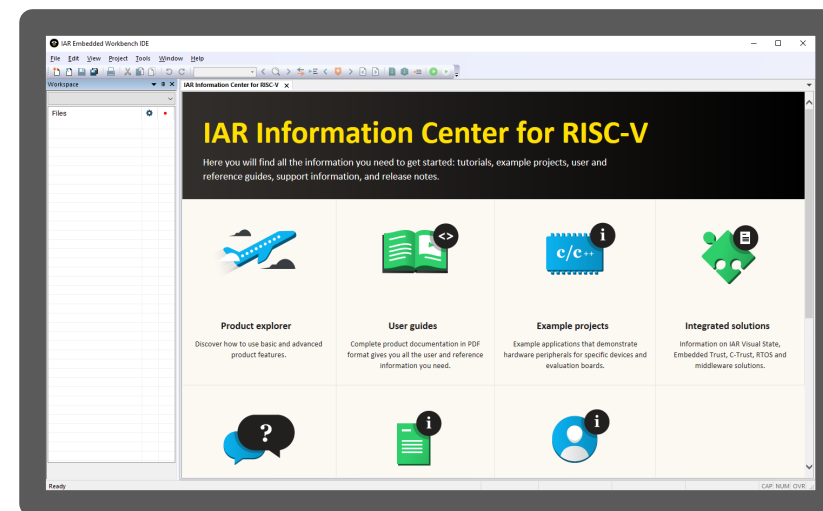
Press release | 16 March 2023



# IAR Embedded Workbench for RISC-V

## 领先的RISC-V嵌入式开发专业解决方案

- 功能安全认证的编译器，提供出色的编译器优化能
- 静态代码分析
- 全面调试功能
- 支持多核多架构调试
  - 例如： RISC-V and Arm 多核调试
- 先进的Trace功能，支持代码覆盖率和性能分析
- 专业的技术支持





# 总结

功能安全需求  
正在上升

IAR

预认证解决方案  
加快用户产品上市时间

静态代码分析  
可提高代码质量

使用功能安全版，  
专注于您的应用



Thank you

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