Solution sheet: Proven example for

Safe Communication Implementation

Microcontroller, Development kit, and Stack

Increasing demands for Safe Communication

As IIoT (Industrial Internet of Things) and DX (Digital Transformation) advance in the industrial automation market, there are increasing demands for visualization and digitization, not only on production line level but also on device level. At the same time, functional safety has become a global standard, and the next step is implementing functional safety via communication (as opposed to convetional hard wiring). Some products on the market, such as industrial robots, semiconductor manufacturing equipment, and food processing machines that are compatible with industrial networks already incorporate safety communication.

Here is an example of implementing safe communication in products which are already compatible with an industrial network.

Case example: FSoE (Functional Safety over EtherCAT) *

1 Functional Safety Package for STM32 & STM8

STMicroelectronics provides a comprehensive set of certified Functional Safety packages based on robust built-in STM8 MCU and STM32 MCU and MPU safety features. The aim is to significantly reduce the development efforts, time and costs required to meet functional safety standards such as IEC61508 and ISO 26262.

ST's industry-leading MCUs have suitable IPs such as watchdog, hardware CRC, memory monitoring and protection to enable functional safety on the system. ST partners such as IAR systems and HMS Networks, are experts in functional safety and their software and services are the high affinity with ST MCUs. This combination helps users achieve embedded functional safety applications.

2 Functional Safety Certified Integrated Development Environment IAR Embedded Workbench

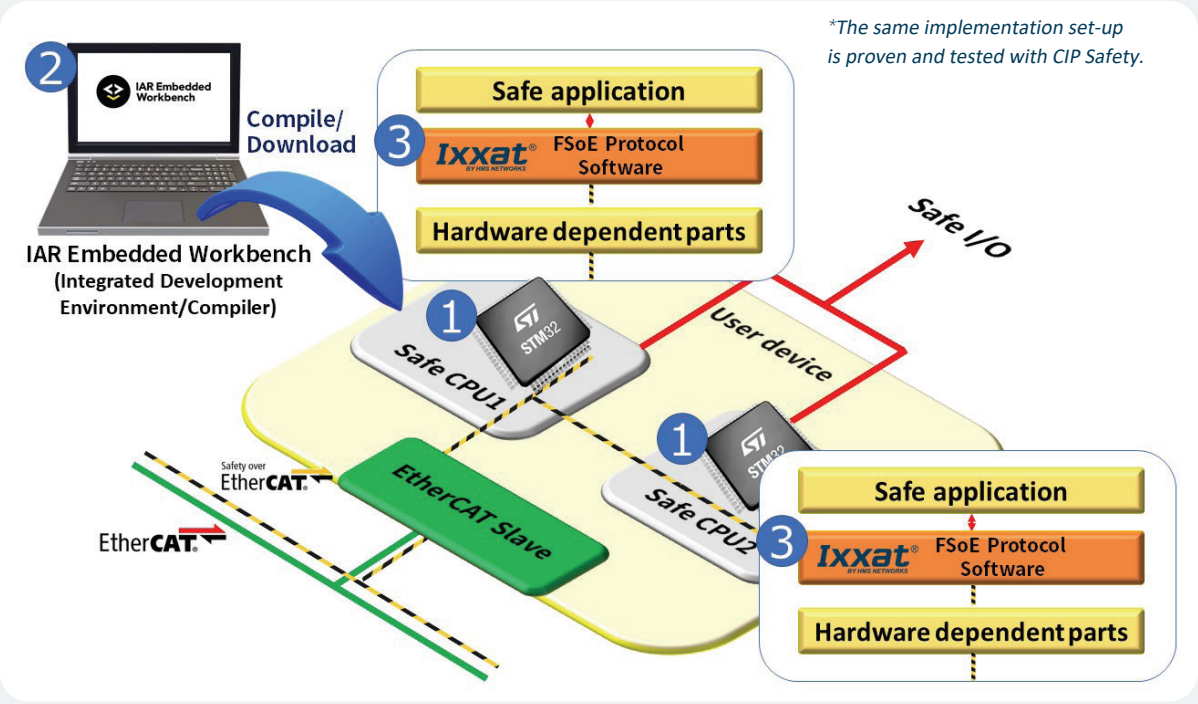
IAR Systems provides a completely integrated development environment called IAR Embedded Workbench. It covers all the tools necessary for embedded software development, including IDE, compiler, and debugger. The Functional Safety Edition has been certified in compliance with international standards, such as IEC 61508, which is the standard for functional safety at present. In this case, the tool is used to implement software such as safety applications and safety communication (FSoE) that runs in the safety device. This reduces the effort required to certify and prove the reliability of the tool during the certification process and significantly shortens the time to market for the product.

3 Ixxat FSoE Protocol Software

The Ixxat FSoE protocol software from HMS Networks realizes software for realizing safety communication using Safety over EtherCAT (FSoE), which is standardized according to IEC 61784-3. The software is certified in accordance with IEC 61508, and can support safety levels up to SIL 3.

This software allows users to significantly reduce the effort required to obtain certification for the safe communication part.

**The same implementation set-up is proven and tested with CIP Safety.*



STMicroelectronics

https://www.st.com

Functional Safety Package for STM32 & STM8

ST provides a comprehensive set of free-of-charge and certified Functional Safety packages based on robust built-in STM8 MCU and STM32 MCU and MPU safety features with the aim of significantly reducing the development efforts, time and costs required to meet functional safety standards.

Product URL: https://www.st.com/content/st_com/en/ecosystems/functionalsafety.html

IAR Systems AB

https://www.iar.com/

IAR Embedded Workbench, a Functional Safety Certified Integrated Development Environment

IAR Systems is one of the world's leading manufacturers of embedded development tools, providing a wide range of C/C++ compiler and debugger Integrated Development Environments (IDEs), development kits, emulators (ICEs), and state machine design tools for embedded systems development. With the certified edition of IAR Embedded Workbench, IAR Systems provides a Functional Safety Support and Update Agreement with guaranteed support for the sold version for the longevity of the contract. Along with prioritized technical support, the agreement includes access to validated service packs and regular reports of known deviations and problems.

Product URL: https://www.iar.com/safety

HMS Networks

www.hms-networks.com/

Ixxat Safe Protocol Software

HMS Networks is a market-leading provider of solutions in industrial information and communication technology (Industrial ICT). HMS develops and manufactures products under the Anybus®, Ixxat®, Ewon® and Intesis® brands. Under Ixxat brand, HMS provides solutions for easy implementation of safety communication including I/O modules, stacks and engineering services to enable secure communications such as CIP Safety and PROFIsafe.

Product URL: https://www.ixxat.com/products/safety-products/safety-overview/ixxat-safe