

ARM KNOWLEDGE LAB: DESIGNING THE FUTURE

DAY 3

Arm's Functional Safety offerings
Matthias Hertel, Arm

Arm Knowledge Lab: Three short and compact sessions



Day 1

Secure by Design – From
Threats to Trusted Devices



Day 2

AI at the Edge – Building
Smarter Embedded Systems



Day 3

Safety-Critical Systems –
Engineering Reliability

Find more presentations from our Arm Knowledge Lab:
<https://www2.hitex.com/arm-knowledge-lab-2026-download>



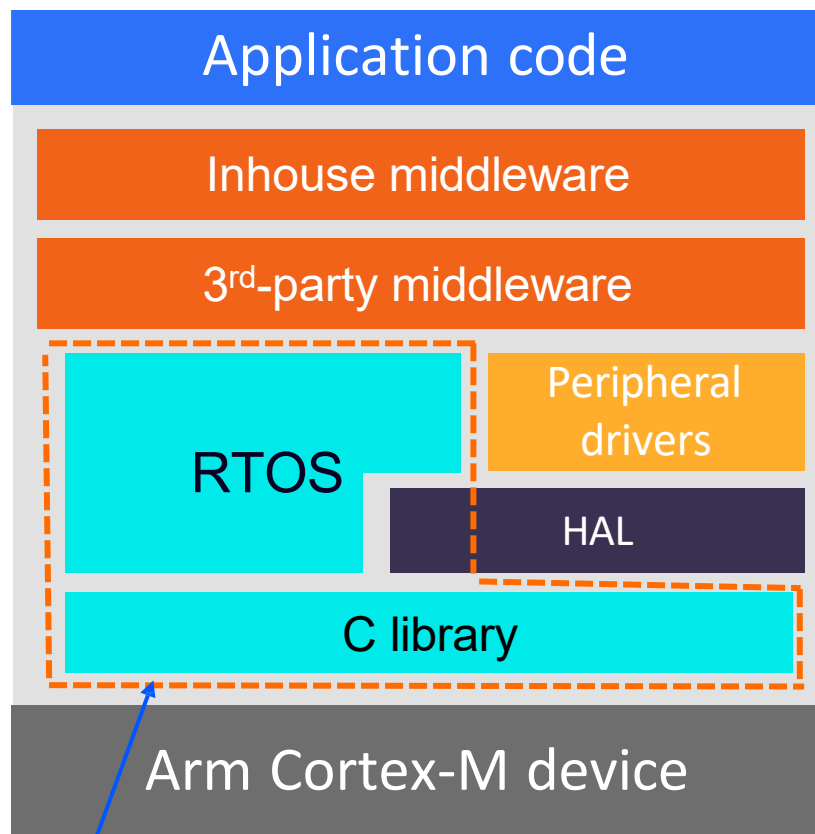
Functional Safety Tool Solutions by Arm

Matthias Hertel
June 2026



Software development for safety requires a lot of effort

Multiple building blocks from different sources

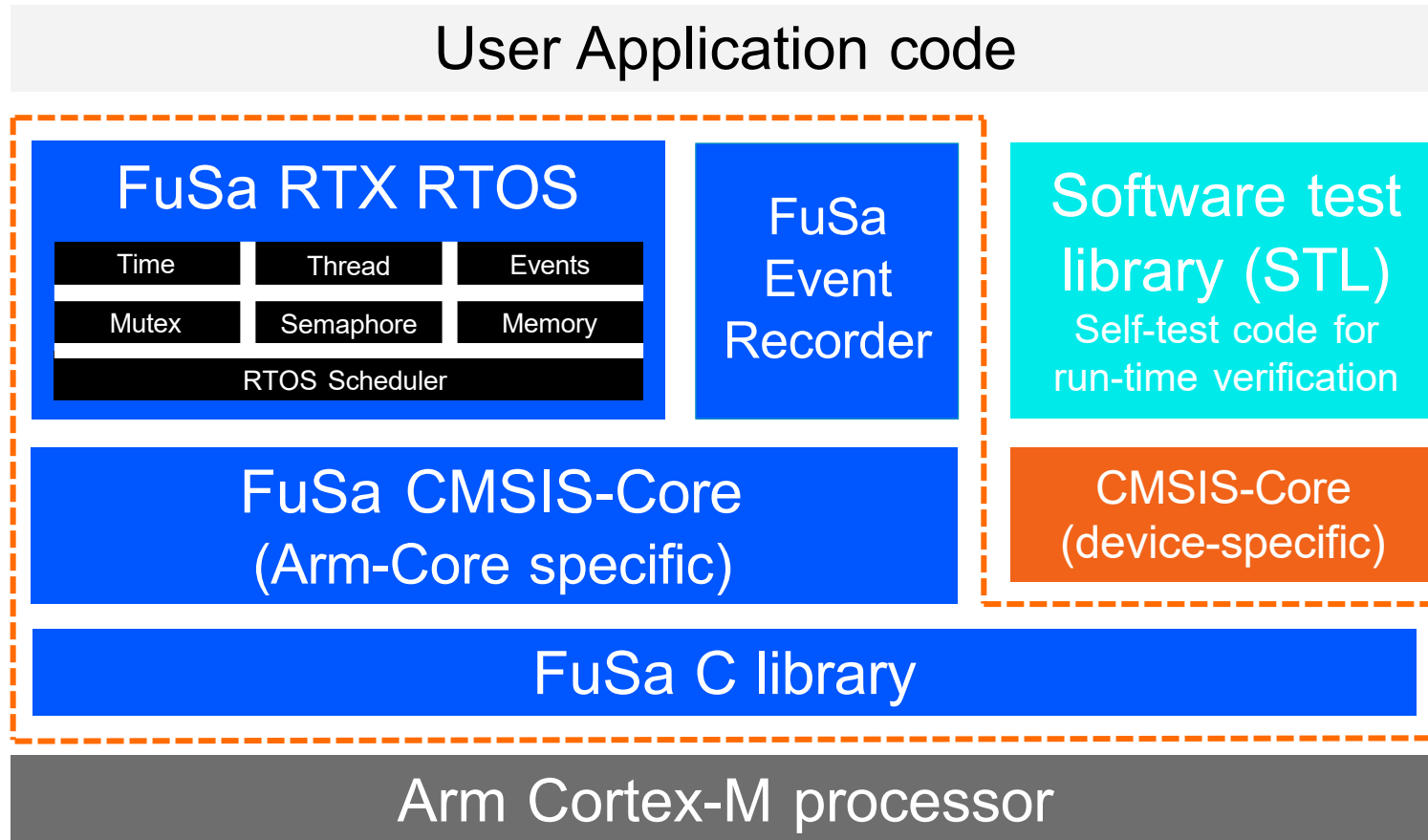


Arm FuSa RTS

- Today's software stacks use 3rd party software
 - Not every part of the software stack is safety critical
- Structured development process with:
 - Clean software structure
 - Detailed safety analysis
 - Extensive validation process for safety critical parts
- Reduce development effort with:
 - Process isolation to achieve freedom of interference
 - Certified software components

Arm FuSa RTS: Run-Time System for Functional Safety

Software components certified for safety-critical applications

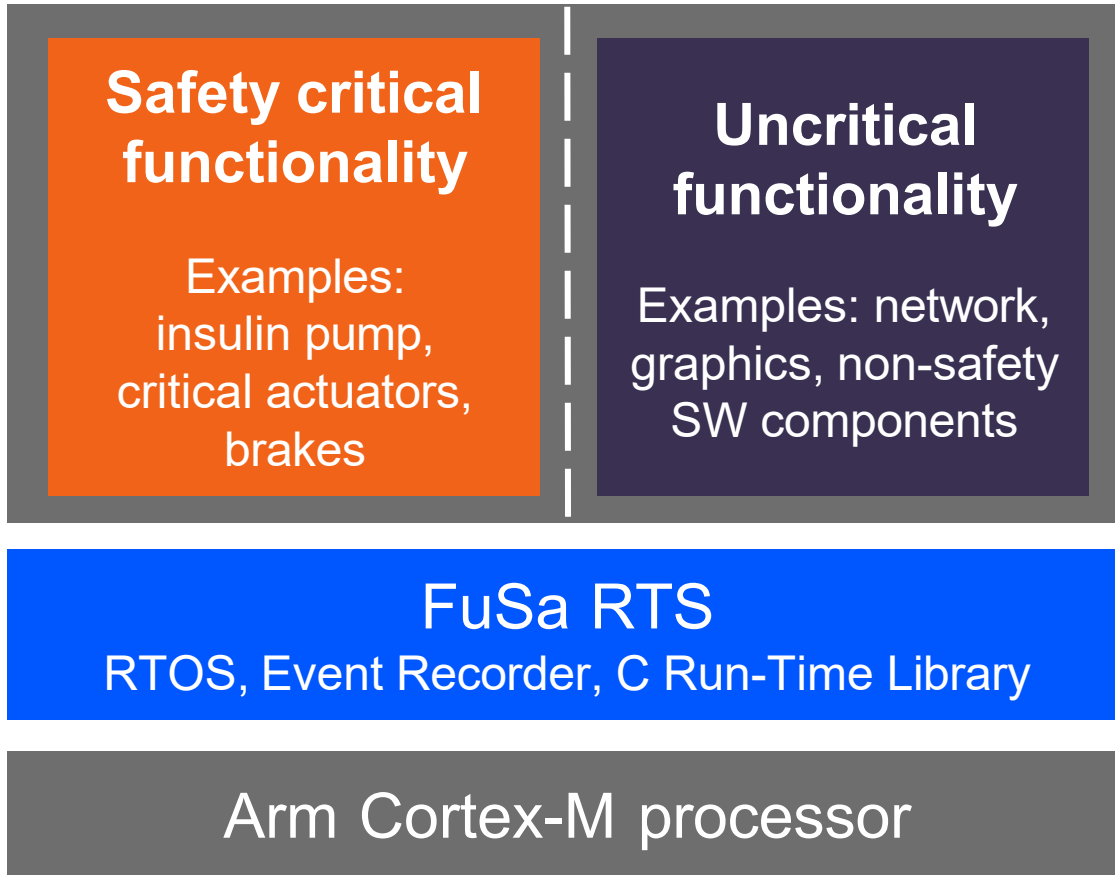


- Covered safety standards:
 - Automotive: ISO 26262, ASIL D
 - Industrial: IEC 61508, SIL 3
 - Medical: IEC 62304, Class C
 - Railway: EN 50128, SIL 4
- Supported processors:
 - Cortex-M0, Cortex-M0+
 - Cortex-M3, Cortex-M4, Cortex-M7
 - Cortex-M23, Cortex-M33, Cortex-M55

-----FuSa RTS components certified with Arm Compiler 6 for functional safety

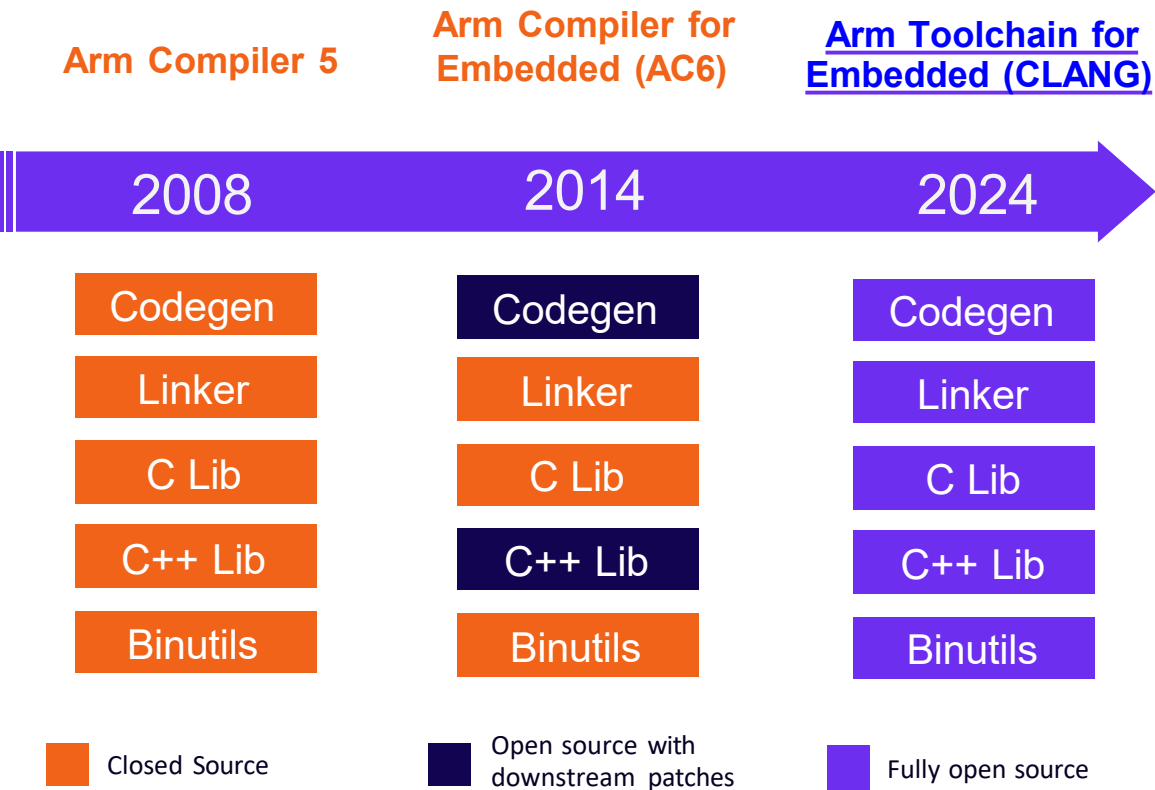
Process Isolation

Enables use of software with different safety integrity levels within a system

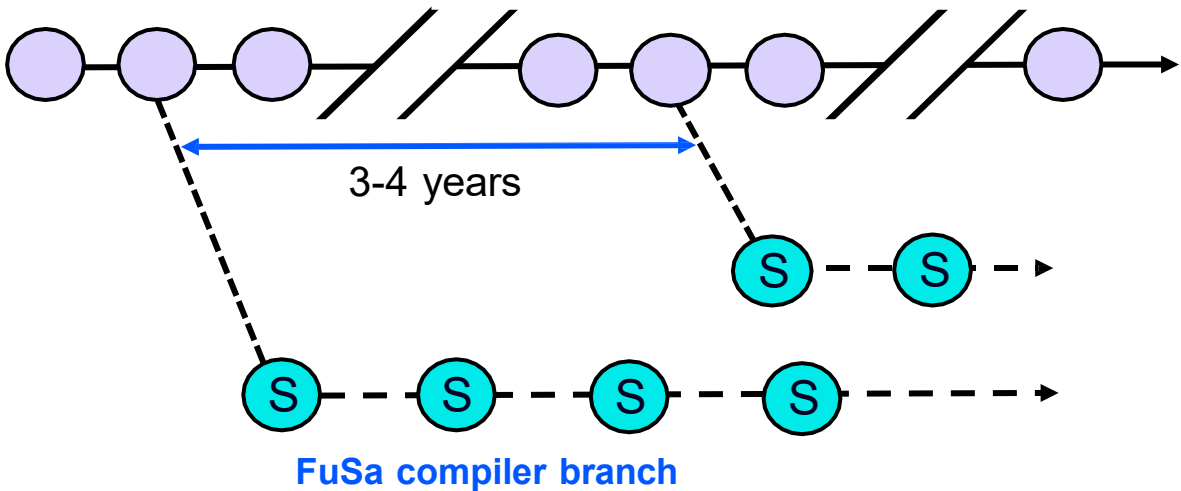


- **Benefits:**
 - Reduced validation effort for lower SIL components
 - Reuse of existing software
 - Smaller system BOM with one single-core MCU
- **FuSa RTS allows to protect safety-critical functions from software flaws in other parts of the system:**
 - Spatial isolation: protected access to memory and peripherals using processor MPU
 - Temporal isolation: uses thread watchdogs to ensure that critical threads are not delayed
 - Controlled system recovery in case of failures (on MPU fault or watchdog alarm)

Compilers are a long-term commitment



Mainline (non-FuSa) compiler branch (6 months release tick)



FuSa compiler	Initial Release	Last Release
AC5.04.x	Oct 2013	Sep 2018
AC5.06.x	May 2016	Jan 2021
AC6.6.x	May 2017	Feb 2023
AC6.16.x	Oct 2021	Long-term support To Oct 2025
AC6.22.x	Oct 2024	Long-term support To Oct 2029

- Why LLVM Technology?
- It's more than just a compiler (sanitizer, clangd, etc.)
 - Base for other languages (RUST)
 - MLIR Codegen used for AI model deployment

FuSa RTS 1.2.0 Licensing

Straightforward licensing with transparent project costs

- Commercial usage rights for users with active MDK v6 Professional licenses:
 - required for each user
 - also gives access to Arm Compiler for Embedded FuSa, required for certification
 - users with active node-lock/FlexNet MDK-Pro S&M can use FuSa RTS until S&M expires
- No limitation to defined project or target platform
- Royalty-free, independent on the production volume
- No complex legal contract required: click-through license (see [FuSa RTS 1.2.0 EULA](#))

FuSa RTS Delivery

Delivered via Arm Product Download Hub (PDH):
<https://developer.arm.com/downloads/view/FSRTS-CM>

Requires Arm account, but no special entitlement needed

Deliverables:

.pack file for use in MDK: SW components and Blinky examples

Safety Package: TÜV certificates and reports, user & safety manual

Examples Package: complex application note examples

Defect Report file: up-to-date list of known defects

Same package can be used for evaluation without MDK-Professional

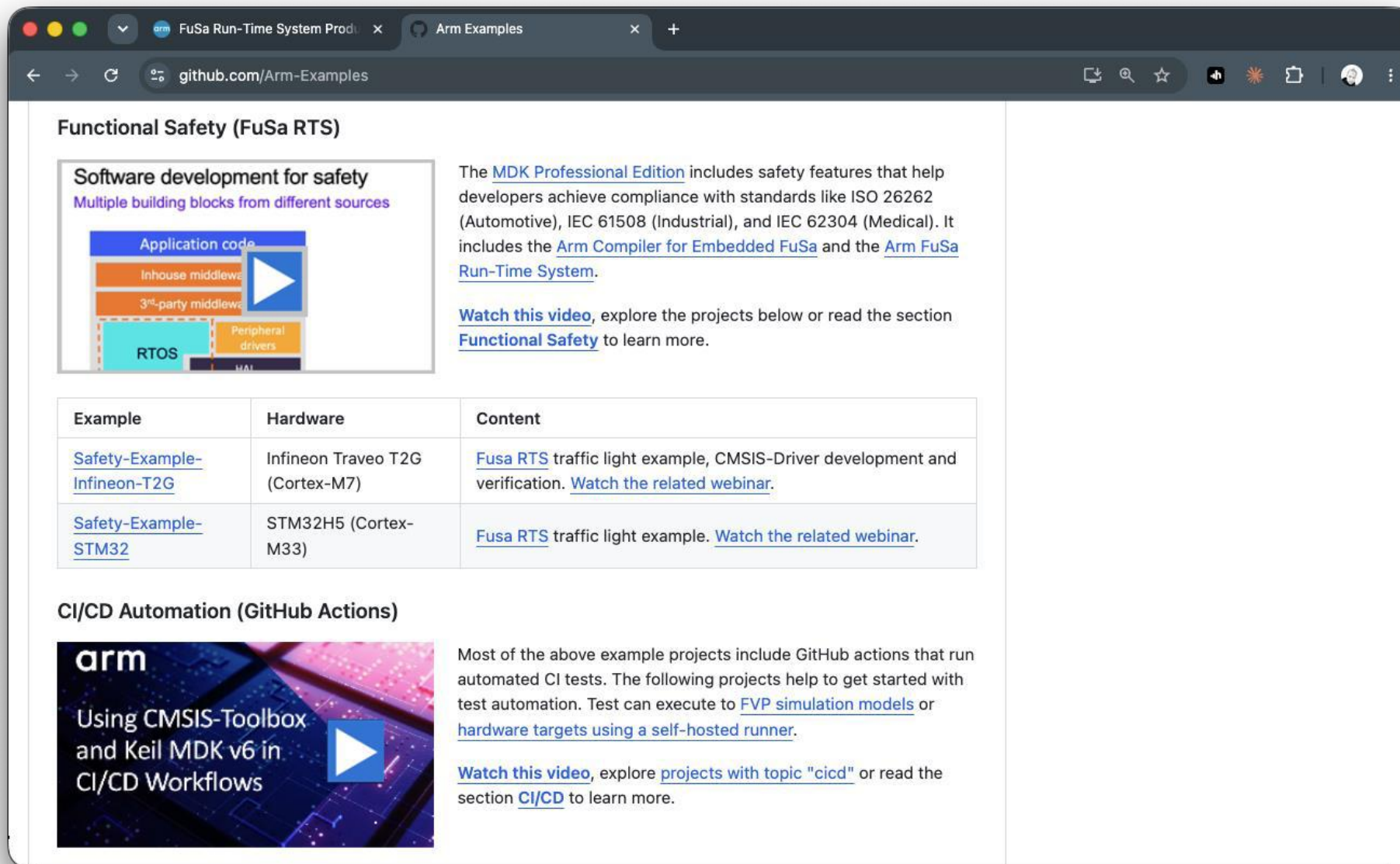
Older versions available as before to customers with entitled access (under different product codes)

The screenshot shows the Arm Developer website interface. At the top, there's a navigation bar with 'arm Developer' logo and links for 'Community', 'Documentation', and 'Downloads'. Below this, a breadcrumb trail reads 'Home / Downloads / Search / Arm FuSa RTS for Cortex-M (FSRTS-CM)'. The main heading is 'Arm FuSa RTS for Cortex-M (FSRTS-CM)' with a sub-heading 'Software Development Tools / FSRTS-CM'. A sidebar on the right contains links like 'Home', 'Search', 'Recently Viewed', 'Category Tags', and 'Getting Started'. The main content area displays product information: 'Product Group: Dev System Misc.', 'ECCN: 3D991', and 'Taxonomy: Legacy Keil Development Tool'. It also shows a 'Releases' section with a 'Sort releases by:' dropdown set to 'Available date'. Below this is a 'Select Revision to Download' section with a dropdown menu showing 'r1p2-00rel0'. To the right of the dropdown, it lists 'Release Name: FSRTS-CM-r1p2-00rel0', 'Release Quality: REL', and 'Available Date: May 6, 2024'. The main content area lists two items: 'Arm FuSa RTS for Cortex-M. Software pack v1.2.0' (8.3 MB) and 'Arm FuSa RTS Safety Package v1.2.0' (7.6 MB). Each item has a '+ Add to queue' button and a 'Download Now' button. On the far right, there are additional links like 'Imp', 'Soft', 'Class', 'User', 'Need', 'Open', and 'Set up'.

FuSa RTS 1.2.0 in Product Download Hub (PDH)

GitHub Repo

<https://github.com/Arm-Examples>



The screenshot shows a web browser window with the URL github.com/Arm-Examples. The page is titled "Functional Safety (FuSa RTS)" and features a diagram of software development for safety, a table of examples, and a section on CI/CD Automation (GitHub Actions).

Functional Safety (FuSa RTS)

Software development for safety
Multiple building blocks from different sources



The diagram illustrates the software development stack for functional safety. It consists of several layers: "Application code" (blue), "Inhouse middleware" (orange), "3rd-party middleware" (orange), "RTOS" (light blue), and "Peripheral drivers" (orange). A play button icon is overlaid on the diagram.

The [MDK Professional Edition](#) includes safety features that help developers achieve compliance with standards like ISO 26262 (Automotive), IEC 61508 (Industrial), and IEC 62304 (Medical). It includes the [Arm Compiler for Embedded FuSa](#) and the [Arm FuSa Run-Time System](#).

[Watch this video](#), explore the projects below or read the section [Functional Safety](#) to learn more.

Example	Hardware	Content
Safety-Example-Infineon-T2G	Infineon Traveo T2G (Cortex-M7)	Fusa RTS traffic light example, CMSIS-Driver development and verification. Watch the related webinar .
Safety-Example-STM32	STM32H5 (Cortex-M33)	Fusa RTS traffic light example. Watch the related webinar .

CI/CD Automation (GitHub Actions)



The video thumbnail shows the ARM logo and the text "Using CMSIS-Toolbox and Keil MDK v6 in CI/CD Workflows" with a play button icon.

Most of the above example projects include GitHub actions that run automated CI tests. The following projects help to get started with test automation. Test can execute to [FVP simulation models](#) or [hardware targets using a self-hosted runner](#).

[Watch this video](#), explore [projects with topic "cicd"](#) or read the section [CI/CD](#) to learn more.

arm

Tack

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Merci

Danke

Gracias

Grazie

谢谢

ありがとう

Asante

Thank you

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Köszönöm

Hitex offerings ...



Ask alexander.hess@hitex.de – he looks forward to receiving your inquiries regarding Hitex offerings, including:

- Development support & services
- Self-test libraries for ArmV8 microcontrollers
- Training courses: From tools and software to RTOS and Security with Arm
- Unit testing for embedded software with TESSY
- SO-DIMM compute modules for PSOC™, TRAVEO™ and more for an easy entry into the Infineon MCs.

**THANK YOU.
SEE YOU NEXT TIME!**

**Stay informed: webinars, training sessions, knowledge labs
Find all the information at www.hitex.de**