

ARM software development solutions for ARM Cortex-M23 and Cortex-M33 processors

Highlights

- Comprehensive software development tools for secure and non-secure programming.
- Standardized software frameworks and software components for rapid design start.
- Debug and trace with simulation models and target hardware for system validation.

Accelerating overall system design

Embedded system programmers face demanding product requirements that include cost sensitive hardware, deterministic real time behavior, low-power operation, and secure asset protection. As time-to-market is critical, ARM provides a set of development tools and software components that accelerate the overall system design.

MDK - Microcontroller Development Kit

[ARM® Keil® MDK](#) is a comprehensive software development solution for ARM-based microcontrollers and includes all components that you need to create, build, and debug embedded applications.

MDK includes the ARM Compiler 6, which combines highly optimized ARM C libraries with modern LLVM technology. Developed alongside the ARM Cortex®-M23 and Cortex-M33 processors, the C/C++ toolchain enables software developers to fully benefit from ARMv8-M security extensions and the latest C language standards such as C++11 and C++14.

Software Packs add device support and software components which are used as application building blocks. MDK includes CMSIS, RTOS, and royalty-free middleware designed for microcontrollers. Third-party software packs provide components for IoT, security, encryption, and networking applications.

The MDK debugger offers two access modes for secure and non-secure application verification and optimization. Secure access offers full visibility to all instruction execution, memory regions, and device peripherals. With non-secure access the programmer has no visibility to the secure domain. Debugging is accelerated with meaningful peripherals dialogs and even while the program is running at full speed, variables can be inspected and breakpoints may be altered. Trace capabilities include variable tracking, code coverage, and performance analysis.

The MDK debugger connects to both simulation models and target hardware using debug adapters. Models allow integration into the wider SoC design process for system and software verification prior to silicon availability. MDK includes a [Fixed Virtual Platform](#) corresponding to the MPS2+ memory map based on [ARM Fast Models](#) for Cortex-M23 and Cortex-M33 processors that simulates a complete system including peripherals. FPGA targets using the [Cortex-M Prototyping System](#) for both processors with an example ARMv8M reference system will also be available.

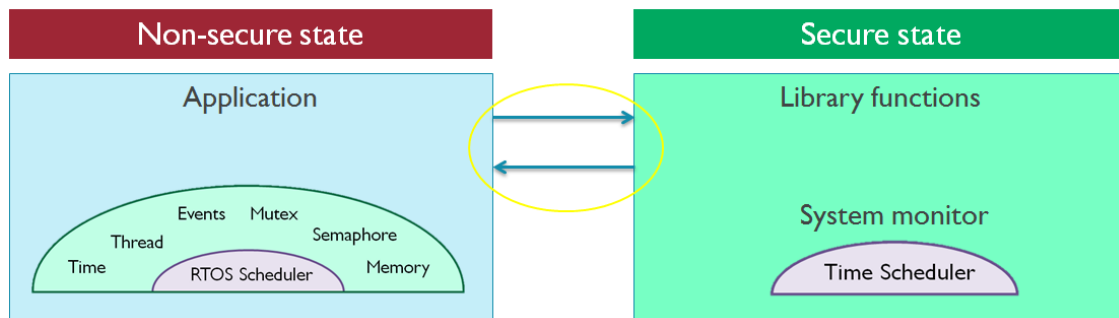
ULINK – debug/trace adapter series

A ULINK debug adapter connects the MDK debugger to the Cortex-M23 or Cortex-M33 processors target system and allows the user to program, debug, and analyze applications. Serial-wire trace offers event and timing information on interrupt execution, RTOS thread scheduling, code annotations, and variable access. Streaming trace utilizes the ETM technology for non-intrusive performance analysis and complete code coverage during system validation with real-time code execution.

CMSIS – Cortex-M Microcontroller Software Interface Standard

[CMSIS](#) provides industry standard software support for the ARM Cortex-M series and includes an open source software frame-work with processor HAL, DSP library, and RTOS kernel. CMSIS-Pack defines the distribution of device support and software components and is widely adopted in the industry.

CMSIS Version 5 is extended for the ARMv8-M architecture including access to ARM TrustZone® hardware security extensions. The RTOS API standardizes access to the secure domain which ensures software compatibility across compliant real-time operating systems. The RTX reference implementation is a full featured real-time operating system for non-secure applications that interfaces to the secure domain for data and firmware protection.



CMSIS-RTOS RTX reference implementation on Cortex-M33