

# The Designer's Guide to the Cortex-M Processor Family

Trevor Martin



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*The Designer's Guide to the Cortex-M Microcontrollers* gives you an easy-to-understand introduction to the concepts required to develop programs in C with a Cortex-M based microcontroller. The book begins with an overview of the Cortex-M family, giving architectural descriptions supported with practical examples, enabling you to easily develop basic C programs to run on the Cortex-M0/M0+/M3 and M4 and M7. It then examines the more advanced features of the Cortex architecture such as memory protection, operating modes, and dual stack operation.

Once a firm grounding in the Cortex-M processor has been established the book introduces the use of a small footprint RTOS and the CMSIS-DSP library. The book also examines techniques for software testing and code reuse specific to Cortex-M microcontrollers. With this book you will learn: the key differences between the Cortex-M0/M0+/M3 and M4 and M7; how to write C programs to run on Cortex-M based processors; how to make the best use of the CoreSight debug system; the Cortex-M operating modes and memory protection; advanced software techniques that can be used on Cortex-M microcontrollers; how to use a Real Time Operating System with Cortex-M devices; how to optimize DSP code for the Cortex-M4; and how to build real time DSP systems.

- Includes an update to the latest version (5) of MDK-ARM, which introduces the concept of using software device packs and software components
- Includes overviews of the new CMSIS specifications
- Covers developing software with CMSIS-RTOS showing how to use RTOS in a real world design
- Provides a new chapter on the Cortex-M7 architecture covering all the new features
- Includes a new chapter covering test driven development for Cortex-M microcontrollers
- Features a new chapter on creating software components with CMSIS-Pack and device abstraction with CMSIS-Driver
- Features a new chapter providing an overview of the ARMv8-M architecture including the TrustZone hardware security model

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