



Digital Electronic Systems Practices LIBRO ELECTRÓNICO

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This book gathers a set of practical developments that support and complement the basic concepts acquired in the theoretical study of the Cortex-M3 microcontroller from ARM. It consists of a series of guided initiation practices in which basic theoretical concepts are used in a sequential, progressive and orderly manner, to facilitate the consolidation of knowledge, while at the same time provides the use and learning tools for the design, development and debugging of digital electronic systems based on a microcontroller. Its content and order are organized according to the development of practices that are carried out in the laboratory of the Digital Electronic Systems of the ICT Bachelor Degrees taught in the Polytechnic School of the University of Alcalá. However, this publication is valid for students of any other degree or any reader who wants to carry out the practical application of basic concepts acquired from Cortex-M3.

The contents covered are organized into eight practices. The first two practices are about assembly language and microcontroller addressing modes, as well as modular programming and stack management. At the same time, both practices are used to check what the microcontroller does when executing each instruction, what the compiler converts each high-level language statement into, etc. In the following six practices all the developments are carried out with a high level language (C language in this case), and through them hardware debugging tools are learned and practiced with the microcontroller ports; interrupts are handled through the specific controller; management and use of the SysTick (system timer) and the basic timers/counters are learned. Finally, the last two practices involve working with the digital-to-analog and analog-to-digital converters that integrate the Cortex-M3 device. The LPCr768-Mini-DK.2 card has been used as the hardware development platform.

The main purpose of this publication is to serve as a guide and consultation to facilitate the development of the lab practices for students. The basic aspects of Cortex-M3 and its development tools are introduced clearly and orderly in this book.

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