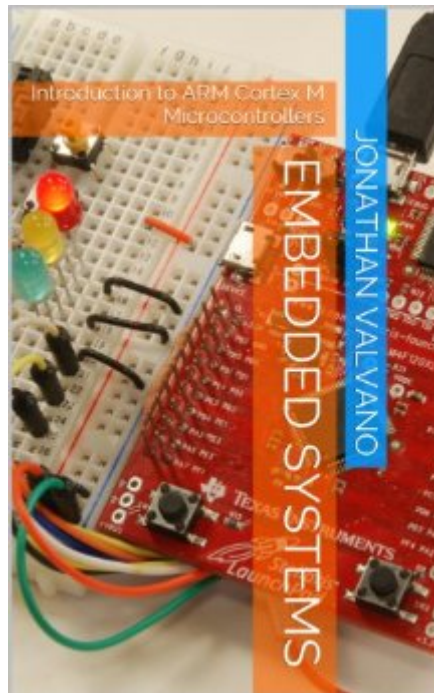# Embedded Systems (Introduction To Arm\xae Cortex\u2122-M Microcontrollers)

Synopsis

Embedded systems are a ubiquitous component of our everyday lives. We interact with hundreds of tiny computers every day that are embedded into our houses, our cars, our toys, and our work. As our world has become more complex, so have the capabilities of the microcontrollers embedded into our devices. The ARM Cortex-M family represents a new class of microcontrollers much more powerful than the devices available ten years ago. The purpose of this book is to present the design methodology to train young engineers to understand the basic building blocks that comprise devices like a cell phone, an MP3 player, a pacemaker, antilock brakes, and an engine controller. This book, now in its 5th edition, is the first in a series of three books that teach the fundamentals of embedded systems as applied to the ARM® Cortex™-M family of microcontrollers. This first book is an introduction to computers and interfacing focusing on assembly language and C programming. The second book Embedded Systems: Real-Time Interfacing to ARM Cortex-M Microcontrollers focuses on hardware/software interfacing and the design of embedded systems. The third book Embedded Systems: Real-Time Operating Systems for ARM Cortex-M Microcontrollers is an advanced book focusing on operating systems, high-speed interfacing, control systems, and robotics. The third volume could also be used for professionals wishing to design or deploy a real-time operating system onto an ARM platform. This first book is an introductory book that could be used at the college level with little or no prerequisites. An embedded system is a system that performs a specific task and has a computer embedded inside. A system is comprised of components and interfaces connected together for a common purpose. This book is an introduction to embedded systems. Specific topics include microcontrollers, fixed-point numbers, the design of software in assembly language and C, elementary data structures, programming input/output including interrupts, analog to digital conversion, digital to analog conversion.The book will cover embedded systems for ARM® Cortex™-M microcontrollers with specific details on the LM3S1968, TM4C123, and TM4C1294. Most of the topics can be run on any of these microcontrollers. In these books the terms LM3S LM4F and TM4C will refer to families of microcontrollers with the Texas Instruments Stellaris® line. Although the solutions are specific for the LM3S LM4F and TM4C families, it will be possible to use these books for other ARM derivatives.The true engineering experience occurs not with your eyes and ears, but rather with your fingers and elbows. In other words, engineering education does not happen by listening in class or reading a book; rather it happens by designing under the watchful eyes of a patient mentor. So, go build something today, then show it to someone you respect!

Book Information

Customer Reviews

This was required for my class. It's a decent book. One major draw back is the code examples. Prof. Valvano (yeah, he was my professor) likes to use names for the bit values he pushes into registers which would be fine if he would also share the code where he #DEFINE the words with the value. Without this, almost half the code he's written in the book doesn't work. Other than that, it's a great jump into embedded systems.

the contents of book is undoubtably great but Kindle Edition still has a lot of things to be improved. I'm so disappointed of Kindle program itself. I should have bought this book as paperback.

I find this book has more detail applied to it than some of the other books from this author, even though the others host more detailed analog information and interfacing detail perhaps...I just think that you really have to focus hard to understand what he is preaching. I find his teaching style quite dry and formatted in such a way that you have to force-feed yourself the material...It is not well defined direction wise, but it does contain the basics you need...I wish his teaching style was more

mature and refined rather than dry, boring and lack of detail...

*** DO NOT BUY THE KINDLE VERSION, BUY A BOUND COPY ***Assuming that you have made the decision to purchase, at least get bound copy.The content of the book is not bad. I got through three first 3 chapters and hated it because I couldn't understand what was going on, then I picked up the bound copy and figured out why. The pages are really wide so they don't fit in a kindle page correctly and the examples are all smooshed together making the examples very discontinuous.After figuring this out purchasing the bound copy, the content is only so so. It doesn't show examples from start for finish, it only seams to show examples bits of assembly code. If you have written assembly before, then I sure it would be fine because you would understand how to implement the code. However, it does show the bits of code next to a C version of the code which helps.*** Update *** This book was actually written to compliment the authors class so if you look, you can find their website which does have a lot of useful material. The additional material is organized well and tell which chapters in the book it's complimenting.

But the software/firmware explanation is vague. We need to put extra effort or a good really good back ground. But the rest of the book is very good. I will buy also the next parts of this book. Because the next part looks like more detailed. The online projects are also helpful.

Information is there but I found it difficult to understand it. The way things are explained is sometime confusing and frustrating. Mainly language used is not clear cut. It might suits litreture but not a technical book. I bought all three volume of this series and realized that many items are repeated in the later volumes those already were I, earlier volumes. This could have been a single book easily. Such approach is condemnable as this not only costs a reader more money to buy all 3 volumes but reader also looses valuable time. I would never buy any future book from the same author.

i had to buy this book because it is the textbook for quite a few of the Electrical Engineering courses at UT. this book is actually written by my professor, and it is fairly well written and very detailed about the ARM cortex-M3 microcontroller. all the instruction are thoroughly explained with examples. i have no complaint about it, and it is really useful.

This is in regard to the Kindle version of the book.It is absolutely atrocious! I bought the kindle version so I didn't have to carry around the book at school, however, I can't study the book very

easily because the images for all the diagrams and figures in the e-book are too tiny to read. They expect you to have to long press each image and then touch the enlarge button to view each and every image (there are hundreds of images and they are paramount to learning the material). Well there are too many and it takes too long for this process to be a viable solution for any student who is trying to study the material actually learn something in a timely manner. It's ridiculous, and to top it all off, the PC version of Kindle doesn't even allow you to zoom into the images at all.Now I have to spend twice as much on a the paperback version of the book, with no hope of getting my money back from Kindle....

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