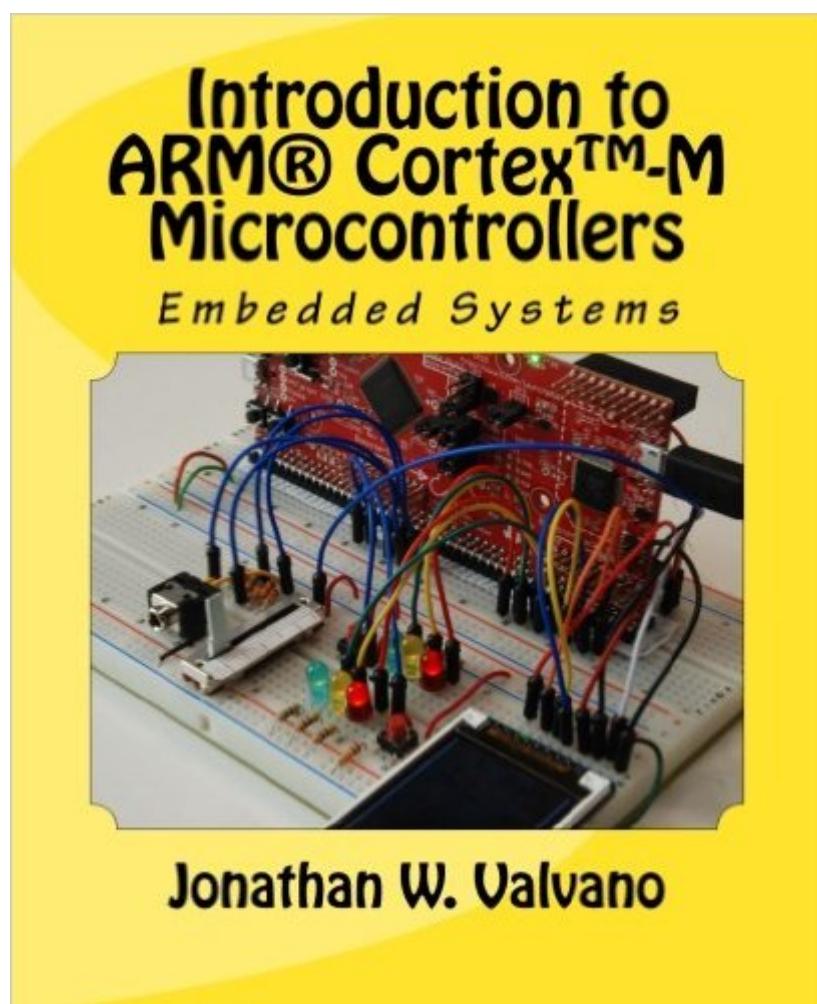


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# Embedded Systems: Introduction To Arm® CortexTM-M Microcontrollers , Fifth Edition (Volume 1)



## Synopsis

This book is self-published and is printed on demand. The original ISBN was generated in 2012, but if you purchase the book new from CreateSpace or you will get the new version, which was uploaded June 29, 2015. This book, now in its fifth 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 fifth edition focuses on the LaunchPads based on both the TM4C123 and TM4C1294 microcontrollers. This first volume is an introduction to computers and interfacing focusing on assembly language and C programming. The second volume, *Embedded Systems: Real-Time Interfacing to ARM Cortex-M Microcontrollers*, focuses on hardware/software interfacing and the design of embedded systems. The third volume, *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. This book employs many approaches to learning. It will not include an exhaustive recapitulation of the information in data sheets. First, it begins with basic fundamentals, which allows the reader to solve new problems with new technology. Second, the book presents many detailed design examples. These examples illustrate the process of design. There are multiple structural components that assist learning. Checkpoints, with answers in the back, are short easy to answer questions providing immediate feedback while reading. Simple homework, with answers to the odd questions on the web, provides more detailed learning opportunities. The book includes an index and a glossary so that information can be searched. The most important learning experiences in a class like this are of course the laboratories. Each chapter has suggested lab assignments. More detailed lab descriptions are available on the web. Specifically for this volume, look at the lab assignments for EE319K. For Volume 2 refer to the EE445L labs, and for Volume 3, look at the lab assignments for EE445M/EE380L.6. There is a web site accompanying this book <http://users.ece.utexas.edu/~valvano/arm>. Posted here are Keil™ uVision® and Texas Instruments Code Composer Studio™ projects for each of the example

programs in the book. You will also find data sheets and Excel spreadsheets relevant to the material in this book. 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 from Texas Instruments. Although the example designed are specific for the TM4C123, it will be possible to use these books for other ARM derivatives.

## **Book Information**

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## **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 seems 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 literature 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 in, 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 loses 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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