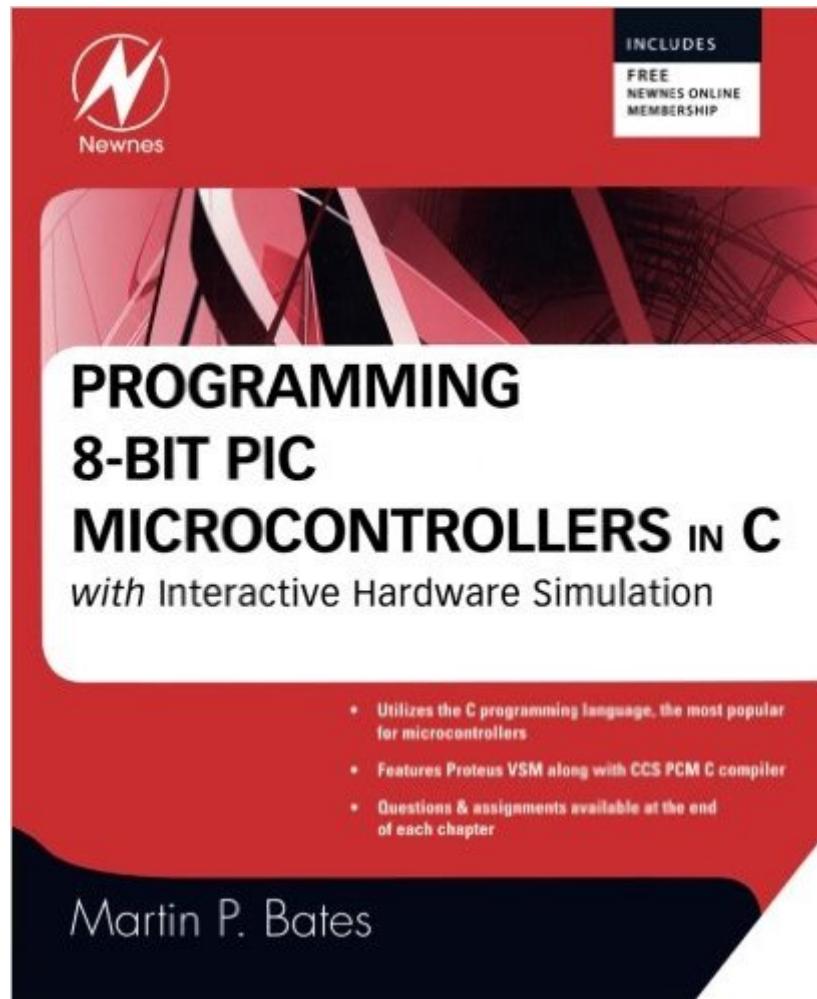


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# Programming 8-bit PIC Microcontrollers In C: With Interactive Hardware Simulation



## **Synopsis**

Microcontrollers are present in many new and existing electronic products, and the PIC microcontroller is a leading processor in the embedded applications market. Students and development engineers need to be able to design new products using microcontrollers, and this book explains from first principles how to use the universal development language C to create new PIC based systems, as well as the associated hardware interfacing principles. The book includes many source code listings, circuit schematics and hardware block diagrams. It describes the internal hardware of 8-bit PIC microcontroller, outlines the development systems available to write and test C programs, and shows how to use CCS C to create PIC firmware. In addition, simple interfacing principles are explained, a demonstration program for the PIC mechatronics development board provided and some typical applications outlined. \*Focuses on the C programming language which is by far the most popular for microcontrollers (MCUs)\*Features Proteus VSMg the most complete microcontroller simulator on the market, along with CCS PCM C compiler, both are highly compatible with Microchip tools\*Extensive downloadable content including fully worked examples

## **Book Information**

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## **Customer Reviews**

Hello.I own several microcontroller books, including Bates books about microcontrollers (PICs), the one before this one (the assembler one).I have a good programming background in assembler for these micros, the mid range and base range (16Fs and 12Fs) so I know the architecture of several

micros (including the new 16F887). Actually, if you know a little of PICs architecture you know it's very much the same on all the "product line". I've programmed in BASIC with PICBASIC PRO, and know how the code generates (32 bytes of RAM just to use the compiler) but lately I wanted to learn another programming language for the Microchip PIC. Since I use 12F, 16F and 18F series I wanted a good compiler and I was between the FED C (from Dogan Ibrahim books) and the CCS (from several forums and the fact it can run in MPLAB). I own Prata's C PRIMER PLUS and "The white book" (K&R second edition) and have read a little, so if I see a program, I think I can understand it. That been said, let's get to the book: Bates does a great job of presenting the programming basics (for, while, if, switch, etc) with the CCS compiler, as he presents the program, comments on it (explains how it works) and provides several pointers on each subject. He also proposes several exercises at the end of each chapter. After the explanation with respect to the programming fundamentals, he goes into the modules of the PIC (again, using CCS) and does a good job of explaining the program and also the inner workings of the modules. If you have 150 dollars you could get the mechatronics development board from Microchip (I own it), since one of the chapters is devoted to it.

Conclusion: This was the book that "got me over the hump" and I am now comfortably programming PIC microcontrollers in C using the CCS compiler. Overall, I am very happy with this purchase and think that the price is very reasonable for the knowledge that you gain from this text. Comments: If you know about embedded systems, you know that they are the most basic elements of circuitry. All they are is a chip and you have to figure out how to make it "Go" and do something useful. Just getting it to turn on takes an organized act of programming and hardware together. By contrast, most books on learning C programming start with the almost famous `printf ("Hello World")`; program that requires not only that the processor be running, but that it have some kind of output device (Monitor, printer, etc.) attached to it and be working. In other words, this is practically impossible to accomplish as you have to have a completely functional system and a high level of proficiency in programming before you can even start to learn how to program. I own a sizable stack of books on learning C and they all subscribe to this same backwards technique and have all proved useless toward actually learning C on embedded systems. Martin Bates book is the first one that I have read that starts with turning the processor on and takes you through turning an LED on which is a realistic example of a first C program with a microcontroller. You already have a half-dozen or so projects under your belt before you see a `printf` statement, which is the ONLY way to do it in an embedded world. I don't really have all that much negative to say about this book. It does use the

Proteus simulator for most of the projects in the beginning, which I elected not to use and to do it all in actual hardware.

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