Embedded Design with the PIC18F452 Microcontroller

JOHN B. PEATMAN

John Peatman's latest microcontroller work focuses on Microchip Technology's PIC18FXXX family, and its newest member, the PIC18F452. The enhanced instruction set and addressing modes simplify program code development, and the on-chip resources make this the most powerful PIC microcontroller ever.

Its flash program memory and built-in background debug mode provide internal programming/debugging support of program development. The presentation style throughout this book is to introduce the reader to simple programs that encompass features of the PIC18F452, plus interactions with I/O devices, providing the reader with a smooth and quick learning process for creatively writing enhanced application code. Hundreds of figures give visual support to the text. Examples, end-of-chapter problems, suggested lab projects, complete designs, plus a QwikFlash development board support a "learning by doing" environment.

John B. Peatman is a Professor of Electrical and Computer Engineering at the Georgia Institute of Technology. He is the author of five earlier digital design, microprocessor, and microcontroller textbooks. He is also a director with the Intelligent Systems Corporation. His current research interests include the design of low-cost development tools for microcontrollers. Professor Peatman is a Fellow of the IEEE.

CONTENTS:

- Introduction
- 2. **CPU** Architecture
- 3 Instruction Set
- QwikFlash Target Board Δ
- Program Development (P1 template) 5.
- Structured Assembly Preprocessor
- Alphanumeric Liquid–Crystal Displays (P2 template)
- **Rotary Pulse Generators** 8.
- Interrupts and Interrupt Timing 9.
- Analog-to-Digital Conversion 10.
- 11. I/O Pin Considerations
- LCD Screens (P3 template) 12.
- 13. Time-Interval Measurements
- Math Subroutines 14.
- 15. Serial Peripheral Interface for I/O Expansion
- 16. Output Time-Interval Control (P4 template)
- 17. SMBus/I2C for Peripheral Chip Access
- 18. UART
- 19. Programmed Peripheral Chips
- 20. Miscellaneous Features

APPENDICES

- A1. Assembly of the QwikFlash Board
- A2. Laboratory Development with the QwikProto Add-On Board
- A3. Use of Structured Assembler with MPLAB User Interface
- A4. QwikBug Monitor Program
- A5. QwikAddress and QwikPH Utilities
- A6. Verification of Math Subroutines
- A7. Use of C Programming for the PIC18F452
- A8. PIC18F452 Special Function Registers and Their Bits
- A9. Parts and Packages
- A10. Example of Course Organization and Lab Projects

Pearson Education **Prentice Hall** Upper Saddle River, NJ 07458 www.prenhall.com



ATM Embedded Design with the PIC18F452 Microcontrolle

Prentice Hall

Embedded Design with PIC18F452 Microcontroller



