



Analog inter-facing to embedded microprocessors [real world design /

Ball, Stuart R. (1956-)

Newnes Press,
2001

Monografía

Analog Interfacing to Embedded Microprocessors addresses the technologies and methods used in interfacing analog devices to microprocessors, providing in-depth coverage of practical control applications, op amp examples, and much more. A companion to the author's popular Embedded Microprocessor Systems: Real World Design, this new embedded systems book focuses on measurement and control of analog quantities in embedded systems that are required to interface to the real world. At a time when modern electronic systems are increasingly digital, a comprehensive source on interfacing the real world to microprocessors should prove invaluable to embedded systems engineers, students, technicians, and hobbyists. Anyone involved in connecting the analog environment to their digital machines, or troubleshooting such connections will find this book especially useful. Stuart Ball is also the author of Debugging Embedded Microprocessor Systems, both published by Newnes. Additionally, Stuart has written articles for periodicals such as Circuit Cellar INK, Byte, and Modern Electronics. Provides hard-to-find information on interfacing analog devices and technologies to the purely digital world of embedded microprocessors. Gives the reader the insight and perspective of a real embedded systems design engineer, including tips that only a hands-on professional would know. Covers important considerations for both hardware and software systems when linking analog and digital devices

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Nota general: Includes index

Contenido: System Design -- Dynamic Range -- Calibration -- Bandwidth -- Processor Throughput -- Avoiding Excess Speed -- Other System Considerations -- Sample Rate and Aliasing -- Digital-to-Analog Converters -- Analog-to-Digital Converters -- Types of ADCs -- Sample and Hold -- Real Parts -- Microprocessor Interfacing --

Serial Interfaces -- Multichannel ADCs -- Internal Microcontroller ADCs -- Codecs -- Interrupt Rate -- Dual-Function Pins on Microcontrollers -- Design Checklist -- Sensors -- Temperature Sensors -- Optical Sensors -- CCDs -- Magnetic Sensors -- Motion/Acceleration Sensors -- Strain Gauge -- Time-Based Measurements -- Measuring Period versus Frequency -- Mixing -- Voltage-to-Frequency Converters -- Clock Resolution -- Output Control Methods -- Open-Loop Control -- Negative Feedback and Control -- Microprocessor-Based Systems -- On-Off Control -- Proportional Control -- PID Control -- Motor Control -- Measuring and Analyzing Control Loops -- Solenoids, Relays, and Other Analog Outputs -- Solenoids -- Heaters -- Coolers -- Fans -- LEDs -- Motors -- Stepper Motors -- DC Motors -- Brushless DC Motors -- Tradeoffs between Motors -- Motor Torque -- EMI -- Ground Loops -- ESD -- High-Precision Applications -- Input Offset Voltage -- Input Resistance -- Frequency Characteristics -- Temperature Effects in Resistors -- Voltage References -- Temperature Effects in General -- Noise and Grounding -- Supply-Based References -- Standard Interfaces -- IEEE 1451.2 -- 4-20 ma Current Loop -- Opamp Basics

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