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**Sinopsis**

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Features

Highlights the functionality, integrated components, memory, and assembly programming of the LF2407 DSP processor

Delivers a complete overview of DSP-based vector control of induction motors

Facilitates the design of a new generation of consumer appliances by detailing design control systems that use the TMSLF240X DSP controller

Analyzes the DSP-based control of permanent magnet synchronous machines and their applications in the automotive industry

Provides examples on DSP controlled dc-to-dc buck-boost converters, as well as stepper motor applications

Summary

Although the programming and use of a Digital Signal Processor (DSP) may not be the most complex process, utilizing DSPs in applications such as motor control can be extremely challenging for the first-time user. DSP-Based Electromechanical Motion Control provides a general application guide for students and engineers who want to implement DSP-based motion control systems in products and industrial systems.

This overview explains the benefits of integrating DSP into motion control, detailing the degree of freedom provided by a DSP for the development of constructive, computationally extensive algorithms. The authors explain how the use of these advanced algorithms can drastically increase the performance and efficiency of an electromechanical system.

Chapters are supported by laboratory exercises, enabling you to immediately apply the information to practical scenarios. Following an extensive analysis of the LF2407 DSP processor, the book presents numerous real-world applications, demonstrating current use and inspiring future development.

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Introduction to the TMSLF2407 DSP Controller  
C2xx DSP CPU and Instruction Set  
General Purpose Input/Output (GPIO) Functionality  
Interrupts on the TMS320LF2407  
The Analog-to-Digital Converter (ADC)  
The Event Managers (EVA, EVB)  
DSP-Based Implementation of DC-DC Buck-Boost Converters  
DSP-Based Control of Stepper Motors  
DSP-Based Control of Permanent Magnet Brushless DC Machines  
Park and Clarke's Transformations  
Space Vector Pulse Width Modulation  
DSP-Based Control of Permanent Magnet Synchronous Machines  
DSP-Based Vector Control of Induction Motors  
DSP-Based Control of Switched Reluctance Motor Drives  
DSP-Based Control of Matrix Converters  
Appendix A: Induction Motor Simulation and Control using Software Packages