

# Digital Systems Design with FPGAs and CPLDs

By Ian Grout

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*Digital Systems Design with FPGAs and CPLDs* explains how to design and develop digital electronic systems using programmable logic devices (PLDs). Totally practical in nature, the book features numerous (quantify when known) case study designs using a variety of Field Programmable Gate Array (FPGA) and Complex Programmable Logic Devices (CPLD), for a range of applications from control and instrumentation to semiconductor automatic test equipment.

Key features include:

- \* Case studies that provide a walk through of the design process, highlighting the trade-offs involved.
- \* Discussion of real world issues such as choice of device, pin-out, power supply, power supply decoupling, signal integrity- for embedding FPGAs within a PCB based design.

With this book engineers will be able to:

- \* Use PLD technology to develop digital and mixed signal electronic systems
- \* Develop PLD based designs using both schematic capture and VHDL synthesis techniques
- \* Interface a PLD to digital and mixed-signal systems
- \* Undertake complete design exercises from design concept through to the build and test of PLD based electronic hardware

This book will be ideal for electronic and computer engineering students taking a practical or Lab based course on digital systems development using PLDs and for engineers in industry looking for concrete advice on developing a digital system using a FPGA or CPLD as its core.

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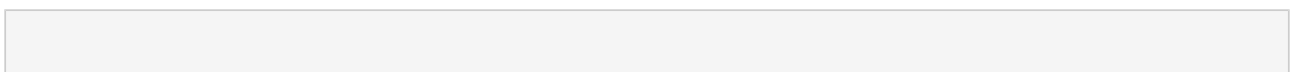
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## Digital Systems Design with FPGAs and CPLDs By Ian Grout Bibliography

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## **Editorial Review**

From the Back Cover

**If you are just starting in the field of digital system design with programmable logic, this book is all you will need!**

Programmable logic has made it possible to create digital systems that are malleable allowing for updates, changes, and enhancements on the same chip making digital systems cost effective and quickly available. This book focuses on two types of this logic: field programmable gate arrays (FPGAs) and complex programmable logic devices (CPLDs). Critical insight is provided via detailed discussions, worked examples, and case studies of circuit design principles and common design decisions. VHDL (VHSIC Hardware Description Language) is introduced and used throughout the book as it is one of the primary languages used in programmable logic.

Design Fundamentals and Concepts Include

- The Basics: Flow Charts, Block Diagrams, Formal Verification, Design Specifications
- Printed Circuit Boards (PCB): Design, Testing, and Environmental Issues
- Software and Hardware Programming Languages
- Digital Logic Design Principles with VHDL
- Digital Signal Processing
- Interfacing Analog and Digital: DAC and ADC
- Systems Level Design Including 2 Cases Studies

About the Author

Ian A. Grout received his B.Eng in Electronic Engineering (1991) and PhD (1994) from Lancaster University (UK). He has worked in both industry and the academic field in microelectronic circuit and electronics design and test. He currently works in the areas of mixed-signal integrated circuit (IC) design for testability (DfT) and digital electronic circuit design using programmable logic. The author is currently a lecturer within the Department of Electronic and Computer Engineering at the University of Limerick (Ireland). He currently teaches programmable logic and integrated circuit design and test principles within the university and has worked in Limerick since 1998. Prior to this he was a lecturer in the Engineering Department at Lancaster University (UK).

## **Users Review**

**From reader reviews:**

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**Ana May:**

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