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A programmable logic controller (PLC) or programmable controller is an industrial digital computer which has been ruggedized and adapted for the control of manufacturing processes, such as assembly lines, or robotic devices, or any activity that requires high reliability, ease of programming and process fault diagnosis.. PLCs can range from small modular devices with tens of inputs and

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outputs ...

The fifth edition of Programmable Logic Controllers continues to provide an up to date introduction to all aspects of PLC programming, installation, and maintaining procedures. Improvements have been made to every chapter. The Content, Applied Programming Examples, Instructor/Student Resources (including lesson PowerPoint presentations with simulated PLC program videos), Test Generator, LogixPro Lab Manual, and Activities Manual - leaves little to be desired by the student or instructor. With the fifth edition, students and instructors also have access to McGraw-Hill Education's digital products, Connect and SmartBook, for the first time! Connect is the only integrated learning system that empowers students by continuously adapting to deliver precisely what they need, when they need it, how they need it, so that class time is more engaging and effective.

The Lab Manual for Programmable Logic Controllers: Hardware and Programming is designed to supplement your PLC training and works in conjunction with the Programmable Logic Controllers: Hardware and Programming textbook. The activities in this manual are written to give you hands-on experience practicing PLC programming and creating your own controller systems.

Programmable Logic Controllers: Hardware and Programming provides an introduction to PLCs and their applications in process and industrial control systems. Using a practical applied approach to master comprehension, students will begin with basic hardware and programming concepts and then progress to system-level applications. This text is based on RSLogix 500 programming software and Allen-Bradley SLC 500 controller. To prepare technicians to meet the needs of industry, the author covers PLC

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applications, maintenance, testing, and troubleshooting. Illustrations and examples help to explain system functions and complex concepts presented in the text. Comprehensive review questions and lab activities at the end of each chapter allow students to practice and apply what they have learned.

A programmable logic controllers (PLC) is a real-time system optimized for use in severe conditions such as high/low temperatures or an environment with excessive electrical noise. This control technology is designed to have multiple interfaces (I/Os) to connect and control multiple mechatronic devices such as sensors and actuators. Programmable Logic Controllers, Fifth Edition, continues to be a straight forward, easy-to-read book that presents the principles of PLCs while not tying itself to one vendor or another. Extensive examples and chapter ending problems utilize several popular PLCs currently on the market highlighting understanding of fundamentals that can be used no matter the specific technology. Ladder programming is highlighted throughout with detailed coverage of design characteristics, development of functional blocks, instruction lists, and structured text. Methods for fault diagnosis, testing and debugging are also discussed. This edition has been enhanced with new material on I/Os, logic, and protocols and networking. For the UK audience only: This book is fully aligned with BTEC Higher National requirements. \*New material on combinational logic, sequential logic, I/Os, and protocols and networking \*More worked examples throughout with more chapter-ending problems \*As always, the book is vendor agnostic allowing for general concepts and fundamentals to be taught and applied to several controllers

This is the introduction to PLCs for which baffled students, technicians and managers have been waiting. In this straightforward, easy-to-read guide, Bill Bolton has kept the jargon to a minimum, considered all the programming methods in the

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standard IEC 1131-3 - in particular ladder programming, and presented the subject in a way that is not device specific to ensure maximum applicability to courses in electronics and control systems. Now in its fourth edition, this best-selling text has been expanded with increased coverage of industrial systems and PLCs and more consideration has been given to IEC 1131-3 and all the programming methods in the standard. The new edition brings the book fully up to date with the current developments in PLCs, describing new and important applications such as PLC use in communications (e.g. Ethernet – an extremely popular system), and safety – in particular proprietary emergency stop relays (now appearing in practically every PLC based system). The coverage of commonly used PLCs has been increased, including the ever popular Allen Bradley PLCs, making this book an essential source of information both for professionals wishing to update their knowledge, as well as students who require a straight forward introduction to this area of control engineering. Having read this book, readers will be able to:

- \* Identify the main design characteristics and internal architecture of PLCs
- \* Describe and identify the characteristics of commonly used input and output devices
- \* Explain the processing of inputs and outputs of PLCs
- \* Describe communication links involved with control systems
- \* Develop ladder programs for the logic functions AND, OR, NOT, NAND, NOT and XOR
- \* Develop functional block, instruction list, structured text and sequential function chart programs
- \* Develop programs using internal relays, timers, counters, shift registers, sequencers and data handling
- \* Identify safety issues with PLC systems
- \* Identify methods used for fault diagnosis, testing and debugging programs

Fully matched to the requirements of BTEC Higher Nationals, students are able to check their learning and understanding as they work through the text using the Problems section at the end of each chapter. Complete answers are provided in the back of the book.

- \* Thoroughly practical introduction to PLC use and application - not device specific, ensuring relevance to a



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wide range of courses \* New edition expanded with increased coverage of IEC 1131-3, industrial control scenarios and communications - an important aspect of PLC use \* Problems included at the end of each chapter, with a complete set of answers given at the back of the book

An indispensable resource for those just starting off in the industrial electronics field, this practical, clearly written guide combines comprehensive, accessible coverage on programmable logic controllers with a wealth of industry examples - offering a broad-based foundation that will serve them well on the job. Reflecting the latest programming manuals for eight major PLC manufacturers, it examines every aspect of controller usage in an easy-to-understand, jargon-free narrative, beginning with a basic layout, segueing right into programming techniques, then progressing through fundamental, intermediate, and advanced functions. Discusses applications for each PLC function, and integrates a vast array of examples and problems to help readers achieve both an understanding of PLCs and the experience needed to use them. Now includes expanded coverage of jump functions, and consider such timely topics as stacking functions; newer methods of PID programming; human-machine-interfacing (HMI); and the most recent developments in control languages for PLC's. Ideal for industrial electronics and electronics maintenance training programs.

This textbook, now in its sixth edition, continues to be straightforward and easy-to-read, presenting the principles of PLCs while not tying itself to one manufacturer or another. Extensive examples and chapter ending problems utilize several popular PLCs, highlighting understanding of fundamentals that can be used regardless of manufacturer. This book will help you to understand the main design characteristics, internal architecture, and operating principles of PLCs, as well as Identify safety issues and methods for

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fault diagnosis, testing, and debugging. New to This edition: A new chapter 1 with a comparison of relay-controlled systems, microprocessor-controlled systems, and the programmable logic controller, a discussion of PLC hardware and architecture, examples from various PLC manufacturers, and coverage of security, the IEC programming standard, programming devices and manufacturer ' s software More detail of programming using Sequential Function Charts Extended coverage of the sequencer More Information on fault finding, including testing inputs and outputs with an illustration of how it is done with the PLC manufacturer ' s software New case studies A methodical introduction, with many illustrations, describing how to program PLCs, no matter the manufacturer, and how to use internal relays, timers, counters, shift registers, sequencers, and data-handling facilities Consideration of the standards given by IEC 1131-3 and the programming methods of ladder, functional block diagram, instruction list, structured text, and sequential function chart Many worked examples, multiple-choice questions, and problems are included, with answers to all multiple-choice questions and problems given at the end of the book

Programmable logic controllers (PLCs) are extensively used in industry to perform automation tasks, with manufacturers offering a variety of PLCs that differ in functions, program memories, and the number of inputs/outputs (I/O). Not surprisingly, the design and implementation of these PLCs have long been a secret of manufacturers. Unveiling the mysteries of PLC technology, Building a Programmable Logic Controller with PIC16F648A Microcontroller explains how to design and use a PIC16F648A-microcontroller-based PLC. The author first described a microcontroller-based implementation of a PLC in a series of articles published in Electronics World magazine between 2008 and 2010. This book is based on an improved version of the project, including: Updates to the hardware configuration, with a smaller

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CPU board and two I/O extension boards that now support 16 inputs and 16 outputs instead of 8 An increased clock frequency of 20 MHz Improvements to several macros Flowcharts to help you understand the macros (functions) In this book, the author provides detailed explanations of hardware and software structures. He also describes PIC Assembly macros for all basic PLC functions, which are illustrated with numerous examples and flowcharts. An accompanying CD contains source files (.ASM) and object files (.HEX) for all of the examples in the book. It also supplies printed circuit board (PCB) (Gerber and .pdf) files so that you can have the CPU board and I/O extension boards produced by a PCB manufacturer or produce your own boards. Making PLCs more easily accessible, this unique book is written for advanced students, practicing engineers, and hobbyists who want to learn how to build their own microcontroller-based PLC. It assumes some previous knowledge of digital logic design, microcontrollers, and PLCs, as well as familiarity with the PIC16F series of microcontrollers and w

Updated to reflect recent industry developments, this edition features practical information on Rockwell Automation's SLC 500 family of PLCs and includes a no-nonsense introduction to RSLogix software and the new ControlLogix PLC. To assist readers in understanding key concepts, the art program has been modernized to include improved illustrations, current manufacturer-specific photos, and actual RSLogix software screens to visibly illustrate essential principles of PLC operation. New material has been added on ControlNet and DeviceNet, and a new chapter on program flow instructions includes updated references to the SLC 500, MicroLogix, and the PLC 5. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

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