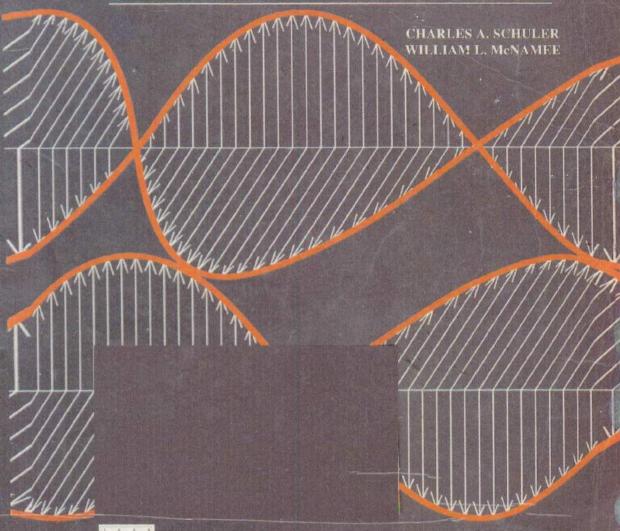
Industrial Electronics and Robotics





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INDUSTRIAL ELECTRONICS AND ROBOTICS

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PREFACE

Modern industry, confronted with intense competition and the need to improve productivity, costs, and product quality, has turned to automation for its survival. The heart and soul of automation technology is electronics—and that is what *Industrial Electron*ics and Robotics is all about.

This book was written for students of electronics technology programs that emphasize industrial applications. These students will have completed a traditional de and ac circuits course; basic algebra and trigonometry are the only mathematics prerequisites.

Industrial technicians must understand theory, devices, circuits, and systems. All these are covered thoroughly within the fifteen chapters of this text. It is equally important that technicians exhibit personal skills when interacting with other workers, supervisors, and customers. Interviews with industry leaders have invariably amplified this point. Because human-to-human interface must be a top priority for technical personnel, the topic is discussed in Chapter 1.

Industrial Electronics and Robotics is comprehensive in its treatment of devices and applications. It covers basic control devices, semiconductor devices, motor control circuits, amplifiers, and operational amplifiers. It covers digital electronics and microprocessors, and it applies the microprocessor to a basic control system. The treatment of these subjects is up to date and relevant to the needs of a modern electronics technology program. Students will find the material interesting, well illustrated, and practical.

Robotics is an important issue, although the industrial robot is largely misunderstood. A robot is a piece of equipment; some robots are quite simple, some rather sophisticated. Even the most sophisticated do not replace human workers on a one-to-one basis. Attempts at substituting robots for human beings have resulted in failure and lost revenues.

Robots work best in an environment designed for automation technology. Such an environment is very different from that found in previous industrial eras. In the modern plant, automation is based heavily on both computer control and an almost total integration of many pieces of equipment. Materials are moved, positioned, machined, inspected, assembled, and tested under computer control. The robot is an important component of automation technology, but not the focal point. It is true that some specialists in robotics are needed. However, the intent of this book is to prepare the electronics technician to deal with the broad concepts of automation technology and to show how electronics makes it work.

A book of this type would not be possible without the cooperation of educators and industrial organizations. We wish to acknowledge the invaluable input provided by both groups, although it is not possible to list them all here. We also wish to express our appreciation to our families for their understanding, assistance, and support, throughout the preparation of this text.

Charles A Schuler William L. McNamee

