Book Reviews

The PLC Workbook—Programmable Logic Controllers Made Easy, by K. CLEMENTS-JEWERY and W. JEFFCOAT. Prentice Hall; London, UK; 1996; 197 pp.; £20-95; ISBN: 0-13-489840-0

Reviewed by: Steve ROGERS
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Programmable Logic Controllers (PLCs) have become the main workhorse for equipment control in a variety of industries since they were introduced in 1969. They have evolved extensively in both hardware and software. They have become cheaper, smaller, more reliable, and much more capable than their early predecessors. PLCs have been used in nearly all industries, including chemical processing, power plants, the automotive industry, computers, aerospace, agriculture, etc., in test and manufacturing. This popularity has, in large part, been due to advances in computer technology. These advances have permitted the use of more sophisticated algorithms, and have provided the ability to control high-speed operations. Thus, PLCs have been used in a very broad spectrum of applications.

In view of the popularity of the PLC it is critical for the plant engineer to have a good working knowledge of its operating principles and terminology. With this in mind, the authors have developed a tutorial handbook to this end. The objective of the text is to enable the reader:

- to understand PLC programming and hardware fundamentals
- to size and select PLCs
- to design and document PLC software to enhance reliability
- to diagnose hardware and software faults, and troubleshoot.

The text covers control system basics, PLC hardware basics, application of PLCs for control, PLC functions and programming, the physical elements and operation of a PLC, programming devices, selecting a PLC for a given application, and some advanced PLC programming techniques. The authors emphasize practical applications of PLCs, and do not cover control theory, hardware details, or software details. Chapters 1 to 4 provide an introduction into the basics of PLCs. By means of examples taken from industrial experience and exercises, the reader learns to configure and design logic circuits, and program PLCs. Chapters 6 to 8 emphasize hardware basics. The physical parts and operation are explained in more detail, available functions are explained, programming devices are shown, and selection criteria are covered. Chapter 9 is devoted to developing a selection checklist; numerous topics are listed and explained. Chapters 10 and 11 discuss advanced PLC programming and troubleshooting techniques. Chapter 12 consists of examples and solutions, and the Appendix is devoted to a PLC design example.

The text is intended mainly for technicians wanting to learn the intricacies of PLC operation. Engineers and students will also benefit from it. Very little or no prior knowledge of electronics, machine control, or computers is assumed. Straightforward examples and exercises are provided, with photographs, schematics, and drawings to highlight the PLC themes throughout the text. The authors' style is relatively easy to follow, and the text will make a useful addition to the library of anyone desiring a better understanding of PLC design, selection, programming, and operation.

Nonlinear Control Systems, by Alberto ISIDORI. 3rd Edition; Springer-Verlag; New York, USA; 1995; 549 pp.; £45-00; ISBN: 3-540-19916-0

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The third edition of this well-known and excellent monograph reflects the fast, dynamic developments of the theory of nonlinear control systems, especially the differential geometric approach to such systems. The first edition was published in 1985, and was written while the author was teaching at the Department of Systems Science and Mathematics at Washington University in St. Louis, USA. In the second edition, published in 1989, two additional chapters and some recent results were incorporated. In this third edition, a few significant new results have been included. Chapters 1 to 4 are unchanged. In chapters 5 to 8 significant changes are introduced, and Chapters 8 and 9 are completely new.