
Contents

<i>Preface</i>	<i>vii</i>
<i>Disclaimer</i>	<i>ix</i>
<i>Acknowledgments</i>	<i>xi</i>
<i>Author</i>	<i>xiii</i>
1 Measurement fundamentals and instrumentation	1
2 Control terminology, theory, and tuning	39
3 Basic electronics	67
4 Digital theory, logic, and two-state control	85
5 Motor controllers	105
6 Variable-frequency drives and harmonics	153
7 Boiler controls	193
8 Pump and fan controls	243
9 Control valves	265
10 Speed, load, and alternator control	307
11 Programmable-logic controllers and operation	339
12 Wiring PLCs and I/O devices	359
13 Allen-Bradley RSLogix software and ladder-diagram programming	373
14 Electronic 4–20mA analog signals	407
15 Analog functions using Allen-Bradley’s RSLogix software	419

16 IEC 61131-3 PLC programming languages (LD, FBD, SFC, ST, and IF)	445
17 Centralized control systems, DCS, and SCADA	463
18 PLC cabling, data transmission, and networking	493
19 Industrial control system security	511
20 PLC terms and definitions	527
<i>Index</i>	537