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4b.2 Typical approach; 4b.3 Test equipment; 4b.4 Typical RS-232 problems; 4b.5 Summary of troubleshooting; 5a. RS-485 overview; 5a.1 The RS-485 interface standard; 5b. RS-485 troubleshooting; 5b.1 Introduction; 5b.2 RS-485 vs RS-422; 5b.3 RS-485 installation; 5b.4 Noise problems; 5b.5 Test equipment; 5b.6 Summary; 6a. Current loop and RS-485 converters overview; 6a.1 The 20 mA current loop; 6a.2 Serial interface converters; 6b. Current loop and RS-485 converters troubleshooting; 6b.1 Troubleshooting converters; 7a. TCP/IP overview; 7a.1 Introduction; 7a.2 Internet layer protocols (packet transport); 7a.3 Host-to-host layer: end to end reliability; 7b. TCP/IP troubleshooting; 7b.1 Introduction; 7b.2 Common problems; 7b.3 Tools of the trade; 7b.4 Typical network layer problems; 7b.5 Transport layer problems; 8a. Modbus overview; 8a.1 General overview; 8a.2 Modbus protocol structure; 8a.3 Function codes; 8b. Modbus troubleshooting; 8b.1 Common problems and faults; 8b.2 Description of tools used; 8b.3 Detailed troubleshooting; 8b.4 Conclusion; 9. Fundamentals of DNP3; 9.1 Fundamental concepts; 9.2 Understanding the DNP3 message structure; 9.3 Physical layer; 9.4 Data-link layer; 9.5 Transport layer (pseudo-transport); 9.6 Application layer message handling; 9.7 Application layer message functions; 10. Fundamentals of IEC 60870-5; 10.1 The IEC 60870-5 standard; 10.2 Protocol architecture; 10.3 Physical layer; 10.4 Data-link layer; 10.5 Application layer; 10.6 Information elements; 11a. Industrial Ethernet overview; 11a.1 Introduction; 11a.2 10 Mbps Ethernet; 11a.3 100 Mbps Ethernet; 11a.4 Gigabit Ethernet; 11a.5 Industrial Ethernet; 11b. Industrial Ethernet troubleshooting; 11b.1 Introduction; 11b.2 Common problems and faults; 11b.3 Tools of the trade

Sommario/riassunto

The objective of this book is to outline the best practice in designing, installing, commissioning and troubleshooting industrial data communications systems. In any given plant, factory or installation there are a myriad of different industrial communications standards used and the key to successful implementation is the degree to which the entire system integrates and works together. With so many different standards on the market today, the debate is not about what is the best - be it Foundation Fieldbus, Profibus, Devicenet or Industrial Ethernet - but rather about selecting the most a
