

ELECTRONIC SECURITY SYSTEMS

ELECTRONIC SECURITY SYSTEMS

A Manager's Guide to Evaluating and Selecting System Solutions

Robert L. Pearson, PE



ELSEVIER

AMSTERDAM • BOSTON • HEIDELBERG • LONDON
NEW YORK • OXFORD • PARIS • SAN DIEGO
SAN FRANCISCO • SINGAPORE • SYDNEY • TOKYO

Butterworth-Heinemann is an imprint of Elsevier



Acquisitions Editor: Mark Listewnik
Assistant Editor: Kelly Weaver
Marketing Manager: Christian Nolin
Project Manager: Jeff Freeland
Cover Designer: Eric DeCicco
Compositor: SPI Publisher Services
Cover Printer: Phoenix Color Corp.
Text Printer/Binder: The Maple-Vail Book Manufacturing Group

Butterworth-Heinemann is an imprint of Elsevier
30 Corporate Drive, Suite 400, Burlington, MA 01803, USA
Linacre House, Jordan Hill, Oxford OX2 8DP, UK

Copyright © 2007, Elsevier Inc. All rights reserved.

No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the publisher.

Permissions may be sought directly from Elsevier's Science & Technology Rights Department in Oxford, UK: phone: (+44) 1865 843830, fax: (+44) 1865 853333, E-mail: permissions@elsevier.com. You may also complete your request on-line via the Elsevier homepage (<http://elsevier.com>), by selecting "Support & Contact" then "Copyright and Permission" and then "Obtaining Permissions."

- ∞ Recognizing the importance of preserving what has been written, Elsevier prints its books on acid-free paper whenever possible.

Library of Congress Cataloging-in-Publication Data

Pearson, Robert L.

Electronic security systems : a manager's guide to evaluating and selecting systems solutions / Robert L. Pearson.

p. cm.

Includes bibliographical references and index.

ISBN 0-7506-7999-9 (alk. paper)

1. Electronic securitysystems. 2. Office buildings--Security measures. 3. Business enterprises--Security measures. I. Title.

TH9737.P43 2006
621.389'28--dc22

200649578

British Library Cataloguing-in-Publication Data

A catalogue record for this book is available from the British Library.

ISBN 13: 978-0-7506-7999-2

ISBN 10: 0-7506-7999-9

For information on all Elsevier Butterworth-Heinemann publications visit our Web site at www.books.elsevier.com

Printed in the United States of America

06 07 08 09 10 11 10 9 8 7 6 5 4 3 2 1

Working together to grow
libraries in developing countries

www.elsevier.com | www.bookaid.org | www.sabre.org

ELSEVIER

BOOK AID
International

Sabre Foundation

Table of Contents

Preface	vii	
Acknowledgments	xi	
Chapter 1	Electronic Access Control	1
Chapter 2	Badge Making	19
Chapter 3	Biometrics	37
Chapter 4	Electronic Alarm Systems	53
Chapter 5	Fire Systems	73
Chapter 6	Exterior and Interior Security Sensors	95
Chapter 7	Closed Circuit Television	111
Chapter 8	Wireless	133
Chapter 9	Intercoms and Controls	149
Chapter 10	Security Control Center	163
Chapter 11	Database Management	179
Chapter 12	System Configuration Control	193
Chapter 13	Process Automation	209
Chapter 14	Building Automation	221
Chapter 15	Integration	233
Chapter 16	Consolidation	249
Chapter 17	Maintenance and Testing	263
Chapter 18	Security Design Process	277

vi *Table of Contents*

Chapter 19	Special Compliance	291
Chapter 20	Trends	303
Appendix A	Pros and Cons of a Consolidated Database	313
Appendix B	Security Audit	323
Appendix C	Integration Tips	329
Appendix D	Technical Security Job Grades	337
Appendix E	Interviewing	347
Index		355

Preface

The technology and sophistication of electronics has exploded. Digital cameras on cell phones and the Internet have affected everyone. It was not many years ago that a cell phone was a luxury; today it is becoming a necessity. The Internet has become part of the majority of households. Preschool children can operate personal computers and grandparents send messages and JPEG pictures over the Internet. Online purchasing and banking have become big-time businesses, seriously impacting brick and mortar stores' sales. These enhancements and advantages in technology have been a benefit to our society by providing more capabilities, more automation, and less physical effort to accomplish a task at a reasonable cost. A microwave oven is the appliance of choice for most families today. Technology has impacted all aspects of our work and play.

These enhancements in technology have also affected security equipment. Enhanced sophisticated electronics is part of virtually every electronic security functional system. Processing capability has been added to the alarm sensors to mitigate false alarms and intelligence has been added to access cards/badges (smart cards) which process duplex communication via a reader. The card can be updated by the reader, can internally process information, and communicate back to the reader. Entire electronic functional

systems have incorporated features that allow improved operation and integration into a total electronic security system solution. Even communications between field equipment and a central station have become faster and more sophisticated. The Internet/Intranet is part of many access control, alarm, and closed circuit television, CCTV, systems available in today's market.

The sophistication and intelligence in the systems have forced the end user to become more technically oriented. Unfortunately, the typical security professional's knowledge of these various systems has not kept pace with the changes. Over the years, there have been many seminars, books, and training classes related to physical security with the primary emphasis on personnel, legal issues, facility considerations, management, and interfacing with law enforcement. In the early days, the physical security profession focused on the physical issues while the electronic systems possessed very rudimentary capabilities. Since many security professionals in the private business sector originally came from a physical security/law enforcement background, this training was appropriate. With the expanding technology, the security professional tended to consider the electronic security applications based upon functional solutions versus a holistic approach. Little consideration has been given to a key sophisticated component of the security program as to ongoing issues, maintenance, system configuration, and system philosophies.

Even today, the information that is available is primarily constrained to an electronic security functional area. For example, CCTV systems information is available that explains the different camera technologies, digital video recording, matrix systems, different communication techniques, lighting issues, and so on. There is limited information as to how all these components of any one function should operate with other functional security systems. There is a need to provide information about these different electronic security functions with a focus on integration, philosophies, tradeoffs, and ongoing issues for the end user in a corporate environment. A holistic view will incorporate these concepts as well as the perceptions of employees, visitors, contractors, management, and various business units within the company. The electronic security concerns needed to address all the different electronic security functions in a corporate central monitoring facility must be evaluated.

Electronic security is a vital aspect of any security program. It is usually a major investment and should receive a high level of scrutiny by the security professional. Often the security professional accepts a new system or has an existing system upgraded without becoming personally involved, relying on the designer, manufacturer's representative, an alarm company, or an integrator. After the installation is complete, the security professional will become the system owner from upper management's viewpoint. For a security professional to be effective, he or she needs to understand the electronics and the interactions of various electronic security functions to some level as they are integrated into a total security system solution. With this knowledge, many pitfalls can be avoided. It is a mistake to believe that a new integrated security system is top quality based solely on the fact that several electronic security components are connected together. To be successful, the security professional does not have to be the designer; however, all aspects of a holistic view must be incorporated. Since the security professional does inherit the designer's system, thus becoming the system owner, it is imperative that a holistic view is taken and the capabilities of the various electronic systems are fully understood. Further, if the security professional is fully involved in system planning, establishing data input standards, functional expectations, training of staff, and so on, a significantly better end product is assured. Short cuts, intentional or not, will undermine the foundation on which the entire system rests. If the electronic security system functions poorly, is poorly maintained, or is poorly installed, every employee, visitor, contractor and manager will become aware of the problems and be critical of the security program.

The focus of this book is to help the security professional understand the various electronic security functional components and the ways these components interconnect, as well as provide a guide to a holistic approach to solving security issues with various technologies. Issues associated with integrating electronic functions, developing a system, component philosophy, possible long-term issues, and the culture within a corporation which will impact the final system design will also be discussed. The book includes a collection of practical experiences, solutions, and an approach to solving technical problems. Electronic security solutions are as much an art form as a science; there is not just one answer to a given problem.

This book is not meant to be an engineering text, but is offered as a text for providing a solid understanding of the systems and issues that need to be addressed. Issues and information covered in this book will apply to many different environments. A corporate setting is used as its example; however, the basic issues can be applied to virtually any environment. It is my sincere hope that this book will provide you with insights into the various electronic systems and approaches to address electronic security issues by providing a lifetime of acquired experiences gained through designing, installing and maintaining electronic security systems.

Acknowledgments

It is difficult to accomplish any task totally by oneself. We are all an accumulation of experiences, information, and insights provided by other people. This book would not have been possible without the understanding, knowledge, and wisdom of the many people I have worked and collaborated with over the years. It is not possible to thank all of them by name due to the length of such a list. I do, however, want to give recognition, and my sincere appreciation, to those who helped me in reviewing the chapters in this book. Two colleagues who spent their personal time and effort to provide the needed perspective were Jim Phillips and Christine Stark. Jim provided a technical perspective and Christine provided an administrative manager's perspective, both of which were helpful in providing a balance in the material presented.

I am always thankful for the support and encouragement provided by those that are close to me. My family and my wife, particularly, encouraged the concept as well as the day-to-day work required. My final thanks go to Elsevier and Mark Listewnik for their initial interest and ongoing support in publishing this book. They have been patient and supportive and have provided the necessary assistance to bring this book to fruition. The encouraging notes from Kelly Weaver, Assistant Editor, were especially appreciated.