



**SLOVENSKI STANDARD**  
**SIST EN ISO 16484-5:2004**  
**01-februar-2004**

---

**Avtomatizacija stavb in sistemi za regulacijo – 5. del: Protokol izmenjave podatkov  
(ISO 16484-5:2003)**

Building automation and control systems - Part 5: Data communication protocolcity (ISO 16484-5:2003)

Systeme der Gebäudeautomation - Teil 5: Datenkommunikationsprotokoll (ISO 16484-5:2003)

**iTeh STANDARD PREVIEW**

Systemes d'automatisation et de gestion technique du bâtiment - Partie 5: Protocole de communication de données (ISO 16484-5:2003)

[SIST EN ISO 16484-5:2004](https://standards.iteh.ai/catalog/standards/sist/bec5402e-bbfd-40a6-bced-0a0192c3caac/sist-en-iso-16484-5-2004)

**Ta slovenski standard je istoveten z: EN ISO 16484-5:2003**

---

**ICS:**

35.240.99

97.120

**SIST EN ISO 16484-5:2004**

**en**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN ISO 16484-5:2004

<https://standards.iteh.ai/catalog/standards/sist/bec5402e-bbfd-40a6-bced-6a6f32e3eaac/sist-en-iso-16484-5-2004>

English version

Building automation and control systems - Part 5: Data  
communication protocolcity (ISO 16484-5:2003)

Systèmes d'automatisation et de gestion technique du  
bâtiment - Partie 5: Protocole de communication de  
données (ISO 16484-5:2003)

Systeme der Gebäudeautomation - Teil 5:  
Datenkommunikationsprotokoll (ISO 16484-5:2003)

This European Standard was approved by CEN on 14 October 2003.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

[SIST EN ISO 16484-5:2004](https://standards.iteh.ai/catalog/standards/sist/bec5402e-bbfd-40a6-bced-6a6f32e3eaac/sist-en-iso-16484-5-2004)

<https://standards.iteh.ai/catalog/standards/sist/bec5402e-bbfd-40a6-bced-6a6f32e3eaac/sist-en-iso-16484-5-2004>



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

## Foreword

This document (EN ISO 16484-5:2003) has been prepared by Technical Committee ISO/TC 205 "Building environment design" in collaboration with Technical Committee CEN/TC 247 "Building Automation, Controls and Building Management", the secretariat of which is held by SNV.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2004, and conflicting national standards shall be withdrawn at the latest by May 2004.

This document supersedes ENV 1805-1:1998.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

**NOTE FROM CMC** The foreword is susceptible to be amended on reception of the German language version. The confirmed or amended foreword, and when appropriate, the normative annex ZA for the references to international publications with their relevant European publications will be circulated with the German version.

iteh STANDARD PREVIEW  
(standards.iteh.ai)  
Endorsement notice

The text of ISO 16484-5:2003 has been approved by CEN as EN ISO 16484-5:2003 without any modifications. <https://standards.iteh.ai/catalog/standards/sist/bec5402e-bbfd-40a6-bced-6a6f32e3eaac/sist-en-iso-16484-5-2004>

---

---

**Building automation and control  
systems —**

**Part 5:  
Data communication protocol**

*STANDARDS PREVIEW*  
*iTeh (standards.iteh.ai)*  
*Systèmes d'automatisation et de gestion technique du bâtiment —*  
*Partie 5: Protocole de communication de données*

[SIST EN ISO 16484-5:2004](https://standards.iteh.ai/catalog/standards/sist/6a6f32e3eac/sist-en-iso-16484-5-2004)

<https://standards.iteh.ai/catalog/standards/sist/6a6f32e3eac/sist-en-iso-16484-5-2004>



**PDF disclaimer**

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN ISO 16484-5:2004](https://standards.iteh.ai/catalog/standards/sist/6a6f32e3eac/sist-en-iso-16484-5-2004)

<https://standards.iteh.ai/catalog/standards/sist/6a6f32e3eac/sist-en-iso-16484-5-2004>

© ISO 2003

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
Case postale 56 • CH-1211 Geneva 20  
Tel. + 41 22 749 01 11  
Fax + 41 22 749 09 47  
E-mail [copyright@iso.org](mailto:copyright@iso.org)  
Web [www.iso.org](http://www.iso.org)

Published in Switzerland

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 16484-5 was prepared by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) (as ANSI/ASHRAE 135-2001) and was adopted without modifications by Technical Committee ISO/TC 205, *Building environment design*.

ISO 16484 consists of the following parts, under the general title *Building automation and control systems*:

- *Part 1: Overview and definitions* [SIST EN ISO 16484-5:2004](https://standards.iteh.ai/catalog/standards/sist/en-iso-16484-5-2004)
- *Part 2: Hardware* <https://standards.iteh.ai/catalog/standards/sist/bec5402e-bbfd-40a6-bced-6a6f32e3eaac/sist-en-iso-16484-5-2004>
- *Part 3: Functions*
- *Part 5: Data communication protocol*

Further parts are under preparation.

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN ISO 16484-5:2004

<https://standards.iteh.ai/catalog/standards/sist/bec5402e-bbfd-40a6-bced-6a6f32e3eaac/sist-en-iso-16484-5-2004>



# Building automation and control systems —

## Part 5: Data communication protocol

### 1 Scope

This part of ISO 16484 defines data communication services and protocols for computer equipment used for monitoring and control of heating, ventilation, air-conditioning and refrigeration (HVAC&R) and other building systems. It defines, in addition, an abstract, object-oriented representation of information communicated between such equipment, thereby facilitating the application and use of digital control technology in buildings.

The scope and field of application are furthermore detailed in Clause 2 of the enclosed ANSI/ASHRAE publication.

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

### 2 Requirements

Requirements are the technical recommendations made in the following publication (reproduced on the following pages), which is adopted as an International Standard:

<https://standards.iteh.ai/catalog/standards/sist/bec5402e-bbfd-40a6-bced-0a052c5ca038/iso-16484-5-2004>  
ANSI/ASHRAE 135-2001, *A Data Communication Protocol for Building Automation and Control Networks*

The text on the back of the title page of the ANSI/ASHRAE standard and the policy statement on the last page are not relevant for the purposes of international standardization.

International Standards cited in the text are the following:

ISO/IEC 7498 (all parts), *Information technology — Open Systems Interconnection — Basic Reference Model*

ISO/TR 8509, *Information processing systems — Open Systems Interconnection — Service conventions*

ISO/IEC 8802-2, *Information technology — Telecommunications and information exchange between systems — Local and metropolitan area networks — Specific requirements — Part 2: Logical link control*

ISO/IEC 8824 (all parts), *Information technology — Abstract Syntax Notation One (ASN.1): Specification of basic notation*

### 3 Revision of ANSI/ASHRAE 135

It has been agreed with the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) that Technical Committee ISO/TC 205 will be consulted in the event of any revision or amendment of ANSI/ASHRAE 135. To this end, ANSI will act as a liaison body between ASHRAE and ISO.

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**  
(Blank page)

[SIST EN ISO 16484-5:2004](https://standards.iteh.ai/catalog/standards/sist/bec5402e-bbfd-40a6-bced-6a6f32e3eaac/sist-en-iso-16484-5-2004)

<https://standards.iteh.ai/catalog/standards/sist/bec5402e-bbfd-40a6-bced-6a6f32e3eaac/sist-en-iso-16484-5-2004>

## ANSI/ASHRAE Standard 135-2001

(Including ANSI/ASHRAE Addenda listed in the History of Revisions)



# ASHRAE<sup>®</sup>

# STANDARD



## A Data Communication Protocol for Building Automation and Control Networks

STANDARD PREVIEW  
(standards.iteh.ai)

Approved by the ASHRAE Standards Committee June 23, 2001; by the ASHRAE Board of Directors June 28, 2001; and by the American National Standards Institute September 7, 2001. See "History of Revisions" section for approval dates of addenda.

This standard is under continuous maintenance by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions, including procedures for timely, documented, consensus action on requests for change to any part of the standard. The change submittal form, instructions, and deadlines are given at the back of this document and may be obtained in electronic form from ASHRAE's Internet Home Page, <http://www.ashrae.org>, or in paper form from the Manager of Standards. The latest edition of an ASHRAE Standard and printed copies of a public review draft may be purchased from ASHRAE Customer Service, 1791 Tullie Circle, NE, Atlanta, GA 30329-2305. E-mail: [orders@ashrae.org](mailto:orders@ashrae.org). Fax: 404-321-5478. Telephone: 404-636-8400 (worldwide), or toll free 1-800-527-4723 (for orders in U.S. and Canada).

©Copyright 2001 American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.

ISSN 1041-2336



AMERICAN SOCIETY OF HEATING,  
REFRIGERATING AND  
AIR-CONDITIONING ENGINEERS, INC.  
1791 Tullie Circle, NE Atlanta, GA 30329

**ASHRAE STANDING STANDARD PROJECT COMMITTEE 135**  
**Cognizant TC: TC 1.4, Control Theory and Applications**  
**SPLS Liaison: Ronald E. Jarnagin**

Steven T. Bushby, *Chair\**  
 William O. Swan III, *Vice-Chair*  
 Keith A. Corbett, *Secretary\**  
 Ron E. Anderson  
 Beauford W. Atwater  
 David J. Branson  
 Barry B. Bridges\*  
 James F. Butler  
 A. J. Capowski\*  
 Jeffery Cosiol\*  
 Harsha M. Dabholkar

Dana R. Epperson  
 Thomas S. Ertsgaard\*  
 David M. Fisher  
 Daniel P. Giorgis\*  
 Ira G. Goldschmidt  
 Jerald Griliches  
 John L. Hartman  
 Winston I. Hetherington  
 Richard Holtz  
 Anthony J. Icenhour  
 Stephen Karg\*  
 J. D. Ljungquist\*

Jerald P. Martocci\*  
 Carl Neilson\*  
 H. Michael Newman  
 Cherisse M. Nicastrò  
 Robert L. Old, Jr.  
 Mark A. Railsback\*  
 David Robin\*  
 Patrick Sheridan  
 Kevin G. Sweeney  
 Daniel A. Traill\*  
 Grant N. Wichenko\*  
 Robert J. Zamojcin

*\*Denotes members of voting status when this standard was approved for publication.*

**ASHRAE STANDARDS COMMITTEE 2000-2001**

Martha J. Hewett, *Chairman*  
 Nance C. Lovvorn, *Vice-Chairman*  
 Van D. Baxter  
 Dean S. Borges  
 Waller S. Clements  
 Piotr A. Domanski  
 Richard A. Evans  
 John F. Hogan  
 Ronald E. Jarnagin

David E. Knebel  
 Frederick H. Kohloss  
 William J. Landman  
 Rodney H. Lewis  
 Ross D. Montgomery  
 Davor Novosel  
 Joseph A. Pietsch  
 James A. Ranfone  
 Michael Tavares

Steven T. Taylor  
 James K. Vallort  
 Thomas E. Watson  
 Bruce A. Wilcox  
 J. Richard Wright  
 Gerald C. Groff, BOD ExO  
 William J. Buck, CO

**iTeh STANDARD PREVIEW**  
 (standards.iteh.ai)

Claire B. Ramspeck, Manager of Standards

**SPECIAL NOTE**

This American National Standard (ANS) is a national voluntary consensus standard developed under the auspices of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). Consensus is defined by the American National Standards Institute (ANSI), of which ASHRAE is a member and which has approved this standard as an ANS, as "substantial agreement reached by directly and materially affected interest categories. This signifies the concurrence of more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that an effort be made toward their resolution." Compliance with this standard is voluntary until and unless a legal jurisdiction makes compliance mandatory through legislation.

ASHRAE obtains consensus through participation of its national and international members, associated societies, and public review.

ASHRAE Standards are prepared by a Project Committee appointed specifically for the purpose of writing the Standard. The Project Committee Chair and Vice-Chair must be members of ASHRAE; while other members may or may not be members of ASHRAE, all must be technically qualified in the subject area of the standard. Every effort is made to balance the concerned interests on all Project Committees.

The Manager of Standards of ASHRAE should be contacted for:

- a. interpretation of the contents of this Standard,
- b. participation in the next review of the Standard,
- c. offering constructive criticism for improving the Standard,
- d. permission to reprint portions of the Standard.

**DISCLAIMER**

ASHRAE uses its best efforts to promulgate standards for the benefit of the public in light of available information and accepted industry practices. However, ASHRAE does not guarantee, certify, or assure the safety or performance of any products, components, or systems tested, designed, installed, or operated in accordance with ASHRAE's Standards or Guidelines or that any tests conducted under its standards will be nonhazardous or free from risk.

**ASHRAE INDUSTRIAL ADVERTISING POLICY ON STANDARDS**

ASHRAE Standards and Guidelines are established to assist industry and the public by offering a uniform method of testing for rating purposes, by suggesting safe practices in designing and installing equipment, by providing proper definitions of this equipment, and by providing other information that may serve to guide the industry. The creation of ASHRAE Standards and Guidelines is determined by the need for them, and conformance to them is completely voluntary.

In referring to this standard and marking of equipment and in advertising, no claim shall be made, either stated or implied, that the product has been approved by ASHRAE.

## CONTENTS

FOREWORD .....	vii
1 PURPOSE.....	1
2 SCOPE.....	1
3 DEFINITIONS .....	1
3.1 Terms Adopted from International Standards.....	1
3.2 Terms Defined for this Standard.....	2
3.3 Abbreviations and Acronyms Used in this Standard .....	5
4 BACnet PROTOCOL ARCHITECTURE .....	8
4.1 The BACnet Collapsed Architecture .....	9
4.2 BACnet Network Topology.....	11
4.3 Security.....	13
5 THE APPLICATION LAYER .....	14
5.1 The Application Layer Model.....	14
5.2 Segmentation of BACnet Messages .....	18
5.3 Transmission of BACnet APDUs.....	19
5.4 Application Protocol State Machines.....	23
5.5 Application Protocol Time Sequence Diagrams.....	37
5.6 Application Layer Service Conventions .....	45
6 THE NETWORK LAYER .....	47
6.1 Network Layer Service Specification .....	47
6.2 Network Layer PDU Structure .....	48
6.3 Messages for Multiple Recipients.....	53
6.4 Network Layer Protocol Messages.....	54
6.5 Network Layer Procedures .....	56
6.6 BACnet Routers.....	58
6.7 Point-To-Point Half-Routers.....	63
7 DATA LINK/PHYSICAL LAYERS: ISO 8802-3 ("Ethernet") LAN.....	68
7.1 The Use of ISO 8802-2 Logical Link Control (LLC).....	68
7.2 Parameters Required by the LLC Primitives.....	68
7.3 Parameters Required by the MAC Primitives.....	68
7.4 Physical Media .....	68
8 DATA LINK/PHYSICAL LAYERS: ARCNET LAN.....	70
8.1 The Use of ISO 8802-2 Logical Link Control (LLC).....	70
8.2 Parameters Required by the LLC Primitives .....	70
8.3 Mapping the LLC Services to the ARCNET MAC Layer .....	70
8.4 Parameters Required by the MAC Primitives.....	70
8.5 Physical Media .....	70
9 DATA LINK/PHYSICAL LAYERS: MASTER-SLAVE/TOKEN PASSING (MS/TP) LAN .....	72
9.1 Service Specification .....	72
9.2 Physical Layer .....	74
9.3 MS/TP Frame Format.....	76
9.4 Overview of the MS/TP Network.....	77
9.5 MS/TP Medium Access Control.....	78
9.6 Cyclic Redundancy Check (CRC).....	94
9.7 Interfacing MS/TP LANs with Other BACnet LANs.....	95
9.8 Responding BACnet User Processing of Messages from MS/TP.....	95
9.9 Repeaters .....	95
10 DATA LINK/PHYSICAL LAYERS: POINT-TO-POINT (PTP).....	97
10.1 Overview .....	97
10.2 Service Specification .....	97
10.3 Point-to-Point Frame Format.....	102
10.4 PTP Medium Access Control Protocol.....	104
11 DATA LINK/PHYSICAL LAYERS: EIA/CEA-709.1 ("LonTalk") LAN .....	125
11.1 The Use of ISO 8802-2 Logical Link Control (LLC).....	125
11.2 Parameters Required by the LLC Primitives .....	125

11.3	Mapping the LLC Services to the LonTalk Application Layer .....	125
11.4	Parameters Required by the Application Layer Primitives.....	125
11.5	Physical Media .....	126
12	MODELING CONTROL DEVICES AS A COLLECTION OF OBJECTS .....	127
12.1	Analog Input Object Type .....	130
12.2	Analog Output Object Type.....	135
12.3	Analog Value Object Type .....	140
12.4	Averaging Object Type.....	145
12.5	Binary Input Object Type .....	148
12.6	Binary Output Object Type.....	153
12.7	Binary Value Object Type .....	159
12.8	Calendar Object Type .....	164
12.9	Command Object type .....	166
12.10	Device Object Type .....	169
12.11	Event Enrollment Object Type .....	175
12.12	File Object Type .....	180
12.13	Group Object Type .....	182
12.14	Life Safety Point Object Type .....	184
12.15	Life Safety Zone Object Type .....	190
12.16	Loop Object Type .....	196
12.17	Multi-state Input Object Type.....	203
12.18	Multi-state Output Object Type.....	207
12.19	Multi-state Value Object Type .....	211
12.20	Notification Class Object type .....	216
12.21	Program Object Type.....	219
12.22	Schedule Object Type.....	224
12.23	Trend Log Object Type .....	227
13	ALARM AND EVENT SERVICES.....	233
13.1	Change of Value Reporting .....	234
13.2	Intrinsic Reporting.....	236
13.3	Algorithmic Change Reporting.....	239
13.4	Alarm and Event Occurrence and Notification.....	245
13.5	AcknowledgeAlarm Service .....	248
13.6	ConfirmedCOVNotification Service .....	250
13.7	UnconfirmedCOVNotification Service .....	252
13.8	ConfirmedEventNotification Service.....	253
13.9	UnconfirmedEventNotification Service.....	256
13.10	GetAlarmSummary Service.....	258
13.11	GetEnrollmentSummary Service .....	260
13.12	GetEventInformation Service .....	263
13.13	LifeSafetyOperation Service.....	265
13.14	SubscribeCOV Service.....	267
13.15	SubscribeCOVProperty Service .....	269
14	FILE ACCESS SERVICES .....	272
14.1	AtomicReadFile Service.....	273
14.2	AtomicWriteFile Service.....	276
15	OBJECT ACCESS SERVICES .....	278
15.1	AddListElement Service.....	278
15.2	RemoveListElement Service.....	280
15.3	CreateObject Service .....	282
15.4	DeleteObject Service .....	284
15.5	ReadProperty Service .....	285
15.6	ReadPropertyConditional Service.....	287
15.7	ReadPropertyMultiple Service.....	292
15.8	ReadRange Service.....	295
15.9	WriteProperty Service .....	299
15.10	WritePropertyMultiple Service.....	301

  
 (standards.itech.ai)  
 SIST EN ISO 16484-5:2004  
<https://standards.itech.ai/catalog/standards/sist/bec5402e-bbfd-40a6-bced-6a6f32e3eaac/sist-en-iso-16484-5-2004>

16	REMOTE DEVICE MANAGEMENT SERVICES .....	304
16.1	DeviceCommunicationControl Service .....	304
16.2	ConfirmedPrivateTransfer Service .....	306
16.3	UnconfirmedPrivateTransfer Service .....	308
16.4	ReinitializeDevice Service .....	309
16.5	ConfirmedTextMessage Service .....	311
16.6	UnconfirmedTextMessage Service .....	313
16.7	TimeSynchronization Service .....	314
16.8	UTCTimeSynchronization Service .....	315
16.9	Who-Has and I-Have Services .....	316
16.10	Who-Is and I-Am Services .....	318
17	VIRTUAL TERMINAL SERVICES .....	320
17.1	Virtual Terminal Model .....	320
17.2	VT-Open Service .....	324
17.3	VT-Close Service .....	326
17.4	VT-Data Service .....	327
17.5	Default-terminal Characteristics .....	329
18	ERROR, REJECT, and ABORT CODES .....	333
18.1	Error Class - DEVICE .....	333
18.2	Error Class - OBJECT .....	333
18.3	Error Class - PROPERTY .....	333
18.4	Error Class - RESOURCES .....	334
18.5	Error Class - SECURITY .....	334
18.6	Error Class - SERVICES .....	335
18.7	Error Class - VT .....	336
18.8	Reject Reason .....	336
18.9	Abort Reason .....	336
19	BACnet PROCEDURES .....	338
19.1	Backup and Restore .....	338
19.2	Command Prioritization .....	341
20	ENCODING BACnet PROTOCOL DATA UNITS .....	345
20.1	Encoding the Fixed Part of BACnet APDUs .....	345
20.2	Encoding the Variable Part of BACnet APDUs .....	355
21	FORMAL DESCRIPTION OF APPLICATION PROTOCOL DATA UNITS .....	369
22	CONFORMANCE AND INTEROPERABILITY .....	409
22.1	Conformance to BACnet .....	409
22.2	BACnet Interoperability .....	410
23	EXTENDING BACnet TO ACCOMMODATE VENDOR PROPRIETARY INFORMATION .....	412
23.1	Extending Enumeration Values .....	412
23.2	Using the PrivateTransfer Services to Invoke Non-Standardized Services .....	412
23.3	Adding Proprietary Properties to a Standardized Object .....	413
23.4	Adding Proprietary Object Types to BACnet .....	413
23.5	Restrictions on Extending BACnet .....	414
24	NETWORK SECURITY .....	415
24.1	Security Architecture .....	415
24.2	Authentication Mechanisms .....	416
24.3	Data Confidentiality Mechanism .....	418
24.4	RequestKey Service .....	419
24.5	Authenticate Service .....	420
25	REFERENCES .....	423
	ANNEX A - PROTOCOL IMPLEMENTATION CONFORMANCE STATEMENT (NORMATIVE) .....	425
	ANNEX B - GUIDE TO SPECIFYING BACnet DEVICES (INFORMATIVE) .....	427
	ANNEX C - FORMAL DESCRIPTION OF OBJECT TYPE STRUCTURES (INFORMATIVE) .....	428
	ANNEX D - EXAMPLES OF STANDARD OBJECT TYPES (INFORMATIVE) .....	439
	D.1 Example of an Analog Input Object .....	439
	D.2 Example of an Analog Output Object .....	439
	D.3 Example of an Analog Value Object .....	440