ICS 35.240.60, 91.040.01 SLOVENSKÁ TECHNICKÁ NORMA November 2026

STN	**Automatizácia v budovách a riadiace systémy (BACS) Časť 5: Dátový komunikačný protokol (ISO 16484-5: 2026)**	**STN EN ISO 16484-5** 74 7400

Building automation and control systems (BACS) - Part 5: Data communication protocol (ISO 16484-5:2026)

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 10/26

Obsahuje: EN ISO 16484-5:2026, ISO 16484-5:2026

Oznámením tejto normy sa ruší
STN EN ISO 16484-5 (74 7400) z januára 2023

143250

Úrad pre normalizáciu, metrológiu a skúšobníctvo Slovenskej republiky, 2026
Slovenská technická norma a technická normalizačná informácia je chránená zákonom č. 60/2018 Z. z. o technickej normalizácii v znení neskorších predpisov.

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 16484-5

August 2026

ICS

Supersedes EN ISO 16484-5:2022

English Version

Building automation and control systems (BACS) - Part 5: Data communication protocol (ISO 16484-5:2026)

Systèmes d'automatisation et de gestion technique du bâtiment (BACS) - Partie 5: Protocole de communication de données (ISO 16484-5:2026)

Systeme der Gebäudeautomation - Teil 5: Datenkommunikationsprotokoll (ISO 16484-5:2026)

This European Standard was approved by CEN on 26 July 2026.

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 CEN-CENELEC 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

© 2026 CEN All rights of exploitation in any form and by any means reserved worldwide for CEN national Members.

Ref. No. EN ISO 16484-5:2026 E

Contents

Page

European foreword..... 3

European foreword

This document (EN ISO 16484-5:2026) 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 February 2027, and conflicting national standards shall be withdrawn at the latest by February 2027.

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

This document supersedes EN ISO 16484-5:2022.

Any feedback and questions on this document should be directed to the users’ national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

Endorsement notice

The text of ISO 16484-5:2026 has been approved by CEN as EN ISO 16484-5:2026 without any modification.

International Standard

ISO 16484-5

Building automation and control systems (BACS) —

Part 5: Data communication protocol

Systèmes d'automatisation et de gestion technique du bâtiment (BACS) —

Partie 5: Protocole de communication de données

Eighth edition
2026-08

Reference number
ISO 16484-5:2026(en)

© ISO 2026



COPYRIGHT PROTECTED DOCUMENT

© ISO 2026

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

CONTENTS

Foreword xi
FOREWORD xii
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 8
4 BACnet PROTOCOL ARCHITECTURE 12
4.1 The BACnet Collapsed Architecture 13
4.2 BACnet Network Topology 15
4.3 Security 16
5 THE APPLICATION LAYER 17
5.1 The Application Layer Model 17
5.2 Segmentation of BACnet Messages 23
5.3 Transmission of BACnet APDUs 24
5.4 Application Protocol State Machines 28
5.5 Application Protocol Time Sequence Diagrams 46
5.6 Application Layer Service Conventions 55
6 THE NETWORK LAYER 57
6.1 Network Layer Service Specification 57
6.2 Network Layer PDU Structure 59
6.3 Messages for Multiple Recipients 65
6.4 Network Layer Protocol Messages 65
6.5 Network Layer Procedures 69
6.6 BACnet Routers 71
6.7 Point-To-Point Half-Routers 76
7 DATA LINK/PHYSICAL LAYERS: Ethernet (ISO 8802-3) LAN 81
7.1 The Use of ISO 8802-2 Logical Link Control (LLC) 81
7.2 Parameters Required by the LLC Primitives 81
7.3 Parameters Required by the MAC Primitives 81
7.4 Physical Media 81
8 DATA LINK/PHYSICAL LAYERS: ARCNET (ATA 878.1) LAN 82
8.1 The Use of ISO 8802-2 Logical Link Control (LLC) 82
8.2 Parameters Required by the LLC Primitives 82
8.3 Mapping the LLC Services to the ARCNET MAC Layer 82
8.4 Parameters Required by the MAC Primitives 82
8.5 Physical Media 82
9 DATA LINK/PHYSICAL LAYERS: MULTIDROP SERIAL BUS/TOKEN PASSING (MS/TP) LAN 84
9.1 Service Specification 84
9.2 Physical Layer 86
9.3 MS/TP Frame Format 96
9.4 Overview of the MS/TP Network 98
9.5 MS/TP Medium Access Control 99
9.6 Cyclic Redundancy Check (CRC) 120
9.7 Interfacing MS/TP LANs with Other BACnet LANs 121
9.8 Responding BACnet User Processing of Messages from MS/TP 121
9.9 Repeaters 122
9.10 COBS (Consistent Overhead Byte Stuffing) Encoding 123
9.11 Documenting MS/TP Node Design Choices 127
10 DATA LINK/PHYSICAL LAYERS: POINT-TO-POINT (PTP) 128
10.1 Overview 128
10.2 Service Specification 128
10.3 Point-to-Point Frame Format 133

© ISO 2026 – All rights reserved

10.4 PTP Medium Access Control Protocol 135
11 DATA LINK/PHYSICAL LAYERS: LonTalk (ISO/IEC 14908.1) LAN 157
11.1 The Use of ISO 8802-2 Logical Link Control (LLC) 157
11.2 Parameters Required by the LLC Primitives 157
11.3 Mapping the LLC Services to the LonTalk Application Layer 157
11.4 Parameters Required by the Application Layer Primitives 157
11.5 Physical Media 158
12 MODELING CONTROL DEVICES AS A COLLECTION OF OBJECTS 160
12.1 Object Characteristics and Requirements 160
12.2 Analog Input Object Type 167
12.3 Analog Output Object Type 174
12.4 Analog Value Object Type 182
12.5 Averaging Object Type 190
12.6 Binary Input Object Type 194
12.7 Binary Output Object Type 201
12.8 Binary Value Object Type 210
12.9 Calendar Object Type 218
12.10 Command Object Type 221
12.11 Device Object Type 228
12.12 Event Enrollment Object Type 244
12.13 File Object Type 253
12.14 Group Object Type 257
12.15 Life Safety Point Object Type 260
12.16 Life Safety Zone Object Type 268
12.17 Loop Object Type 276
12.18 Multi-state Input Object Type 286
12.19 Multi-state Output Object Type 292
12.20 Multi-state Value Object Type 299
12.21 Notification Class Object Type 307
12.22 Program Object Type 313
12.23 Pulse Converter Object Type 320
12.24 Schedule Object Type 328
12.25 Trend Log Object Type 336
12.26 Access Door Object Type 347
12.27 Event Log Object Type 357
12.28 Load Control Object Type 365
12.29 Structured View Object Type 376
12.30 Trend Log Multiple Object Type 381
12.31 Access Point Object Type 391
12.32 Access Zone Object Type 409
12.33 Access User Object Type 418
12.34 Access Rights Object Type 422
12.35 Access Credential Object Type 429
12.36 Credential Data Input Object Type 439
12.37 CharacterString Value Object Type 446
12.38 DateTime Value Object Type 453
12.39 Large Analog Value Object Type 459
12.40 BitString Value Object Type 467
12.41 OctetString Value Object Type 474
12.42 Time Value Object Type 479
12.43 Integer Value Object Type 485
12.44 Positive Integer Value Object Type 493
12.45 Date Value Object Type 501
12.46 DateTime Pattern Value Object Type 507
12.47 Time Pattern Value Object Type 513
12.48 Date Pattern Value Object Type 519
12.49 Deleted Clause 525

© ISO 2026 – All rights reserved

12.50 Global Group Object Type ... 526
12.51 Notification Forwarder Object Type ... 534
12.52 Alert Enrollment Object Type ... 542
12.53 Channel Object Type ... 546
12.54 Lighting Output Object Type ... 557
12.55 Binary Lighting Output Object Type ... 575
12.56 Network Port Object Type ... 587
12.57 Timer Object Type ... 629
12.58 Elevator Group Object Type ... 642
12.59 Lift Object Type ... 646
12.60 Escalator Object Type ... 659
12.61 Accumulator Object Type ... 667
12.62 Staging Object Type ... 677
12.63 Audit Reporter Object Type ... 688
12.64 Audit Log Object Type ... 694
12.65 Color Object Type ... 701
12.66 Color Temperature Object Type ... 707
13 ALARM AND EVENT SERVICES ... 714
13.1 Change of Value Reporting ... 714
13.2 Event Reporting ... 719
13.3 Event Algorithms ... 732
13.4 Fault Algorithms ... 764
13.5 AcknowledgeAlarm Service ... 772
13.6 ConfirmedCOVNotification Service ... 774
13.7 UnconfirmedCOVNotification Service ... 776
13.8 ConfirmedEventNotification Service ... 777
13.9 UnconfirmedEventNotification Service ... 780
13.10 GetAlarmSummary Service ... 783
13.11 GetEnrollmentSummary Service ... 785
13.12 GetEventInformation Service ... 788
13.13 LifeSafetyOperation Service ... 791
13.14 SubscribeCOV Service ... 793
13.15 SubscribeCOVProperty Service ... 796
13.16 SubscribeCOVPropertyMultiple Service ... 799
13.17 ConfirmedCOVNotificationMultiple Service ... 805
13.18 UnconfirmedCOVNotificationMultiple Service ... 808
13.19 AuditLogQuery ... 810
13.20 ConfirmedAuditNotification ... 814
13.21 UnconfirmedAuditNotification ... 815
14 FILE ACCESS SERVICES ... 816
14.1 AtomicReadFile Service ... 816
14.2 AtomicWriteFile Service ... 819
15 OBJECT ACCESS SERVICES ... 822
15.1 AddListElement Service ... 822
15.2 RemoveListElement Service ... 825
15.3 CreateObject Service ... 827
15.4 DeleteObject Service ... 830
15.5 ReadProperty Service ... 831
15.6 Deleted Clause ... 833
15.7 ReadPropertyMultiple Service ... 834
15.8 ReadRange Service ... 837
15.9 WriteProperty Service ... 845
15.10 WritePropertyMultiple Service ... 848
15.11 WriteGroup Service ... 851
16 REMOTE DEVICE MANAGEMENT SERVICES ... 853
16.1 DeviceCommunicationControl Service ... 853
16.2 ConfirmedPrivateTransfer Service ... 855

© ISO 2026 – All rights reserved

16.3 UnconfirmedPrivateTransfer Service ... 857
16.4 ReinitializeDevice Service ... 858
16.5 ConfirmedTextMessage Service ... 860
16.6 UnconfirmedTextMessage Service ... 862
16.7 TimeSynchronization Service ... 863
16.8 UTCTimeSynchronization Service ... 864
16.9 Who-Has and I-Have Services ... 865
16.10 Who-Is and I-Am Services ... 867
16.11 Who-Am-I and You-Are Services ... 869
17 AUTHENTICATION AND AUTHORIZATION SERVICES ... 872
17.1 Overview ... 872
17.2 Trust of Intermediaries ... 873
17.3 Authentication ... 874
17.4 Authorization ... 876
17.5 Conformance Requirements ... 882
17.6 AuthRequest Service ... 883
18 ERROR, REJECT, and ABORT CODES ... 887
18.1 Error Class - DEVICE ... 887
18.2 Error Class - OBJECT ... 887
18.3 Error Class - PROPERTY ... 888
18.4 Error Class - RESOURCES ... 890
18.5 Error Class - SECURITY ... 890
18.6 Error Class - SERVICES ... 892
18.7 Error Class - COMMUNICATION ... 893
18.8 Error Class - VT ... 898
18.9 Reject Reason ... 898
18.10 Abort Reason ... 899
18.11 Confirmed Service Common Errors ... 900
19 BACnet PROCEDURES ... 901
19.1 Backup and Restore ... 901
19.2 Command Prioritization ... 906
19.3 Device Restart Procedure ... 911
19.4 Determining Maximum Conveyable APDU ... 912
19.5 Value Source Mechanism ... 914
19.6 Audit Logging ... 916
19.7 Unconfigured Device Discovery and Address Assignment ... 927
19.8 Replacing Certificates in a BACnet/SC Network ... 928
19.9 Device Address Proxying ... 930
20 ENCODING BACnet PROTOCOL DATA UNITS ... 934
20.1 Encoding the Fixed Part of BACnet APDUs ... 935
20.2 Encoding the Variable Part of BACnet APDUs ... 947
21 FORMAL DESCRIPTION OF APPLICATION PROTOCOL DATA UNITS ... 963
21.1 APDU Definitions ... 963
21.2 Confirmed Service Productions ... 965
21.3 Unconfirmed Service Productions ... 976
21.4 Error Productions ... 980
21.5 Application Types ... 992
21.6 Base Types ... 994
22 CONFORMANCE AND INTEROPERABILITY ... 1082
22.1 Conformance to BACnet ... 1082
22.2 BACnet Interoperability ... 1083
23 EXTENDING BACnet TO ACCOMMODATE VENDOR PROPRIETARY INFORMATION ... 1085
23.1 Extending Enumeration Values ... 1085
23.2 Using the PrivateTransfer Services to Invoke Non-Standardized Services ... 1086
23.3 Adding Proprietary Properties to a Standardized Object ... 1086
23.4 Adding Proprietary Object Types to BACnet ... 1087
23.5 Restrictions on Extending BACnet ... 1087

© ISO 2026 – All rights reserved

24 DELETED CLAUSE 1088
25 REFERENCES 1089
ANNEX A - PROTOCOL IMPLEMENTATION CONFORMANCE STATEMENT (NORMATIVE) 1094
ANNEX B - GUIDE TO SPECIFYING BACnet DEVICES (INFORMATIVE) 1098
ANNEX C - Removed 1099
ANNEX D - Removed 1100
ANNEX E - EXAMPLES OF BACnet APPLICATION SERVICES (INFORMATIVE) 1101
E.1 Alarm and Event Services 1101
E.2 File Access Services 1106
E.3 Object Access Services 1107
E.4 Remote Device Management Services 1114
E.5 Virtual Terminal Services 1117
ANNEX F - EXAMPLES OF APDU ENCODING (INFORMATIVE) 1120
F.1 Example Encodings for Alarm and Event Services 1120
F.2 Example Encodings for File Access Services 1131
F.3 Example Encodings for Object Access Services 1134
F.4 Example Encodings for Remote Device Management Services 1144
F.5 Example Encodings for Virtual Terminal Services 1150
ANNEX G - CALCULATION OF CRC (INFORMATIVE) 1153
G.1 Calculation of the Header CRC 1153
G.2 Calculation of the Data CRC 1159
G.3 Calculation of the Encoded CRC-32K 1163
ANNEX H - COMBINING BACnet NETWORKS WITH NON-BACnet NETWORKS (NORMATIVE) 1167
H.1 BACnet Gateways 1167
H.2 Requirements and Best Practices for BACnet Gateway Implementations 1167
H.3 Using BACnet with the DARPA Internet Protocols 1169
H.4 Using BACnet with the IPX Protocol 1171
H.5 Using BACnet with EIB/KNX 1172
H.6 Using BACnet with the Former BACnet/WS Web Services Interface Defined by Annex N 1182
H.7 Virtual MAC Addressing 1183
ANNEX I - COMMANDABLE PROPERTIES WITH MINIMUM ON AND OFF TIMES (INFORMATIVE) 1185
ANNEX J - BACnet/IP (NORMATIVE) 1187
J.1 General 1187
J.2 BACnet Virtual Link Layer 1188
J.3 BACnet/IP Directed Messages 1191
J.4 BACnet/IP Broadcast Messages 1191
J.5 Addition of Foreign B/IP Devices to an Existing B/IP Network 1194
J.6 Routing Between B/IP and non-B/IP BACnet Networks 1195
J.7 Routing Between Two B/IP BACnet Networks 1196
J.8 Use of IP Multicast within BACnet/IP 1202
ANNEX K - BACnet INTEROPERABILITY BUILDING BLOCKS (BIBBs) (NORMATIVE) 1203
K.1 Data Sharing BIBBs 1203
K.2 Alarm and Event Management BIBBs 1224
K.3 Scheduling BIBBs 1237
K.4 Trending BIBBs 1242
K.5 Device Management BIBBs 1245
K.6 Network Management BIBBs 1253
K.7 Gateway BIBBs 1257
K.8 Audit Reporting BIBBs 1258
K.9 Authentication and Authorization BIBBs 1259
ANNEX L - DESCRIPTIONS AND PROFILES OF STANDARDIZED BACnet DEVICES (NORMATIVE) 1261
L.1 Operator Interface Profiles 1261
L.2 Life Safety Operator Interface Profiles 1264
L.3 Access Control Operator Interface Profiles 1267
L.4 Controller Profiles 1270
L.5 Life Safety Controller Profiles 1272

© ISO 2026 – All rights reserved

L.6 Access Control Controller Profiles ... 1274
L.7 Miscellaneous Profiles ... 1276
L.8 BACnet General (B-GENERAL) Profile ... 1279
L.9 Lighting Operator Interface Profiles ... 1280
L.10 Lighting Control Station Profiles ... 1282
L.11 Lighting Controller Profiles ... 1283
L.12 Elevator Operator Interface Profiles ... 1285
L.13 Elevator Controller Profiles ... 1287
L.14 Authentication and Authorization Profiles ... 1289
ANNEX M - GUIDE TO EVENT NOTIFICATION PRIORITY ASSIGNMENTS (INFORMATIVE) ... 1290
M.1 Life Safety Message Group (0 - 31) ... 1290
M.2 Property Safety Message Group (32 - 63) ... 1291
M.3 Supervisory Message Group (64 - 95) ... 1292
M.4 Trouble Message Group (96 - 127) ... 1292
M.5 Miscellaneous Higher Priority Message Group (128 - 191) ... 1293
M.6 Miscellaneous Lower Priority Message Group (192 - 255) ... 1293
ANNEX N - FORMER BACnet/WS WEB SERVICES INTERFACE (INFORMATIVE) ... 1294
N.1 Data Model ... 1294
N.2 Paths ... 1295
N.3 Normalized Points ... 1296
N.4 Reference Nodes ... 1296
N.5 Localization ... 1297
N.6 Security ... 1297
N.7 Sessions ... 1297
N.8 Attributes ... 1297
N.9 Standard Nodes ... 1303
N.10 Encodings ... 1304
N.11 Service Options ... 1305
N.12 Services ... 1307
N.13 Errors ... 1325
N.14 Extending BACnet/WS ... 1326
ANNEX O - BACnet OVER ZigBee AS A DATA LINK LAYER (NORMATIVE) ... 1327
O.1 General ... 1327
O.2 ZigBee Overview ... 1327
O.3 Definitions ... 1328
O.4 Unicast Addressing ... 1328
O.5 Broadcast Addressing ... 1328
O.6 BACnet/ZigBee Data Link Layer (BZLL) ... 1329
O.7 Maximum Payload Size ... 1332
O.8 Vendor Specific Commands ... 1332
ANNEX P - BACnet ENCODING OF STANDARD AUTHENTICATION FACTOR FORMATS (NORMATIVE) ... 1333
ANNEX Q - XML DATA FORMATS (NORMATIVE) ... 1339
Q.1 Introduction ... 1339
Q.2 XML Document Structure ... 1343
Q.3 Expressing Data ... 1346
Q.5 Expressing Values ... 1348
Q.6 Binary Encoding and Access Rules ... 1350
Q.7 Extensibility ... 1350
Q.8 BACnet URI Scheme ... 1351
ANNEX R - MAPPING NETWORK LAYER ERRORS (NORMATIVE) ... 1352
ANNEX S - Removed ... 1353
ANNEX T - COBS (CONSISTENT OVERHEAD BYTE STUFFING) FUNCTIONS (INFORMATIVE) ... 1354
T.1 Preparing a COBS-Encoded MS/TP Frame for Transmission ... 1354
T.2 Decoding an Extended MS/TP Frame upon Reception ... 1357
T.3 Example COBS-Encoded Frame - Who-Has Service ... 1359
ANNEX U - BACnet/IPv6 (NORMATIVE) ... 1361

© ISO 2026 – All rights reserved

U.1 General ... 1361
U.2 BACnet/IPv6 BACnet Virtual Link Layer ... 1362
U.3 BACnet/IPv6 Directed Messages ... 1366
U.4 BACnet/IPv6 Broadcast Messages ... 1366
U.5 BACnet /IPv6 VMAC Table Management ... 1371
ANNEX V - MIGRATION FROM SOAP SERVICES (INFORMATIVE) ... 1373
V.1 Services ... 1373
V.2 Service Options ... 1375
ANNEX W - BACnet/WS RESTful WEB SERVICES INTERFACE (NORMATIVE) ... 1377
W.1 Data Model ... 1377
W.2 Paths ... 1377
W.3 Security ... 1378
W.4 Sessions ... 1388
W.5 Standard Data Items ... 1388
W.6 Metadata ... 1393
W.7 Functions ... 1393
W.8 Query Parameters ... 1395
W.9 Representation of Data ... 1397
W.10 Representation of Metadata ... 1397
W.11 Representation of Logs ... 1398
W.12 Filtering Items ... 1403
W.13 Limiting Number of Items ... 1405
W.14 Selecting Children ... 1405
W.15 Controlling Content of Data Representations ... 1405
W.16 Specifying Ranges ... 1409
W.17 Localized Values ... 1411
W.18 Accessing Individual Tags and Bits ... 1412
W.19 Semantics ... 1412
W.20 Links and Relationships ... 1412
W.21 Foreign XML and Other Media Types ... 1412
W.22 Logical Modeling ... 1413
W.23 Mapped Modeling ... 1414
W.24 Commandability ... 1414
W.25 Writability and Visibility ... 1414
W.26 Working with Optional Data ... 1416
W.27 Working with Optional Metadata ... 1416
W.28 Creating Data ... 1417
W.29 Setting Data ... 1418
W.30 Deleting Data ... 1420
W.31 Parentally Inherited Values ... 1420
W.32 Concurrency Control ... 1420
W.33 Server Support for Data Definitions ... 1421
W.34 Server Support for Metadata ... 1421
W.35 Client Implementation Guidelines ... 1422
W.36 Subscriptions ... 1423
W.37 Reading Multiple Resources ... 1424
W.38 Writing Multiple Resources ... 1426
W.39 Mapping of BACnet Systems ... 1426
W.40 Errors ... 1430
W.41 Examples ... 1432
ANNEX X - EXTENDED DISCOVERY OF DEVICES, PROFILES, AND VIEWS (NORMATIVE) ... 1460
X.1 Profiles ... 1460
X.2 xdd Files ... 1461
X.3 Example of Definition of Objects, Properties, and Datatypes. ... 1462
X.4 Views ... 1463
X.5 PICS Declarations ... 1469

© ISO 2026 – All rights reserved

ANNEX Y - ABSTRACT DATA MODEL (NORMATIVE) 1470
Y.1 Model Components 1470
Y.2 Trees 1472
Y.3 Base Types 1474
Y.4 Common Metadata 1475
Y.5 Named Values 1489
Y.6 Named Bits 1492
Y.7 Primitive Values 1493
Y.8 Range Restrictions 1495
Y.9 Engineering Units 1497
Y.10 Length Restrictions 1497
Y.11 Collections 1499
Y.12 Primitive Data 1500
Y.13 Constructed Data 1504
Y.14 Data of Undefined Type 1508
Y.15 Logical Modeling 1508
Y.16 Links 1508
Y.17 Change Indications 1510
Y.18 Definitions, Types, Instances, and Inheritance 1510
Y.19 Data Revisions 1517
Y.20 BACnet-Specific Base Types 1519
Y.21 BACnet-Specific Metadata 1520
ANNEX Z - JSON DATA FORMATS (NORMATIVE) 1522
Z.1 Introduction 1522
Z.2 JSON Document Structure 1526
Z.3 Expressing Data 1528
Z.4 Expressing Metadata 1530
Z.5 Expressing Values 1531
Z.6 Extensibility 1533
ANNEX AA –FILE FORMATS 1535
AA.1 Time Series Data Exchange File Format (NORMATIVE) 1535
AA.2 Certificate Authority Requirements Interchange File Format (NORMATIVE) 1537
ANNEX AB – BACnet Secure Connect (NORMATIVE) 1540
AB.1 BACnet Secure Connect Data link 1540
AB.2 BACnet/SC Virtual Link Layer Messages 1546
AB.3 BACnet/SC Node Operation 1559
AB.4 Node Switch and Direct Connections 1562
AB.5 Hub Function and Hub Connector 1564
AB.6 BACnet/SC Connections 1567
AB.7 Application of WebSockets in BACnet/SC 1572
ANNEX AC - EXAMPLES OF AUTHENTICATION AND AUTHORIZATION (INFORMATIVE) 1578
AC.1 Authentication Examples 1578
AC.2 Authorization Examples 1580
ANNEX AD - BACNET ENERGY SERVICES INTERFACE (NORMATIVE) 1584
AD.1 Introduction to BACnet ESI 1584
AD.2 BACnet ESI Data Classes 1585
AD.3 Data Access 1586
AD.4 Data Definitions 1587
AD.5 Examples 1589
HISTORY OF REVISIONS 1590

© ISO 2026 – All rights reserved

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted (see www.iso.org/directives).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 205, *Building environment design*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 247, *Building Automation, Controls and Building Management*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement) and with the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. (ASHRAE).

This eighth edition cancels and replaces the seventh edition (ISO 16484-5:2022), which has been technically revised.

The main changes are as follows:

— see the detailed list of changes on pages 1506 to 1527.

A list of all parts in the ISO 16484 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

© ISO 2026 – All rights reserved

FOREWORD

BACnet, the ASHRAE building automation and control networking protocol, has been designed specifically to meet the communication needs of building automation and control systems for applications such as heating, ventilating, and air-conditioning control, lighting control, access control, and fire detection systems. The BACnet protocol provides mechanisms by which computerized equipment of arbitrary function may exchange information, regardless of the particular building service it performs. As a result, the BACnet protocol may be used by head-end computers, general-purpose direct digital controllers, and application specific or unitary controllers with equal effect.

The motivation for this Standard was the widespread desire of building owners and operators for "interoperability," the ability to integrate equipment from different vendors into a coherent automation and control system - and to do so competitively. To accomplish this, the Standard Project Committee (SPC) solicited and received input from dozens of interested firms and individuals; reviewed all relevant national and international data communications standards, whether de facto or the result of committee activity; and spent countless hours in debate and discussion of the pros and cons of each element of the protocol.

What has emerged from the committee deliberations is a network protocol model with these principal characteristics:

(a) All network devices (except MS/TP subordinates) are peers, but certain peers may have greater privileges and responsibilities than others.

(b) Each network device is modeled as a collection of network-accessible, named entities called "objects." Each object is characterized by a set of attributes or "properties." While this Standard prescribes the most widely applicable object types and their properties, implementors are free to create additional object types if desired. Because the object model can be easily extended, it provides a way for BACnet to evolve in a backward compatible manner as the technology and building needs change.

(c) Communication is accomplished by reading and writing the properties of particular objects and by the mutually acceptable execution of other protocol "services." While this Standard prescribes a comprehensive set of services, mechanisms are also provided for implementors to create additional services if desired.

(d) Because of this Standard's adherence to the ISO concept of a "layered" communication architecture, the same messages may be exchanged using various network access methods and physical media. This means that BACnet networks may be configured to meet a range of speed and throughput requirements with commensurately varying cost. Multiple BACnet networks can be interconnected within the same system forming an internetwork of arbitrarily large size. This flexibility also provides a way for BACnet to embrace new networking technologies as they are developed.

BACnet was designed to gracefully improve and evolve as both computer technology and demands of building automation systems change. Upon its original publication in 1995, a Standing Standards Project Committee was formed to deliberate enhancements to the protocol under ASHRAE rules for "continuous maintenance." Much has happened since the BACnet standard was first promulgated. BACnet has been translated into Chinese, Japanese, and Korean, and embraced across the globe. BACnet devices have been designed, built and deployed on all seven continents. Suggestions for enhancements and improvements have been continually received, deliberated, and, ultimately, subjected to the same consensus process that produced the original standard. This publication is the result of those deliberations and brings together all of the corrections, refinements, and improvements that have been adopted.

Among the features that have been added to BACnet are: increased capabilities to interconnect systems across wide area networks using Internet Protocols, new objects and services to support fire detection, other life safety applications, lighting, physical access control, and elevator monitoring, capabilities to backup and restore devices, standard ways to collect trend data, new tools to make specifying BACnet systems easier, a mechanism for making interoperable extensions to the standard visible, and many others. The successful addition of these features demonstrates that the concept of a protocol deliberately crafted to permit extension of its capabilities over time as technology and needs change is viable and sound.

The latest update to this standard includes many new capabilities and several clarifications. These new capabilities include a BACnet/SC Certificate Authority Requirements Interchange File Format, support for BACnet/SC configuration including certificate management, Device Proxying, Authentication and Authorization, new Color Object concepts and modernization of language used for defining to MS/TP.

© ISO 2026 – All rights reserved

All communication protocols are, in the end, a collection of arbitrary solutions to the problems of information exchange and all are subject to change as time and technology advance. BACnet is no exception. Still, it is the hope of those who have contributed their time, energies, and talents to this work that BACnet will help to fulfill, in the area of building automation and control, th^e promise of the information age for the public good!

© ISO 2026 – All rights reserved

1 PURPOSE

The purpose of this standard is to define data communication services and protocols for computer equipment used for monitoring and control of HVAC&R and other building systems and to define, 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.

2 SCOPE

2.1 This protocol provides a comprehensive set of messages for conveying encoded binary, analog, and alphanumeric data between devices including, but not limited to:

(a) hardware binary input and output values,
(b) hardware analog input and output values,
(c) software binary and analog values,
(d) text string values,
(e) schedule information,
(f) alarm and event information,
(g) files, and
(h) control logic.

2.2 This protocol models each building automation and control computer as a collection of data structures called "objects," the properties of which represent various aspects of the hardware, software, and operation of the device. These objects provide a means of identifying and accessing information without requiring knowledge of the details of the device's internal design or configuration.

koniec náhľadu – text ďalej pokračuje v platenej verzii STN