**ANSI/ASHRAE Addendum r to
ANSI/ASHRAE Standard 135.1-2013**

Method of Test for Conformance to BACnet®

Approved by ASHRAE on May 31, 2018, and by the American National Standards Institute on June 1, 2018.

This addendum was approved 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 may be obtained in electronic form from the ASHRAE® website (www.ashrae.org) or in paper form from the Senior Manager of Standards.

The latest edition of an ASHRAE Standard may be purchased on the ASHRAE website (www.ashrae.org) or from ASHRAE Customer Service, 1791 Tullie Circle, NE, Atlanta, GA 30329-2305. E-mail: orders@ashrae.org. Fax: 678-539-2129. Telephone: 404-636-8400 (worldwide), or toll free 1-800-527-4723 (for orders in US and Canada). For reprint permission, go to www.ashrae.org/permissions.

Approved American National Standard

ANSI
www.ansi.org

ASHRAE Standing Standard Project Committee 135
Cognizant TC: 1.4, Control Theory and Application
SPLS Liaison: Drury B. Crawley

SPECIAL NOTE

This American National Standard (ANS) is a national voluntary consensus Standard developed under the auspices of 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 committee members may or may not be ASHRAE members, 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 Senior 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, or
d. permission to reprint portions of the Standard.

DISCLAIMER

ASHRAE uses its best efforts to promulgate Standards and Guidelines 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, installed, or operated in accordance with ASHRAE's Standards or Guidelines or that any tests conducted under its Standards or Guidelines 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 or Guideline and in marking of equipment and in advertising, no claim shall be made, either stated or implied, that the product has been approved by ASHRAE.

[This foreword and the "rationales" on the following pages are not part of this standard. They are merely informative and do not contain requirements necessary for conformance to the standard.]

FOREWORD

The purpose of this addendum is to present changes to ANSI/ASHRAE 135.1-2013 and Addenda. These modifications are the result of change proposals made pursuant to the ASHRAE continuous maintenance procedures and of deliberations within Standing Standard Project Committee 135. The changes are summarized below.

135.1-2013r-1. Add Property_List property tests, p. 2
135.1-2013r-2. Add tests for DUPLICATE_ENTRY error code, p. 4

In the following document, language to be added to existing clauses is indicated through the use of italics, while deletions are indicated by ~~strikethrough~~. Where entirely new subclauses are added, plain type is used throughout. All other material in this addendum is provided for context only.

The use of placeholders like X, Y, Z, X1, X2, etc., should not be interpreted as literal values of the final standard. These placeholders will be assigned actual numbers/letters only after incorporation of this addendum into the standard for republication.

135.1-2013*r*-1. Add Property_List property tests.

Rationale

Addendum 135-2010*ao*-5 added the Property_List property, required in every object.

Tests are needed.

[Add new **Clause 7.1.X**, p. 33]

7.1.X Verifying Property_List against the EPICS

Purpose: To verify the correct content of the Property_List using the properties in each object as claimed in the EPICS.

Test Concept: Match the properties in each object as claimed in the EPICS, against the content of each object's Property_List.

Test Conditionality: If Protocol_Revision is not present, or Protocol_Revision < 14, then this test shall be skipped.

Test Steps:

1.   READ OL = Object_List
2.   REPEAT O1 = (each object in the content of OL) DO {
3.   READ PL = O1, Property_List
4.   CHECK (that the property identifiers in the EPICS for O1 and those in PL match, except as specified in Notes to Tester)
     }

Notes to Tester: Object_Name (77), Object_Type (79), Object_Identifier (75), and Property_List (371) will appear in the EPICS, but shall not appear in the Property_List value. Any proprietary properties that are supported for the object-type shall be in the Property_List, but are not required to appear in the EPICS. The order in which property identifiers appear in the EPICS is not required to match the order that they appear in the Property_List value.

[Change **Clause 9.20.1.7**, p. 334]

9.20.1.7 Reading ALL Properties

Purpose: To verify the ability to correctly execute a ReadPropertyMultiple service request that uses the special property identifier ALL. One instance of each object-type supported is tested.

Test Steps:

1.   REPEAT ObjectX = (one instance of each supported object type) DO {
         TRANSMIT ReadPropertyMultiple-Request,
             'Object Identifier' =   ObjectX,
             'Property Identifier' =   ALL
         RECEIVE ReadPropertyMultiple-ACK,
             'Object Identifier' =   ObjectX,
             REPEAT P = (each property supported by ~~Object1~~ *ObjectX*) DO {
                 'Property Identifier' =   P,
                 'Property Value' =   (*any valid value for P* ~~the value of P specified in the EPICS~~)
             }
     }

ANSI/ASHRAE Addendum r to ANSI/ASHRAE Standard 135.1-2013

Notes to Tester: Any proprietary properties that are supported for the object-type shall also be returned (see BACnet 15.7.3.1.2). *If a property which is defined by the standard to be not readable using the ReadPropertyMultiple service is in the specified object, and Protocol_Revision < 7, then either no entry or an error code is returned for that property. If Protocol_Revision >= 7, then the entry shall contain 'Error Class': PROPERTY and 'Error-Code': READ_ACCESS_DENIED for that property. Property_List (371) shall not appear in the List of Results.*

[Change **Clause 9.20.1.9**, p. 335]

9.20.1.9 Reading REQUIRED Properties

Purpose: To verify the ability to correctly execute a ReadPropertyMultiple service request that uses the special property identifier REQUIRED. One instance of each object-type supported is tested. *The property identifier REQUIRED means that only those standard properties having a conformance code of "R" or "W" shall be returned.*

Test Steps:
1. REPEAT ObjectX = (one instance of each supported object type) DO {
    TRANSMIT ReadPropertyMultiple-Request,
        'Object Identifier' =   ObjectX,
        'Property Identifier' =   REQUIRED
    RECEIVE ReadPropertyMultiple-ACK,
        'Object Identifier' =   ObjectX,
        REPEAT P = (each required property defined for ~~Object1~~ *ObjectX*) DO {
            'Property Identifier' =   P,
            'Property Value' =   (*any valid value for P* ~~the value of P specified in the EPICS~~)
        }
    }

Notes to Tester: If a property which is defined by the standard to be not readable using the ReadPropertyMultiple service is in the specified object, and Protocol_Revision < 7, then either no entry or an error code is returned for that property. If Protocol_Revision >= 7, then the entry shall contain 'Error Class': PROPERTY and 'Error-Code': READ_ACCESS_DENIED for that property. Property_List (371) shall not appear in the List of Results.

135.1-2013*r*-2. Add tests for DUPLICATE_ENTRY error code.

Rationale

Addendum 135-2012*ax*-4 added the new error code DUPLICATE_ENTRY, with required behavior in the Schedule object.

A test is needed.

[Add new **Clause 7.3.2.23.X**, p. 130]

7.3.2.23.X Forbid Duplicate Time Values

Purpose: To verify that the IUT does not accept duplicate BACnetTimeValue entries.

Test Concept: Transmit a request in which the property value contains duplicate BACnetTimeValue entries.

Configuration Requirements: Select an object, Sched1, which contains a writable Weekly_Schedule or Exception_Schedule property, P1. If the IUT claims a Protocol_Revision less than 16, this test shall be skipped.

Test Steps:
1. READ V1 = (Sched1), P1
2. TRANSMIT WriteProperty-Request,
      'Object Identifier' =   Sched1,
      'Property Identifier' =   P1,
      'Property Value' =   (a value that contains a list of BACnetTimeValue with two
                                            entries at the same time within a BACnetDailySchedule
                                            or BACnetSpecialEvent)
3. RECEIVE BACnet-Error-PDU,
            Error Class =   PROPERTY,
            Error Code =   DUPLICATE_ENTRY
4. VERIFY P1 = V1

ANSI/ASHRAE Addendum r to ANSI/ASHRAE Standard 135.1-2013

[Add to **HISTORY OF REVISIONS**, p. 662]

HISTORY OF REVISIONS

Summary of Changes to the Standard
. . .
ANSI/ASHRAE Standard 135.1-2013 A consolidated version of the standard that incorporates Addenda *j, k, l, m and n* to ANSI/ASHRAE 135.1-2011 and all of the known errata.
Addendum *r* to ANSI/ASHRAE 135.1-2013 Approved by ASHRAE on May 31, 2018, and by the American National Standards Institute on June 1, 2018. 1.   Add Property_List property tests 2.   Add tests for DUPLICATE_ENTRY error code

POLICY STATEMENT DEFINING ASHRAE'S CONCERN
FOR THE ENVIRONMENTAL IMPACT OF ITS ACTIVITIES

ASHRAE is concerned with the impact of its members' activities on both the indoor and outdoor environment. ASHRAE's members will strive to minimize any possible deleterious effect on the indoor and outdoor environment of the systems and components in their responsibility while maximizing the beneficial effects these systems provide, consistent with accepted Standards and the practical state of the art.

ASHRAE's short-range goal is to ensure that the systems and components within its scope do not impact the indoor and outdoor environment to a greater extent than specified by the Standards and Guidelines as established by itself and other responsible bodies.

As an ongoing goal, ASHRAE will, through its Standards Committee and extensive Technical Committee structure, continue to generate up-to-date Standards and Guidelines where appropriate and adopt, recommend, and promote those new and revised Standards developed by other responsible organizations.

Through its *Handbook*, appropriate chapters will contain up-to-date Standards and design considerations as the material is systematically revised.

ASHRAE will take the lead with respect to dissemination of environmental information of its primary interest and will seek out and disseminate information from other responsible organizations that is pertinent, as guides to updating Standards and Guidelines.

The effects of the design and selection of equipment and systems will be considered within the scope of the system's intended use and expected misuse. The disposal of hazardous materials, if any, will also be considered.

ASHRAE's primary concern for environmental impact will be at the site where equipment within ASHRAE's scope operates. However, energy source selection and the possible environmental impact due to the energy source and energy transportation will be considered where possible. Recommendations concerning energy source selection should be made by its members.

About ASHRAE

ASHRAE, founded in 1894, is a global society advancing human well-being through sustainable technology for the built environment. The Society and its members focus on building systems, energy efficiency, indoor air quality, refrigeration, and sustainability. Through research, Standards writing, publishing, certification and continuing education, ASHRAE shapes tomorrow's built environment today.

For more information or to become a member of ASHRAE, visit www.ashrae.org.

To stay current with this and other ASHRAE Standards and Guidelines, visit www.ashrae.org/standards.

Visit the ASHRAE Bookstore

ASHRAE offers its Standards and Guidelines in print, as immediately downloadable PDFs, on CD-ROM, and via ASHRAE Digital Collections, which provides online access with automatic updates as well as historical versions of publications. Selected Standards and Guidelines are also offered in redline versions that indicate the changes made between the active Standard or Guideline and its previous version. For more information, visit the Standards and Guidelines section of the ASHRAE Bookstore at www.ashrae.org/bookstore.