BSR/ASHRAE Addendum c
to ANSI/ASHRAE Standard 135.1-2003

Public Review
Draft

ASHRAE® Standard

Proposed Addendum c to
Standard 135.1-2003,
Method of Test for
Conformance to BACnet®

First Public Review (March 2007)
(Draft Shows Proposed Changes to
Current Standard)

This draft has been recommended for public review by
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FOREWORD

The purpose of this addendum is to present a proposed change for public review. 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 proposed changes are summarized below.

SSPC 135 wishes to recognize the efforts of the following people in developing this addendum: tbd.


In the following document, language to be added to existing clauses of ANSI/ASHRAE 135.1-2003 and Addenda is indicated through the use of italics, while deletions are indicated by strikethrough. Where entirely new subclauses are proposed to be added, plain type is used throughout. Only this new and deleted text is open to comment as this time. All other material in this addendum is provided for context only and is not open for public review comment except as it relates to the proposed changes.
135.1-2003c-1. Update references to correspond to 135-2004

Rationale
135.1-2003 makes references to 135-2001 that need to be updated to refer to 135-2004.

Addendum 135.1-2003c-1

[Change 3, p. 1]

3. DEFINITIONS

All definitions from ANSI/ASHRAE Standard 135-2001 also apply to this addendum.

[Change 6.2.8, p. 25]

6.2.8 WAIT Statement

The WAIT statement is used to pause the execution of the TD for some specified amount of time.

<wait statement> ::= WAIT <timer value>

Test Steps: The TD shall pause the amount of time specified by the <timer value> before proceeding to the next test step. The <timer value> shall be one of the timers specified in 6.3 of this standard, in ANSI/ASHRAE 135-2001, 135-2004, or as otherwise specified.

[Change 6.4, p. 27]

6.4 BACnet References


[Change 7.3.1.1, p. 29]

7.3.1.1 Out_Of_Service, Status_Flags, and Reliability Tests

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clauses: 12.1.7, 12.1.9, 12.1.10, 12.2.7, 12.2.9, 12.2.10, 12.3.6, 12.3.8, 12.3.9, 12.3.7, 12.3.9, 12.3.10, 12.4.6, 12.4.8, 12.4.9, 12.5.7, 12.5.9, 12.5.10, 12.6.7, 12.6.9, 12.6.10, 12.7.6, 12.7.8, 12.7.9, 12.7.7, 12.7.9, 12.7.10, 12.8.6, 12.8.8, 12.8.9, 12.14.8, 12.14.10, 12.14.11, 12.15.8, 12.15.10, 12.15.11, 12.16.6, 12.16.8, 12.16.9, 12.16.10, 12.16.11, 12.17.7, 12.17.9, 12.17.10, 12.17.6, 12.17.8, 12.17.9, 12.18.7, 12.18.9, 12.18.10, 12.19.6, 12.19.8, and 12.19.9, 12.19.7, 12.19.9, 12.19.10, 12.20.6, 12.20.8, 12.20.9, 12.23.7, 12.23.9, and 12.23.10.

Purpose: This test case verifies that Present_Value is writable when Out_Of_Service is TRUE. It also verifies the interrelationalship between the Out_Of_Service, Status_Flags, and Reliability properties. If the PICS indicates that the Out_Of_Service property of the object under test is not writable, and if the value of the property cannot be changed by other means, then this test shall be omitted. This test applies to Accumulator, Analog Input, Analog Output, Analog Value, Binary Input, Binary Output, Binary Value, Life Safety Point, Life Safety Zone, Multi-state Input, Multi-state Output, Multi-state Value, and Loop and Pulse Converter objects.
[Change 7.3.1.2, p. 30]

7.3.1.2 Relinquish Default Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.


[Change 7.3.1.4, p. 32]

7.3.1.4 Minimum_Off_Time

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.


[Change 7.3.1.5, p. 32]

7.3.1.5 Minimum_On_Time

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clauses: 12.6.20, 12.7.18, 12.7.20, 12.8.18, 19.2.3, and Annex I.

[Change 7.3.1.6, p. 33]

7.3.1.6 Override of Minimum Time

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clause: 19.2.

[Change 7.3.1.8, p. 33]

7.3.1.8 Binary Object Change of State Tests

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.


[Change 7.3.1.9, p. 35]

7.3.1.9 Binary Object Elapsed Active Time Tests

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clauses: 12.5.17, 12.5.18, 12.6.17, 12.6.18, 12.7.15, and 12.7.16, 12.6.17, 12.6.18, 12.7.17, 12.7.18, 12.8.15, and 12.8.16.
7.3.1.10 Event_Enable Tests

Dependencies: ConfirmedEventNotification Service Initiation Tests, 8.4; UnconfirmedEventNotification Service Initiation Tests, 8.5; ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clauses: 12.1.27, 12.1.23, 12.2.24, 12.3.20, 12.5.22, 12.6.26, 12.7.24, 12.11.10, 12.2.23, 12.3.24, 12.4.20, 12.6.22, 12.7.26, 12.8.24, 12.12.10, 12.14.18, 12.15.18, 12.15.19, 12.16.19, 12.16.33, 12.17.17, 12.18.18, 12.19.18, 12.20.18, 12.23.26, and 12.23.23, 12.25.22.

Purpose: To verify that notification messages are transmitted only if the bit in Event_Enable corresponding to the event transition has a value of TRUE. This test applies to Event Enrollment objects and Accumulator, Analog Input, Analog Output, Analog Value, Binary Input, Binary Output, Binary Value, Life Safety Point, Life Safety Zone, Loop, Multi-state Input, Multi-state Output, and Multi-state Value, Pulse Converter and Trend Log objects that support intrinsic reporting.

7.3.1.11 Acked_Transitions Tests

Dependencies: ConfirmedEventNotification Service Initiation Tests, 8.4; UnconfirmedEventNotification Service Initiation Tests, 8.5; AcknowledgeAlarm Service Execution Tests, 9.1; ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clauses: 12.1.28, 12.1.24, 12.2.25, 12.3.21, 12.5.23, 12.6.27, 12.7.25, 12.11.11, 12.2.24, 12.3.25, 12.4.21, 12.6.23, 12.7.27, 12.8.25, 12.12.11, 12.14.19, 12.15.19, 12.15.20, 12.16.20, 12.16.34, 12.17.18, 12.18.19, 12.19.19, 12.20.19, 12.23.27 and 12.23.24, 12.25.23.

Purpose: To verify that the Acked_Transitions property tracks whether or not an acknowledgment has been received for a previously issued event notification. It also verifies the interrelationship between Status_Flags and Event_State. This test applies to Event Enrollment objects and Accumulator, Analog Input, Analog Output, Analog Value, Binary Input, Binary Output, Binary Value, Life Safety Point, Life Safety Zone, Loop, Multi-state Input, Multi-state Output, and Multi-state Value, Pulse Converter and Trend Log objects that support intrinsic reporting.

7.3.1.12 Notify_Type Test

Dependencies: ConfirmedEventNotification Service Initiation Tests, 8.4; UnconfirmedEventNotification Service Initiation Tests, 8.5; WriteProperty Service Execution Tests, 9.22.


Purpose: To verify that the value of the Notify_Type property determines whether an event notification is transmitted as an alarm or as an event. This test applies to Event Enrollment objects and Accumulator, Analog Input, Analog Output, Analog Value, Binary Input, Binary Output, Binary Value, Life Safety Point, Life Safety Zone, Loop, Multi-state Input, Multi-state Output, and Multi-state Value, Pulse Converter and Trend Log objects that support intrinsic reporting.
[Change 7.3.1.13, p. 43]

7.3.1.13 Limit_Enable Test

Dependencies: ConfirmedEventNotification Service Initiation Tests, 8.4; UnconfirmedEventNotification Service Initiation Tests, 8.5; ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clauses: 12.1.22, 12.2.23, and 12.3.19, 12.1.26, 12.2.22, 12.3.23, 12.4.19, and 12.23.25.

Purpose: To verify that the Limit_Enable property correctly enables or disables reporting of out of range events. This test applies to Accumulator, Analog Input, Analog Output, and Analog Value objects that support intrinsic reporting. If the Limit_Enable property is not writable and cannot be reconfigured this test shall be omitted.

[Change 7.3.1.14.1, p. 46]

7.3.1.14.1 Process_Identifier Property Test

Dependencies: None.


Purpose: To verify that the Process_Identifier property correctly supports the required value range. This test shall be performed only if the Protocol_Revision property is present in the Device object and has a value greater than or equal to 4 in the range of 1 through 3.

[Change 7.3.1.14.2, p. 46]

7.3.1.14.2 Recipient_List Test

Dependencies: None

BACnet Reference Clause: 12.20.8, 12.21.8.

[Change 7.3.2.1.1, p. 47]

7.3.2.1.1 Input Tracking Test

Dependencies: ReadProperty Service Execution Tests, 9.18.

BACnet Reference Clause: 12.1.4, 12.2.4.

[Change 7.3.2.2.1, p. 47]

7.3.2.2.1 Output Tracking Test

Dependencies: WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clause: 12.2.4, 12.3.4.
7.3.2.4 Averaging Object Tests

An Averaging object provides a way to monitor the average, minimum, and maximum values attained by a sampled property. The datatype of the sampled property can be BOOLEAN, INTEGER, Unsigned, Enumerated, or Real. The tests in this clause shall be repeated once for each of these datatypes.

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clause: 12.4, 12.5.

7.3.2.4.2 Managing the Sample Window

BACnet Reference Clause: 12.4.15, 12.5.15.

7.3.2.5.1 Input Tracking Test

Dependencies: ReadProperty Service Execution Tests, 9.18.

BACnet Reference Clause: 12.5.4, 12.6.4.

7.3.2.5.3 Polarity Property Tests

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clause: 12.5.11, 12.6.11.

7.3.2.6.1 Output Tracking Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clause: 12.6.4, 12.7.4.

7.3.2.6.3 Polarity Property Tests

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clause: 12.6.11, 12.7.11.

7.3.2.8 Calendar Test

These tests verify that the Present_Value property of the Calendar object bears the relationship to Date_List specified by BACnet Clause 12.8.6, 12.9.6.
[Change 7.3.2.8.1, p. 53]

**7.3.2.8.1 Single Date Rollover Test**


[Change 7.3.2.8.2, p. 54]

**7.3.2.8.2 Date Range Test**


[Change 7.3.2.8.3, p. 54]

**7.3.2.8.3 WeekNDay Test**


[Change 7.3.2.9.1, p. 55]

**7.3.2.9.1 All Writes Successful with Post Delay Test**

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.


[Change 7.3.2.9.2, p. 56]

**7.3.2.9.2 Quit on Failure Test**

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.


[Change 7.3.2.9.3, p. 56]

**7.3.2.9.3 External Writes Test**

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.


[Change 7.3.2.9.4, p. 57]

**7.3.2.9.4 Empty Action List Test**

Dependencies: WriteProperty Service Execution Tests, 9.22.

7.3.2.9 Action 0 Test
Dependencies: WriteProperty Service Execution Tests, 9.22.
BACnet Reference Clause: 12.9.8, 12.10.8.

7.3.2.9.6 Action_Text Test
Dependencies: ReadProperty Service Execution Tests, 9.18.
BACnet Reference Clauses: 12.9.8 and 12.9.9, 12.10.8 and 12.10.9.

7.3.2.9.7 Write While In_Process is TRUE Test.
Dependencies: WriteProperty Service Execution Tests, 9.22.
BACnet Reference Clauses: 12.9.8 and 12.9.9, 12.10.8 and 12.10.9.

7.3.2.13 Group Object Test
Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

7.3.2.14.1 Tracking Value Test
Dependencies: ReadProperty Service Execution Tests, 9.18.
BACnet Reference Clause: 12.14, 12.15.5.

7.3.2.15.1 Tracking Value Test
Dependencies: ReadProperty Service Execution Tests, 9.18.
BACnet Reference Clause: 12.15, 12.16.5.

7.3.2.16.1 Manipulated_Variable_Reference Tracking
Dependencies: ReadProperty Service Execution Tests, 9.18.
[Change 7.3.2.16.2, p. 61]

7.3.2.16.2 Controlled_Variable_Reference Tracking

Dependencies: ReadProperty Service Execution Tests, 9.18.


[Change 7.3.2.16.3, p. 62]

7.3.2.16.3 Setpoint_Reference Tracking

Dependencies: ReadProperty Service Execution Tests, 9.18.

BACnet Reference Clause: 12.16.16, 12.17.16.

[Change 7.3.2.17.2, p. 62]

7.3.2.17.2 Number_Of_States and State_Text

Dependencies: ReadProperty Service Execution Tests, 9.18.

BACnet Reference Clauses: 12.17.11 and 12.17.12, 12.18.11 and 12.18.12.

[Change 7.3.2.17.4, p. 63]

7.3.2.17.4 Input Tracking Test

Dependencies: ReadProperty Service Execution Tests, 9.18.

BACnet Reference Clause: 12.17.4, 12.18.4.

[Change 7.3.2.18.2, p. 63]

7.3.2.18.2 Number_Of_States and State_Text

Dependencies: ReadProperty Service Execution Tests, 9.18.


[Change 7.3.2.18.5, p. 64]

7.3.2.18.5 Output Tracking Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.


[Change 7.3.2.19.2, p. 64]

7.3.2.19.2 Number_Of_States and State_Text

Dependencies: ReadProperty Service Execution Tests, 9.18.

BACnet Reference Clause: 12.19, 12.20.10 and 12.20.11.
7.3.2.20.1 Priority Tests

Dependencies: ConfirmedEventNotification Service Initiation Tests, 8.4; UnconfirmedEventNotification Service Initiation Tests, 8.5; ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clause: 12.20.6, 12.21.6.

7.3.2.20.2.1 Ack_Required False Test

Dependencies: ConfirmedEventNotification Service Initiation Tests, 8.4; UnconfirmedEventNotification Service Initiation Tests, 8.5; ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.


7.3.2.20.2.2 Ack_Required True Test

Dependencies: ConfirmedEventNotification Service Initiation Tests, 8.4; UnconfirmedEventNotification Service Initiation Tests, 8.5; ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.


7.3.2.20.3.1 ValidDays Test

Dependencies: ConfirmedEventNotification Service Initiation Tests, 8.4; UnconfirmedEventNotification Service Initiation Tests, 8.5; ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22; TimeSynchronization Service Execution Tests, 9.30.

BACnet Reference Clause: 12.20.8, 12.21.8.

7.3.2.20.3.2 FromTime and ToTime Test

Dependencies: ValidDays Test, 7.3.2.20.3.1; ConfirmedEventNotification Service Initiation Tests, 8.4; UnconfirmedEventNotification Service Initiation Tests, 8.5; ReadProperty Service Execution Tests, 9.18; TimeSynchronization Service Execution Tests, 9.30.

BACnet Reference Clause: 12.20.8, 12.21.8.

7.3.2.20.3.3 IssueConfirmedNotifications Test

Dependencies: ConfirmedEventNotification Service Initiation Tests, 8.4; UnconfirmedEventNotification Service Initiation Tests, 8.5; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clause: 12.20.8, 12.21.8.
7.3.2.20.3.4 Transitions Test

Dependencies: ConfirmedEventNotification Service Initiation Tests, 8.4; UnconfirmedEventNotification Service Initiation Tests, 8.5; ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clause: 12.20.8, 12.21.8.

7.3.2.22.1 Effective_Period Test


7.3.2.22.2 Weekly_Schedule Property Test


7.3.2.22.3.1 Calendar Reference Test


7.3.2.22.3.2 Calendar Entry Date Test


7.3.2.22.3.3 Calendar Entry DateRange Test


7.3.2.22.3.4 Calendar Entry WeekNDay Month Test


[Change 7.3.2.22.3.5, p. 78]

7.3.2.22.3.5 Calendar Entry WeekNDay Week Of Month Test

[Change 7.3.2.22.3.6, p. 78]

7.3.2.22.3.6 Calendar Entry WeekNDay Last Week Of Month Test

[Change 7.3.2.22.3.7, p. 79]

7.3.2.22.3.7 Calendar Entry WeekNDay Day Of Week Test

[Change 7.3.2.22.3.8, p. 80]

7.3.2.22.3.8 Event Priority Test

[Change 7.3.2.22.3.9, p. 80]

7.3.2.22.3.9 List of BACnetTimeValue Test

[Change 7.3.2.22.4, p. 81]

7.3.2.22.4 Weekly_Schedule and Exception_Schedule Interaction Test

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[Change 7.3.2.22.5, p. 81]

7.3.2.22.5 Exception_Schedule Restoration Test


[Change 7.3.2.22.6, p. 82]

7.3.2.22.6 Weekly_Schedule Restoration Test


[Change 7.3.2.22.7, p. 83]

7.3.2.22.7 List_Of_Object_Property_Reference Internal Test


BACnet Reference Clause: 12.22.9, 12.24.10.

[Change 7.3.2.22.8, p. 83]

7.3.2.22.8 List_Of_Object_Property_Reference External Test


BACnet Reference Clause: 12.22.9, 12.24.10.

[Change 7.3.2.23.1, p. 84]

7.3.2.23.1 Log_Enable Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clause: 12.23.5, 12.25.5.

[Change 7.3.2.23.2, p. 85]

7.3.2.23.2 Start_Time Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clause: 12.23.6, 12.25.6.
[Change 7.3.2.23.3, p. 86]

7.3.2.23.3 Stop_Time Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.
BACnet Reference Clause: 12.23.7, 12.25.7.

[Change 7.3.2.23.4, pp. 86-87]

7.3.2.23.4 Log_Interval Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.
BACnet Reference Clause: 12.23.9, 12.25.9.

[Change 7.3.2.23.5, p. 87]

7.3.2.23.5 COV_Resubscription_Interval Test

Dependencies: Confirmed Notifications Subscription, 8.10.1; Unconfirmed Notifications Subscription, 8.10.2.
BACnet Reference Clause: 12.23.10, 12.25.10.

[Change 7.3.2.23.6.1, p. 88]

7.3.2.23.6.1 Stop_When_Full TRUE Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.
BACnet Reference Clause: 12.23.12, 12.25.12.

[Change 7.3.2.23.6.2, p. 89]

7.3.2.23.6.2 Stop_When_Full FALSE Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.
BACnet Reference Clause: 12.23.12, 12.25.12.

[Change 7.3.2.23.7, p. 89]

7.3.2.23.7 Buffer_Size Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

[Change 7.3.2.23.8, p. 90]

7.3.2.23.8 Record_Count Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.
BACnet Reference Clause: 12.23.15, 12.25.15.
[Change 7.3.2.23.9, p. 90]

**7.3.2.23.9 Total_Record_Count Test**

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clause: 12.23.16, 12.25.16.

Purpose: To verify that the Total_Record_Count property increments for each record added to the Log_Buffer, even after Buffer_Size records have been added. (Note: it is not reasonable to test for the requirement of BACnet Clause 12.23.16 12.25.16 that the value wrap from -1 to 0; even if a record was collected every 100\(^{th}\) of a second it could take more than 497 days to complete the test.)

[Change 7.3.2.23.10, p. 91]

**7.3.2.23.10 Notification_Threshold Test**

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.


[Change 7.3.2.23.11, p. 92]

**7.3.2.23.11 Notification Time Tests**

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.


[Change 7.3.2.23.12, p. 94]

**7.3.2.23.12 COV Subscription Failure Test**

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clauses: 12.23.5, 12.23.9, and 12.23.10, 12.25.5, 12.25.9, and 12.25.10.

[Change 8.3, p. 105]

**8.3 UnconfirmedCOVNotification Service Initiation Tests**

This clause defines the tests necessary to demonstrate support for initiating UnconfirmedCOVNotification service requests. The UnconfirmedCOVNotification tests are specific to a particular object type that provides intrinsic COV reporting capabilities. The IUT shall pass all of the tests for each object type that is claimed to be supported in the PICS.

Dependencies: SubscribeCOV Service Execution Tests, 9.10; ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.


[Change 8.4.1, p. 107]

**8.4.1 CHANGE_OF_BITSTRING Tests**

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

[Change 8.4.2, p. 108]

8.4.2 CHANGE_OF_STATE Tests

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.


[Change 8.4.3.1, p. 111]

8.4.3.1 Numerical Algorithm

The test in this clause applies to use of the CHANGE_OF_VALUE algorithm applied to Integer or Real datatypes.

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clauses: 12.11, 12.12, 12.19, 12.6, 12.8, 12.18, 12.20, 13.2, 13.3.2, and 13.8.

[Change 8.4.3.2, p. 112]

8.4.3.2 Bitstring Algorithm

The test in this clause applies to use of the CHANGE_OF_VALUE algorithm applied to Bitstring datatypes.

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clauses: 12.11, 12.12, 13.3.2, and 13.8.

[Change 8.4.4, p. 113]

8.4.4 COMMAND_FAILURE Tests

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.


[Change 8.4.5, p. 115]

8.4.5 FLOATING_LIMIT Tests

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.


[Change 8.4.6, p. 118]

8.4.6 OUT_OF_RANGE Tests

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

[Change 8.4.7, p. 121]

8.4.7 BUFFER_READY Tests

Dependencies: ReadProperty Service Execution Tests, 9.18.


[Change 8.4.8.1, p. 122]

8.4.8.1 NORMAL to OFFNORMAL Transition Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clauses: 12.11.7, 12.14, 12.15, 12.12.7, 12.15, 12.16, 13.3.8, 13.13, 13.8 and Figure 13.9, 13-9.

[Change 8.4.8.2, p. 123]

8.4.8.2 OFFNORMAL to NORMAL Transition Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clauses: 12.11.7, 12.14, 12.15, 12.12.7, 12.15, 12.16, 13.3.8, 13.13, 13.8 and Figure 13.9, 13-9.

[Change 8.4.8.3, p. 124]

8.4.8.3 NORMAL to LIFE_SAFETY_ALARM Transition Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clauses: 12.11.7, 12.14, 12.15, 12.12.7, 12.15, 12.16, 13.3.8, 13.13, 13.8 and Figure 13.9, 13-9.

[Change 8.4.8.4, p. 125]

8.4.8.4 LIFE_SAFETY_ALARM to NORMAL Transition Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clauses: 12.11.7, 12.14, 12.15, 12.12.7, 12.15, 12.16, 13.3.8, 13.13, 13.8 and Figure 13.9, 13-9.

[Change 8.4.8.5, p. 126]

8.4.8.5 LIFE_SAFETY_ALARM to OFFNORMAL Transition Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clauses: 12.11.7, 12.14, 12.15, 12.12.7, 12.15, 12.16, 13.3.8, 13.13, 13.8 and Figure 13.9, 13-9.

[Change 8.4.8.6, p. 127]

8.4.8.6 OFFNORMAL to LIFE_SAFETY_ALARM Transition Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clauses: 12.11.7, 12.14, 12.15, 12.12.7, 12.15, 12.16, 13.3.8, 13.13, 13.8 and Figure 13.9, 13-9.
8.4.8.7 Mode Transition Tests when Event State is Maintained

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.


8.4.8.8 NORMAL to OFFNORMAL Mode Transition Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.


8.4.8.9 OFFNORMAL to NORMAL Mode Transition Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.


8.4.8.10 NORMAL to LIFE_SAFETY_ALARM Mode Transition Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.


8.4.8.11 LIFE_SAFETY_ALARM to NORMAL Mode Transition Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.


8.4.8.12 LIFE_SAFETY_ALARM to OFFNORMAL Mode Transition Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.


8.4.8.13 OFFNORMAL to LIFE_SAFETY_ALARM Mode Transition Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

[Change 8.4.8.14, p. 137]

8.4.8.14 TO-FAULT Transition Tests

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clauses: 12.11.7, 12.14, 12.15, 12.12.7, 12.15, 12.16, 13.3.8, 13.13 13.8 and Figure 13.9, 13.9.

[Change 8.5.1, p. 138]

8.5.1 CHANGE_OF_BITSTRING Tests

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clauses: 12.11, 12.12, 13.3.1, and 13.7.

[Change 8.5.2, p. 138]

8.5.2 CHANGE_OF_STATE Tests

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.


[Change 8.5.3.1, p. 139]

8.5.3.1 Numerical Algorithm

The test in this clause applies to use of the CHANGE_OF_VALUE algorithm applied to Integer or Real datatypes.

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clauses: 12.11, 12.12, 13.3.3, and 13.9.

[Change 8.5.3.2, p. 139]

8.5.3.2 Bitstring Algorithm

The test in this clause applies to use of the CHANGE_OF_VALUE algorithm applied to Bitstring datatypes.

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clauses: 12.11, 12.12, 13.3.3, and 13.9.

[Change 8.5.4, pp. 130-140]

8.5.4 COMMAND_FAILURE Tests

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clauses: 12.6, 12.18, 12.7, 12.12, 12.19, 13.2, 13.3.4, and 13.9.
8.5.5 FLOATING_LIMIT Tests

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.


8.5.6 OUT_OF_RANGE Tests

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.


8.5.7 BUFFER_READY Tests

Dependencies: ReadProperty Service Execution Tests, 9.18.


8.5.8.1 NORMAL to OFFNORMAL Transition Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clauses: 12.11.7, 12.14, 12.15, 12.12.7, 12.15, 12.16, 13.3.8, 13.9 and Figure 13.9.

8.5.8.2 OFFNORMAL to NORMAL Transition Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clauses: 12.11.7, 12.14, 12.15, 12.12.7, 12.15, 12.16, 13.3.8, 13.9 and Figure 13.9.

8.5.8.3 NORMAL to LIFE_SAFETY_ALARM Transition Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clauses: 12.11.7, 12.14, 12.15, 12.12.7, 12.15, 12.16, 13.3.8, 13.9 and Figure 13.9.

8.5.8.4 LIFE_SAFETY_ALARM to NORMAL Transition Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clauses: 12.11.7, 12.14, 12.15, 12.12.7, 12.15, 12.16, 13.3.8, 13.9 and Figure 13.9.
8.5.8.5 LIFE_SAFETY_ALARM to OFFNORMAL Transition Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.
BACnet Reference Clauses: 12.11.7, 12.14, 12.15, 12.12.7, 12.15, 12.16, 13.3.8, 13.9 and Figure 13-9.

8.5.8.6 OFFNORMAL to LIFE_SAFETY_ALARM Transition Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.
BACnet Reference Clauses: 12.11.7, 12.14, 12.15, 12.12.7, 12.15, 12.16, 13.3.8, 13.9 and Figure 13-9.

8.5.8.7 Mode Transition Tests when Event State is Maintained

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.
BACnet Reference Clauses: 12.11.7, 12.14, 12.15, 12.12.7, 12.15, 12.16, 13.3.8, 13.9 and Figure 13-9.

8.5.8.8 NORMAL to OFFNORMAL Mode Transition Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.
BACnet Reference Clauses: 12.11.7, 12.14, 12.15, 12.12.7, 12.15, 12.16, 13.3.8, 13.9 and Figure 13-9.

8.5.8.9 OFFNORMAL to NORMAL Mode Transition Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.
BACnet Reference Clauses: 12.11.7, 12.14, 12.15, 12.12.7, 12.15, 12.16, 13.3.8, 13.9 and Figure 13-9.

8.5.8.10 NORMAL to LIFE_SAFETY_ALARM Mode Transition Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.
BACnet Reference Clauses: 12.11.7, 12.14, 12.15, 12.12.7, 12.15, 12.16, 13.3.8, 13.9 and Figure 13-9.

8.5.8.11 LIFE_SAFETY_ALARM to NORMAL Mode Transition Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.
BACnet Reference Clauses: 12.11.7, 12.14, 12.15, 12.12.7, 12.15, 12.16, 13.3.8, 13.9 and Figure 13-9.
8.4.8.12 LIFE_SAFETY_ALARM to OFFNORMAL Mode Transition Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clauses: 12.11.7, 12.14, 12.15, 12.12.7, 12.15, 12.16, 13.3.8, 13.13, 13.9 and Figure 13.9, 13-9.

8.5.8.13 OFFNORMAL to LIFE_SAFETY_ALARM Mode Transition Test

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clauses: 12.11.7, 12.14, 12.15, 12.12.7, 12.15, 12.16, 13.3.8, 13.13, 13.9 and Figure 13.9, 13-9.

8.5.8.14 TO-FAULT Transition Tests

Dependencies: ReadProperty Service Execution Tests, 9.18; WriteProperty Service Execution Tests, 9.22.

BACnet Reference Clauses: 12.11.7, 12.14, 12.15, 12.12.7, 12.15, 12.16, 13.3.8, 13.13, 13.9 and Figure 13.9, 13-9.

8.36 VT-Open Service Initiation Tests

This clause defines the tests necessary to demonstrate support for initiating VT-Open service requests.

Dependencies: ReadProperty Service Execution tests, 9.18.

BACnet Reference Clauses: 17.2 and 12.10, 12.11.

8.37 VT-Close Service Initiation Tests

This clause defines the tests necessary to demonstrate support for initiating VT-Close service requests. The IUT shall pass the test defined in 8.37.1. If the IUT supports more than one active VT session it shall also pass the tests defined in 8.37.2 and 8.37.3.

Dependencies: ReadProperty Service Execution tests, 9.18.

BACnet Reference Clauses: 17.3 and 12.10, 12.11.

9.28 ConfirmedTextMessage Service Execution Tests

The purpose of this test group is to verify the correct execution of the ConfirmedTextMessage service request. BACnet does not define what is to happen when a ConfirmedTextMessage service request is received except that an acknowledgement is to be returned. It is likely that some other externally observable action will take place but this is vendor specific. These tests verify that a correct acknowledgment is returned and any other action that is defined by the vendor.
BACnet Reference Clause: 16.5.

[Change 13.2, p. 425]

13.2 Time Master

Purpose: To verify that an IUT can perform the function of a time master. To be a time master, a device must be capable of keeping time and of issuing TimeSynchronization service requests.

Dependencies: None.

BACnet Reference Clause: 12.10, 12.11.
### 135.1-2003c-2 Add new object types

**Rationale**

Several object types have been added to ANSI/ASHRAE Standard 135 since the 2001 version. This revision adds object types that appear in the published 2004 version (without addenda). This addendum adds references to those objects only, not the tests for those objects.

**Addendum 135.1-2003c-2**

[Change 4.5.4, p. 6]
[This clause is also changed in the proposed Addendum 135.1-2003b; the changes are additive and do not conflict]

#### 4.5.4 Object Types Supported

The standard objects may be any of:

<table>
<thead>
<tr>
<th>Analog Input</th>
<th>Command</th>
<th>Multi-state Input</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analog Output</td>
<td>Device</td>
<td>Multi-state Output</td>
</tr>
<tr>
<td>Analog Value</td>
<td>Event Enrollment</td>
<td>Multi-state Value</td>
</tr>
<tr>
<td>Averaging</td>
<td>File</td>
<td>Notification Class</td>
</tr>
<tr>
<td>Binary Input</td>
<td>Group</td>
<td>Program</td>
</tr>
<tr>
<td>Binary Output</td>
<td>Life Safety Point</td>
<td>Schedule</td>
</tr>
<tr>
<td>Binary Value</td>
<td>Life Safety Zone</td>
<td>Trend Log</td>
</tr>
<tr>
<td>Calendar</td>
<td>Loop</td>
<td></td>
</tr>
</tbody>
</table>

[Insert new 4.5.10.1, p. 10, and renumber subsequent clauses]
[An identical addition is proposed by Addendum 135.1-2003b]

#### 4.5.10.1 Accumulator

```plaintext
{  
  object-identifier: (accumulator, □)  
  object-name: "□"  
  object-type: accumulator  
  present-value: □  
  description: "□"  
  device-type: "□"  
  status-flags: □  
  event-state: □  
  reliability: □  
  out-of-service: □  
  scale: □  
  units: □  
  prescale: □  
  max-pres-value: □  
  value-change-time: □  
}  
```
value-before-change: 
value-set: 
logging-record: 
logging-object: 
pulse-rate: 
high-limit: 
low-limit: 
limit-monitoring-interval: 
notification-class: 
time-delay: 
limit-enable: 
event-enable: { }, 
acked-transitions: { }, 
notify-type: 
event-time-stamps: { }, 
profile-name: " 

[Insert new 4.5.10.23, p.19, and renumber subsequent clauses]  
[An identical addition is proposed by Addendum 135.1-2003b]

4.5.10.23 Pulse Converter
{
    object-identifier: (pulse-converter, )
    object-name: ""
    object-type: pulse-converter
    description: ""
    present-value: 
    input-reference: 
    status-flags: 
    event-state: 
    reliability: 
    out-of-service: 
    units: 
    scale-factor: 
    adjust-value: 
    count: 
    update-time: 
    count-change-time: 
    count-before-change: 
    cov-increment: 
    cov-period: 
    notification-class: 
    time-delay: 
    high-limit: 
    low-limit: 
    deadband: 
    limit-enable: 
    event-enable: 
    acked-transitions: { }, 
    notify-type: 
    event-time-stamps: { }, 
    profile-name: " "
}
[Change ANNEX A, pp. 444-458]

ANNEX A – EXAMPLE EPICS (INFORMATIVE)

(This annex is not part of the standard but is included for informative purposes.)

... Standard Object Types Supported:
{
  "Accumulator" Creatable Deleteable
  Analog Input Creatable Deleteable
  Program Creatable Deleteable
  Pulse Converter Creatable Deleteable
  Schedule Creatable Deleteable
  Trend Log Creatable Deleteable
}

List of Objects in test device:
{
  {
    object-identifier: (accumulator, 1)
    object-name: "meter 1"
    object-type: ACCUMULATOR
    present-value: 125
    description: ""
    device-type: "electric pulse"
    status-flags: {FALSE,FALSE,FALSE,FALSE,FALSE}
    event-state: NORMAL
    reliability: NO-FAULT-DETECTED
    out-of-service: FALSE
    scale: 0
    units: KILOWATT_HOURS
    prescale: (1,10000)
    max-pres-value: 9999
    value-change-time: {(Tuesday, 2-January-2007), 9:39:21.02}
    value-before-change: 0
    value-set: 67 W
    logging-record: {{(Tuesday, 2-January-2007), 9:39:33.01}, 0, 27,NORMAL}
    logging-object: (trend-log, 3)
    pulse-rate: 3
    high-limit: 15
    low-limit: 0
    limit-monitoring-interval: 300
    notification-class: 1
    time-delay: 10
    limit-enable: {TRUE, TRUE}
    event-enable: {TRUE, FALSE, TRUE}
    acked-transitions: {TRUE, TRUE, TRUE}
    notify-type: ALARM
    {(*,*/*), *:*:*:*}, {{Monday, 1-January-2007), 18:51:34.0}}
}
profile-name: ""
},
...
{
object-identifier: (device, 90)
...
protocol-object-types-supported:
{
T, T, T, T, T, T, -- AI, AO, AV, BI, BO, BV
T, T, T, T, T, -- calendar, command, device, event enrollment, file, group
T, T, T, T, T, T, T, -- loop, MSI, MSO, notification class, program, schedule
T, T, -- accumulator, pulse-converter
}
object-list:
{
(accumulator, 1),
...
(analog-value, 1),
(averaging, 1),
(binary-input, 1),
...
(group, 1),
(life-safety-point, 1),
(life-safety-zone, 1),
(loop, 1),
...
(program, 1),
(pulse-converter, 1),
(schedule, 1),
(trend-log, 1),
...
}
...
{
object-identifier: (pulse-converter, 1)
object-name: "Meter 5"
object-type: PULSE_CONVERTER
description: ""
present-value: 125.0
input-reference: {(accumulator, 1), present-value}
status-flags: {FALSE,FALSE,FALSE,FALSE}
event-state: NORMAL
reliability: NO-FAULT-DETECTED
out-of-service: FALSE
units: LITERS_PER_HOUR
scale-factor: 0.5
adjust-value: 500.0
count: 250
update-time: {(Thursday, 4-January-2007), 9:39:21.02}
count-change-time: {(Thursday, 4-January-2007), 9:39:41.52}
count-before-change: 523
cov-increment: 10.0
cov-period: 3600
notification-class: 1
time-delay: 0
high-limit: 1000.0
low-limit: 0.0
deadband: 0.0
limit-enable: {FALSE, TRUE}
event-enable: {TRUE, FALSE, TRUE}
acked-transitions: {TRUE, TRUE, TRUE}
notify-type: ALARM
                  {(\*\*,\*),\*:*:*:*},
                  {(Monday, 1-January-2007), 18:51:34.0}}
profile-name: ""
}
...
{
object-identifier: (trend-log, 1)
object-name: "Room 3 Log"
object-type: TREND_LOG
description: "Room 3 Temperature"
log-enable: T
log-deviceobjectproperty: {(device, 100), (analog input, 3), present-value}
log-interval: 6000
stop-when-full: FALSE
buffer-size: 250
log-buffer: ()
record-count: 250
total-record-count: 131040
notification-threshold: 83
records-since-notification: 30
last-notify-record: 131010
event-state: NORMAL
notification-class: 1
event-enable: {FALSE, TRUE, TRUE}
acked-transitions: {TRUE, TRUE, TRUE}
notify-type: EVENT
                    {(\*\*,\*),\*:*:*:*},
                    {(Monday, 1-January-2007), 18:51:34.0}}
profile-name: ""
}

End of BACnet Protocol Implementation Conformance Statement
135.1-2003c-3 Omit certain tests based on Protocol_Revision

**Rationale**

Several tests were made invalid by changes to 135-2004. This revision checks the Protocol_Revision property to determine test validity.

**Addendum 135.1-2003c-3**

[Change 7.3.2.22.3.2, p. 76]

**7.3.2.22.3.2 Calendar Entry Date Test**

...  
Configuration Requirements: The IUT shall be configured to contain a Schedule object with an Exception_Schedule containing a BACnetCalendarEntry with a specific date. The criteria for the dates used in the test are given in Table 7-4. The local date and time shall be set such that the Present_Value property has a value other than V1. *This test shall not be performed if the Protocol_Revision property is present in the Device object and has a value of 4 or greater.*

[Change 7.3.2.22.3.3, p. 76]

**7.3.2.22.3.3 Calendar Entry DateRange Test**

...  
Configuration Requirements: The IUT shall be configured to contain a Schedule object with an Exception_Schedule containing a BACnetCalendarEntry with a date range. The criteria for the dates used in the test are given in Table 7-5. The local date and time shall be set such that the Present_Value property has a value other than V1. *This test shall not be performed if the Protocol_Revision property is present in the Device object and has a value of 4 or greater.*

[Change 7.3.2.22.3.4, p. 77]

**7.3.2.22.3.4 Calendar Entry WeekNDay Month Test**

...  
Configuration Requirements: The IUT shall be configured to contain a Schedule object with an Exception_Schedule containing a BACnetCalendarEntry with a WeekNDay entry specifying a month. The criteria for the dates used in the test are given in Table 7-6. The local date and time shall be set such that the Present_Value property has a value other than V1. *This test shall not be performed if the Protocol_Revision property is present in the Device object and has a value of 4 or greater.*

[Change 7.3.2.22.3.5, p. 78]

**7.3.2.22.3.5 Calendar Entry WeekNDay Week Of Month Test**

...  
Configuration Requirements: The IUT shall be configured to contain a Schedule object with an Exception_Schedule containing a BACnetCalendarEntry with a WeekNDay entry specifying a week of the month. The criteria for the dates used in the test are given in Table 7-7. The local date and time shall be set such that the Present_Value property has a value other than V1. *This test shall not be performed if the Protocol_Revision property is present in the Device object and has a value of 4 or greater.*
[Change 7.3.2.22.3.6, p. 78]

7.3.2.22.3.6 Calendar Entry WeekNDay Last Week Of Month Test

... Configuration Requirements: The IUT shall be configured to contain a Schedule object with an Exception_Schedule containing a BACnetCalendarEntry with a WeekNDay entry specifying the last week of the month. The criteria for the dates used in the test are given in Table 7-8. The local date and time shall be set such that the Present_Value property has a value other than V1. This test shall not be performed if the Protocol_Revision property is present in the Device object and has a value of 4 or greater.

[Change 7.3.2.22.3.7, p. 79]

7.3.2.22.3.7 Calendar Entry WeekNDay Day Of Week Test

... Configuration Requirements: The IUT shall be configured to contain a Schedule object with an Exception_Schedule containing a BACnetCalendarEntry with a WeekNDay entry specifying the day of the week. The criteria for the dates used in the test are given in Table 7-9. The local date and time shall be set such that the Present_Value property has a value other than V1. This test shall not be performed if the Protocol_Revision property is present in the Device object and has a value of 4 or greater.

[Change 7.3.2.22.5, p. 81]

7.3.2.22.5 Exception_Schedule Restoration Test

... Configuration Requirements: The IUT shall be configured with a Schedule object that contains an Exception_Schedule that has more than one scheduled write operation for a particular day. None of the write operations shall be scheduled for time 00:00 and there shall be no higher priority coincident BACnetSpecialEvents. In the test description D1 represents a time between 00:00 on the day the Exception_Schedule is active and the time of the first schedule write operation in the BACnetSpecialEvent. Vlast represents the value that is scheduled to be written in the last BACnetTimeValue pair for the day. This test shall not be performed if the Protocol_Revision property is present in the Device object and has a value of 4 or greater.

[Change 7.3.2.22.6, p. 82]

7.3.2.22.6 Weekly_Schedule Restoration Test

... Configuration Requirements: The IUT shall be configured with a Schedule object that contains a Weekly_Schedule that has more than one scheduled write operation for a particular day. None of the write operations shall be scheduled for time 00:00 and there shall be no higher priority coincident BACnetSpecialEvents. In the test description D1 represents a time between 00:00 and the time of the first scheduled write operation in the BACnetDailySchedule. Vlast represents the value that is scheduled to be written in the last BACnetTimeValue pair for the day. This test shall not be performed if the Protocol_Revision property is present in the Device object and has a value of 4 or greater.
[Change 7.3.2.23.11, p. 92]

### 7.3.2.23.11 Notification Time Tests

Purpose: To verify that the Previous_Notify_Time and Current_Notify_Time properties reflect the values sent in the most recent notification. *This test shall be performed only if the Protocol_Revision property is present in the Device object and has a value of 1 or 2.*
135.1-2003c-4 Exception schedule priority requirements

Rationale
Proper testing requires that there is no interference from higher priority exception schedules.

Addendum 135.1-2003c-4

[Change 7.3.2.22.3.9, p. 80]

7.3.2.22.3.9 List of BACnetTimeValue Test

... Configuration Requirements: The IUT shall be configured with a Schedule object containing a BACnetSpecialEvents BACnetSpecialEvent with two or more BACnetTimeValue entries, and no BACnetSpecialEvents with a higher priority. Each BACnetTimeValue entry shall have a distinguishable value.

[Change 7.3.2.22.7, p. 83]

7.3.2.22.7 List_Of_Object_Property_Reference Internal Test

... Configuration Requirements: The IUT is configured with a Schedule object containing a List_Of_Object_Property_References property that references, if possible, at least one property in another object within the IUT. The Schedule object is configured with either a Weekly_Schedule or an active Exception_Schedule, during a period where Effective_Period is active, with at least two consecutive entries with distinguishable values in the List of BACnetTimeValues, and with no Exception_Schedules at a higher priority. D1 represents the date and time of the first of these two BACnetTimeValues, with corresponding value V1, while D2 and V2 (a value distinguishable from V1) represent the second BACnetTimeValue. A time Dt is defined to occur between D1 and D2.

[Change 7.3.2.22.8, p. 83]

7.3.2.22.8 List_Of_Object_Property_Reference External Test

... Configuration Requirements: The TD is configured to indicate that it supports the WriteProperty-Request service but not WritePropertyMultiple-Request. The IUT is configured with a Schedule object containing a List_Of_Object_Property_References property that references a property of an object contained in the TD. The Schedule object is configured with either a Weekly_Schedule or an active Exception_Schedule, during a period where Effective_Period is active, with at least two consecutive entries with distinguishable values in the List of BACnetTimeValues, and with no Exception_Schedules at a higher priority. D1 represents the date and time of the first of these two BACnetTimeValues, with corresponding value V1, while D2 and V2 (a value distinguishable from V1) represent the second BACnetTimeValue. A time Dt is defined to occur between D1 and D2.
135.1-2003c-5 Minor corrections

Rationale
Several small changes are required to correct or update the standard to match standard 135-2004.

Addendum 135.1-2003c-5

[Change 4.1, pp. 1-2]

... Table 4-1. Character Set Codes

<table>
<thead>
<tr>
<th>code</th>
<th>character set</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>ANSI 3.4 x3.4</td>
</tr>
<tr>
<td>1</td>
<td>Microsoft DBCS</td>
</tr>
<tr>
<td>2</td>
<td>JIS C 6226</td>
</tr>
<tr>
<td>3</td>
<td>ISO 10646 (UCS-4)</td>
</tr>
<tr>
<td>4</td>
<td>ISO 10646 (UCS-2)</td>
</tr>
<tr>
<td>5</td>
<td>ISO 8859-1</td>
</tr>
</tbody>
</table>

An octet stream format can be recognized by examining the first eight octets of the EPICS file. Using ANSI 3.4 X3.4 encoding as an example these eight octets will contain: X'50' X'49' X'43' X'53' X'20' X'30' X'0D' X'0A'. This represents the text "PICS 0" followed by carriage return and linefeed.

[Change 4.5.5, p. 7]

4.5.5 Data Link Layer Options

... BACnet/IP, 'DIX' Ethernet,
BACnet/IP, PPP Other: Other:
Other,

[Change 7.3.2.23.9, p. 90]

7.3.2.23.9 Total_Record_Count Test

... Purpose: To verify that the Total_Record_Count property increments for each record added to the Log_Buffer, even after Buffer_Size records have been added. (Note: it is not reasonable to test for the requirement of BACnet Clause 12.23.16 that the value wrap from $2^{32} - 1$ to 0 one; even if a record was collected every 100th of a second it could take more than 497 days to complete the test.)
ANNEX A – EXAMPLE EPICS (INFORMATIVE)

(This annex is not part of the standard but is included for informative purposes.)

Data Link Layer Option:

{ ...
  BACnet/IP, 'DIX' Ethernet
  BACnet/IP, PPP
  Other: ____________________
  LonTalk
  Other
}
...

Character Sets Supported:

{ ANSI X3.4
  IBM/Microsoft DBCS
  ISO 8859-1
  JIS C 6226
  ISO 10646 (UCS-4)
  ISO 10646 (UCS-2)
}
...

Special Functionality:

{ Maximum APDU size in octets: 1470 1476 ...
}
...

List of Objects in test device:

{ ...
  { object-identifier: (analog-input, 1) ...
    out-of-service: FALSE ...
  }, ...
  { object-identifier: (device, 90) ...
    protocol-revision: 2 4
    protocol-services-supported:
T, T, T, T, -- ReadRange, UTCTimeSync, LifeSafetyOperation, SubscribeCOVProperty
T -- GetEventInfo
}
...
},
...
{
  object-identifier: (schedule, 2)
  ...
  exception-schedule: { (23-November-1995),({0:00,INACTIVE}),10},
  schedule-default: INACTIVE
  list-of-object-property-references: ((binary-output, 9),present-value)
  priority-for-writing: 15
  reliability: NO_FAULT_DETECTED
  out-of-service: FALSE
  profile-name: ""
},
...
}