

Clarification Request

References: "e.g" ANSI/ASHRAE Standard 135-2020

Date of BTL-WG Response: January 9, 2025

Background

In Chapter 12.1.7 of the ANSI/ASHRAE Standard 135-2020, on page 163, it states:

"Several object types defined in this clause have properties that are of type BACnetDateTime, and specify a specific point in time. These properties shall have an unspecified datetime value if the point in time is undefined or a specific datetime value if the point in time is specified."

For the Accumulator Object, Chapter 12.61.15 Value_Change_Time on page 605 states:

"This read-only property, of type BACnetDateTime, shall be present if the Present_Value property is adjustable by writing to the Value_Before_Change or Value_Set properties. It represents the date and time of the most recent occurrence of such a write operation. This property shall have an unspecified datetime to indicate that it is uninitialized; otherwise, it shall have a specific datetime value."

For the PulseConverter Object, Chapter 12.23.16 Count_Change_Time on page 305 states:

"This read-only property, of type BACnetDateTime, represents the date and time of the most recent occurrence of a write to the Adjust_Value property."

Additionally, regarding the Adjust_Value property, Chapter 12.23.13 on page 304 under point (4) specifies:

"The current date and time shall be stored in the Count_Change_Time property."

In the BTL test plan 23.3 in chapter 3.37.5 there is the test 135.1-2023 - 7.3.2.32.7 - Value_Set Writing Test

Purpose: Verifying that writes to the Value_Set are reflected atomically into the object's properties.

Test Concept: Writing the Value_Set shall be reflected atomically in the Value_Set and Present_Value properties, while the old Present_Value is stored into the Value_Before_Change property, and the Value_Change_Time shall update.

Test Steps:

1. READ OldV = Present_Value
2. WRITE Value_Set = (NewV, any valid value)
3. VERIFY Value_Set = NewV
4. VERIFY Present_Value = NewV

5. VERIFY Value_Before_Change = OldV
6. VERIFY Value_Change_Time = (approximately the current local time)

The BTL test plan 23.3 in chapter 3.41 contains the following tests:

135.1-2023 - 7.3.2.33.1 - Adjust_Value Write Test

Purpose: To verify the correct write operation of a Pulse Converter's several properties, when writing the Adjust_Value.

Count_Before_Change reflects the prior Count before a write to the Adjust_Value property.

Configuration Requirements: Select a Pulse Converter object for which the pulse can be stopped so that Count remains unchanged during the test.

Test Steps:

1. READ OldC = Count
2. WRITE Adjust_Value = (NewA, any valid value)
3. VERIFY Present_Value = Count * Scale_Factor
4. VERIFY Count_Change_Time ~= (the current local time)
5. VERIFY Count_Before_Change = OldC

7.3.2.33.5 Adjust_Value Out-of-Range WriteProperty Test

Purpose: To verify the correct atomic operations of change to the Pulse Converter Count property, when an attempt is made to write Adjust_Value with a value that would cause an overflow or underflow condition in Count. The test is performed once using WriteProperty and once using WritePropertyMultiple, if IUT supports both services.

Test Steps:

1. READ OldV = Present_Value
2. READ OldC = Count
3. READ OldU = Update_Time
4. READ OldT = Count_Change_Time
5. READ OldA = Adjust_Value
6. READ OldS = Scale_Factor
7. READ OldB = Count_Before_Change
8. TRANSMIT WriteProperty-Request

'Property Identifier' = Adjust_Value
'Property Value' = (NewA, a valid value that would cause an overflow or underflow condition in Count)

9. RECEIVE BACnet-Error-PDU

'Error Class' = PROPERTY

'Error Code' = VALUE_OUT_OF_RANGE

10. VERIFY Update_Time = OldU

11. VERIFY Adjust_Value = OldA

12. VERIFY Count_Before_Change = OldB

Problem:

A specific IUT does not have a realtime clock. But they implement both the Accumulator Object Type and the PulseConverter Object Type.

It is not clear whether a device without knowledge of current time is allowed to implement Accumulator and PulseConverter object types at all or whether they are allowed to implement these objects when not supporting certain optional features.

The specific interpretations of the properties Count_Change_Time (Accumulator Object), Count_Change_Time, and Adjust_Value (PulseConverter Object), as well as the requirements of the tests described above, suggest that the rule mentioned in Chapter 12.1.7 of ANSI/ASHRAE Standard 135-2020 on page 163 is overridden when the IUT includes one of these object types.

In this case, an internal clock is required, and properties of the BACnetDateTime data type must be specified.

Questions:

1. Is it allowed to support an Accumulator Object if the device does not have a clock?
2. Is it allowed to support a PulseConverter Object if a device does not have a clock?
3. Is it allowed to support an Accumulator Object with writable Value_Set or writable Value_Before_Change leaving Count_Change_Time, unspecified if a device does not have a clock?
4. Should, depending on answers to above questions, the referenced tests or testplan be adapted to accommodate devices without a clock?

Response.

1. **Yes. However, if the Accumulator Object supports a writable Value_Set property or a writable Value_Before_Change property, then it is required to have a concept of time.**
2. **No.**
3. **No.**
4. **No.**