



ASHRAE STANDARD

BACnet[®]—A Data Communication Protocol for Building Automation and Control Networks

Approved by the ASHRAE Standards Committee on January 23, 2010; by the ASHRAE Board of Directors on January 27, 2010; and by the American National Standards Institute on January 28, 2010.

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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.

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[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

Addendum 135x to ANSI/ASHRAE Standard 135-2008 contains a number of changes to the current standard. 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.

135-2008x-1 Fix the Criteria for COV for Load Control, p. 2.

135-2008x-2 Clarify Trend Log Time Stamp, p. 3.

135-2008x-3 Clarify ReadRange on Lists, p. 4.

135-2008x-4 Clarify Results of Using Special Property Identifiers, p. 5.

In the following document, language added to existing clauses of ANSI/ASHRAE 135-2008 and addenda is indicated through the use of *italics*, while deletions are indicated by ~~strike through~~. Where entirely new subclauses are added, plain type is used throughout.

135-2008x-1 Fix the Criteria for COV for Load Control.

Rationale

The criteria listed in Table 13-1 for sending COV notifications for the Load Control Object do not include a change in the *Status_Flags* property. This was not an intentional omission, and to be consistent with other COV Criteria, *Status_Flags* will be listed in the table.

[Change Table 13-1, p. 291]

Table 13-1. Standardized Objects That May Support COV Reporting

Object Type	Criteria	Properties Reported
...		
Load Control	If <i>Present_Value</i> , <i>Status_Flags</i> , <i>Requested_Shed_Level</i> , <i>Start_Time</i> , <i>Shed_Duration</i> , or <i>Duty_Window</i> changes at all	<i>Present_Value</i> , <i>Status_Flags</i> , <i>Requested_Shed_Level</i> , <i>Start_Time</i> , <i>Shed_Duration</i> , <i>Duty_Window</i>
...		

135-2008x-2 Clarify Trend Log Time Stamp.

Rationale

It is not completely clear from the standard that a time stamp of a time change shall give the new time.

Taking into account that the value for time-change can be zero than it's apparent that only the new time makes sense. But to avoid any ambiguity, it will be clarified in the standard.

[Change Clause 12.25.14, Log_Buffer, p. 252]

...

The choices available for the LogDatum are listed below:

...

time-change	This choice represents a change in the clock setting in the device, it records the number of seconds by which the clock changed. If the number is not known, such as when the clock is initialized for the first time, the value recorded shall be zero. <i>This record shall be recorded after changing the local time of the device and the timestamp shall reflect the new local time of the device.</i>
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...

...

135-2008x-3 Clarify ReadRange on Lists.

Rationale

The ReadRange service allows the use of its 'By Position' option to be used with properties that are "Lists". This leads to ambiguity about what position means in the context of Clause 12's definition of Lists vs. Arrays. Clarifying Language needs to be added to Clause 12.

[Change Clause 12, p. 128]

...

The difference between a "BACnetARRAY" property and a "List of" property is that the elements of the array can be uniquely accessed by an array index while the elements of the "List of" property *can only be positionally accessed using the ReadRange service*. Moreover, the number of elements in the BACnetARRAY may be ascertained by reading the array index 0, while the number of elements present in a "List of" property can only be determined by reading the entire property value and performing a count.

The ordering of list elements when a list is written or modified is not required to be preserved upon subsequent reading of the same list, even if the set of elements that make up the list has not changed.

In the context of ReadRange 'By Position', the ordering of List elements shall follow the conventions that the first element of the List shall be position 1, and positions 2, 3, 4 and greater shall correspond to list elements in strict sequence. The sequence of list elements shall follow the same ordering that those elements would appear in if the entire list was read using ReadProperty to read the entire list. Assuming that the list has not been written or modified, repeated reading of list elements shall return those elements in the same order each time.

...

135-2008x-4 Clarify Results of Using Special Property Identifiers.

Rationale

The standard makes many references to BACnetPropertyIdentifier. In all but a few places there is no qualifying language to disallow the usage of the special properties ALL, REQUIRED and OPTIONAL.

The OPTIONAL property as defined in the standard does not explicitly restrict nonstandard properties. Additionally, the text for the special property ALL uses the words "defined properties" or just "properties" which could indicate all the properties that are defined for a particular object in the standard, even if those properties are not implemented or supported. The testing standard 135.1 typically uses the word "supported" in reference to implemented functionality

[Change Clause 12 Preamble, p. 129]

...

The difference between a "BACnetARRAY" property and a "List of" property is that the elements of the array can be uniquely accessed by an array index while the elements of the "List of" property cannot. Moreover, the number of elements in the BACnetARRAY may be ascertained by reading the array index 0, while the number of elements present in a "List of" property can only be determined by reading the entire property value and performing a count.

Several object types defined in this clause—~~the Command, Event Enrollment, Group, Loop, and Schedule~~—have one or more properties *that are capable of referencing object properties*. For example, the *Object Property Reference* property of the *Event Enrollment* object contains such a reference ~~of type BACnetObjectPropertyReference~~. The property identifier component of these references ~~shall~~^{may} not be any of the special property identifiers ALL, REQUIRED, or OPTIONAL. These are reserved for use in the ReadPropertyConditional and ReadPropertyMultiple services or in *objects and services* not defined in this standard.

Several object types defined in this clause have a property called "Reliability." This property is an enumerated datatype that may have different possible enumerations for different object types. The values defined below are a superset of all possible values of the Reliability property for all object types. The range of possible values returned for each specific object is defined in the appropriate object type definition.

[Change Clause 15.6.1.1.2, page 345]

15.6.1.1.2 List of Property References

This optional parameter, if present, shall be a list of one or more BACnetPropertyReferences, each of which corresponds directly to a specific property of any object selected on the basis of the 'Object Selection Criteria'. Specifying the property ALL indicates that all properties of any selected object shall be returned, including any proprietary properties.

Specifying the property *identifier* REQUIRED means that only those *standard* properties having a conformance code of "R" or "W" shall be returned. Specifying the property identifier OPTIONAL means that only those *standard* properties *present in the object* that have a conformance code of "O" shall be returned. See the specification for the particular object type in Clause 12. If this parameter is absent, no properties shall be returned in the 'List of Read Access Results' portion of the 'Result(+)' primitive; however, the object identifier shall be returned in the 'Object Identifier' parameter.

[Change Clause 15.7.3.1.2, page 351]

15.7.3.1.2 List of Property References

This parameter shall be a list of one or more BACnetPropertyReferences, each of which corresponds directly to a specific property of the object identified above. The property identifier ALL means that all defined properties of the object are to be accessed, including any proprietary properties.

The property identifier REQUIRED means that only those *standard* properties having a conformance code of "R" or "W" shall be returned. The property identifier OPTIONAL means that only those *standard* properties *present in the object* that have a conformance code "O" shall be returned. See the specification for the particular object type in Clause 12.

[Add a new entry to **History of Revisions**, p. 688]

(This History of Revisions is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard.)

HISTORY OF REVISIONS

<i>Protocol</i>		<i>Summary of Changes to the Standard</i>
<i>Version</i>	<i>Revision</i>	
...	...	...
1	10	Addendum x to ANSI/ASHRAE 135-2008 Approved by the ASHRAE Standards Committee January 23, 2010; by the ASHRAE Board of Directors January 27, 2010; and by the American National Standards Institute January 28, 2010. 1. Fix the Criteria for COV for Load Control. 2. Clarify Trend Log Time Stamp. 3. Clarify ReadRange on Lists. 4. Clarify Results of Using Special Property Identifiers.

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.