BACnet Errata
ANSI/ASHRAE STANDARD 135-2010
A Data Communication Protocol for Building Automation and Control Networks

June 26, 2012

This document lists all known ***errata*** to ANSI/ASHRAE 135-2010 as of the above date. Each entry is cited first by clause, then page number, except where an erratum covers more than one clause. The outside back cover marking identifying the first printing of Standard 135-2010 is "Product Code: 86440 3/11". Items 29 through 45 have been added since the previous errata sheet dated January 25, 2012 was distributed.

Changes are indicated by using ~~strikeout~~ for text to be removed and ***italics*** for text to be added, unless noted otherwise.

1) **Clause 20.1.2.11**, p.541. There is an extra "|" in the PDU Type field.

Replace

```
|---|---|---|---|---|---|---|---|
|  PDU Type |   |SEG|MOR| SA| 0 |
|---|---|---|---|---|---|---|---|
```

With

```
|---|---|---|---|---|---|---|---|
|  PDU Type     |SEG|MOR| SA| 0 |
|---|---|---|---|---|---|---|---|
```

2) **Table 14-1**, p. 461. The "Requested Record Count" parameter should be aligned with "File Start Record".

Table 14-1. Structure of AtomicReadFile Service Primitives

Parameter Name	Req	Ind	Rsp	Cnf
Argument	M	M(=)		
File Identifier	M	M(=)		
Stream Access	S	S(=)		
File Start Position	M	M(=)		
Requested Octet Count	M	M(=)		
Record Access	S	S(=)		
File Start Record	M	M(=)		
~~Requested Record Count~~	~~M~~	~~M(=)~~		
Requested Record Count	*M*	*M(=)*		
...			...	...

3) **Clause 12.48**, p. 399. The description of the Date Pattern Value Object incorrectly mentions "time" and has a typo.

12.48 Date Pattern Value Object Type

...

Date Pattern objects can be used to represent multiple recurring dates ~~and times~~ based on rules ~~definted~~ *defined* by the pattern of individual fields of the date ~~and time~~, some of which can be special values like "even months", or "don't care", which matches any value in that field. Examples of possibilities would be: "every Thursday in May of any year", or "every day in May 2009".

4) **Clauses 13.5.1.2 through 13.5.1.7**, p. 435. These clauses should be numbered as subclauses of the preceding clause 'Argument'.

5) **Clause 13.5.1.10**, p. 436. This clause should be numbered as a subclause of the preceding clause, 'Result(-)'.

6) **Clauses 13.6.1.2 through 13.6.1.6**, p. 437. These clauses should be numbered as subclauses of the preceding clause 'Argument'.

7) **Clauses 13.7.1.2 through 13.7.1.6**, p. 438. These clauses should be numbered as subclauses of the preceding clause 'Argument'.

8) **Clauses 13.8.1.2 through 13.8.1.14**, p. 440. These clauses should be numbered as subclauses of the preceding clause 'Argument'.

9) **Clauses 13.9.1.2 through 13.9.1.14**, p. 443. These clauses should be numbered as subclauses of the preceding clause 'Argument'.

10) **Clauses 13.14.1.2 through 13.14.1.5**, p. 454. These clauses should be numbered as subclauses of the preceding clause 'Argument'.

11) **Clauses 13.15.1.2 through 13.15.1.7**, p. 457. These clauses should be numbered as subclauses of the preceding clause 'Argument'.

12) **Clause 16.6.1**, p. 499. The 'Argument' parameter should have its own clause heading, 16.6.1.1.

~~The 'Argument' parameter shall convey the parameters for the UnconfirmedTextMessage service request.~~

16.6.1.1 Argument

This parameter shall convey the parameters for the UnconfirmedTextMessage service request.

13) **Clauses 16.6.1.1 through 16.6.1.4**, p. 499. These clauses should be numbered as subclauses of the preceding clause 'Argument' (given a clause number by the preceding erratum).

14) **Clause 5.4.4.2**, p. 30. The SegmentedComplexACK_Received transition is missing an obvious instruction to save the segment.

5.4.4.2 SEGMENTED_REQUEST

...

SegmentedComplexACK_Received

If a BACnet-ComplexACK-PDU that has sufficient security parameters is received from the network layer whose 'segmented-message' parameter is TRUE and whose 'sequence-number' parameter is zero and this device supports segmentation and SentAllSegments is TRUE,

then *save the BACnet-ComplexACK-PDU segment;* stop SegmentTimer; compute ActualWindowSize based on the 'proposed-window-size' parameter of the received BACnet-ComplexACK-PDU and on local conditions; issue an N-UNITDATA.request with 'data_expecting_reply' = FALSE to transmit a BACnet-SegmentACK-PDU with 'negative-ACK' = FALSE, 'server' = FALSE, and 'actual-window-size' = ActualWindowSize; start SegmentTimer; set LastSequenceNumber to zero; set InitialSequenceNumber to zero; set DuplicateCount to zero; and enter the SEGMENTED_CONF state to receive the remaining segments. (The method used to determine ActualWindowSize is a local matter, except that the value shall be less than or equal to the 'proposed-window-size' parameter of the received BACnet-ComplexACK-PDU and shall be in the range 1 to 127, inclusive.)

15) **Clause 5.4.5.1**, p. 35. The ConfirmedSegmentedReceived transition is missing an obvious instruction to save the segment.

5.4.5.1 IDLE

...

ConfirmedSegmentedReceived

If a BACnet-Confirmed-Request-PDU whose 'segmented-message' parameter is TRUE, whose 'sequence-number' parameter is zero, and whose 'proposed-window-size' is greater than zero and less than or equal to 127 is received from the network layer and the local device supports the reception of segmented messages,

then *save the BACnet-ComplexACK-PDU segment;* compute ActualWindowSize based on the 'proposed-window-size' parameter of the received BACnet-Confirmed-Request-PDU and on local conditions; issue an N-UNITDATA.request with 'data_expecting_reply' = FALSE to transmit a BACnet-SegmentACK-PDU with 'negative-ACK' = FALSE, 'server' = TRUE, and 'actual-window-size' = ActualWindowSize; start SegmentTimer; set LastSequenceNumber to zero; set InitialSequenceNumber to zero; set DuplicateCount to zero; and enter the SEGMENTED_REQUEST state to receive the remaining segments. (The method used to determine ActualWindowSize is a local matter, except that the value shall be less than or equal to the 'proposed-window-size' parameter of the received BACnet-Confirmed-Request-PDU and shall be in the range 1 to 127, inclusive.)

16) **Clause 12.49.13**, p. 403. The APDU_Timeout property is incorrectly called Max_APDU_Timeout.

12.49.13 Update_Key_Set_Timeout
This property, of type Unsigned16, indicates the maximum amount of time, in milliseconds, that the device will take to respond to an Update-Key-Set message. This value added to the device ~~Max_APDU_Timeout~~ *APDU_Timeout* results in the amount of time that a Key Server shall wait for a Security-Response for an Update-Key-Set message. The use of ~~Max_APDU_Timeout~~ *APDU_Timeout* is to allow for network delay; whereas the Update_Key_Set_Timeout provides for the actual time the device will need to apply the keys to its key set.

17) **Clause K.1.1**, p. 848. The clause title, for some inexplicable reason, says "BLAH".

K.1.1 BIBB - Data Sharing - ReadProperty-A (DS-RP-A) ~~BLAH~~

18) **Clause L**.7, p. 881. The B-OD is missing the requirement for AE-N-A which is required by AE-VN-A.

Alarm & Event Management

B-AWS	B-OWS	B-OD	B-BC	B-AAC	B-ASC	B-SA	B-SS
AE-N-A	AE-N-A	*AE-N-A*	AE-N-I-B	AE-N-I-B			
AE-ACK-A	AE-ACK-A		AE-ACK-B	AE-ACK-B			
			AE-INFO-B	AE-INFO-B			
			AE-ESUM-B				
AE-AS-A	AE-AS-A						
AE-AVM-A	AE-VM-A						
AE-AVN-A	AE-VN-A	AE-VN-A					
AE-ELVM-A[2]							

19) **Table K.5**, p. 854. The Event Enrollment and Program objects do not have a Present_Value property and should be stricken form this table.

Table K-5. Standard Properties That DS-M-A Devices Shall Be Capable of Writing

Analog Objects, Binary Objects, Accumulator, Averaging, Loop, Multi-state Objects, Pulse Converter	**Command, ~~Event Enrollment, Program~~**	**Pulse Converter**	**Program**	**Accumulator**	**Loop**
Present_Value Out_Of_Service	Present_Value	Adjust_Value	Program_Change	Value_Before_Change Value_Set Pulse_Rate	Setpoint

21) **Clause 21**, p. 627. BACnetShedLevel and BACnetShedState should be moved to the correct alphabetical position after BACnetSetpointReference.

22) **Clause 21**, p. 619. Some property identifiers are missing from the numerical order listing.

```
BACnetPropertyIdentifier ::= ENUMERATED { -- see below for numerical order
    ...
-- -numerical order reference
    -- see acked-transitions          (0),
    -- see ack-required               (1),
    ...
    -- see valid-samples              (146),
    -- see window-interval            (147),
    -- see window-samples             (148),
    -- see maximum-value-timestamp    (149),
    ...
```

23) **Clause 21**, p. 619. The percent-relative-humidity entry is out of order numerically.

```
BACnetEngineeringUnits ::= ENUMERATED {   -- See below for numerical order
    ...
    -- see cycles-per-minute                (26),
```

~~-- see percent-relative-humidity (29),~~
-- see hertz (27),
-- see grams-of-water-per-kilogram-dry-air (28),
-- *see percent-relative-humidity* *(29),*
-- see millimeters (30),

24) **Clause 21**, p. 571. DeviceCommunicationControl-Request should be move to its locally alphabetical position under ConfirmedTextMessage-Request on p. 572.

25) **Clause N.8.7**, p. 892. As indicated elsewhere, the DisplayName attribute is optional.

N.8.7 DisplayName

This ~~required~~ *optional* attribute is a string of printable characters ...

26) **HISTORY OF REVISIONS**, p. 997. The history is missing some entries.

Protocol		Summary of Changes to the Standard
Version	**Revision**	
...	...	...
1	7	**ANSI/ASHRAE 135-2008** A consolidated version of the standard that incorporates all of the known errata and Addenda *a, b, c, d, e, f* and *m* to ANSI/ASHRAE 135-2004.
1	*7*	***EN ISO 16484-5 2010*** *This ISO standard contains the same technical content as Version 1 Revision 7 of ANSI/ASHRAE Standard 135-2008. It also includes all errata approved as of May 6, 2009.*
...	...	**...**
1	12	**ANSI/ASHRAE 135-2010** A consolidated version of the standard that incorporates all of the known errata and Addenda *g, h, j, k, l, n, o, p, q, r, s, t, u, v, w, x, y, z, ab, ac, ag* and *ah* to ANSI/ASHRAE 135-2008.
1	*12*	***EN ISO 16484-5 2012*** *This ISO standard contains the same technical content as Version 1 Revision 12 of ANSI/ASHRAE Standard 135-2010.*
...	...	**...**

27) **Clause 21**, p. 580-582. In the numerical order section of the Error production, "missing required-parameter" should be "missing-required-parameter" and "register- foreign-device-failed" should be "register-foreign-device-failed".

28) **Clause 20.2.15**, p. 558. The encoded data is incorrect. Thursday should be X'04'.

Example: Context-tagged date value
ASN.1 = [9] Date
Value = January 24, 1991 (Day of week = Thursday)
Context Tag = 9
Encoded Tag = X'9C'
Encoded Data = ~~X'5B011805'~~ *X'5B011804'*

29) **Clauses 12.11.36, 12.11.40, and 12.11.42**, pp. 201-202. BACnetARRAY is misspelled.

12.11.36 Configuration_Files

This optional property is a ~~BACnet Array~~ *BACnetARRAY* of BACnetObjectIdentifier. ...

12.11.40 Slave_Proxy_Enable

This property, of type ~~BACnetArray~~ *BACnetARRAY* of BOOLEAN, ...

12.11.42 Auto_Slave_Discovery

This property, of type ~~BACnetArray~~ *BACnetARRAY* of BOOLEAN, ...

30) **Addendum *af***, p.48 of the addendum. Strike the change to the Loop object's Present_Value. Elsewhere in the addendum, the Controlled_Variable_Value is correctly identified as the pMonitoredValue parameter for the Loop object.

~~[Change Clause 12.17.4, in the Loop Object Type, p. 231]~~

~~**12.17.4 Present_Value**~~

~~This property indicates the current output value of the loop algorithm in units of the Output_Units property.~~

~~*If the object supports event reporting, then this property shall be the pMonitoredValue parameter for the object's event algorithm. See Clause 13.3 for event algorithm parameter descriptions.*~~

31) **Clause 12 preamble**, p. 147. Strike the reference to the Multi-state object in the description of MULTI_STATE_FAULT since that fault condition is now used by other objects as well.

MULTI_STATE_FAULT	The Present_Value ~~of the Multi-state object~~ is equal to one of the states in the Fault_Values property and no other fault has been detected.

32) **Clauses 16.10.3.1.2 and 16.10.3.1.3**, p. 505, and **Clause H.5.2.15,** p. 818, clause references are wrong.

16.10.3.1.2 Max APDU Length Accepted
.... See ~~12.11.17~~ *12.11.18*.

16.10.3.1.3 Segmentation Supported
.... See ~~12.11.18~~ *12.11.19*.

H.5.2.15 Max_APDU_Length_Accepted
... See Clause ~~12.11.17~~ *12.11.18*.

33) **Clause 12**, p. 145, and **Clause 20.2.17**, p. 560. A clarification needs to be added that ambiguously parsable data structures are not allowed. This has always been true but it may not be obvious that optional components can cause ambiguity.

12 MODELING CONTROL SYSTEM DEVICES A COLLECTION OF OBJECTS
...
Some of the properties of certain BACnet objects need to represent a collection of data elements of the same type, rather than a single primitive data value or a complex datatype constructed from other datatypes. In some instances, the size of this collection of data elements is fixed, while in other instances the number of elements may be variable. In some cases the elements may need to be accessed individually or their order may be important. BACnet provides two forms of datatypes for properties that represent a collection of data elements of the same type: "BACnetARRAY" and "List of." *Both "BACnetARRAY" and "List of" are encoded as a "Sequence-Of". Therefore, see the note about datatype restrictions in Clause 20.2.17.*
...

20.2.17 Encoding of a Sequence-Of Value

The encoding of a sequence-of value shall consist of zero, one, or more complete encodings, including tags, of data values from the types listed in the ASN.1 definition.

The use of OPTIONAL components or ABSTRACT-SYNTAX_&Type in datatypes can lead to ambiguous parsing of concatenations. Therefore, the members of a Sequence-Of shall be restricted to datatypes that can be unambiguously parsed when concatenated.

The order of the encodings of the data values shall be the same as the order of the data values in the sequence-of value to be encoded.

34) **Addendum af**, p. 59 of the addendum. The Event_State property was mistakenly left off the list of additional properties. This property is required for the execution of the alarm query services and must be present in all event initiating objects. Add the shaded text below to the addendum and note instructions in { }.

Table 12-26. Properties of the Program Object Type

...	...	. . .
Event_Enable	*BACnetEventTransitionBits*	*O*[x,y]
Event_State	*BACnetEventState*	*O*[x,y]
Acked_Transitions	*BACnetEventTransitionBits*	*O*[x,y]
...	...	...

...

12.22.X3 Event_Enable

12.22.X4 Event_State

{renumber following "12.22.Xn" clauses in the addenda}

...

Table 12-28. Properties of the Schedule Object Type

...	...	. . .
Event_Enable	*BACnetEventTransitionBits*	*O*[x,y]
Event_State	*BACnetEventState*	*O*[x,y]
Acked_Transitions	*BACnetEventTransitionBits*	*O*[x,y]
...	...	...

...

12.24.X3 Event_Enable

12.24.X4 Event_State

{renumber following "12.24.Xn" clauses in the addenda}

...

Table 12-43. Properties of the Credential Data Input Object Type

...	...	. . .
Event_Enable	*BACnetEventTransitionBits*	*O*[x,y]
Event_State	*BACnetEventState*	*O*[x,y]
Acked_Transitions	*BACnetEventTransitionBits*	*O*[x,y]
...	...	...

...

12.36.X3 Event_Enable

12.36.X4 Event_State

{renumber following "12.36.Xn" clauses in the addendum}

...

35) **Clause 12.22.11**, p. 257, **Clause 12.24.11**, p.269, and **Clause 12.36.6**, p. 354. The text for IN_ALARM in these objects needs to be aligned with other objects that have an optional Event_State property.

IN_ALARM ~~The value of this flag shall be logical FALSE (0).~~ *Logical TRUE (1) if the Event_State property is present and does not have a value of NORMAL, otherwise logical FALSE (0)*

36) **Clause K.2.16**, p. 858**, Clause K.2.17**, p. 859, and **Clause K.4.12**, p. 867. The table references are wrong for the "writing" cases.

K.2.16 BIBB - Alarm and Event Management - View and Modify - A (AE-VM-A)

...

Devices claiming support for this BIBB shall be capable of writing values within the full range as defined in Tables ~~K-3~~ *K-6* and K-4. ...

K.2.17 BIBB - Alarm and Event Management - Advanced View and Modify - A (AE-AVM-A)

...

Devices claiming support for this BIBB shall be capable of writing the full range of values as defined in Tables ~~K-3~~ *K-6* and K-4.

K.4.12 BIBB - Trending-Advanced View and Modify -A (T-AVM-A)

...

Devices claiming support for this BIBB shall be capable of writing values within the full range as defined in tables ~~K-3~~ *K-6* and K-4.

37) **Addendum af**, p. 67 of the addendum. The units specified for Time Remaining in the table is wrong. Text elsewhere sets the units to be clearly in minutes. Also, the use of "lifetime" below the table is confusing and should be clarified. Add the highlighted text and remove the double-strikethrough text.

12.X.9 Subscribed_Recipients

...

Table 12-X2. Components of a BACnetEventNotificationSubscription

Parameter	Type	Description
Recipient	BACnetRecipient	The destination device(s) to receive notifications.
Process Identifier	Unsigned32	The handle of a process within the recipient device that is to receive the event notification.
Issue Confirmed Notifications	Boolean	(TRUE) if confirmed notifications are to be sent and (FALSE) if unconfirmed notifications are to be sent.
Time Remaining	Unsigned	Actual time the entry will remain in the Subscribed_Recipients in ~~seconds~~ minutes.

The Time Remaining field of a BACnetEventNotificationSubscription entry, of type Unsigned, indicates the remaining ~~lifetime~~ time of the subscription in minutes. An entry shall be removed from the list when the remaining time ~~lifetime~~ reaches zero, and therefore no entries in the property shall have a Time Remaining value of zero. Notification Forwarder objects shall accept subscriptions with Time Remaining values in the range of 1 through 1440 (24 hours). It is a local matter whether or not a Notification Forwarder accepts larger Time Remaining values.

...

38) **Clause 24.13.5**, p. 675. The test for Last Message Id incorrectly allows the "equal to" condition to be missed as a duplicate. Correct as follows. Also add a missing "to" in a following paragraph.

24.13.5 Validating the Message Id

...

When a message is received, the cache shall be checked and if the Message Id is already present in the cache, or if the Message Id is less than *or equal to* the Last Message Id (taking into account wrapping), then the Message Id validation shall fail. Otherwise the Message Id Validation shall succeed.

...

The cache holds Message Id, Timestamp, Source Device tuples that are received over the last Packet Reorder Time window. When an entry in the cache becomes older than Packet Reorder Time, the Message Id is compared to Last Message Id for the source device (taking into account wrapping) and if it is larger, Last Message Id is set *to* the Message Id of the entry removed from the cache,

39) **Figure 9-4**, p. 103. The Master Node State Machine diagram is missing a transition marked "BroadcastDataNeedingReply" from the IDLE state to the IDLE state, similar to the "ReceivedDataNoReply" transition. This is described in Clause 9.5.6.2.

40) **Clause 4.2**, p. 12. With the addition of ZigBee, there are now five LAN types.

4.2 BACnet Network Topology

In the interest of application flexibility, BACnet does not prescribe a rigid network topology. Rather, BACnet devices are physically connected to one of ~~four~~ *five* types of local area networks (LANs) or via dedicated or dial-up serial, asynchronous lines. These networks may then be further interconnected by BACnet routers as described in Clause 6.

41) **Addendum af**, p. 19 of the addendum. The rationale is incorrect.

135-2010*af*-12. Clarify when the Restart Related Properties are Allowed to be Present.

Rationale

Clarify that Last_Restart_Reason, Time_Of_Device_Restart, Restart_Notification_Recipients shall only be present if the device supports execution of ~~SubscribeCOV or SubscribeCOVProperty~~ *the restart procedure described in Clause 19.3*.

42) **Clause 24.1**, p. 638, and **Clause K.5.35.9**, p. 875. In several places, the incorrect term "secure proxy" should be changes to "security proxy".

24.1 Overview

The BACnet network security architecture provides device authentication, data hiding, and user authentication. This has been accomplished within the constraints that BACnet security should allow for:

...

(e) Placing non-security-aware devices, if physically secure, behind a ~~secure~~ *security* proxy firewall router

...

K.5.35.9 BIBB - Network Security-Security Proxy (NS-SP)

The ~~Secure~~ *Security* Proxy BIBB describes the basic functionality that all secure BACnet ~~Secure~~ *Security* Proxy devices shall support.

A device claiming the ~~Secure~~ *Security* Proxy BIBB shall support the NS-SR BIBB and shall also support at least 1 port that can be configured to be plain-trusted for which it acts as a security proxy.

Security proxy devices shall provide the functionality to protect a complete network of non-secured BACnet devices as described in Clause **Error! Reference source not found.** BACnet Security Proxy. The optional ability to protect a subset of the devices is not required by this BIBB.

43) **Clause K.5.13**, p. 870, and **Clause K.5.14**, p. 870. The text in the clause does not match the title.

K.5.13 BIBB - Device Management-UTCTimeSynchronization-A (DM-UTC-A)

...

Devices claiming conformance to ~~DM-TS-A~~ *DM-UTC-A* must support the Time_Synchronization_Recipients property of the Device object.

K.5.14 BIBB - Device Management-UTCTimeSynchronization-B (DM-UTC-B)

...

Devices claiming conformance to ~~DM-TS-B~~ *DM-UTC-B* must support the Local_Time, Local_Date, UTC_Offset, and Daylight_Saving_Status properties of the Device object.

44) **Addendum af**, for Clause 13.3.8, p. 111 of the addendum. The description for two of the CHANGE_OF_LIFE_SAFETY Event parameters does not match the datatype of the properties used for those parameters.

13.3.8 CHANGE_OF_LIFE_SAFETY Event Algorithm

...

pAlarmValues This parameter, of type List Of ~~BACnetPropertyStates~~ *BACnetLifeSafetyState*, represents a list of values that are considered offnormal values.

pLifeSafetyAlarmValues This parameter, of type List Of ~~BACnetPropertyStates~~ *BACnetLifeSafetyState*, represents a list of values that are considered life safety alarm values.

45) **Addendum af**, for Clause 13.4.4, p. 133 of the addendum. The life safety fault algorithm includes an additional restriction on pFaultValues that was incorrectly omitted from the parameter description.

13.4.4 FAULT_LIFE_SAFETY Fault Algorithm

...

pFaultValues	This parameter, of type List Of BACnetLifeSafetyState, represents a list of values that are considered fault values. This parameter shall not contain values that are present in the pAlarmValues *or pLifeSafetyAlarmValues* parameter of the associated CHANGE_OF_LIFE_SAFETY algorithm performed by the same object.