ADDENDA

ANSI/ASHRAE Addendum bz to
ANSI/ASHRAE Standard 135-2016

A Data Communication Protocol for Building Automation and Control Networks

Approved by ASHRAE and by the American National Standards Institute on November 18, 2019.

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. Instructions for how to submit a change can be found on the ASHRAE® website (www.ashrae.org/continuous-maintenance).

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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

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.

135-2016*bz*-1. Add Who-Am-I and You-Are Services, p. 3

In the following document, language to be added to existing clauses of ANSI/ASHRAE 135-2016 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 at this time. All other material in this document is provided for context only and is not open for public review comment except as it relates to the proposed changes.

The use of placeholders like X, Y, Z, X1, X2, N, NN, x, n, ?, etc., should not be interpreted as literal values of the final published version. These placeholders will be assigned actual numbers/letters only after final publication approval of the addendum.

135-2016*bz*-1. Add Who-Am-I and You-Are Services

Rationale

It is common to create generic BACnet devices that ship from the factory which are not configured, and which require the Device ID and potentially the MS/TP MAC address to be configured after installation on the site. A BACnet service could be used to configure these devices, and another BACnet service could be used by those devices having a MAC address to indicate that they require configuration.

This proposal describes a service that is used to respond when a Broadcast Who-Is service request is received that includes the special Device ID of 4194303. This proposal also describes a scheme for allowing devices to receive a Broadcast packet that includes a vendor ID, model name, and serial number uniquely identifying the device, along with an MS/TP MAC address (if writable) and Device ID (if writable) to be configured into the device. Although this could be accomplished with UnconfirmedPrivateTransfer for each vendor, that would not be an interoperable service that any workstation or building controller vendor could implement.

[Change **Table 12-13**, pp. 211-212]

Table 12-13. Properties of the Device Object Type

Property Identifier	Property Datatype	Conformance Code
…	…	…
Serial_Number	CharacterString	O[N]
…	…	…

…

[N] If the device supports the execution of the You-Are service, then this property shall be present.

[Change **Clause 16.10**, p. 720]

16.10 Who-Is and I-Am Services

The Who-Is service is used by a sending BACnet-user to determine the device object identifier, the network address, or both, of other BACnet devices that share the same internetwork. The Who-Is service is an unconfirmed service. The Who-Is service may be used to determine the device object identifier and network addresses of all devices on the network, or to determine the network address of a specific device whose device object identifier is known, but whose address is not. The I-Am service is also an unconfirmed service. The I-Am service is used to respond to Who-Is service requests. However, the I-Am service request may be issued at any time. It does not need to be preceded by the receipt of a Who-Is service request. In particular, a device may wish to broadcast an I-Am service request when it powers up. The network address is derived either from the MAC address associated with the I-Am service request, if the device issuing the request is on the local network, or from the NPCI if the device is on a remote network.

The Who-Is service may be used to discover devices supporting the Who-Am-I service that also require Device ID configuration. See Clause 19.

[Add new **Clause 16.X**, p. 721]

16.X Who-Am-I and You-Are Services

The You-Are service is used by a client BACnet-user to configure the MAC address and BACnet Device object instance number in a remote device. The You-Are service provides a mechanism for specifying device identifier values across a network in a standardized manner. The vendor identification, model name, and serial number parameters together serve to unambiguously identify the remote device. Additional parameters are supplied for the MAC address or the Device object identifier, or both.

The Who-Am-I service is used by a sending BACnet-user to indicate that it requires identity configuration via the You-Are service. The Who-Am-I service provides a mechanism for requesting device identifier values across a network in a standardized manner. The vendor identification, model name, and serial number parameters are included in the request to unambiguously identify this device. The Who-Am-I service is also used to respond to a Who-Is service request that uses the Device Object_Identifier instance number of 4194303.

16.X.1 Who-Am-I Service Structure

The structure of the Who-Am-I service primitive is shown in Table 16-X1. The terminology and symbology used in this table are explained in 5.6.

Table 16-X1. Structure of Who-Am-I Service Primitive

Parameter Name	Req	Ind
Argument	M	M(=)
Vendor ID	M	M(=)
Model Name	M	M(=)
Serial Number	M	M(=)

16.X.1.1 Argument
This parameter shall convey the parameters for the Who-Am-I service request.

16.X.1.1.1 Vendor ID
This parameter, of type Unsigned16, shall convey the identity of the vendor of the device initiating the Who-Am-I service request. The value of this parameter shall be the same as the value of the Vendor_Identifier property of the Device object. See 12.11.6 and Clause 23.

16.X.1.1.2 Model Name
This parameter, of type CharacterString, shall specify the model name of the device initiating the Who-Am-I service request. The value of this parameter shall be the same as the value of the Model_Name property of the Device object. See 12.11.7.

16.X.1.1.3 Serial Number
This parameter, of type CharacterString, shall specify the serial identifier of the device initiating the Who-Am-I service request. The value of this parameter shall be the same as the value of the Serial_Number property in the of the Device object. See 12.11.56.

16.X.2 Service Procedure

The sending BACnet-user shall broadcast or unicast the Who-Am-I unconfirmed request. If the Who-Am-I is broadcast, this broadcast may be on the local network only, a remote network only, or globally on all networks at the discretion of the application.

If the Who-Am-I is being sent in response to a previously received Who-Is, then the Who-Am-I shall be sent in such a manner that the BACnet-user that sent the Who-Is will receive the resulting Who-Am-I. The sending BACnet-user Device Object_Identifier instance number shall be 4194303 when determining its inclusion in the Who-Is range. See Clause 19.

Since the request is unconfirmed, no further action is required. The BACnet-user may issue a Who-Am-I service request at any time, but shall not repeat the service request more frequently than every 5 minutes except when the Who-Am-I is being sent in response to a previously received Who-Is, or in response to manual intervention.

16.X.3 You-Are Service Structure

The structure of the You-Are service primitive is shown in Table 16-X2. The terminology and symbology used in this table are explained in 5.6.

Table 16-X2. Structure of You-Are Service Primitive

Parameter Name	Req	Ind

Argument	M	M(=)
Vendor ID	M	M(=)
Model Name	M	M(=)
Serial Number	M	M(=)
Device Identifier	C	C(=)
Device MAC Address	C	C(=)

16.X.3.1 Argument
This parameter shall convey the parameters for the You-Are service request.

16.X.3.1.1 Vendor ID
This parameter, of type Unsigned16, shall specify the identity of the vendor of the device that is qualified to receive this You-Are service request. The value of this parameter shall be compared to the value of the Vendor_Identifier property in the Device object by recipients of the You-Are service request. See 12.11.6 and Clause 23.

16.X.3.1.2 Model Name
This parameter, of type CharacterString, shall specify the model name of the device qualified to receive the You-Are service request. The value of this parameter shall be compared to the value of the Model_Name property in the Device object by recipients of the You-Are service request. See 12.11.7.

16.X.3.1.3 Serial Number
This parameter, of type CharacterString, shall specify the serial number of the device qualified to receive the You-Are service request. The value of this parameter shall be compared to the value of the Serial_Number property in the Device object by recipients of the You-Are service request. See 12.11.56.

16.X.3.1.4 Device Identifier
This parameter, of type BACnetObjectIdentifier, is the Device Object_Identifier to be assigned in the qualified device. Either the 'Device Identifier', or 'Device MAC Address', or both shall be present.

16.X.3.1.5 Device MAC Address
This parameter, of type OctetString, defines the device MAC address that is to be configured in the qualified device. For qualified devices that use VMAC addresses as defined in H.7.2, this parameter shall be ignored. Either the 'Device Identifier', or 'Device MAC Address', or both shall be present.

16.X.4 Service Procedure

If the sending BACnet-user knows the MAC address of the receiving BACnet device, this service shall be unicast. Otherwise, this service shall be broadcast. The receiving BACnet-user, whose Vendor ID matches 'Vendor ID', Device object Serial_Number property value matches the 'Serial Number', the Device object Model_Name property value matches the 'Model Name', and the 'Device MAC Address' is valid for the device, shall change its Device object Object_Identifier property and its device MAC address (if it is changeable) on the received port accordingly, based on the presence or absence of 'Device Identifier' or 'Device MAC Address'. After accepting the 'Device Identifier' or 'Device MAC Address' if provided, the device shall subsequently generate an I-Am, except when the receiving BACnet-user is an MS/TP slave node. The device is required to maintain the value of the Device Object_Identifier property and device MAC address across power failures or "restarts."

If the instance portion of the 'Device Identifier' is 4194303, then the device shall become an unconfigured device as defined by Clause 19.X.

[Add new **Clause 19.X**, p. 756]

19.X Unconfigured Device Discovery and Address Assignment

The You-Are service provides a mechanism that a sending BACnet-user, such as a workstation, may use to specify a device identifier value across a network to a remote device in a standardized manner. The vendor identification, model name, and

serial number parameters together serve to unambiguously identify the remote device. Additional parameters are supplied for the MAC address or the Device object identifier, or both.

The Who-Am-I service provides a mechanism for requesting device identifier values across a network in a standardized manner. The vendor identification, model name, and serial number parameters are included in the request to unambiguously identify this device.

The Who-Is service may be used to discover devices supporting the Who-Am-I service. The Who-Is service relies on devices in a BACnet network having both a valid Device Identifier and a network MAC address assigned to them. Unconfigured devices might require either a valid Device Identifier, a network MAC address, or both.

Prior to configuration, devices that require Device ID configuration shall only support initiation of Who-Am-I and execution of Who-Is and You-Are services, and shall use Device Identifier 4194303. Devices that require a network MAC address shall only support execution of the You-Are service. It is possible for a collection of unconfigured devices to saturate a network segment and respond with Who-Am-I service at the same time resulting in an incomplete set of discovered devices. This issue can be managed by configuring the discovered devices using the You-Are service, and repeating the Who-Is service unconfigured device discovery process.

19.X.1 Device Identifier Assignment

A Device in a BACnet network might have a network MAC address, but require a Device Identifier, and still be connected to the network. Discovering these unconfigured devices may be performed by using the Who-Is service parameters Device Instance Range Low Limit with a value of 4194303, and Device Instance Range High Limit with a value of 4194303. These unconfigured devices respond with Who-Am-I service. The discovered devices can then be assigned a valid Device Identifier using the You-Are service.

19.X.2 Network MAC Address Assignment

A Device in a BACnet network might have a Device Identifier, but require a network MAC address, and still be connected to the network. These devices may be remotely assigned a valid network MAC address using the You-Are service.

19.X.3 Device Identifier and Network MAC Address Assignment

A Device in a BACnet network might require a Device Identifier and a network MAC address, and still be connected to the network. These devices may be remotely assigned a valid Device Identifier and a network MAC address using the You-Are service.

[Update ASN.1 Productions in **Clause 21**, p. 782]

BACnetUnconfirmedServiceChoice ::= ENUMERATED {
…
~~unconfirmed-cov-notification-multiple (11)~~
unconfirmed-cov-notification-multiple (11),
who-Am-I (13),
you-Are (14)
}

BACnet-Unconfirmed-Service-Request ::= CHOICE {
…
~~unconfirmed-cov-notification-multiple [11] UnconfirmedCOVNotificationMultiple-Request~~
unconfirmed-cov-notification-multiple [11] UnconfirmedCOVNotificationMultiple-Request,
who-Am-I [13] Who-Am-I-Request,
you-Are [14] You-Are-Request
}

```
BACnetServicesSupported ::= BIT STRING {
…
-- Remote Device Management Services
    deviceCommunicationControl      (17),
    confirmedPrivateTransfer        (18),
    confirmedTextMessage            (19),
    reinitializeDevice              (20),
    who-Am-I                        (47),
    you-Are                         (48),
…
-- Services added after 2012
    subscribe-cov-property-multiple (41), -- Alarm and Event Service
    confirmed-cov-notification-multiple (42), -- Alarm and Event Service
    ~~unconfirmed-cov-notification-multiple (43) -- Alarm and Event Service~~
    unconfirmed-cov-notification-multiple (43), -- Alarm and Event Service

-- Services added after 2016
    who-Am-I                        (47), -- Remote Device Management Service
    you-Are                         (48) -- Remote Device Management Service
    }
```

[Add new ASN.1 Productions in **Clause 21** maintaining the alphabetical order, pp. 795-796]

```
Who-Am-I-Request ::= SEQUENCE {
    vendorID                Unsigned,
    modelName               CharacterString,
    serialNumber            CharacterString
    }

You-Are-Request ::= SEQUENCE {
    vendorID                Unsigned,
    modelName               CharacterString,
    serialNumber            CharacterString,
    deviceIdentifier    BACnetObjectIdentifier OPTIONAL,
    deviceMACAddress        OctetString OPTIONAL
    }
```

[Add new **Clause E.4.X**, p. 957]

E.4.X Examples of the Who-Am-I and You-Are Services

Examples of parameter usage for the Who-Am-I and You-Are services follow.

Example 1: Assigning the network address and Device Identifier of a device.

We wish to assign the network address and Device Identifier of another BACnet Device, and only its Vendor Identifier, Model Name, and Serial Number are known.

```
Service =           You-Are
'Vendor ID' =       555
'Model Name' =      "LMCP24"
'Serial Number' = "12345"
'Device Identifier' = (Device, Instance 3)
```

'Device MAC Address' = X'2A'

Assuming that there is such a device on the network, it responds sometime later using the I-Am service:

Service = I-Am
'I-Am Device Identifier' = (Device, Instance 3)
'Max APDU Length Accepted' = 480
'Segmentation Supported' = NO_SEGMENTATION
'Vendor Identifier' = 555

Example 2: A device needs its Device Identifier configured, and only its Vendor Identifier, Model Name, and Serial Number are known.

Service = Who-Am-I Service
'Vendor ID' = 555
'Model Name' = "LMCP24"
'Serial Number' = "12345"

Another device has a list, for a number of devices, of a Device Identifier, MAC address, Vendor Identifier, Model Name, and Serial Number for each device in the list. This device has the responsibility for handling the assignment of Device Identifier of the requesting device answers, resulting in a You-Are service request:

Service = You-Are
'Vendor ID' = 555
'Model Name' = "LMCP24"
'Serial Number' = "12345"
'Device Identifier' = (Device, Instance 3)

Assuming that there is such a device on the network, it responds sometime later using the I-Am service:

Service = I-Am
'I-Am Device Identifier' = (Device, Instance 3)
'Max APDU Length Accepted' = 480
'Segmentation Supported' = NO_SEGMENTATION
'Vendor Identifier' = 555

[Add new **Clause F.4.X**, p. 986]

F.4.X Encoding for Example E.4.X - Who-Am-I and You-Are Services

Example 1: Assigning the network address and Device Identifier of a device.

X'10' PDU Type=1 (Unconfirmed-Service-Request-PDU)
X'n+1' Service Choice=n+1 (You-Are-Request)

X'22' Application Tag 2 (Unsigned Integer, L=2) (Vendor ID)
X' 022B' 555
X'75' Application Tag 7 (Character String, L>4)
X'06' Extended Length=6
X'00' ISO 10646 (UTF-8) Encoding
X'4C4D43503234' "LMCP24"
X'75' Application Tag 7 (Character String, L>4)
X'1C' Extended Length=5
X'00' ISO 10646 (UTF-8) Encoding
X'3132333435' "12345"

Assuming that there is such a device on the network, it responds sometime later using the I-Am service:

```
X'10'           PDU Type=1 (Unconfirmed-Service-Request-PDU)
X'00'           Service Choice=0 (I-Am-Request)

X'C4'           Application Tag 12 (Object Identifier, L=4) (I-Am Device Identifier)
X'02000003'             Device, Instance Number=3
X'22'           Application Tag 2 (Unsigned Integer, L=2) (Max APDU Length Accepted)
X'01E0'         480
X'91'           Application Tag 9 (Enumerated, L=1) (Segmentation Supported)
X'03'           3 (NO_SEGMENTATION)
X'22'           Application Tag 2 (Unsigned Integer, L=2) (Vendor ID)
X'022B'         555
```

Example 2: A device (Vendor ID=555, Model Name "LMCP24", Serial Number="12345") needs its Device Identifier and MAC address configured, and only its Vendor Identifier, Model Name, and Serial Number are known.

```
X'10'           PDU Type=1 (Unconfirmed-Service-Request-PDU)
X'n'                    Service Choice=n (Who-Am-I-Request)

X'22'           Application Tag 2 (Unsigned Integer, L=2) (Vendor ID)
X' 022B'        555
X'75'           Application Tag 7 (Character String, L>4)
X'06'           Extended Length=6
X'00'           ISO 10646 (UTF-8) Encoding
X'4C4D43503234'         "LMCP24"
X'75'           Application Tag 7 (Character String, L>4)
X'1C'           Extended Length=5
X'00'           ISO 10646 (UTF-8) Encoding
X'3132333435'   "12345"
```

Some other device has a list, for a number of devices, of a Device Identifier, MAC address, Vendor Identifier, Model Name, and a Serial Number for each device in the list. This device has the responsibility for handling the assignment of Device Identifier and MAC Address of the requesting device (Vendor ID=555, Model Name "LMCP24", Serial Number="12345"), resulting in a You-Are service request:

```
X'10'           PDU Type=1 (Unconfirmed-Service-Request-PDU)
X'n'                    Service Choice=n (You-Are-Request)

X'22'           Application Tag 2 (Unsigned Integer, L=2) (Vendor ID)
X' 022B'        555
X'75'           Application Tag 7 (Character String, L>4)
X'06'           Extended Length=6
X'00'           ISO 10646 (UTF-8) Encoding
X'4C4D43503234'         "LMCP24"
X'75'           Application Tag 7 (Character String, L>4)
X'1C'           Extended Length=5
X'00'           ISO 10646 (UTF-8) Encoding
X'3132333435'   "12345"
X'C4'           Application Tag 12 (Object Identifier, L=4) (I-Am Device Identifier)
X'02000003'             Device, Instance Number=3
X'61'           Application Tag 6 (Octet String, L=1)
X'2A'
```

Assuming that a device on the network matches the criteria in the You-Are service request, it responds sometime later using the I-Am service:

X'10' PDU Type=1 (Unconfirmed-Service-Request-PDU)
X'00' Service Choice=0 (I-Am-Request)

X'C4' Application Tag 12 (Object Identifier, L=4) (I-Am Device Identifier)
X'02000003' Device, Instance Number=3
X'22' Application Tag 2 (Unsigned Integer, L=2) (Max APDU Length Accepted)
X'01E0' 480
X'91' Application Tag 9 (Enumerated, L=1) (Segmentation Supported)
X'03' 3 (NO_SEGMENTATION)
X'22' Application Tag 2 (Unsigned Integer, L=2) (Vendor ID)
X'022B' 555

[Add new BIBBs to Clause **K.5**, pp. 1076]

K.5.X BIBB - Device Management-Dynamic Device Assignment-A (DM-DDA-A)

The A device assigns other devices their device attributes and responds to requests for device attributes.

BACnet Service	Initiate	Execute
Who-Am-I		x
You-Are	x	
Who-Is	x	

K.5.X BIBB - Device Management-Dynamic Device Assignment-B (DM-DDA-B)

The B device seeks information about device attributes of itself and interprets device assignments.

BACnet Service	Initiate	Execute
Who-Am-I	x	
You-Are		x
Who-Is		x
I-Am	x	

[Change **Clause L.1**, p. 1079]

L.1 Operator Interface Profiles

The following table indicates which BIBBs shall be supported by the device types of this family, for each interoperability area. The B-XAWS is excluded from this table.

Data Sharing

B-AWS	**B-OWS**	**B-OD**
DS-RP-A,B	DS-RP-A,B	DS-RP-A,B
DS-RPM-A	DS-RPM-A	
DS-WP-A	DS-WP-A	DS-WP-A
DS-WPM-A	DS-WPM-A	
DS-AV-A	DS-V-A	DS-V-A
DS-AM-A	DS-M-A	DS-M-A

Alarm & Event Management

B-AWS	**B-OWS**	**B-OD**
AE-N-A	AE-N-A	AE-N-A
AE-ACK-A	AE-ACK-A	
AE-AS-A	AE-AS-A	
AE-AVM-A	AE-VM-A	
AE-AVN-A	AE-VN-A	AE-VN-A
AE-ELVM-A[1]		

[1] Not required for devices claiming conformance to a Protocol_Revision less than 7

Scheduling

B-AWS	**B-OWS**	**B-OD**
SCHED-AVM-A	SCHED-VM-A	

Trending

B-AWS	**B-OWS**	**B-OD**
T-AVM-A	T-V-A	

Device & Network Management

B-AWS	B-OWS	B-OD
DM-DDB-A,B	DM-DDB-A,B	DM-DDB-A,B
DM-ANM-A		
DM-ADM-A		
DM-DOB-B	DM-DOB-B	DM-DOB-B
DM-DCC-A		
DM-MTS-A	DM-MTS-A	
DM-OCD-A		
DM-RD-A		
DM-BR-A		
DM-DDA-A		

[Change **Clause L.1.2**, p. 1080]

L.1.2 BACnet Advanced Operator Workstation (B-AWS)

The B-AWS is the advanced operator's window into a BACnet system. It is primarily used to monitor the performance of a system and to modify parameters that affect the operation of a system. It may also be used for configuration activities that are beyond the scope of this standard.

...

Device and Network Management

- Ability to find other BACnet devices
- Ability to find all objects in BACnet devices
- Ability to silence a device on the network that is transmitting erroneous data
- Ability to synchronize the time in devices across the BACnet internetwork at the request of the operator
- Ability to cause a remote device to reinitialize itself
- Ability to backup and restore the configuration of other devices
- Ability to command half-routers to establish and terminate connections
- *Ability to perform dynamic device assignment*

[Add a new entry to **History of Revisions**, p. 1349]

HISTORY OF REVISIONS

. . .	. . .	**. . .**
1	22	**Addendum *bz* to ANSI/ASHRAE Standard 135-2016** Approved by ASHRAE and by the American National Standards Institute on November 18, 2019 1. Add Who-Am-I and You-Are Services

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.

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