

INTERPRETATION IC 135-2024-16 OF ANSI/ASHRAE STANDARD 135-2024 BACnet® - A Data Communication Protocol for Building Automation and Control Networks

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Reference: This request for interpretation refers to ANSI/ASHRAE Standard 135-2024 and pertains to the Network Port object that represents a non-BACnet network port.

Background:

Table 12-71.12. Additional Properties of the Network Port Object Type if Network Type is proprietary

Property Identifier	Property Datatype	BACNET APPLICATION	PROTOCOL	PHYSICAL
Network_Number	Unsigned16	(R)		
Network_Number_Quality	BACnetNetworkNumberQuality	(R)		
APDU_Length	Unsigned	(R)		
Routing_Table	BACnetLIST of BACnetRouterEntry	O		
MAC_Address	OctetString	O ¹	O ¹	O ¹
Device_Address_Proxy_Enable	Boolean	O ²		
Device_Address_Proxy_Timeout	Unsigned	O ²		
<other standard properties>	<as defined for the property>	O ²	O ²	O ²

- ¹ Required to be present in one of the Network Port objects in the hierarchy if the topmost Network Port object has a Protocol_Level of BACNET_APPLICATION.
- ² Any standard property defined for this object type and not listed in this table may be present. If the presence or capability of one of these properties require other properties to be present, then the other properties shall be present.
- ³ Required to be present and writable if the port supports device address proxying as specified in Clause 19.9.

12.56.9 Network_Type

This property, of type BACnetNetworkType, represents the type of network this Network Port object is representing.

This property shall have one of the following values:

ARCNET
IPV4
IPV6
ETHERNET
LONTALK
MSTP
PTP
SERIAL
ZIGBEE
VIRTUAL

MS/TP, as defined in Clause 9.

Point-To-Point, as defined in Clause 10.

A physical serial port.

ZigBee as defined in Annex O

Indicates that this port represents the configuration and properties of a virtual network as described in Clauses H.1.1.1 and H.1.1.2.

SECURE_CONNECT
<Proprietary Enum Values>

BACnet Secure Connect virtual link layer as defined in Annex AB.
A vendor may use other proprietary enumeration values to indicate that this port represents the use of message structures, procedures, and medium access control techniques other than those contained in this standard. For proprietary extensions of this enumeration, see Clause 23.1 of this standard.

When the Protocol_Level is BACNET_APPLICATION, the Network_Type indicates the protocol over which BACnet is operating and implies that the requirements laid out in the appropriate clause are being met. For example, if the Network_Type is IPV4, then the port is operating as a BACnet/IP port as defined in Annex J.

12.56.10 Protocol_Level

This property, of type BACnetProtocolLevel, indicates whether the object represents a physical network interface (PHYSICAL), a BACnet or non-BACnet protocol (PROTOCOL), the BACnet use of the protocol (BACNET_APPLICATION), or a non-BACnet use of the protocol (NON_BACNET_APPLICATION).

If the Reference_Port property is absent, this property shall be BACNET_APPLICATION or NON_BACNET_APPLICATION.

12.56.13 Network_Number

This property, of type Unsigned16, represents the BACnet network number associated with this network.

The range for this property shall be 0 .. 65534. A Network_Number of 0 indicates that the Network_Number is not known or cannot be determined. Writing 0 to the Network_Number property shall force the value of the Network_Number_Quality property to UNKNOWN and allows the device to attempt to learn the network number, if possible. Writing a value other than 0 shall force the Network_Number_Quality property to CONFIGURED.

This property shall be writable in routers and any other device that requires knowledge of the network number for proper operation. Routers are permitted to refuse a value of 0. In that case, the write request shall result in an error response with 'Error Class' of PROPERTY and an 'Error Code' of VALUE_OUT_OF_RANGE.

If this property is writable, then a successful write to this property shall set the Changes_Pending property to TRUE. A value written to this property shall become effective when the device receives a ReinitializeDevice service request with a 'Reinitialized State of Device' of ACTIVATE_CHANGES or WARMSTART.

12.56.14 Network_Number_Quality

This read-only property, of type BACnetNetworkNumberQuality, represents the current quality of the Network_Number property.

This property shall have one of the following values:

UNKNOWN	None of the below meanings.
LEARNED	The Network_Number was learned via receipt of a Network-Number-Is message with a flag value of 0 (learned).
LEARNED_CONFIGURED	The Network_Number was learned via receipt of a Network-Number-Is message with a flag value of 1 (configured).
CONFIGURED	The Network_Number is configured for this port.

12.56.19 MAC_Address

This property, of type OctetString, contains the BACnet MAC address used on this network. The value of this property shall be conveyed with the most significant octet first.

When a port is represented by a single non-hierarchical Network Port object, this property is required except when Network_Type is PTP.

If this property is writable, then a successful write to this property shall set the Changes_Pending property to TRUE. The value of this property shall become effective when the device receives a ReinitializeDevice service request with a 'Reinitialized State of Device' of ACTIVATE_CHANGES or WARMSTART.

12.56.20 APDU_Length

This property, of type Unsigned, is the maximum number of octets that may be contained in a single indivisible application protocol data unit sent or received on this port. The value of this property shall be greater than or equal to 50. This property also indicates the maximum number of octets that may be contained in a single individual network service data unit sent or received on this port.

AB.1.8 BACnet/SC Network Port Objects

Participation in a BACnet/SC network is represented by single network port regardless of the number of connections and initiated or accepted WebSocket connections in use by the network port.

For BACnet/SC network port implementations less than protocol revision 17, the configuration of BACnet/SC network ports is a local matter and cannot be represented by Network Port objects.

For BACnet/SC network port implementations with a Protocol_Revision 17 through Protocol_Revision 23, BACnet/SC network ports shall be represented by a Network Port object at the BACNET_APPLICATION protocol level with a proprietary network type value. For the required standard properties to be present see Clause 12.56.

For BACnet/SC network port implementations with a Protocol_Revision 24 and higher, BACnet/SC network ports shall be represented by a Network Port object at the BACNET_APPLICATION protocol level with network type of SECURE_CONNECT. For the required standard properties to be present see Clause 12.56.

Problem:

Table 12-71.12 assumes the Network Port object represents a BACnet/SC network port in a device at Protocol_Revision between 17 and 23. See Clause AB.1.8. If a Network Port object represents a non-BACnet network port:

- The Protocol_Level property cannot equal BACNET_APPLICATION. See Clause 12.56.10.
- The Network_Number, Network_Number_Quality, and APDU_Length properties are BACnet network specific properties and should not be required. See Clauses 12.56.13, 12.56.14, and 12.56.20.
- The MAC_Address should not be required if the underlying non-BACnet protocol does not require it. See Clause 12.56.19.
- Device address proxying, as defined in Clause 19.9, proxies BACnet devices so the Device_Address_Proxy_Enable and Device_Address_Proxy_Timeout properties. should not be allowed.

Interpretation #1:

A Network Port object that represents a non-BACnet network port is not required to include the Network_Number, Network_Number_Quality, APDU_Length, and MAC_Address properties.

Question #1: Is this Interpretation correct?

Answer #1: YES

Comment #1: A proprietary Network Port object of Protocol_Level = NON_BACNET_APPLICATION is only required to include the properties with Conformance Code of 'R' or 'W' in Table 12-71 and Table 12-71.12 does not apply

Interpretation #2:

A Network Port object that represents a non-BACnet network shall not include the Device_Address_Proxy_Enable and Device_Address_Proxy_Timeout properties.

Question #2: Is this Interpretation correct?

Answer #2: YES

Comment #2: 'if and only if' and will be correct in a future erratum