



BACnet<sup>®</sup> TESTING LABORATORIES

# INTERIM TEST SPECIFICATION

To Be Used with Test Package 26.0  
Version 2  
March 24, 2025

Published on April 8, 2025

## Foreward

The purpose of this document is to define interim tests and other test package changes made to support testing of a device that supports functionality currently not covered in the released BTL Test Package. This document shall be applied and used with BTL Test Package 26.0.

Vendors who are planning to submit a device for testing and who implement Protocol\_Revision 27 and higher, or which contain functionality not covered by the Official Test Package, should use this Interim Test document.

Please note that if the device contains functionality not yet covered by the official Test Package, nor by the Interim Tests document, development of new tests may be required for your device. Please contact the BTL Manager before submitting your device for testing to ensure you are aware of all tests that will need to be applied to your device.

The changes in this document are for interim use only and may or may not be used as documented here when the final changes are applied to the next Test Package revision. Devices tested using this interim test document shall be recalled for updated testing when the next revision of test package is released that includes the topics covered here.

In the following document, language to be added to existing clauses of ANSI/ASHRAE 135.1-2023 or any part of the Test Package 26.0 are indicated through the use of *italics*, while deletions are indicated by ~~striketrough~~. Where entirely new sections are proposed to be added, plain type is used throughout.

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## BTL Test Plan Changes

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This section of the document contains interim changes to the BTL Checklist and the BTL Test Plan documents to support testing of products with functionality outside the scope of the official test plan.

This section is ordered the same as the BTL Checklist and BTL Test Plan documents to allow easy navigation of the material.

All test changes can be found in the next major section.

[Change Clause 9.10.1]

### 9.10.1 Base Requirements

~~Contact BTL for Interim Tests for this functionality.~~ There are no base requirements for this section.

[Add Clauses 9.10.2 to 9.10.17]

### 9.10.2 Supports GW-VN-B

The IUT supports GW-VN-B.

Verify Checklist		
	Test Conditionality	Must be executed.
	Test Directives	Verify that the IUT claims support for GW-VN-B.
	Testing Hints	

### 9.10.3 Supports the Network Port Object

The IUT contains a Network Port object with Network Type = VIRTUAL.

Verify Checklist		
	Test Conditionality	Must be executed.
	Test Directives	Verify that the IUT claims support for DS-WP-B.
	Testing Hints	
135.1-2023 - 7.3.2.46.1.1 - Configure Network Through Network Port Object Test		
	Test Conditionality	Must be executed.
	Test Directives	Execute this test at least once on each Network Port object that has Network_Type = VIRTUAL and contains writable properties. Execute test 7.3.2.46.1.1 at least once with ReinitializeDevice WARMSTART and at least once with ACTIVATE_CHANGES.
	Testing Hints	
BTL - 7.3.2.46.1.3 - Network Port Non-Volatility Properties Test		
	Test Conditionality	Must be executed if any writable properties are supported for which the values are required for proper operation of the network.
	Test Directives	
	Testing Hints	
135.1-2023 - 7.3.2.46.1.4 - Network Port Configuration Conflict Test		
	Test Conditionality	Must be executed.
	Test Directives	
	Testing Hints	

## 9.10.4 Supports Writable Network\_Number Property

The IUT contains a Network Port object with Network Type = VIRTUAL and Protocol\_Level = BACNET\_APPLICATION that contains a writable Network\_Number property.

135.1-2023 - 7.3.2.46.2 - Network-Number-Is Updates Network_Number Quality Test		
	Test Conditionality	For IUTs which do not accept a value of zero in their Network_Number property, this test shall be skipped.
	Test Directives	
	Testing Hints	

## 9.10.5 Supports Configurable Out\_Of\_Service Property

The IUT contains a Network Port object with Network Type = VIRTUAL and contains a writable or configurable Out\_Of\_Service property.

BTL - 7.3.1.1.X5 - Out Of Service, Status Flags, Reliability and Command Property Test		
	Test Conditionality	Must be executed.
	Test Directives	
	Testing Hints	

## 9.10.6 Supports Hierarchical Network Port Objects

The IUT contains a Network Port object with Network Type = VIRTUAL, Protocol\_Level = BACNET\_APPLICATION and supports a set of Network Port objects which form a hierarchy of Network Port objects.

Verify EPICS		
	Test Conditionality	Must be executed if the IUT claims Protocol_Revision >= 24.
	Test Directives	Verify that each hierarchical Network Port object contains only required and optional properties based on its Network_Type and Protocol_Level.
	Testing Hints	
BTL - 7.3.2.46.X.Y - Valid Hierarchy Chain - Virtual Test		
	Test Conditionality	Must be executed.
	Test Directives	Repeat this test on all Network Port objects with Protocol_Level = BACNET_APPLICATION, Network_Type = VIRTUAL, and Reference_Port <> 4194303.
	Testing Hints	
BTL - 7.3.2.46.4.2 - Properties in Referenced Network Port Reflected in Top Network Port Object		
	Test Conditionality	Must be executed if the IUT claims Protocol_Revision < 24.
	Test Directives	
	Testing Hints	
135.1-2023 - 7.3.2.46.4.3 - Changes Reflected in Top Network Port Object		
	Test Conditionality	Must be executed if the IUT claims Protocol_Revision < 24 and supports writable properties in its Network Port hierarchies.
	Test Directives	
	Testing Hints	
135.1-2023 - 7.3.2.46.4.4 - Changes Reflected in Lower Network Port Objects		
	Test Conditionality	Must be executed if the IUT claims Protocol_Revision < 24 and supports writable properties in its Network Port hierarchies.
	Test Directives	
	Testing Hints	

### 9.10.7 Supports Non-hierarchical Network Port Objects

The IUT contains a Network Port object with Network Type = VIRTUAL, Protocol\_Level = BACNET\_APPLICATION and supports non-hierarchical Network Port objects.

<b>Verify EPICS</b>		
	<b>Test Conditionality</b>	Must be executed.
	<b>Test Directives</b>	Verify IUT contains non-hierarchical Network Port objects with Protocol_Level equal to BACNET_APPLICATION for this Network_Type.
	<b>Testing Hints</b>	
<b>Verify EPICS</b>		
	<b>Test Conditionality</b>	Must be executed if the IUT claims Protocol_Revision < 24.
	<b>Test Directives</b>	Verify the Reference_Port is absent or equal to 4194303 for all non-hierarchical Network Port objects of this Network_Type.
	<b>Testing Hints</b>	
<b>Verify EPICS</b>		
	<b>Test Conditionality</b>	Must be executed if the IUT claims Protocol_Revision >= 24.
	<b>Test Directives</b>	Verify the Reference_Port is absent for all non-hierarchical Network Port objects of this Network_Type.
	<b>Testing Hints</b>	
<b>Verify EPICS</b>		
	<b>Test Conditionality</b>	Must be executed.
	<b>Test Directives</b>	Verify the Additional_Reference_Ports property is absent for all non-hierarchical Network Port objects of this Network_Type.
	<b>Testing Hints</b>	
<b>Verify EPICS</b>		
	<b>Test Conditionality</b>	Must be executed if the IUT claims Protocol_Revision >= 24.
	<b>Test Directives</b>	Verify each non-hierarchical Network Port object contains all required properties for this Network_Type.
	<b>Testing Hints</b>	
<b>Verify EPICS</b>		
	<b>Test Conditionality</b>	Must be executed if the IUT claims Protocol_Revision >= 24.
	<b>Test Directives</b>	Verify each non-hierarchical Network Port object contains only valid optional properties for this Network_Type.
	<b>Testing Hints</b>	

### 9.10.8 Supports the Routing\_Table Property

The IUT contains a Network Port object with Network Type = VIRTUAL and Protocol\_Level = BACNET\_APPLICATION that contains the Routing\_Table property.

<b>135.1-2023 - 7.3.2.46.6 - Routing_Table Test</b>		
	<b>Test Conditionality</b>	If the IUT only supports 1 entry in its routing table, then this test shall be skipped.
	<b>Test Directives</b>	
	<b>Testing Hints</b>	

### 9.10.9 Supports the Network Port Object Command Property

The IUT contains a Network Port object with Network Type = VIRTUAL and supports the Command property.

<b>135.1-2023 - 7.3.2.46.3.1 - IDLE Command Rejected</b>		
	<b>Test Conditionality</b>	Must be executed.
	<b>Test Directives</b>	
	<b>Testing Hints</b>	

<b>BTL - 7.3.2.46.3.9 - No Commands if Changes Pending Test</b>		
	<b>Test Conditionality</b>	Must be executed if the Network Port object supports DISCARD CHANGES and at least 1 other non-IDLE command.
	<b>Test Directives</b>	
	<b>Testing Hints</b>	
<b>BTL - 7.3.2.46.3.2.X2 - DISCARD CHANGES Command Failure Test</b>		
	<b>Test Conditionality</b>	Must be executed if the Network Port object does not support the DISCARD CHANGES command.
	<b>Test Directives</b>	
	<b>Testing Hints</b>	
<b>135.1-2023 - 7.3.2.46.3.3.2 - RENEW FD REGISTRATION Command Failure Test</b>		
	<b>Test Conditionality</b>	Must be executed if the Network Port object does not support the RENEW FD REGISTRATION command.
	<b>Test Directives</b>	
	<b>Testing Hints</b>	
<b>135.1-2023 - 7.3.2.46.3.4.2 - RESTART SLAVE DISCOVERY Command Failure Test</b>		
	<b>Test Conditionality</b>	Must be executed if the Network Port object does not support the RESTART SLAVE DISCOVERY command.
	<b>Test Directives</b>	
	<b>Testing Hints</b>	
<b>135.1-2023 - 7.3.2.46.3.5.2 - RENEW DHCP Command Failure Test</b>		
	<b>Test Conditionality</b>	Must be executed if the Network Port object does not support the RENEW DHCP command.
	<b>Test Directives</b>	
	<b>Testing Hints</b>	
<b>135.1-2023 - 7.3.2.46.3.6.2 - RESTART AUTONEGOTIATION Command Failure Test</b>		
	<b>Test Conditionality</b>	Must be executed if the Network Port object does not support the RESTART AUTONEGOTIATION command.
	<b>Test Directives</b>	
	<b>Testing Hints</b>	
<b>135.1-2023 - 7.3.2.46.3.7.2 - DISCONNECT Command Failure Test</b>		
	<b>Test Conditionality</b>	Must be executed.
	<b>Test Directives</b>	
	<b>Testing Hints</b>	
<b>135.1-2023 - 7.3.2.46.3.8.2 - RESTART PORT Command Failure Test</b>		
	<b>Test Conditionality</b>	Must be executed if the Network Port object does not support the RESTART PORT command.
	<b>Test Directives</b>	
	<b>Testing Hints</b>	
<b>BTL - 7.3.2.46.3.X.2 - GENERATE_CSR_FILE Command Failure Test</b>		
	<b>Test Conditionality</b>	Must be executed if the Network Port object does not support the GENERATE_CSR_FILE command.
	<b>Test Directives</b>	
	<b>Testing Hints</b>	
<b>BTL - 7.3.2.46.3.X.4 - VALIDATE CHANGES Command Failure Test</b>		
	<b>Test Conditionality</b>	Must be executed if the Network Port object does not support the VALIDATE CHANGES command.
	<b>Test Directives</b>	
	<b>Testing Hints</b>	

### 9.10.10 Supports the DISCARD\_CHANGES Command

The IUT contains a Network Port object with Network Type = VIRTUAL and supports the DISCARD\_CHANGES command.

BTL - 7.3.2.46.3.2.X1 - DISCARD_CHANGES Command Test		
	Test Conditionality	Must be executed.
	Test Directives	
	Testing Hints	

### 9.10.11 Supports the RENEW\_FD\_REGISTRATION Command

The IUT contains a Network Port object with Network Type = VIRTUAL, Protocol\_Level = BACNET\_APPLICATION, and supports the RENEW\_FD\_REGISTRATION command.

135.1-2023 - 7.3.2.46.3.3.1 - RENEW_FD_REGISTRATION Command Test		
	Test Conditionality	Must be executed.
	Test Directives	
	Testing Hints	

### 9.10.12 Supports the RESTART\_SLAVE\_DISCOVERY Command

The IUT contains a Network Port object with Network Type = VIRTUAL and Protocol\_Level = BACNET\_APPLICATION and supports the RESTART\_SLAVE\_DISCOVERY command.

135.1-2023 - 7.3.2.46.3.4.1 - RESTART_SLAVE_DISCOVERY Command Test		
	Test Conditionality	Must be executed.
	Test Directives	
	Testing Hints	

### 9.10.13 Supports the RENEW\_DHCP Command

The IUT contains a Network Port object with Network Type = VIRTUAL, Protocol\_Level = BACNET\_APPLICATION or PROTOCOL, and supports the RENEW\_DHCP command.

135.1-2023 - 7.3.2.46.3.5.1 - RENEW_DHCP Command Test		
	Test Conditionality	Must be executed.
	Test Directives	
	Testing Hints	

### 9.10.14 Supports the RESTART\_AUTONEGOTIATION Command

The IUT contains a Network Port object with Network Type = VIRTUAL, Protocol\_Level = BACNET\_APPLICATION or PHYSICAL and supports the RESTART\_AUTONEGOTIATION command.

135.1-2023 - 7.3.2.46.3.6.1 - RESTART_AUTONEGOTIATION Command Test		
	Test Conditionality	Must be executed.
	Test Directives	
	Testing Hints	

### 9.10.15 Supports the RESTART\_PORT Command

The IUT contains a Network Port object with Network Type = VIRTUAL and supports the RESTART\_PORT command.

135.1-2023 - 7.3.2.46.3.8.1 - RESTART_PORT Command Test		
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	<b>Test Conditionality</b>	Must be executed.
	<b>Test Directives</b>	
	<b>Testing Hints</b>	

### 9.10.16 Supports the GENERATE\_CSR\_FILE Command

The IUT contains a Network Port object with Network Type = VIRTUAL, Protocol\_Level = BACNET\_APPLICATION, and supports the GENERATE\_CSR\_FILE Command.

<b>BTL - 7.3.2.46.3.X.1 - GENERATE_CSR_FILE Command Test</b>		
	<b>Test Conditionality</b>	Must be executed if the IUT supports the GENERATE_CSR_FILE command.
	<b>Test Directives</b>	
	<b>Testing Hints</b>	

### 9.10.17 Supports the VALIDATE\_CHANGES Command

The IUT contains a Network Port object with Network Type = VIRTUAL and supports the VALIDATE\_CHANGES command.

<b>BTL - 7.3.2.46.3.X.3 - VALIDATE_CHANGES Command Test</b>		
	<b>Test Conditionality</b>	Must be executed.
	<b>Test Directives</b>	
	<b>Testing Hints</b>	

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## BTL Specified Tests Changes

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This section contains all of the new and changed tests required by the interim test BTL Checklist and BTL Test Plan changes.

### JIRA: BTLWG-1683

[Add Test 7.3.2.46.X.Y]

#### 7.3.2.46.X Valid Hierarchy Tests

##### 7.3.2.46.X.Y Valid Hierarchy Chain - Virtual Test

Reason for Change: Explicit test for this data link.

Purpose: To verify that a hierarchical chain of BACnet network port objects in the IUT is organized in a valid hierarchy of protocol levels.

Test Concept: Starting with a hierarchical Network Port object (NP\_APP) and Network\_Type which represents a configured application layer port (BACNET\_APPLICATION), verify this port contains valid Network\_Type, Protocol\_Level, and Reference\_Port. Visit each Network Port object in the hierarchy ensuring that the Network\_Type, Protocol\_Level, and Reference\_Port are valid. Using the Additional\_Reference\_Ports property, visit each Network Port object in the hierarchy ensuring that the Network\_Type, Protocol\_Level, Reference\_Port, and Additional\_Reference\_Ports are valid.

Notes to Tester: NPOs of this Network\_Type are excluded from this test if they are at Protocol\_Level = PROTOCOL and they are not referenced by another NPO. NPOs of this Network\_Type are also excluded from this test if they are at Protocol\_Level = PHYSICAL and they are not referenced by another NPO.

Test Steps:

-- Verify Protocol\_Level = BACNET\_APPLICATION

1. VERIFY NP\_APP, Protocol\_Level = BACNET\_APPLICATION
2. VERIFY NP\_APP, Network\_Type = VIRTUAL
3. RP = READ NP\_APP, Reference\_Port
4. VERIFY RP > 4194303

-- Check the rest of the chain

5. WHILE (RP > 4194303)
  - {
  - 6. NPx = (Network Port, RP)
  - 7. VERIFY NPx, Protocol\_Level <> (NON\_BACNET\_APPLICATION OR BACNET\_APPLICATION)  
-- check that if PHYSICAL level it is the last NPO
  - 8. IF (NPx, Protocol\_Level == PHYSICAL) THEN
  - 9. VERIFY NPx, Reference\_Port = 4194303
  - 10. RP = READ NPx, Reference\_Port
  - }
  - either the NPO is at PROTOCOL and does not reference another NPO or it is PHYSICAL
11. IF (Protocol\_Revision >= 24 and NP\_APP, Additional\_Reference\_Ports is present) THEN {
12. REPEAT ARP = (for each entry in NP\_APP, Additional\_Reference\_Ports) DO {
13. NPx = (Network Port, ARP)
14. VERIFY NPx, Protocol\_Level <> (NON\_BACNET\_APPLICATION or BACNET\_APPLICATION)  
-- check that if PHYSICAL level it is the last NPO
15. IF (NPx, Protocol\_Level == PHYSICAL) THEN
16. IF (NPx, Additional\_Reference\_Ports is present) THEN
17. VERIFY NPx, Additional\_Reference\_Ports = (empty list)

```

-- Check the rest of the chain
18. RP = READ NPx, Reference_Port
19. WHILE (RP <> 4194303)
    {
20.     NPx = (Network Port, RP)
21.     VERIFY NPx, Protocol_Level <> (NON_BACNET_APPLICATION
        or BACNET_APPLICATION)
        -- check that if PHYSICAL level it is the last NPO
22.     IF (NPx, Protocol_Level == PHYSICAL) THEN
23.         VERIFY NPx, Reference_Port = 4194303
24.         RP = READ NPx, Reference_Port
    }
}
}

```

Version	Date	Author	Change
1.0	2024-12-20	Michael Osborne	• Initial Release. Supports Test Package 26.0.
2.0	2025-03-24	Michael Osborne	•