



**BACnet<sup>®</sup> TESTING LABORATORIES  
ADDENDA**

**Addendum al to  
BTL Test Package 16.1**

**Revision 2  
Revised 8/22/2020**

Approved by the BTL Working Group on July 23, 2020.  
Approved by the BTL Working Group Voting Members on September 13, 2020.  
Published on September 15, 2020.

**[This foreword and the “Overview” on the following pages are not part of this Test Package. They are merely informative and do not contain requirements necessary for conformance to the Test Package.]**

### FOREWORD

The purpose of this addendum is to present current changes being made to the BTL Test Package. These modifications are the result of change proposals made pursuant to the continuous maintenance procedures and of deliberations within the BTL-WG Committee. The changes are summarized below.

BTL-16.1al-1: NM-BBMDC-A Testing - BTLWG-74..... 2  
BTL-16.1al-2: Add Testing for NM-BBMDC-B - BTLWG-338..... 5

In the following document, language to be added to existing clauses within the BTL Test Package 16.1 is indicated through the use of *italics*, while deletions are indicated by ~~strike through~~. Where entirely new subclauses are proposed to be added, plain type is used throughout

In contrast, changes to BTL Specified Tests also contain a **yellow** highlight to indicate the changes made by this addendum. When this addendum is applied, all highlighting will be removed. Change markings on tests will remain to indicate the difference between the new test and an existing 135.1 test. If a test being modified has never existed in 135.1, the applied result should not contain any change markings. When this is the case, square brackets will be used to describe the changes required for this test.

Each addendum can stand independently unless specifically noted via dependency within the addendum. If multiple addenda change the same test or section, each future released addendum that changes the same test or section will note in square brackets whether or not those changes are reflected.

**BTL-16.1a1-1: NM-BBMDC-A Testing - BTLWG-74**

**Overview:**

Replace placeholder entries in Checklist and Test Plan for NM-BBMDC-A.

**Changes:**

**BTL Checklist Changes**

[In BTL Checklist, replace Network Management - BBMD Configuration - A section]

Support	Listing	Option
<b>Network Management - BBMD Configuration - A</b>		
	R	Base Requirements
	BTL-C <sup>1</sup>	Is able to configure Network Port objects
<sup>1</sup> This option is required if the IUT claims Protocol Revision 17 or higher.		

**BTL Test Plan Changes**

[In BTL Test Plan, replace 10.6 Network Management - BBMD Configuration - A section]

**10.6 Network Management - BBMD Configuration - A**

**10.6.1 Base Requirements**

Base requirements must be met by any IUT claiming conformance to this BIBB.

<b>BTL - 14.X1.1 - Read-Broadcast-Distribution-Table Initiation</b>		
	<b>Test Conditionality</b>	Must be executed.
	<b>Test Directives</b>	
	<b>Testing Hints</b>	
<b>BTL - 14.X1.2 - Write-Broadcast-Distribution-Table Initiation</b>		
	<b>Test Conditionality</b>	Must be executed.
	<b>Test Directives</b>	
	<b>Testing Hints</b>	
<b>BTL - 14.X1.3 - Read-Foreign-Device-Table Initiation</b>		
	<b>Test Conditionality</b>	Must be executed.
	<b>Test Directives</b>	
	<b>Testing Hints</b>	
<b>BTL - 14.X1.4 - Delete-Foreign-Device-Table-Entry Initiation</b>		
	<b>Test Conditionality</b>	Must be executed.
	<b>Test Directives</b>	
	<b>Testing Hints</b>	

**10.6.2 Is able to Configure Network Port Objects**

The IUT is able to read and modify Network Port objects.

<b>135.1-2013 - 8.18.3 - Reading and Presenting Properties</b>		
	<b>Test Conditionality</b>	Must be executed.

	<b>Test Directives</b>	Repeat the test for <u>all</u> standard properties of the Network Port object which relate to IPv4 BBMDs.
	<b>Testing Hints</b>	
<b>135.1-2013 - 8.22.4 - Accepting Input and Modifying Properties</b>		
	<b>Test Conditionality</b>	Must be executed.
	<b>Test Directives</b>	Repeat the test for <u>all</u> standard properties of the Network Port object which relate to IPv4 BBMDs. Repeat the test for a variety of values that cover the range of values required by the “Minimum Writable Value Ranges” table in the DS-M-A BIBB definition.
	<b>Testing Hints</b>	

## BTL Specified Tests Changes

[In BTL Specified Tests, insert clause 14.X1]

### 14.X1 BBMD Configuration Tests

#### 14.X1.1 Read-Broadcast-Distribution-Table Initiation

Purpose: To verify that an IUT which configures BBMDs, is able to query and present an arbitrary broadcast distribution table.

Test Steps:

1. RECEIVE Read-Broadcast-Distribution-Table
2. TRANSMIT Read-Broadcast-Distribution-Table-Ack,  
List of BDT Entries
3. CHECK (the IUT presents the table entries, in any order)

#### 14.X1.2 Write-Broadcast-Distribution-Table Initiation

Purpose: To verify that an IUT which configures BBMDs, is able to generate an arbitrary Write-Broadcast-Distribution-Table request.

Test Steps:

1. MAKE (the IUT generate a Write-Broadcast-Distribution-Table to configure the TD with a tester selected BDT, B)
2. RECEIVE Write-Broadcast-Distribution-Table,  
(B: a valid list of BDT entries)
2. TRANSMIT BVLC-Result,  
'Result Code' = Successful completion

#### 14.X1.3 Read-Foreign-Device-Table Initiation

Purpose: To verify that an IUT which configures BBMDs, is able to query and present an arbitrary foreign device table.

Test Steps:

1. RECEIVE Read-Foreign-Device-Table
2. TRANSMIT Read-Foreign-Device-Table-Ack,  
List of FDT Entries
3. CHECK (the IUT presents the table entries, in any order)

#### 14.X1.4 Delete-Foreign-Device-Table-Entry Initiation

Purpose: To verify that an IUT which configures BBMDs, is able to generate an arbitrary Delete-Foreign-Device-Table-Entry request.

Configuration Requirements: The IUT is configured with a non-empty FDT.

Test Steps:

1. MAKE (the IUT generate a Delete-Foreign-Device-Table-Entry to configure the TD with a tester selected FDT, F)
2. RECEIVE Delete-Foreign-Device-Table-Entry,  
(F: a valid FDT entry in IUT's FDT)
3. TRANSMIT BVLC-Result,  
'Result Code' = Successful completion

**BTL-16.1a1-2: Add Testing for NM-BBMDC-B - BTLWG-338**

**Overview:**

There are currently no tests for NM-BBMDC-B; this proposal adds some.

**Changes:**

[In BTL Checklist, replace Network Management - BBMD Configuration - B section]

Support	Listing	Option
<b>Network Management - BBMD Configuration - B</b>		
	R	Base Requirements
	R	Supports Registration by Foreign Devices

[In BTL Test Plan, replace 10.7 Network Management - BBMD Configuration - B section]

---

## 10.7 Network Management - BBMD Configuration - B

---

### 10.7.1 Base Requirements

Base requirements must be met by any IUT claiming conformance to this BIBB.

Verify Checklist		
	<b>Test Conditionality</b>	Must be executed.
	<b>Test Directives</b>	Verify that the IUT claims support for BACnet/IP - Annex J - BBMD
	<b>Testing Hints</b>	
BTL - 14.X10.1- Broadcast-Distribution-Table Holds at Least 5 Entries		
	<b>Test Conditionality</b>	Must be executed.
	<b>Test Directives</b>	
	<b>Testing Hints</b>	
BTL - 14.X10.4 - Broadcast Distribution Table Configuration via Hostname Entries		
	<b>Test Conditionality</b>	If the IUT claims Protocol Revision 16 or prior, this test shall be skipped.
	<b>Test Directives</b>	
	<b>Testing Hints</b>	

### 10.7.2 Supports Registration by Foreign Devices

While configured as a BBMD, the IUT supports, or can be made to support, registration by Foreign Devices and forwards as original BACnet/IP unicasts to each, any broadcasts it processes.

BTL - 14.X10.2 - Holds at least 5 Foreign Device Registrations		
	<b>Test Conditionality</b>	Must be executed.
	<b>Test Directives</b>	
	<b>Testing Hints</b>	
BTL - 14.X10.3 - Negative Foreign Device Registration when BBMD_Accept_FD_Registrations is FALSE		
	<b>Test Conditionality</b>	If the IUT supports Protocol Revision <= 16, this test shall be skipped.
	<b>Test Directives</b>	
	<b>Testing Hints</b>	

[Modify clause 4.5.9 in BTL Specified Tests]

#### 4.5.9 Timers

This section defines timer values that are used to determine when a test has failed because an appropriate response has not been observed by the TD. A Real value in seconds must be provided for each timer. See 6.3.

```
Fail Times: ↵
{↵
  Notification Fail Time: ↵
  Internal Processing Fail Time: ↵
  Minimum ON/OFF Time: ↵
  Schedule Evaluation Fail Time: ↵
  External Command Fail Time: ↵
  Program Object State Change Fail Time: ↵
  Acknowledgement Fail Time: ↵
  Slave Proxy Confirm Interval: ↵
  Unconfirmed Response Fail Time: ↵
  Activate Change Fail Time: ↵
}↵
```

[Add in BTL Specified Tests, these four new tests]

#### 14.X10.1 Broadcast-Distribution-Table Holds at Least 5 Entries

Reason For Change: NM-BBMDC-B specifically mandates this capacity behavior is supported by the product.

Purpose: Verify that IUT implements capacity mandated for the product by NM-BBMDC-B.

Test Concept: Fill the IUT's broadcast distribution table with at least five distinct peer BBMDs entries (in addition to the entry containing the address of itself in the table).

Notes to Tester: In a device claiming Protocol\_Revision 16 or less, the means by which the product's Broadcast Distribution Table is configured is not restricted to BACnet network transmissions and can be through the product's end-user interface.

Test Steps:

1. MAKE (IUT enter mode functioning as a BBMD implementation)
2. MAKE (the IUT's broadcast distribution table contain its own entry and entries for at least 5 other BBMDs)
3. TRANSMIT Read-Broadcast-Distribution-Table
4. RECEIVE Read-Broadcast-Distribution-Table-Ack,  
'List of BDT Entries' = (the table as configured, in any order)

#### 14.X10.2 Holds at Least 5 Foreign Device Registrations

Reason For Change: NM-BBMDC-B specifically mandates this capacity behavior is supported by BBMDs.

Purpose: Verify that when configured to accept foreign device registrations, the IUT supports at least five simultaneous foreign device registrations.

Test Concept: The IUT is configured to support foreign device registrations. Five Register-Foreign-Device requests are sent from 5 different devices, to verify that it supports five registrations simultaneously in the FDT.

Configuration Requirements: Set BBMD\_Accept\_FD\_Registrations in the Network Port object representing the port operating as a BBMD to TRUE. The TD will be configured to emulate 5 devices.

Test Steps:

1. REPEAT X = 1 to 5 {  
    TRANSMIT Register-Foreign-Device

```

SOURCE = (device X)
'Time-to-Live ' = (a value longer than the length of the test)
RECEIVE BVLC-Result,
'Result Code' = Successful completion
}
2. TRANSMIT Read-Foreign-Device-Table
3. RECEIVE Read-Foreign-Device-Table-Ack
List of FDT entries = (the 5 registered devices)

```

#### 14.X10.3 Negative Foreign Device Registration when BBMD\_Accept\_FD\_Registrations is FALSE

Reason For Change: The standard specifically mandates that BBMD\_Accept\_FD\_Registrations property is writable if present in BBMDs.

Purpose: Verify that when BBMD\_Accept\_FD\_Registrations is configured as FALSE, the BBMD will accept no more foreign device registrations.

Test Concept: The IUT is configured with BBMD\_Accept\_FD\_Registrations property as FALSE. Then it is verified that no more Register-Foreign-Device registrations succeed, though those already in the FDT operate as normal.

Configuration Requirements: BBMD\_Accept\_FD\_Registrations in the Network Port object representing the port is initially TRUE.

Test Steps:

1. WRITE BBMD\_Accept\_FD\_Registrations = FALSE
2. TRANSMIT ReinitializeDevice-Request  
'Reinitialized State of Device' = ACTIVATE\_CHANGES
3. WAIT **Activate Changes Fail Time**
4. TRANSMIT Register-Foreign-Device
5. RECEIVE BVLC-Result,  
'Result Code' = Register-Foreign-Device NAK

#### 14.X10.4 Broadcast Distribution Table Configuration via Hostname Entries

Reason For Change: With the advent of Network Port objects, BBMDs now need to accept hostname BDT entries.

Purpose: Verify that the IUT accepts and resolves hostname entries in the BBMD\_Broadcast\_Distribution\_Table.

Test Concept: Fill the BBMD\_Broadcast\_Distribution\_Table with 4 entries: the IUT, an entry with an IP address (IP1), an entry with a resolvable hostname (at IP address IP2), and an entry with a non-resolvable hostname. Send a broadcast that the IUT should distribute to its peer BBMDs and verify that it sends to the resolvable entries. Verify that the Broadcast Distribution Table contains the correct entries.

Configuration Requirements: The IUT is configured to operate as a BBMD and the TD is located on the same IP subnet.

Notes to Tester: The Forwarded-NPDU messages can be received in any order.

Test Steps:

1. WRITE BBMD\_Broadcast\_Distribution\_Table = (4 entries:
  - the IUT,
  - an entry with an IP address,
  - an entry with a resolvable hostname,
  - an entry with a non-resolvable hostname)
2. TRANSMIT ReinitializeDevice-Request  
'Reinitialized State of Device' = ACTIVATE\_CHANGES
3. WAIT **Activate Changes Fail Time**
4. WAIT until the IUT completes DNS resolution
5. TRANSMIT  
DA = Local IP Broadcast,



