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SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

E-health multimedia services and applications – Interoperability compliance testing of personal health systems (HRN, PAN, LAN, TAN and WAN)

Conformance of ITU-T H.810 personal health devices: PAN/LAN/TAN interface Part 10: Transcoding for Bluetooth low energy (BLE): Manager

Recommendation ITU-T H.850

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Recommendation ITU-T H.850

Conformance of ITU-T H.810 personal health devices: PAN/LAN/TAN interface Part 10: Transcoding for Bluetooth low energy (BLE): Manager

Summary

Recommendation ITU-T H.850 is a transposition of Continua Test Tool DG2013, Test Suite Structure & Test Purposes, LP-PAN Interface; Part 10: PHD Transcoding Whitepaper. Manager (Version 1.2, 2014-01-24), that was developed by the Continua Health Alliance. A number of versions of this specification existed before transposition.

This Recommendation includes an electronic attachment with the protocol implementation conformance statements (PICS) and the protocol implementation extra information for testing (PIXIT) required for the implementation of Annex A.

History

Edition	Recommendation	Approval	Study Group	Unique ID*
1.0	ITU-T H.850	2015-01-13	16	11.1002/1000/12279

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* To access the Recommendation, type the URL http://handle.itu.int/ in the address field of your web browser, followed by the Recommendation's unique ID. For example, http://handle.itu.int/11.1002/1000/11 830-en.

FOREWORD

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In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

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As of the date of approval of this Recommendation, ITU had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at http://www.itu.int/ITU-T/ipr/.

Table of Contents

Electronic attachment: Protocol implementation conformance statements (PICS) and the protocol implementation extra information for testing (PIXIT) required for the implementation of Annex A.

Introduction

This Recommendation is a transposition of Continua Test Tool DG2013, Test Suite Structure & Test Purposes, LP-PAN Interface; Part 10: PHD Transcoding Whitepaper. Manager (Version 1.2, 2014-01-24), that was developed by the Continua Health Alliance. A number of versions of this specification existed before transposition and these can be found in the table below.

Version	Date	Revision history
1.0	2012-10-05	Initial release
1.1	2013-05-24	Initial release for Test Tool DG2012. It uses "TSS&TP_DG2011_LP-PAN_PART_10_v1.0.doc" as a baseline and it adds new features included in Continua DG 2012 (BPM and HR profiles).
1.2	2014-01-24	Initial release for Test Tool DG2013. It uses "TSS&TP_DG2012_LP-PAN_PART_10_v1.1.doc" as a baseline and it adds new features included in Continua DG 2013: • Add glucose meter BLE • Add BLE SSP support • Add NFC new transport • Add INR device Specialization

Recommendation ITU-T H.850

Conformance of ITU-T H.810 personal health devices: PAN/LAN/TAN interface Part 10: Transcoding for Bluetooth low energy (BLE): Manager

1   Scope

The scope of this Recommendation[1] is to provide a test suite structure and the test purposes (TSS & TP) for the PAN/LAN/TAN interface based on the requirements defined in the Continua specifications. The objective of this test specification is to provide a high probability of air interface interoperability between different devices.

The TSS and TP for the PAN/LAN/TAN interface document have been divided into ten parts. Each part is listed below:

–   **Part 1**: Optimized Exchange Protocol [IEEE 11073-20601A] Agent

–   **Part 2**: Optimized Exchange Protocol [IEEE 11073-20601A] Manager

–   **Part 3**: Continua Design Guidelines. Agent

–   **Part 4**: Continua Design Guidelines. Manager

–   **Part 5**: Device Specializations. Agent. This document is divided into 14 subparts:

   •   **Part 5A**: Weighing Scales

   •   **Part 5B**: Glucose Meter

   •   **Part 5C**: Pulse Oximeter

   •   **Part 5D**: Blood Pressure Monitor

   •   **Part 5E**: Thermometer

   •   **Part 5F**: Cardiovascular Fitness and Activity Monitor

   •   **Part 5G**: Strength Fitness Equipment

   •   **Part 5H**: Independent Living Activity Hub

   •   **Part 5I**: Adherence Monitor

   •   **Part 5J**: Insulin Pump (Future development)

   •   **Part 5K**: Peak Flow

   •   **Part 5L**: Body Composition Analyser

   •   **Part 5M**: Basic Electrocardiograph

   •   **Part 5N**: International Normalized Ratio Monitor

–   **Part 6**: Device Specializations. Manager

–   **Part 7**: Continua Design Guidelines. Agent BLE

–   **Part 8**: Continua Design Guidelines. Manager BLE

–   **Part 9**: Personal Health Devices Transcoding White paper. Agent

–   **Part 10**: Personal Health Devices Transcoding White paper. Manager

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[1] This Recommendation includes an electronic attachment with the protocol implementation extra information for testing (PIXIT) required for the implementation of Annex A.

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T H.810]	Recommendation ITU-T H.810 (2013), *Interoperability design guidelines for personal health systems*.
[Bluetooth PHDT v1.4]	Bluetooth SIG (2013), *Personal Health Devices Transcoding White Paper, v1.4*. <https://www.bluetooth.org/DocMan/handlers/DownloadDoc.ashx?doc_id=294539>
[IEEE 11073-20601A]	IEEE 11073-20601A-2010, *IEEE Health informatics – Personal health device communication Part 20601: Application profile – Optimized Exchange Protocol Amendment 1*. <http://standards.ieee.org/findstds/standard/11073-20601a-2010.html>
[IHE PCD TF 1]	IHE PCD TF 1 (2012), *IHE Patient Care Device Technical Framework – Revision 2.0. Volume 1: Integration Profiles*. <http://www.ihe.net/Technical_Framework/upload/IHE_PCD_TF_Rev2-0_Vol1_FT_2012-08-16.pdf>
[IHE PCD TF 2]	IHE PCD TF 2 (2012), *IHE Patient Care Device Technical Framework – Revision 2.0. Volume 2: Transactions*. <http://www.ihe.net/Technical_Framework/upload/IHE_PCD_TF_Rev2-0_Vol2_FT_2012-08-16.pdf>
[IHE PCD TF 3]	IHE PCD TF 3 (2012), *IHE Patient Care Device Technical Framework – Revision 2.0. Volume 3: Semantic Content*. <http://www.ihe.net/Technical_Framework/upload/IHE_PCD_TF_Rev2-0_Vol3_FT_2012-08-16.pdf>
[ISO/IEEE 11073-104xx]	ISO/IEEE 11073-104xx (in force), *Health informatics – Personal health device communication – Device specialization*. NOTE – Shorthand to refer to the collection of device specialization standards that utilize [b-ISO/IEEE 11073-20601], where xx can be any number from 01 to 99 inclusive.

3 Definitions

3.1 Terms defined elsewhere

3.1.1 agent [IEEE 11073-20601A]: A node that collects and transmits personal health data to an associated manager.

3.1.2 manager [IEEE 11073-20601A]: A node receiving data from one or more agent systems. Some examples of managers include a cellular phone, health appliance, set top box, or a computer system.

3.2 Terms defined in this Recommendation

None.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

ATS	Abstract Test Suite
CDG	Continua Design Guidelines
DUT	Device Under Test
GUI	Graphical User Interface
INR	International Normalized Ratio
IUT	Implementation Under Test
LSB	Least Significant Bit
MDS	Medical Device System
MSB	Most Significant Bit
NFC	Near Field Communication
PAN	Personal Area Network
PCO	Point of Control and Observation
PCT	Protocol Conformance Testing
PHD	Personal Healthcare Device
PHDC	Personal Healthcare Device Class
PHM	Personal Health Manager
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation extra Information for Testing
RACP	Record Access Control Point
SDP	Service Discovery Protocol
SOAP	Simple Object Access Protocol
TCRL	Test Case Reference List
TCWG	Test and Certification Working Group
TP	Test Purposes
TSS	Test Suite Structure
USB	Universal Serial Bus
WDM	Windows Driver Model

5 Conventions

In this text, the uppercase letter L is used as the symbol for litre.

Several of the test purposes in Annex A refer to "WAN PCD-01 messages"; these messages are specified in the Patient Care Device (PCD) Technical Framework defined in [IHE PCD TF 1], [IHE PCD TF 2] and [IHE PCD TF 3]. Similarly, the "IEEE 11073 Objects and Attributes" are defined in [ISO/IEEE 11073-104xx].

The key words "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "MAY", "MAY NOT" in this document are to be interpreted as in [b-ETSI SR 001 262].

- – SHALL is equivalent to 'must' or 'it is required to'.
- – SHALL NOT is equivalent to 'must not' or 'it is not allowed'.
- – SHOULD is equivalent to 'it is recommended to'.
- – SHOULD NOT is equivalent to 'it is not recommended to'.
- – MAY is equivalent to 'is permitted'.
- – MAY NOT is equivalent to 'it is not required that'.

NOTE – The above-mentioned key words are capitalized for illustrative purposes only and they do not appear capitalized within this Recommendation.

Reference is made in the ITU-T H.800-series of Recommendations to different versions of the Continua Design Guidelines (CDG) by a specific designation. The list of terms that may be used in this Recommendation is provided in Table 1.

Table 1 – List of designations associated with the various versions of the CDG

CDG name	Transposed as	Version	Description	Designation
2013 plus errata	ITU-T H.810	4.1	CDG 2013 plus errata noting all ratified bugs.	–
2013	–	4.0	Release 2013 of the CDG including maintenance updates of CDG 2012 and additional guidelines that cover new functionalities.	Endorphin
2012 plus errata	–	3.1	CDG 2012 plus errata noting all ratified bugs [b-CDG 2012].	–
2012	–	3.0	Release 2012 of the CDG including maintenance updates of CDG 2011 and additional guidelines that cover new functionalities.	Catalyst
2011 plus errata	–	2.1	CDG 2011 integrated with identified errata.	–
2011	–	2.0	Release 2011 of the CDG including maintenance updates of CDG 2010 and additional guidelines that cover new functionalities [b-CDG 2011].	Adrenaline
2010 plus errata	–	1.6	CDG 2010 integrated with identified errata.	–
2010	–	1.5	Release 2010 of the CDG with maintenance updates of CDG Version 1 and additional guidelines that cover new functionalities [b-CDG 2010].	1.5
1.0	–	1.0	First released version of the CDG [b-CDG 1.0].	–

6 Test suite structure

The test purposes (TP) for the PAN/LAN/TAN interface have been divided into the groups and subgroups specified below. Annex A describes the TPs for Group 2.4 and its subgroups (shown in bold).

- Group 1: Agent (AG)
  - Group 1.1: Transport (TR)
    - Subgroup 1.1.1: Design guidelines: Common (DGC)
    - Subgroup 1.1.2: USB design guidelines (UDG)
    - Subgroup 1.1.3: Bluetooth design guidelines (BDG)
    - Subgroup 1.1.4: Pulse oximeter design guidelines (PODG)
    - Subgroup 1.1.5: Cardiovascular design guidelines (CVDG)
    - Subgroup 1.1.6: Activity hub design guidelines (HUBDG)
    - Subgroup 1.1.7: ZigBee design guidelines (ZDG)
    - Subgroup 1.1.8: Glucose meter design guidelines (GLDG)
    - Subgroup 1.1.9: Bluetooth low energy design guidelines (BLEDG)
    - Subgroup 1.1.10: Basic electrocardiograph design guidelines (ECGDG)
    - Subgroup 1.1.11: NFC design guidelines (NDG)
  - Group 1.2: 20601: Optimized exchange protocol (OXP)
    - Subgroup 1.2.1: PHD domain information model (DIM)
    - Subgroup 1.2.2: PHD service model (SER)
    - Subgroup 1.2.3: PHD communication model (COM)
  - Group 1.3: Devices class specializations (CLASS)
    - Subgroup 1.3.1: Weighing scales (WEG)
    - Subgroup 1.3.2: Glucose meter (GL)
    - Subgroup 1.3.3: Pulse oximeter (PO)
    - Subgroup 1.3.4: Blood pressure monitor (BPM)
    - Subgroup 1.3.5: Thermometer (TH)
    - Subgroup 1.3.6: Cardiovascular (CV)
    - Subgroup 1.3.7: Strength (ST)
    - Subgroup 1.3.8: Activity hub (HUB)
    - Subgroup 1.3.9: Adherence monitor (AM)
    - Subgroup 1.3.10: Insulin pump (IP) (future development)
    - Subgroup 1.3.11: Peak flow (PF)
    - Subgroup 1.3.12: Body composition analyser (BCA)
    - Subgroup 1.3.13: Basic electrocardiograph (ECG)
    - Subgroup 1.3.14: International normalized ratio (INR)
  - Group 1.4: Personal health device transcoding (PHDTW)
    - Subgroup 1.4.1: General Requirements (GEN)
    - Subgroup 1.4.2: Thermometer Requirements (TH)
    - Subgroup 1.4.3: Blood Pressure Requirements (BPM)
    - Subgroup 1.4.4: Heart Rate Requirements (HR)
    - Subgroup 1.4.5: Glucose Meter Requirements (GL)

- – Group 2: Manager (MAN)
  - • Group 2.1: Transport (TR)
    - ○ Subgroup 2.1.1: Design guidelines: Common (DGC)
    - ○ Subgroup 2.1.2: USB design guidelines (UDG)
    - ○ Subgroup 2.1.3: Bluetooth design guidelines (BDG)
    - ○ Subgroup 2.1.4: Cardiovascular design guidelines (CVDG)
    - ○ Subgroup 2.1.5: Activity hub design guidelines (HUBDG)
    - ○ Subgroup 2.1.6: ZigBee design guidelines (ZDG)
    - ○ Subgroup 2.1.7: Bluetooth low energy design guidelines (BLEDG)
    - ○ Subgroup 2.1.8: NFC design guidelines (NDG)
  - • Group 2.2: 20601: Optimized exchange protocol (OXP)
    - ○ Subgroup 2.2.1: General (GEN)
    - ○ Subgroup 2.2.2: PHD domain information model (DIM)
    - ○ Subgroup 2.2.3: PHD service model (SER)
    - ○ Subgroup 2.2.4: PHD communication model (COM)
  - • Group 2.3: Devices class specializations (CLASS)
    - ○ Subgroup 2.3.1: Weighing scales (WEG)
    - ○ Subgroup 2.3.2: Glucose meter (GL)
    - ○ Subgroup 2.3.3: Pulse oximeter (PO)
    - ○ Subgroup 2.3.4: Blood pressure monitor (BPM)
    - ○ Subgroup 2.3.5: Thermometer (TH)
    - ○ Subgroup 2.3.6: Cardiovascular (CV)
    - ○ Subgroup 2.3.7: Strength (ST)
    - ○ Subgroup 2.3.8: Activity hub (HUB)
    - ○ Subgroup 2.3.9: Adherence monitor (AM)
    - ○ Subgroup 2.3.10: Insulin pump (IP) (future development)
    - ○ Subgroup 2.3.11: Peak flow (PF)
    - ○ Subgroup 2.3.12: Body composition analyser (BCA)
    - ○ Subgroup 2.3.13: Basic electrocardiograph (ECG)
    - ○ Subgroup 2.3.14: International normalized ratio (INR)
  - • Group 2.4: Personal health device transcoding Whitepaper (PHDTW)
    - ○ **Subgroup 2.4.1**: General Requirements (GEN)
    - ○ **Subgroup 2.4.2**: Thermometer Requirements (TH)
    - ○ **Subgroup 2.4.3**: Blood Pressure Requirements (BPM)
    - ○ **Subgroup 2.4.4**: Heart Rate Requirements (HR)
    - ○ **Subgroup 2.4.5**: Glucose Meter Requirements (GL)

7 Electronic attachment

The protocol implementation conformance statements (PICS) and the protocol implementation extra information for testing (PIXIT) required for the implementation of Annex A can be downloaded from http://handle.itu.int/11.1002/2000/12067.

In the electronic attachment, letters "C" and "I" in the column labelled "Mandatory" are used to distinguish between "PICS" and "PIXIT" respectively during testing. If the cell is empty, the corresponding PICS is "independent". If the field contains a "C", the corresponding PICS is dependent on other PICS, and the logical expression is detailed in the "SCR_Expression" field. The SCR static conformance review (SCR) is used in the test tool to assert whether the PICS selection is consistent.

Annex A

Test purposes

(This annex forms an integral part of this Recommendation.)

A.1 TP definition conventions

The test purposes are defined according to the following rules:

- **TP Id**: This is a unique identifier (TP/<TT>/<DUT>/<GR>/<SGR>/<XX> – <NNN>). It is specified according to the naming convention defined below:
    - Each test purpose identifier is introduced by the prefix "TP".
    - <TT>: This is the test tool that will be used in the test case.
        - PAN: Personal area network (Bluetooth or USB)
        - LAN: Local area network (ZigBee)
        - PAN-LAN: Personal area network (Bluetooth or USB) - Local area network (ZigBee)
        - LP-PAN: Low power personal area network (Bluetooth low energy)
        - TAN: Touch area network (NFC)
        - PLT: Personal area network (Bluetooth or USB) – Local area network (ZigBee) – Touch area network (NFC)
    - <DUT>: This is the device under test.
        - AG: PAN/LAN/TAN agent
        - MAN: PAN/LAN/TAN manager
    - <GR>: This identifies a group of test cases.
    - <SGR>: This identifies a subgroup of test cases.
    - <XX>: This identifies the type of testing.
        - BV: Valid Behaviour Test
        - BI: Invalid Behaviour Test
    - <NNN>: This is a sequential number that identifies a test purpose.
- **TP label**: This is the TP's title.
- **Coverage**: This contains the specification reference and clause to be checked by the TP.
    - Spec: This indicates the earliest version of the specification from which the testable items to be checked by the TP were included.
    - Testable item: This contains testable items to be checked by the TP
- **Test purpose**: This is a description of the requirements to be tested.
- **Applicability**: This contains the PICS items that define if the test case is applicable or not for a specific device. When a TP contains an "ALL" in this field it means that it applies to the device under test within that scope of the test (specialization, transport used, etc).
- **Initial condition**: This indicates the state to which the DUT needs to be moved at the beginning of TC execution.
- **Test procedure**: This describes the steps to be followed in order to execute the test case
- **Pass/Fail criteria**: This provides criteria to decide whether the DUT passes or fails the test case.

A.2   Subgroup 2.4.1 – Whitepaper General requirements (GEN)

TP Id		TP/LP-PAN/MAN/PHDTW/GEN/BV-000		
TP label		Whitepaper. MDS Object - Handle Attribute		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	Common MDS 1; O		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a profile (device specialization) supported by the manager under test; it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 3. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test. 4. Check in Manager transcoder output for the MDS object – Handle attribute		
Pass/Fail criteria		In step 4, the MDS object – Handle attribute is not present; however, if it is present, its value is 0.		
Notes		Possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Handle attribute is not present, or if it is present then: ❑ Object: MDS object ❑ Attribute-id: MDC_ATTR_ID_HANDLE (2337) ❑ Attribute-type: INT-U16 ❑ Attribute-value: 0 b) WAN PCD-01 message PCD-01 message does not include segments with a Handle attribute value.		

TP Id		TP/LP-PAN/MAN/PHDTW/GEN/BV-001		
TP label		Whitepaper. MDS Object - System-Model Attribute		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	Common MDS 2; M	String Conv 1; M	String Conv 2; M
		MDS Conv 1; M	MDS Conv 2; M	MDS Conv 3; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a profile (device specialization) supported by the manager under test; it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		2. The simulated agent implements several BLE characteristics. The characteristics of interest for this test case are:
		
		   a. Manufacturer name string (0x2A29)
		      • Format: utf8s
		      • Value: AT4wireless (string char, odd length)
		   b. Model number string (0x2A24)
		      • Format: utf8s
		      • Value: Mod.12 (string char, even length)
		
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		
		4. When the pairing has been completed (connection state), force the manager under test to read the Manufacturer name string and Model number string characteristics.
		
		5. The simulated agent sends the measurement to the manager under test.
		
		6. Check in manager transcoder output for the MDS object – System-Model attribute.		

Pass/Fail criteria		In step 6, the MDS object – System-Model attribute is present, its value matches with BLE Manufacturer name string and Model number string characteristics values, and character strings have even lengths (i.e., transcoder appends padding byte 0x00 to odd length strings).		

Notes		Possible values in typical points of observation after transcoder output are:
		
		a) IEEE 11073 Objects and Attributes
		
		System-Model attribute is present:
		
		  ❑ Object: MDS object
		  ❑ Attribute-id: MDC_ATTR_ID_MODEL (2344)
		  ❑ Attribute-type: SEQUENCE {manufacturer (OCTET STRING), model-number (OCTET STRING)}. OCTET STRING is restricted to printable ASCII characters (0x20 – 0x7E) and even length (padding with 0x00 character)
		  ❑ Attribute-value:
		    i. manufacturer: AT4wireless (string char) or 00 0C 41 54 34 77 69 72 65 6C 65 73 73 00 (hex) [Note that 0x00 0x0C is the string length]
		    ii. model-number: Mod.12 (string char) or 00 06 4d 6f 64 2e 31 32 (hex) [Note that 0x00 0x06 is the string length]
		
		b) WAN PCD-01 message
		
		PCD-01 message includes two segments like these with a System-Model attribute value (check OBX-5 in both segments):
		
		OBX|?|ST|531969^MDC_ID_MODEL_NUMBER^MDC|1.0.0.a|AT4wireless||||||R
		
		OBX|?|ST|531970^MDC_ID_MODEL_MANUFACTURER^MDC|1.0.0.b|Mod.12||||||R		

TP Id		TP/LP-PAN/MAN/PHDTW/GEN/BV-002		
TP label		Whitepaper. MDS Object - System-Id Attribute		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	Common MDS 3; M	MDS Conv 4; M	MDS Conv 5; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a profile (device specialization) supported by the manager under test; it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		
		  a. System ID (0x2A23)
		
		    • Format: uint40, uint24 (64 bits)
		
		    • Value: 11 22 33 44 AA BB CC DD
		
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		
		4. When the pairing has been completed (connection state), force the manager under test to read System ID characteristics.
		
		5. The simulated agent sends the measurement to the manager under test.
		
		6. Check in manager transcoder output for the MDS object – System-Id attribute		

Pass/Fail criteria		In step 6, the MDS object – System-Id attribute is present and its value matches the BLE System ID characteristic value.		

Notes		Possible values in typical points of observation after transcoder output are:
		
		a) IEEE 11073 Objects and Attributes
		
		System-Id attribute is present:
		
		  ❑ Object: MDS object
		  ❑ Attribute-id: MDC_ATTR_SYS_ID (2436)
		  ❑ Attribute-type: OCTET STRING restricted to EUI-64
		  ❑ Attribute-value: 11 22 33 44 AA BB CC DD (hex)
		
		b) WAN PCD-01 message
		
		If the simulated agent implements a Thermometer profile then the PCD-01 message includes a segment like this with the System-Id attribute value (check OBX-18):
		
		OBX|?||528392^MDC_DEV_SPEC_PROFILE_TEMP^MDC|1|||||||X|||||||1122334455 AABBCCDD^EUI-64
		
		If the simulated agent implements a Blood pressure profile then the PCD-01 message includes a segment like this with the System-Id attribute value (check OBX-18):
		
		OBX|?||528391^MDC_DEV_SPEC_PROFILE_BP^MDC|1|||||||X|||||||1122334455 AABBCCDD^EUI-64
		
		If the simulated agent implements a Heart rate profile then the PCD-01 message includes a segment like this with the System-Id attribute value (check OBX-18):
		
		OBX|?||528384^MDC_DEV_SPEC_PROFILE_HYDRA^MDC|1|||||||X|||||||1122334455 AABBCCDD^EUI-64
		
		If the simulated agent implements a Glucose profile then the PCD-01 message includes a segment like this with the System-Id attribute value (check OBX-18):
		
		OBX|?||528384^MDC_DEV_SPEC_PROFILE_GLUCOSE^MDC|1|||||||X|||||||1122334455 AABBCCDD^EUI-64		

TP Id		TP/LP-PAN/MAN/PHDTW/GEN/BV-003		
TP label		Whitepaper. MDS Object - Production-Specification Attribute		
Coverage	**Spec**	[b-Bluetooth PHDT v1.3]		
	Testable items	Common MDS 5; M	String Conv 1; M	String Conv 2; M
		MDS Conv 6; M	MDS Conv 7; M	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a profile (device specialization) supported by the manager under test; it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristics of interest for this test case are:
		     a. Serial number string (0x2A25)
		       • Format: utf8s
		       • Value: SN 2468 (string char, odd length)
		     b. Hardware revision string (0x2A27)
		       • Format: utf8s
		       • Value: HW 13579 (string char, even length)
		     c. Software revision string (0x2A28)
		       • Format: utf8s
		       • Value: SW new-vers (string char, odd length)
		     d. Firmware revision string (0x2A26)
		       • Format: utf8s
		       • Value: FW v1.23 (string char, even length)
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), force the manager under test to read the Serial number string, Hardware revision string, Software revision string and Firmware revision string characteristics.
		 5. The simulated agent sends the measurement to the manager under test.
		 6. Check in manager transcoder output for the MDS object – Production-Specification attribute		

Pass/Fail criteria		In step 6, the MDS object – Production-Specification attribute is present, its value matches with the BLE Serial number string, Hardware revision string, Software revision string and Firmware revision string characteristics values, and character strings have even lengths (i.e., transcoder appends padding byte 0x00 to odd length strings).		

Notes		Possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Production-Specification attribute is present:
		 ❑ Object: MDS object
		 ❑ Attribute-id: MDC_ATTR_ID_PROD_SPECN (2349)
		 ❑ Attribute-type: SEQUENCE OF [{spec-type (INT-U16), component-id (PrivateOid), prod-spec (OCTET STRING)}, {…}]. OCTET STRING is restricted to printable ASCII characters (0x20 – 0x7E) and even length (padding with 0x00 character)
		 ❑ Attribute-value: (note that elements order may be different)
		     i. Element:
		       • spec-type: 1 (dec)
		       • component-id: 0 (dec)
		       • prod-spec: SN 2468 (string char) or 00 08 53 4E 20 32 34 36 38 00 (hex) [Note that 0x00 0x08 is the string length]
		     ii. Element:
		       • spec-type: 3 (dec)
		       • component-id: 0 (dec)
		       • prod-spec: HW 13579 (string char) or 00 08 48 57 20 31 33 35 37 39 (hex) [Note that 0x00 0x08 is the string length]
		     iii. Element:
		       • spec-type: 4 (dec)
		       • component-id: 0 (dec)
		       • prod-spec: SW new-vers (string char) or 00 0C 53 57 20 6E 65 77 2D 76 65 72 73 00 (hex) [Note that 0x00 0x0C is the string length]
		     iv. Element:
		       • spec-type: 5 (dec)
		       • component-id: 0 (dec)
		       • prod-spec: FW v1.23 (string char) or 00 08 46 57 20 76 31 2E 32 33 (hex) [Note that 0x00 0x08 is the string length]
		 b) WAN PCD-01 message
		 PCD-01 message includes four segments like these with Production-Specification attribute value (check OBX-5 in four segments):
		 OBX|?|ST|531972^MDC_ID_PROD_SPEC_SERIAL^MDC|1.0.0.a|SN 2468||||||R
		 OBX|?|ST|531974^MDC_ID_PROD_SPEC_HW^MDC|1.0.0.b|HW 13579||||||R
		 OBX|?|ST|531975^MDC_ID_PROD_SPEC_SW^MDC|1.0.0.c|SW new-vers||||||R
		 OBX|?|ST|531976^MDC_ID_PROD_SPEC_FW^MDC|1.0.0.d|FW v1.23||||||R		

TP Id		TP/LP-PAN/MAN/PHDTW/GEN/BV-004		
TP label		Whitepaper. MDS Object - Date-and-Time Attribute		
Coverage	**Spec**	[b-Bluetooth PHDT v1.3]		
	Testable items	Common MDS 6; M	Date-Time Conv 2; M	Date-Time Conv 3; M
		Date-Time Conv 4; M	Date-Time Conv 5; M	MDS Conv 8; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND (C_MAN_BLE_001 OR C_MAN_BLE_003 OR C_MAN_BLE_007)		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a profile (device specialization) supported by the manager under test; it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		  a. Date Time (0x2A08)
		    Value: April 8th, 2012, 19:45:05
		     i. Field: Year
		      • Format: uint16
		      • Value: 2012
		     ii. Field: Month
		      • Format: uint8
		      • Value: 4
		     iii. Field: Day
		      • Format: uint8
		      • Value: 8
		     iv. Field: Hours
		      • Format: uint8
		      • Value: 19
		     v. Field: Minutes
		      • Format: uint8
		      • Value: 45
		     vi. Field: Seconds
		      • Format: uint8
		      • Value: 5
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		4. When the pairing has been completed (connection state), force the manager under test to read the Date Time characteristic.
		5. The simulated agent sends the measurement to the manager under test.
		6. Check in manager transcoder output for the MDS object – Date-and-Time attribute		

Pass/Fail criteria		In step 6, the MDS object – Date-and-Time attribute is present, its value matches with Date-and-Time characteristic values and the fraction of seconds is set to 0.		

Notes		Possible values in typical points of observation after transcoder output are:
		a) IEEE 11073 Objects and Attributes
		Date-and-Time attribute is present:
		❑ Object: MDS object
		❑ Attribute-id: MDC_ATTR_TIME_ABS (2439)
		❑ Attribute-type: SEQUENCE {century (INT-U8), year (INT-U8), month (INT-U8), day (INT-U8), hour (INT-U8), minute (INT-U8), second (INT-U8), sec-fractions (INT-U8)} (BCD encoding)
		❑ Attribute-value:
		  • century: 20 (hex) or 32 (dec)
		  • year: 12 (hex) or 18 (dec)
		  • month: 04 (hex) or 4 (dec)
		  • day: 08 (hex) or 8 (dec)
		  • hour: 19 (hex) or 25 (dec)
		  • minute: 45 (hex) or 69 (dec)
		  • second: 05 (hex) or 5 (dec)
		  • sec-fractions: 00 (hex) or 0 (dec)
		b) WAN PCD-01 message
		PCD-01 message includes a segment like this with a Type attribute value (check OBX-5):
		OBX|?|DTM|67975^MDC_ATTR_TIME_ABS^MDC|1.0.0.a|20120408194505+0000
		|||||R|||20120408194505+0000		

TP Id		TP/LP-PAN/MAN/PHDTW/GEN/BV-006		
TP label		Whitepaper. MDS Object - Battery-Level Attribute		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	Common MDS 12; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a profile (device specialization) supported by the manager under test; it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		
		    a. Battery level (0x2A19)
		
		        • Format: uint8
		
		        • Value: 75
		
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		
		4. When the pairing has been completed (connection state), force the manager under test to read the Battery level characteristic.
		
		5. The simulated agent sends the measurement to the manager under test.
		
		6. Check in manager transcoder output for the MDS object – Battery-Level attribute.		

Pass/Fail criteria		In step 6, the MDS object – Battery-Level attribute is present and its value matches with the BLE Battery-Level characteristic value.		

Notes		Possible values in typical points of observation after transcoder output are:
		
		a) IEEE 11073 Objects and Attributes
		
		Battery-Level attribute is present:
		
		    ❑ Object: MDS object
		
		    ❑ Attribute-id: MDC_ATTR_VAL_BATT_CHARGE (2460)
		
		    ❑ Attribute-type: INT-U16
		
		    ❑ Attribute-value: 75
		
		b) WAN PCD-01 message
		
		PCD-01 message includes a segment like this with a Battery-Level attribute value (check OBX-5):
		
		OBX|?|NM|67996^MDC_ATTR_VAL_BATT_CHARGE^MDC|1.0.0.a|75|
		262688^MDC_DIM_PERCENT^MDC|||||R|||[current_date_time]		

A.3 Subgroup 2.4.2 – Whitepaper Thermometer requirements (TH)

TP Id		TP/LP-PAN/MAN/PHDTW/TH/BV-000		
TP label		Whitepaper. Thermometer MDS Object - System-Type Attribute		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	TH Specific MDS 1; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_001 AND C_MAN_BLE_002		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a Thermometer profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 3. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test. 4. Check in manager transcoder output for the MDS object – System-Type attribute.		
Pass/Fail criteria		In step 4, the MDS object – System-Type attribute is not present.		
Notes		Possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes System-Type attribute is not present: ❑ Object: MDS object ❑ Attribute-id: MDC_ATTR_SYS_TYPE (2438) ❑ Attribute-type: TYPE ❑ Attribute-value: <NOT PRESENT> b) WAN PCD-01 message PCD-01 message does not include segments with a System-Type attribute value (67974^MDC_ATTR_SYS_TYPE^MDC).		

TP Id		TP/LP-PAN/MAN/PHDTW/TH/BV-001		
TP label		Whitepaper. Thermometer MDS Object - Dev-Configuration-Id Attribute		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	TH Specific MDS 2; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_001 AND C_MAN_BLE_002		
Initial condition		The manager under test and the simulated agent are in the standby state		
Test procedure		1. The simulated agent is configured with a Thermometer profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state) 3. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test. 4. Check in manager transcoder output for the MDS object – Dev-Configuration-Id attribute		
Pass/Fail criteria		In step 4, the MDS object – Dev-Configuration-Id attribute is present and its value is inside the range 0x4000 - 0x7FFF.		
Notes		Possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Dev-Configuration-Id attribute is present: ❑ Object: MDS object ❑ Attribute-id: MDC_ATTR_DEV_CONFIG_ID (2628) ❑ Attribute-type: INT-U16 ❑ Attribute-value: Any value inside the range 16384 - 32767 (dec) or 0x4000 – 0x7FFF (hex) b) WAN PCD-01 message According to [ITU-T H.810] (CDG 2013), the Dev-Configuration-Id shall not be transmitted in the PCD-01 message; therefore it is not possible to check this attribute.		

TP Id		TP/LP-PAN/MAN/PHDTW/TH/BV-002		
TP label		Whitepaper. Thermometer MDS Object - System-Type-Spec-List Attribute		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	Common MDS 15; M	TH Specific MDS 3; M	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_001 AND C_MAN_BLE_002		
Initial condition		The manager under test and the simulated agent are in the standby state		
Test procedure		1. The simulated agent is configured with a Thermometer profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 3. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test. 4. Check in manager transcoder output for the MDS object – System-Type-Spec-List attribute		
Pass/Fail criteria		In step 4, the MDS object – System-Type-Spec-List attribute is present and its value is (MDC_DEV_SPEC_PROFILE_TEMP, Version 1).		
Notes		Possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes System-Type-Spec-List attribute is present: ❑ Object: MDS object ❑ Attribute-id: MDC_ATTR_SYS_TYPE_SPEC_LIST (2650) ❑ Attribute-type: SEQUENCE OF [{type (INT-U16), version (INT-U16)}] ❑ Attribute-value: • type: MDC_DEV_SPEC_PROFILE_TEMP or 4104 (dec) or 10 08 (hex) • version: 1 (dec) or 00 01 (hex) b) WAN PCD-01 message PCD-01 message includes a segment like this with a System-Type-Spec-List attribute value (check OBX-5): OBX|?|NM|68186^MDC_ATTR_SYS_TYPE_SPEC_LIST^MDC|1.0.0.a| 528392^MDC_DEV_SPEC_PROFILE_TEMP^MDC||||||R		

TP Id		TP/LP-PAN/MAN/PHDTW/TH/BV-003		
TP label		Whitepaper. MDS Object - Reg-Cert-Data-List Attribute		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	Common MDS 14; M	Regulatory Conv 1; M	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_001 AND C_MAN_BLE_002		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a Thermometer profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is: a. IEEE 11073-20601 [IEEE 11073-20601A] Regulatory Certification Data List (0x2A2A) • Format: reg-cert-data-list (opaque structure) • Value: 00 02 00 12 02 01 00 08 04 00 00 01 00 02 80 08 02 02 00 02 80 00 (hex) i. Element: • auth-body-and-struc-type: - auth-body: 02 (hex) auth-body-continua(2) - auth-body-struc-type: 01 (hex). continua-version-struct(1)		

	● auth-body-data:
	- major-IG-version: 04 (hex)
	- minor-IG-version: 00 (hex)
	- certified-devices: 80 08 (hex). BLE Thermometer
	ii. Element:
	● auth-body-and-struc-type:
	- auth-body: 02 (hex). auth-body-continua(2)
	- auth-body-struc-type: 02 (hex). continua-reg-struct(2)
	● auth-body-data:
	- regulation-bit-field: 80 00 (hex). Unregulated device
	3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent.
	4. When the pairing has been completed (connection state), force the manager under test to read the IEEE 11073-20601 Regulatory Certification Data List characteristic.
	5. The simulated agent sends the measurement to the manager under test.
	6. Check in manager transcoder output for the MDS object – Reg-Cert-Data-List attribute
Pass/Fail criteria	In step 6, the MDS object – Reg-Cert-Data-List attribute is present and its value matches with the IEEE 11073-20601 Regulatory Certification Data List characteristic value.
Notes	Possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Reg-Cert-Data-List attribute is present:
	❑ Object: MDS object
	❑ Attribute-id: MDC_ATTR_REG_CERT_DATA_LIST (2635)
	❑ Attribute-type: SEQUENCE OF [{auth-body-and-struc-type, auth-body-data}, {…}]
	❑ Attribute-value: 00 02 00 12 02 01 00 08 04 00 00 01 00 02 80 08 02 02 00 02 80 00 (hex) [Note that 0x00 0x02 is the number of elements in the sequence and 0x00 0x12 is the length of the sequence]
	i. Reg-Cert-Data Element:
	● auth-body-and-struc-type:
	- auth-body: 02 (hex) auth-body-continua(2)
	- auth-body-struc-type: 01 (hex). continua-version-struct(1)
	● auth-body-data:
	- major-IG-version: 04 (hex)
	- minor-IG-version: 00 (hex)
	- certified-devices: 80 08 (hex). BLE Thermometer
	ii. Reg-Cert-Data Element:
	● auth-body-and-struc-type:
	- auth-body: 02 (hex). auth-body-continua(2)
	- auth-body-struc-type: 02 (hex). continua-reg-struct(2)
	● auth-body-data:
	- regulation-bit-field: 80 00 (hex). Unregulated device
	b) WAN PCD-01 message
	PCD-01 message includes five segments like these with Reg-Cert-Data-List attribute value (check OBX-5 in five segments):
	OBX|?|CWE|68218^MDC_REG_CERT_DATA_AUTH_BODY^MDC|1.0.0.a| 2^auth-body-continua||||||R
	OBX|?|ST|532352^MDC_REG_CERT_DATA_CONTINUA_VERSION^MDC|1.0.0.a.x| 4.0||||||R
	OBX|?|NA|532353^MDC_REG_CERT_DATA_CONTINUA_CERT_DEV_LIST^MDC| 1.0.0.a.y|32776||||||R
	OBX|?|CWE|68218^MDC_REG_CERT_DATA_AUTH_BODY^MDC|1.0.0.b| 2^auth-body-continua||||||R
	OBX|?|CWE|532354^MDC_REG_CERT_DATA_CONTINUA_REG_STATUS^MDC| 1.0.0.b.z|1^unregulated-device(0)||||||R

TP Id		TP/LP-PAN/MAN/PHDTW/TH/BV-004		
TP label		Whitepaper. Thermometer Body Temperature Object - Handle Attribute		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	TH Numeric 1; O		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_001 AND C_MAN_BLE_002		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a Thermometer profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is: a. Temperature measurement (0x2A1C) i. Field: Flags • Format: 8 bit • Value: 0000 0010 (MSB → LSB). Temperature measurement value in units of Celsius, Time Stamp field is included and Temperature Type field is not included ii. Field: Temperature Measurement Value (Celsius) • Format: FLOAT • Value: Not relevant iii. Field: Temperature Measurement Value (Fahrenheit) • This field is not included iv. Field: Time Stamp • Format: Date and Time • Value: Not relevant v. Field: Temperature Type • This field is not included 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test. 5. Check in manager transcoder output for the Body temperature object – Handle attribute		
Pass/Fail criteria		In step 5, the Body temperature object – Handle attribute is not present; however, if it is present then its value is different to 0.		
Notes		Possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Handle attribute is not present, or if it is present then: ❑ Object: Body temperature numeric object ❑ Attribute-id: MDC_ATTR_ID_HANDLE (2337) ❑ Attribute-type: INT-U16 ❑ Attribute-value: Any value other than 0 b) WAN PCD-01 message PCD-01 message does not include segments with a Handle attribute value.		

TP Id		TP/LP-PAN/MAN/PHDTW/TH/BV-005		
TP label		Whitepaper. Body Temperature Object - Type and Metric-Id Attributes 1		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	TH Numeric 2; M	TH Numeric 3; M	TH Numeric 4; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_001 AND C_MAN_BLE_002		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Thermometer profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		2. The simulated agent implements several BLE characteristics. The characteristics of interest for this test case are:
		   a. Temperature measurement (0x2A1C)
		     i. Field: Flags
		       • Format: 8 bit
		       • Value: 0000 0010 (MSB → LSB). Temperature Type field is not included
		     ii. Field: Temperature Measurement Value (Celsius)
		       • Format: FLOAT
		       • Value: Not relevant
		     iii. Field: Temperature Measurement Value (Fahrenheit)
		       • This field is not included
		     iv. Field: Time Stamp
		       • Format: Date and Time
		       • Value: Not relevant
		     v. Field: Temperature Type
		       • This field is not included
		   b. Temperature type (0x2A1D): This characteristic is not present
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test.
		5. Check in manager transcoder output for the Body temperature object – Type and Metric-Id attributes		

Pass/Fail criteria		In step 5, the Body temperature object – Type attribute is present and its value is {MDC_PART_SCADA, MDC_TEMP_BODY}. In step 5, the Body temperature object – Metric-Id attribute is present and its value is MDC_TEMP_BODY.		

Notes		Possible values in typical points of observation after transcoder output are:
		a) IEEE 11073 Objects and Attributes
		Type attribute is present:
		  ❑ Object: Body temperature object
		  ❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
		  ❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
		  ❑ Attribute-value:
		    • partition: MDC_PART_SCADA or 2 (dec) or 00 02 (hex)
		    • code: MDC_TEMP_BODY or 19292 (dec) or 4B 4C (hex)
		Metric-Id attribute is present:
		  ❑ Object: Body temperature object
		  ❑ Attribute-id: MDC_ATTR_ID_PHYSIO (2347)
		  ❑ Attribute-type: INT-U16
		  ❑ Attribute-value: MDC_TEMP_BODY or 19292 (dec) or 4B 4C (hex)
		b) WAN PCD-01 message
		PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):
		OBX|?|NM|150364^MDC_TEMP_BODY^MDC|1.0.0.a|35.6|
		268192^MDC_DIM_DEGC^MDC|||||R|||[current_date_time]		

TP Id		TP/LP-PAN/MAN/PHDTW/TH/BV-006		
TP label		Whitepaper. Body Temperature Object - Type and Metric-Id Attributes 2		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	TH Numeric 2; M	TH Numeric 3; M	TH Numeric 4; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_001 AND C_MAN_BLE_002		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Thermometer profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		2. The simulated agent implements several BLE characteristics. The characteristics of interest for this test case are:
		   a. Temperature measurement (0x2A1C)
		     i. Field: Flags
		       • Format: 8 bit
		       • Value: 0000 0110 (MSB → LSB). Temperature Type field is included
		     ii. Field: Temperature Measurement Value (Celsius)
		       • Format: FLOAT
		       • Value: Not relevant
		     iii. Field: Temperature Measurement Value (Fahrenheit)
		       • This field is not included
		     iv. Field: Time Stamp
		       • Format: Date and Time
		       • Value: Not relevant
		     v. Field: Temperature Type
		       • Format: 8 bit
		       • Value: Several values are checked in this test case
		   b. Temperature type (0x2A1D): This characteristic is not present.
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test with the field Temperature Type set to Armpit (0x01).
		5. Check in manager transcoder output for the Body temperature object – Type and Metric-Id attributes.
		6. The simulated agent sends the measurement to the manager under test with the field Temperature Type set to Body (general) (0x02).
		7. Check in manager transcoder output for the Body temperature object – Type and Metric-Id attributes.
		8. The simulated agent sends the measurement to the manager under test with field Temperature Type set to Ear (usually earlobe) (0x03).
		9. Check in manager transcoder output for the Body temperature object – Type and Metric-Id attributes.
		10. The simulated agent sends the measurement to the manager under test with field Temperature Type set to Finger (0x04).
		11. Check in manager transcoder output for the Body temperature object – Type and Metric-Id attributes.
		12. The simulated agent sends the measurement to the manager under test with field Temperature Type set to Gastro-intestinal tract (0x05).
		13. Check in manager transcoder output for the Body temperature object – Type and Metric-Id attributes.
		14. The simulated agent sends the measurement to the manager under test with field Temperature Type set to Mouth (0x06).
		15. Check in manager transcoder output for the Body temperature object – Type and Metric-Id attributes.
		16. The simulated agent sends the measurement to the manager under test with field Temperature Type set to Rectum (0x07).
		17. Check in manager transcoder output for the Body temperature object – Type and Metric-Id attributes.
		18. The simulated agent sends the measurement to the manager under test with field Temperature Type set to Toe (0x08).
		19. Check in manager transcoder output for the Body temperature object – Type and Metric-Id attributes.
		20. The simulated agent sends the measurement to the manager under test with field Temperature Type set to Tympanum (ear drum) (0x09).
		21. Check in manager transcoder output for the Body temperature object – Type and Metric-Id attributes.		

Pass/Fail criteria	In step 5, the Body temperature object – Type attribute is present and its value is {MDC_PART_SCADA, MDC_TEMP_BODY}, and the Body temperature object – Metric-Id attribute is present and its value is MDC_TEMP_AXILLA.
	In step 7, the Body temperature object – Type attribute is present and its value is {MDC_PART_SCADA, MDC_TEMP_BODY}, and the Body temperature object – Metric-Id attribute is present and its value is MDC_TEMP_BODY.
	In step 9, the Body temperature object – Type attribute is present and its value is {MDC_PART_SCADA, MDC_TEMP_BODY} and Body temperature object – Metric-Id attribute is present and its value is MDC_TEMP_EAR
	In step 11, the Body temperature object – Type attribute is present and its value is {MDC_PART_SCADA, MDC_TEMP_BODY}, and the Body temperature object – Metric-Id attribute is present and its value is MDC_TEMP_FINGER.
	In step 13, the Body temperature object – Type attribute is present and its value is {MDC_PART_SCADA, MDC_TEMP_BODY}, and the Body temperature object – Metric-Id attribute is present and its value is MDC_TEMP_GIT.
	In step 15, the Body temperature object – Type attribute is present and its value is {MDC_PART_SCADA, MDC_TEMP_BODY}, and the Body temperature object – Metric-Id attribute is present and its value is MDC_TEMP_ORAL.
	In step 17, the Body temperature object – Type attribute is present and its value is {MDC_PART_SCADA, MDC_TEMP_BODY}, and the Body temperature object – Metric-Id attribute is present and its value is MDC_TEMP_RECT.
	In step 19, the Body temperature object – Type attribute is present and its value is {MDC_PART_SCADA, MDC_TEMP_BODY}, and the Body temperature object – Metric-Id attribute is present and its value is MDC_TEMP_TOE.
	In step 21, the Body temperature object – Type attribute is present and its value is {MDC_PART_SCADA, MDC_TEMP_BODY}, and the Body temperature object – Metric-Id attribute is present and its value is MDC_TEMP_TYMP.
Notes	In step 5, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Type attribute is present:
	❑ Object: Body temperature object
	❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
	❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
	❑ Attribute-value:
	• partition: MDC_PART_SCADA or 2 (dec) or 00 02 (hex)
	• code: MDC_TEMP_BODY or 19292 (dec) or 4B 4C (hex)
	Metric-Id attribute is present:
	❑ Object: Body temperature object
	❑ Attribute-id: MDC_ATTR_ID_PHYSIO (2347)
	❑ Attribute-type: code (INT-U16)
	❑ Attribute-value: code: MDC_TEMP_AXILLA or 57380 (dec) or E0 24 (hex)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):
	OBX|?|NM|188452^MDC_TEMP_AXILLA^MDC|1.0.0.a|35.6|
	268192^MDC_DIM_DEGC^MDC|||||R|||[current_date_time]
	In step 7, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Type attribute is present:
	❑ Object: Body temperature object
	❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
	❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
	❑ Attribute-value:
	• partition: MDC_PART_SCADA or 2 (dec) or 00 02 (hex)
	• code: MDC_TEMP_BODY or 19292 (dec) or 4B 4C (hex)
	Metric-Id attribute is present:
	❑ Object: Body temperature object
	❑ Attribute-id: MDC_ATTR_ID_PHYSIO (2347)
	❑ Attribute-type: code (INT-U16)
	❑ Attribute-value: code: MDC_TEMP_BODY or 19292 (dec) or 4B 4C (hex)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):
	OBX|?|NM|150364^MDC_TEMP_BODY^MDC|1.0.0.a|35.7|
	268192^MDC_DIM_DEGC^MDC|||||R|||20120716145210+0000
	In step 9, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Type attribute is present:
	❑ Object: Body temperature object
	❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)

	❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
	❑ Attribute-value:
	• partition: MDC_PART_SCADA or 2 (dec) or 00 02 (hex)
	• code: MDC_TEMP_BODY or 19292 (dec) or 4B 4C (hex)

Metric-Id attribute is present:
- ❑ Object: Body temperature object
- ❑ Attribute-id: MDC_ATTR_ID_PHYSIO (2347)
- ❑ Attribute-type: code (INT-U16)
- ❑ Attribute-value: code: MDC_TEMP_EAR or 57356 (dec) or E0 0C (hex)

b) WAN PCD-01 message

PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):
OBX|?|NM|188428^MDC_TEMP_EAR^MDC|1.0.0.a|35.9|
268192^MDC_DIM_DEGC^MDC|||||R|||20120716145310+0000

In step 11, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Type attribute is present:
- ❑ Object: Body temperature object
- ❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
- ❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
- ❑ Attribute-value:
  - • partition: MDC_PART_SCADA or 2 (dec) or 00 02 (hex)
  - • code: MDC_TEMP_BODY or 19292 (dec) or 4B 4C (hex)

Metric-Id attribute is present:
- ❑ Object: Body temperature object
- ❑ Attribute-id: MDC_ATTR_ID_PHYSIO (2347)
- ❑ Attribute-type: code (INT-U16)
- ❑ Attribute-value: code: MDC_TEMP_FINGER or 57360 (dec) or E0 10 (hex)

b) WAN PCD-01 message

PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):
OBX|?|NM|188432^MDC_TEMP_FINGER^MDC|1.0.0.a|36.1|
268192^MDC_DIM_DEGC^MDC|||||R|||20120716145410+0000

In step 13, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Type attribute is present:
- ❑ Object: Body temperature object
- ❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
- ❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
- ❑ Attribute-value:
  - • partition: MDC_PART_SCADA or 2 (dec) or 00 02 (hex)
  - • code: MDC_TEMP_BODY or 19292 (dec) or 4B 4C (hex)

Metric-Id attribute is present:
- ❑ Object: Body temperature object
- ❑ Attribute-id: MDC_ATTR_ID_PHYSIO (2347)
- ❑ Attribute-type: code (INT-U16)
- ❑ Attribute-value: code: MDC_TEMP_GIT or 57384 (dec) or E0 28 (hex)

b) WAN PCD-01 message

PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):
OBX|?|NM|188456^MDC_TEMP_GIT^MDC|1.0.0.a|36.3|
268192^MDC_DIM_DEGC^MDC|||||R|||20120716145510+0000

In step 15, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Type attribute is present:
- ❑ Object: Body temperature object
- ❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
- ❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
- ❑ Attribute-value:
  - • partition: MDC_PART_SCADA or 2 (dec) or 00 02 (hex)
  - • code: MDC_TEMP_BODY or 19292 (dec) or 4B 4C (hex)

Metric-Id attribute is present:
- ❑ Object: Body temperature object
- ❑ Attribute-id: MDC_ATTR_ID_PHYSIO (2347)
- ❑ Attribute-type: code (INT-U16)
- ❑ Attribute-value: code: MDC_TEMP_ORAL or 57352 (dec) or E0 08 (hex)

b) WAN PCD-01 message

PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):
OBX|?|NM|188424^MDC_TEMP_ORAL^MDC|1.0.0.a|36.5|
268192^MDC_DIM_DEGC^MDC|||||R|||20120716145610+0000

In step 17, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Type attribute is present:
- ❑ Object: Body temperature object
- ❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
- ❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
- ❑ Attribute-value:
  - • partition: MDC_PART_SCADA or 2 (dec) or 00 02 (hex)
  - • code: MDC_TEMP_BODY or 19292 (dec) or 4B 4C (hex)

Metric-Id attribute is present:
- ❑ Object: Body temperature object
- ❑ Attribute-id: MDC_ATTR_ID_PHYSIO (2347)
- ❑ Attribute-type: code (INT-U16)
- ❑ Attribute-value: code: MDC_TEMP_RECT or 57348 (dec) or E0 04 (hex)

b) WAN PCD-01 message

PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):
OBX|?|NM|188420^MDC_TEMP_RECT^MDC|1.0.0.a|36.7|
268192^MDC_DIM_DEGC^MDC|||||R|||20120716145710+0000

In step 19, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Type attribute is present:
- ❑ Object: Body temperature object
- ❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
- ❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
- ❑ Attribute-value:
  - • partition: MDC_PART_SCADA or 2 (dec) or 00 02 (hex)
  - • code: MDC_TEMP_BODY or 19292 (dec) or 4B 4C (hex)

Metric-Id attribute is present:
- ❑ Object: Body temperature object
- ❑ Attribute-id: MDC_ATTR_ID_PHYSIO (2347)
- ❑ Attribute-type: code (INT-U16)
- ❑ Attribute-value: code: MDC_TEMP_TOE or 57376 (dec) or E0 20 (hex)

b) WAN PCD-01 message

PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):
OBX|?|NM|188448^MDC_TEMP_TOE^MDC|1.0.0.a|36.9|
268192^MDC_DIM_DEGC^MDC|||||R|||20120716145810+0000

In step 21, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Type attribute is present:
- ❑ Object: Body temperature object
- ❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
- ❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
- ❑ Attribute-value:
  - • partition: MDC_PART_SCADA or 2 (dec) or 00 02 (hex)
  - • code: MDC_TEMP_BODY or 19292 (dec) or 4B 4C (hex)

Metric-Id attribute is present:
- ❑ Object: Body temperature object
- ❑ Attribute-id: MDC_ATTR_ID_PHYSIO (2347)
- ❑ Attribute-type: code (INT-U16)
- ❑ Attribute-value: code: MDC_TEMP_TYMP or 19320 (dec) or 4B 78 (hex)

b) WAN PCD-01 message

PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):
OBX|?|NM|150392^MDC_TEMP_TYMP^MDC|1.0.0.a|37.1|
268192^MDC_DIM_DEGC^MDC|||||R|||20120716145910+0000

TP Id		TP/LP-PAN/MAN/PHDTW/TH/BV-007		
TP label		Whitepaper. Body Temperature Object - Type and Metric-Id Attributes 3		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	TH Numeric 2; M	TH Numeric 3; M	TH Numeric 4; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_001 AND C_MAN_BLE_002		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Thermometer profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristics of interest for this test case are:
		    a. Temperature measurement (0x2A1C)
		      i. Field: Flags
		        • Format: 8 bit
		        • Value: 0000 0010 (MSB → LSB). Temperature Type field is not included
		      ii. Field: Temperature Measurement Value (Celsius)
		        • Format: FLOAT
		        • Value: Not relevant
		      iii. Field: Temperature Measurement Value (Fahrenheit)
		        • This field is not included
		      iv. Field: Time Stamp
		        • Format: Date and Time
		        • Value: Not relevant
		      v. Field: Temperature Type
		        • This field is not included
		    b. Temperature type (0x2A1D)
		        • Type: 8 bit
		        • Value: 0x01 (Armpit)
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), force the manager under test to read the Temperature type characteristic.
		 5. The simulated agent sends the measurement to the manager under test.
		 6. Check in manager transcoder output for the Body temperature object – Type and Metric-Id attributes.		

Pass/Fail criteria		In step 6, the Body temperature object – Type attribute is present and its value is {MDC_PART_SCADA, MDC_TEMP_BODY}, and the Body temperature object – Metric-Id attribute is present and its value is MDC_TEMP_AXILLA.		

Notes		Possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Type attribute is present:
		 ❑ Object: Body temperature object
		 ❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
		 ❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
		 ❑ Attribute-value:
		    • partition: MDC_PART_SCADA or 2 (dec) or 00 02 (hex)
		    • code: MDC_TEMP_BODY or 19292 (dec) or 4B 4C (hex)
		 Metric-Id attribute is present:
		 ❑ Object: Body temperature object
		 ❑ Attribute-id: MDC_ATTR_ID_PHYSIO (2347)
		 ❑ Attribute-type: code (INT-U16)
		 ❑ Attribute-value: code: MDC_TEMP_AXILLA or 57380 (dec) or E0 24 (hex)
		 b) WAN PCD-01 message
		 PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):
		 OBX|?|NM|188452^MDC_TEMP_AXILLA^MDC|1.0.0.a|35.6|
		 268192^MDC_DIM_DEGC^MDC|||||R|||[current_date_time]		

TP Id		TP/LP-PAN/MAN/PHDTW/TH/BV-008		
TP label		Whitepaper. Body Temperature Object - Metric-Spec-Small Attribute 1		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	TH Numeric 5; M	TH Numeric 6; M	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_001 AND C_MAN_BLE_002		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Thermometer profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		2. The simulated agent implements several BLE characteristics. The characteristics of interest for this test case are:
		
		   a. Temperature measurement (0x2A1C)
		     i. Field: Flags
		       • Format: 8 bit
		       • Value: 0000 0010 (MSB → LSB). Temperature Measurement Value in units of Celsius, Time Stamp field is included and Temperature Type field is not included
		     ii. Field: Temperature Measurement Value (Celsius)
		       • Format: FLOAT
		       • Value: Not relevant
		     iii. Field: Temperature Measurement Value (Fahrenheit)
		       • This field is not included
		     iv. Field: Time Stamp
		       • Format: Date and Time
		       • Value: Not relevant
		     v. Field: Temperature Type
		       • This field is not included
		   b. Measurement interval (0x2A21): This characteristic is not present.
		
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		
		4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test.
		
		5. Check in manager transcoder output for the Body temperature object – Metric-Spec-Small attribute.		

Pass/Fail criteria		In step 5, the Body temperature object – Metric-Spec-Small attribute is present and its value is 0xF040.		

Notes		Possible values in typical points of observation after transcoder output are:
		
		a) IEEE 11073 Objects and Attributes
		
		Metric-Spec-Small attribute is present:
		
		  ❑ Object: Body temperature object
		  ❑ Attribute-id: MDC_ATTR_METRIC_SPEC_SMALL (2630)
		  ❑ Attribute-type: BITS-16
		  ❑ Attribute-value: F0 40 (hex) or BITS mss-avail-intermittent(0), mss-avail-stored-data(1), mss-upd-aperiodic(2), mss-msmt-aperiodic(3), mss-acc-agent-initiated(9) set to TRUE and remaining BITS set to FALSE
		
		b) WAN PCD-01 message
		
		PCD-01 message does not include segments with a Metric-Spec-Small attribute value.		

TP Id		TP/LP-PAN/MAN/PHDTW/TH/BV-009		
TP label		Whitepaper. Body Temperature Object - Metric-Spec-Small Attribute 2		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	TH Numeric 5; M	TH Numeric 6; M	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_001 AND C_MAN_BLE_002		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Thermometer profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		 2. The simulated agent implements several BLE characteristics. The characteristics of interest for this test case are:
		
		     a. Temperature measurement (0x2A1C)
		
		       i. Field: Flags
		         • Format: 8 bit
		         • Value: 0000 0010 (MSB → LSB). Temperature measurement value in units of Celsius, Time Stamp field is included and Temperature Type field is not included
		
		       ii. Field: Temperature Measurement Value (Celsius)
		         • Format: FLOAT
		         • Value: Not relevant
		
		       iii. Field: Temperature Measurement Value (Fahrenheit)
		         • This field is not included
		
		       iv. Field: Time Stamp
		         • Format: Date and Time
		         • Value: Not relevant
		
		       v. Field: Temperature Type
		         • This field is not included
		
		     b. Measurement interval (0x2A21)
		         • Format: uint16
		         • Value: 0
		
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		
		 4. When the pairing has been completed (connection state), force the manager under test to read the Measurement interval characteristic.
		
		 5. The simulated agent sends the measurement to the manager under test.
		
		 6. Check in manager transcoder output for the Body temperature object – Metric-Spec-Small attribute.		

Pass/Fail criteria		In step 6, the Body temperature object – Metric-Spec-Small attribute is present and its value is 0xF040.		

Notes		Possible values in typical points of observation after transcoder output are:
		
		 a) IEEE 11073 Objects and Attributes
		
		 Metric-Spec-Small attribute is present:
		
		    ❑ Object: Body temperature object
		    ❑ Attribute-id: MDC_ATTR_METRIC_SPEC_SMALL (2630)
		    ❑ Attribute-type: BITS-16
		    ❑ Attribute-value: F0 40 (hex) or BITS mss-avail-intermittent(0), mss-avail-stored-data(1), mss-upd-aperiodic(2), mss-msmt-aperiodic(3), mss-acc-agent-initiated(9) set to TRUE and remaining BITS set to FALSE
		
		 b) WAN PCD-01 message
		
		 PCD-01 message does not include segments with a Metric-Spec-Small attribute value.		

TP Id		TP/LP-PAN/MAN/PHDTW/TH/BV-010		
TP label		Whitepaper. Body Temperature Object - Metric-Spec-Small Attribute 3		
Coverage	**Spec**	[b-Bluetooth PHDT v1.3]		
	Testable items	TH Numeric 5; M	TH Numeric 6; M	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_001 AND C_MAN_BLE_002		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Thermometer profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		 2. The simulated agent implements several BLE characteristics. The characteristics of interest for this test case are:
		
		    a. Temperature measurement (0x2A1C)
		
		      i. Field: Flags
		        • Format: 8 bit
		        • Value: 0000 0010 (MSB → LSB). Temperature measurement value in units of Celsius, Time Stamp field is included and Temperature Type field is not included
		
		      ii. Field: Temperature Measurement Value (Celsius)
		        • Format: FLOAT
		        • Value: Not relevant
		
		      iii. Field: Temperature Measurement Value (Fahrenheit)
		        • This field is not included
		
		      iv. Field: Time Stamp
		        • Format: Date and Time
		        • Value: Not relevant
		
		      v. Field: Temperature Type
		        • This field is not included
		
		    b. Measurement interval (0x2A21)
		      • Format: uint16
		      • Value: 30
		
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		
		 4. When the pairing has been completed (connection state), force the manager under test to read the Measurement interval characteristic.
		
		 5. The simulated agent sends the measurement to the manager under test.
		
		 6. Check in manager transcoder output for the Body temperature object – Metric-Spec-Small attribute.		

Pass/Fail criteria		In step 6, the Body temperature object – Metric-Spec-Small attribute is present and its value is 0x4040.		

Notes		Possible values in typical points of observation after transcoder output are:
		
		 a) IEEE 11073 Objects and Attributes
		
		 Metric-Spec-Small attribute is present:
		    ❑ Object: Body temperature object
		    ❑ Attribute-id: MDC_ATTR_METRIC_SPEC_SMALL (2630)
		    ❑ Attribute-type: BITS-16
		    ❑ Attribute-value: 40 40 (hex) or BITS mss-avail-stored-data(1), mss-acc-agent-initiated(9) set to TRUE and remaining BITS set to FALSE
		
		 b) WAN PCD-01 message
		
		 PCD-01 message does not include segments with a Metric-Spec-Small attribute value.		

TP Id		TP/LP-PAN/MAN/PHDTW/TH/BV-011		
TP label		Whitepaper. Body Temperature Object - Unit-Code Attribute		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	TH Numeric 7; M	TH Numeric 8; M	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_001 AND C_MAN_BLE_002		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Thermometer profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		a. Temperature measurement (0x2A1C)
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test with the following value:
		a. Temperature measurement (0x2A1C)
		  i. Field: Flags
		    • Format: 8 bit
		    • Value: 0000 0010 (MSB → LSB). Temperature measurement value in units of Celsius, Time Stamp field is included and Temperature Type field is not included
		  ii. Field: Temperature Measurement Value (Celsius)
		    • Format: FLOAT
		    • Value: 35.6
		  iii. Field: Temperature Measurement Value (Fahrenheit)
		    • This field is not included
		  iv. Field: Time Stamp
		    • Format: Date and Time
		    • Value: Not relevant
		  v. Field: Temperature Type
		    • This field is not included
		5. Check in manager transcoder output for the Body temperature object – Unit-Code attribute.
		6. The simulated agent sends the measurement to the manager under test with the following value:
		a. Temperature measurement (0x2A1C)
		  i. Field: Flags
		    • Format: 8 bit
		    • Value: 0000 0011 (MSB → LSB). Temperature measurement value in units of Fahrenheit, Time Stamp field is included and Temperature Type field is not included
		  ii. Field: Temperature Measurement Value (Celsius)
		    • This field is not included
		  iii. Field: Temperature Measurement Value (Fahrenheit)
		    • Format: FLOAT
		    • Value: 98.1
		  iv. Field: Time Stamp
		    • Format: Date and Time
		    • Value: Not relevant
		  v. Field: Temperature Type
		    • This field is not included
		7. Check in manager transcoder output for the Body temperature object – Unit-Code attribute.		

Pass/Fail criteria		In step 5, the Body temperature object – Unit-Code attribute is present and its value is MDC_DIM_DEGC. In step 7, the Body temperature object – Unit-Code attribute is present and its value is MDC_DIM_FAHR.		
Notes		In step 5, possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Unit-Code attribute is present: ❑ Object: Body temperature object ❑ Attribute-id: MDC_ATTR_UNIT_CODE (2454) ❑ Attribute-type: INT-U16 ❑ Attribute-value: MDC_DIM_DEGC or 6048 (dec) or 17 A0 (hex) b) WAN PCD-01 message PCD-01 message includes a segment like this with a Unit-Code attribute value (check OBX-6): OBX|?|NM|150364^MDC_TEMP_BODY^MDC|1.0.0.a|35.6| 268192^MDC_DIM_DEGC^MDC|||||R||||[current_date_time] In step 7, possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Unit-Code attribute is present: ❑ Object: Body temperature object ❑ Attribute-id: MDC_ATTR_UNIT_CODE (2454) ❑ Attribute-type: INT-U16 ❑ Attribute-value: MDC_DIM_FAHR or 4416 (dec) or 11 40 (hex) b) WAN PCD-01 message PCD-01 message includes a segment like this with a Unit-Code attribute value (check OBX-6): OBX|?|NM|150364^MDC_TEMP_BODY^MDC|1.0.0.a|98.1| 266560^MDC_DIM_FAHR^MDC|||||R|||20120801095012+0000		

TP Id		TP/LP-PAN/MAN/PHDTW/TH/BV-012		
TP label		Whitepaper. Body Temperature Object - Absolute-Time-Stamp Attribute		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	TH Numeric 10; M	Date-Time Conv 2; M	Date-Time Conv 3; M
		Date-Time Conv 4; M	Date-Time Conv 5; M	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_001 AND C_MAN_BLE_002		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Thermometer profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		 a. Temperature measurement (0x2A1C)
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test with the following value:
		 a. Temperature measurement (0x2A1C)
		     i. Field: Flags
		       • Format: 8 bit
		       • Value: 0000 0010 (MSB → LSB). Temperature measurement value in units of Celsius, Time Stamp field is included and Temperature Type field is not included
		     ii. Field: Temperature Measurement Value (Celsius)
		       • Format: FLOAT
		       • Value: 36.2
		     iii. Field: Temperature Measurement Value (Fahrenheit)
		       • This field is not included
		     iv. Field: Time Stamp
		       • Format: Date and Time
		       • Value: August 2nd, 2012, 10:39:27
		     v. Field: Temperature Type
		       • This field is not included
		 5. Check in manager transcoder output for the Body temperature object – Absolute-Time-Stamp attribute.		

Pass/Fail criteria		In step 5, the Body temperature object – Absolute-Time-Stamp attribute is present, its value matches with the Time Stamp field of the Temperature measurement characteristic and the fraction of seconds is set to 0.		

Notes		Possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Absolute-Time-Stamp attribute is present:
		 ❑ Object: Body temperature object
		 ❑ Attribute-id: MDC_ATTR_TIME_STAMP_ABS (2448)
		 ❑ Attribute-type: SEQUENCE {century (INT-U8), year (INT-U8), month (INT-U8), day (INT-U8), hour (INT-U8), minute (INT-U8), second (INT-U8), sec-fractions (INT-U8)} (BCD encoding)
		 ❑ Attribute-value:
		    • century: 20 (hex) or 32 (dec)
		    • year: 12 (hex) or 18 (dec)
		    • month: 08 (hex) or 8 (dec)
		    • day: 02 (hex) or 2 (dec)
		    • hour: 10 (hex) or 16 (dec)
		    • minute: 39 (hex) or 57 (dec)
		    • second: 27 (hex) or 39 (dec)
		    • sec-fractions: 00 (hex) or 0 (dec)
		 b) WAN PCD-01 message
		 PCD-01 message includes a segment like this with Absolute-Time-Stamp attribute value (check OBX-14):
		 OBX|?|NM|150364^MDC_TEMP_BODY^MDC|1.0.0.a|36.2| 268192^MDC_DIM_DEGC^MDC|||||R|||20120802103927+0000		

TP Id		TP/LP-PAN/MAN/PHDTW/TH/BV-013		
TP label		Whitepaper. Body Temperature Object - Simple-Nu-Observed-Value Attribute 1		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	TH Numeric 11; M	Float Type 1; C	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_001 AND C_MAN_BLE_002		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a Thermometer profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is: a. Temperature measurement (0x2A1C) 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test with the following value: a. Temperature measurement (0x2A1C) i. Field: Flags • Format: 8 bit • Value: 0000 0010 (MSB → LSB). Temperature measurement value in units of Celsius, Time Stamp field is included and Temperature Type field is not included ii. Field: Temperature Measurement Value (Celsius) • Format: FLOAT • Value: 35.6 iii. Field: Temperature Measurement Value (Fahrenheit) • This field is not included iv. Field: Time Stamp • Format: Date and Time • Value: Not relevant v. Field: Temperature Type • This field is not included 5. Check in manager transcoder output for the Body temperature object – Simple-Nu-Observed-Value attribute. 6. The simulated agent sends the measurement to the manager under test with the following value: a. Temperature measurement (0x2A1C) i. Field: Flags • Format: 8 bit • Value: 0000 0011 (MSB → LSB). Temperature measurement value in units of Fahrenheit, Time Stamp field is included and Temperature Type field is not included ii. Field: Temperature Measurement Value (Celsius) • This field is not included		

	iii. Field: Temperature Measurement Value (Fahrenheit)
	    • Format: FLOAT
	    • Value: 98.2
	iv. Field: Time Stamp
	    • Format: Date and Time
	    • Value: Not relevant
	v. Field: Temperature Type
	    • This field is not included
	7. Check in manager transcoder output for the Body temperature object – Simple-Nu-Observed-Value attribute.

Pass/Fail criteria	In step 5, the Body temperature object – Simple-Nu-Observed-Value attribute is present and its value matches with the Temperature Measurement Value (Celsius) field of the Temperature measurement characteristic (35.6). In step 7, the Body temperature object – Simple-Nu-Observed-Value attribute is present and its value matches with the Temperature Measurement Value (Fahrenheit) field of the Temperature measurement characteristic (98.2).

Notes	Possible values in typical points of observation after transcoder output are:
	
	a) IEEE 11073 Objects and Attributes
	
	Simple-Nu-Observed-Value attribute is present:
	
	   ❑ Object: Body temperature object
	   ❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_SIMP (2646)
	   ❑ Attribute-type: FLOAT
	   ❑ Attribute-value: FB 36 52 40 (hex) or FC 05 6E A0 (hex) or FD 00 8B 10 (hex) or FE 00 0D E8 (hex) or FF 00 01 64 (hex) or 35.6 (dec)
	
	b) WAN PCD-01 message
	
	PCD-01 message includes a segment like this with a Simple-Nu-Observed-Value attribute value (check OBX-5):
	
	OBX|?|NM|150364^MDC_TEMP_BODY^MDC|1.0.0.a|35.6|
	268192^MDC_DIM_DEGC^MDC|||||R|||[current_date_time]
	
	In step 7, possible values in typical points of observation after transcoder output are:
	
	a) IEEE 11073 Objects and Attributes
	
	Simple-Nu-Observed-Value attribute is present:
	
	   ❑ Object: Body temperature object
	   ❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_SIMP (2646)
	   ❑ Attribute-type: FLOAT
	   ❑ Attribute-value: FB 95 D7 60 (hex) or FC 0E FB F0 (hex) or FD 01 7F 98 (hex) or FE 00 26 5C (hex) or FF 00 03 D6 (hex) or 98.2 (dec)
	
	b) WAN PCD-01 message
	
	PCD-01 message includes a segment like this with a Simple-Nu-Observed-Value attribute value (check OBX-5):
	
	OBX|?|NM|150364^MDC_TEMP_BODY^MDC|1.0.0.a|98.2|
	266560^MDC_DIM_FAHR^MDC|||||R|||20120802105712+0000

TP Id		TP/LP-PAN/MAN/PHDTW/TH/BV-014		
TP label		Whitepaper. Body Temperature Object - Simple-Nu-Observed-Value Attribute 2		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	TH Numeric 11; M	Float Type 1; C	Float Type 2; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_001 AND C_MAN_BLE_002		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Thermometer profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		 a. Temperature measurement (0x2A1C)
		
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		
		 4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test with the following value:
		 b. Temperature measurement (0x2A1C)
		    i. Field: Flags
		      • Format: 8 bit
		      • Value: 0000 0010 (MSB → LSB). Temperature measurement value in units of Celsius, Time Stamp field is included and Temperature Type field is not included
		    ii. Field: Temperature Measurement Value (Celsius)
		      • Format: FLOAT
		      • Value: 35.6
		    iii. Field: Time Stamp
		      • Format: Date and Time
		      • Value: Not relevant
		    iv. Field: Temperature Type
		      • This field is not included
		
		 5. Check in manager transcoder output for the Body temperature object – Simple-Nu-Observed-Value attribute.
		
		 6. The simulated agent sends the measurement to the manager under test with the following value:
		 a. Temperature measurement (0x2A1C)
		    i. Field: Flags
		      • Format: 8 bit
		      • Value: 0000 0010 (MSB → LSB). Temperature measurement value in units of Celsius, Time Stamp field is included and Temperature Type field is not included
		    ii. Field: Temperature Measurement Value (Celsius)
		      • Format: FLOAT
		      • Value: 00 7F FF FF (hex). Special value: NaN
		    iii. Field: Time Stamp
		      • Format: Date and Time
		      • Value: Not relevant
		    iv. Field: Temperature Type
		      • This field is not included
		
		 7. Check in manager transcoder output for the Body temperature object – Simple-Nu-Observed-Value attribute.
		
		 8. The simulated agent sends the measurement to the manager under test with the following value:
		 a. Temperature measurement (0x2A1C)
		    i. Field: Flags
		      • Format: 8 bit		

- Value: 0000 0010 (MSB → LSB). Temperature measurement value in units of Celsius, Time Stamp field is included and Temperature Type field is not included
  - ii. Field: Temperature Measurement Value (Celsius)
    - Format: FLOAT
    - Value: 00 08 00 00 (hex). Special value: NRes
  - iii. Field: Time Stamp
    - Format: Date and Time
    - Value: Not relevant
  - iv. Field: Temperature Type
    - This field is not included
9. Check in manager transcoder output for the Body temperature object – Simple-Nu-Observed-Value attribute.
10. The simulated agent sends the measurement to the manager under test with the following value:
   a. Temperature measurement (0x2A1C)
     - i. Field: Flags
       - Format: 8 bit
       - Value: 0000 0010 (MSB → LSB). Temperature measurement value in units of Celsius, Time Stamp field is included and Temperature Type field is not included
     - ii. Field: Temperature Measurement Value (Celsius)
       - Format: FLOAT
       - Value: 00 07 FF FE (hex). Special value: +INFINITY
     - iii. Field: Time Stamp
       - Format: Date and Time
       - Value: Not relevant
     - iv. Field: Temperature Type
       - This field is not included
11. Check in manager transcoder output for the Body temperature object – Simple-Nu-Observed-Value attribute.
12. The simulated agent sends the measurement to the manager under test with the following value:
   a. Temperature measurement (0x2A1C)
     - i. Field: Flags
       - Format: 8 bit
       - Value: 0000 0010 (MSB → LSB). Temperature measurement value in units of Celsius, Time Stamp field is included and Temperature Type field is not included
     - ii. Field: Temperature Measurement Value (Celsius)
       - Format: FLOAT
       - Value: 00 08 00 02 (hex). Special value: -INFINITY
     - iii. Field: Time Stamp
       - Format: Date and Time
       - Value: Not relevant
     - iv. Field: Temperature Type
       - This field is not included
13. Check in manager transcoder output for the Body temperature object – Simple-Nu-Observed-Value attribute.

Pass/Fail criteria	In step 5, the Body temperature object – Simple-Nu-Observed-Value attribute is present and its value is 35.6.
	In step 7, the Body temperature object – Simple-Nu-Observed-Value attribute is present and its value is 0x007FFFFF.
	In step 9, the Body temperature object – Simple-Nu-Observed-Value attribute is present and its value is 0x00800000.
	In step 11, the Body temperature object – Simple-Nu-Observed-Value attribute is present and its value is 0x007FFFFE.
	In step 13, the Body temperature object – Simple-Nu-Observed-Value attribute is present and its value is 0x00800002.

Notes	In step 5, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Simple-Nu-Observed-Value attribute is present:
	❑ Object: Body temperature object
	❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_SIMP (2646)
	❑ Attribute-type: FLOAT
	❑ Attribute-value: FB 36 52 40 (hex) or FC 05 6E A0 (hex) or FD 00 8B 10 (hex) or FE 00 0D E8 (hex) or FF 00 01 64 (hex)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with a Simple-Nu-Observed-Value attribute value (check OBX-5):
	OBX|?|NM|150364^MDC_TEMP_BODY^MDC|1.0.0.a|35.6| 268192^MDC_DIM_DEGC^MDC|||||R|||[current_date_time]
	In step 7, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Simple-Nu-Observed-Value attribute is present:
	❑ Object: Body temperature object
	❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_SIMP (2646)
	❑ Attribute-type: FLOAT
	❑ Attribute-value: 00 7F FF FF (hex) or NaN (note that is not allowed a decimal value)
	b) WAN PCD-01 message
	PCD-01 message does not include segments with a Simple-Nu-Observed-Value attribute value (150364^MDC_TEMP_BODY^MDC) because it has a special value and these values are not included in the PCD-01 message.
	In step 9, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Simple-Nu-Observed-Value attribute is present:
	❑ Object: Body temperature object
	❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_SIMP (2646)
	❑ Attribute-type: FLOAT
	❑ Attribute-value: 00 08 00 00 (hex) or NRes (note that a decimal value is not allowed)
	b) WAN PCD-01 message
	PCD-01 message does not include segments with a Simple-Nu-Observed-Value attribute value (150364^MDC_TEMP_BODY^MDC) because it has a special value and these values are not included in the PCD-01 message.
	In step 11, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Simple-Nu-Observed-Value attribute is present:
	❑ Object: Body temperature object
	❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_SIMP (2646)
	❑ Attribute-type: FLOAT
	❑ Attribute-value: 00 7F FF FE (hex) or +INFINITY (note that a decimal value is not allowed)
	b) WAN PCD-01 message
	PCD-01 message does not include segments with a Simple-Nu-Observed-Value attribute value (150364^MDC_TEMP_BODY^MDC) because it has a special value and these values are not included in the PCD-01 message.
	In step 13, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Simple-Nu-Observed-Value attribute is present:
	❑ Object: Body temperature object
	❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_SIMP (2646)
	❑ Attribute-type: FLOAT
	❑ Attribute-value: 00 08 00 02 (hex) or -INFINITY (note that a decimal value is not allowed)
	b) WAN PCD-01 message
	PCD-01 message does not include segments with a Simple-Nu-Observed-Value attribute value (150364^MDC_TEMP_BODY^MDC) because it has a special value and these values are not included in the PCD-01 message.

TP Id		TP/LP-PAN/MAN/PHDTW/TH/BV-015		
TP label		Whitepaper. Temperature measurement value		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	Float Type 1; C	Date-Time Conv 1; M	TH Numeric 10; M
		TH Numeric 11; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_001		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Thermometer profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		 a. Temperature measurement (0x2A1C)
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test with the following value:
		 a. Temperature measurement (0x2A1C)
		    i. Field: Flags
		      • Format: 8 bit
		      • Value: 0000 0010 (MSB → LSB). Temperature measurement value in units of Celsius, Time Stamp field is included and Temperature Type field is not included
		    ii. Field: Temperature Measurement Value (Celsius)
		      • Format: FLOAT
		      • Value: 35.8
		    iii. Field: Temperature Measurement Value (Fahrenheit)
		      • This field is not included
		    iv. Field: Time Stamp
		      • Format: Date and Time
		      • Value: August 2nd, 2012, 11:08:25
		    v. Field: Temperature Type
		      • This field is not included
		 5. Check that the manager accepts the measurement and decodes its value properly (temperature measurement value, temperature units and time stamp).
		 6. The simulated agent sends the measurement to the manager under test with the following value:
		 b. Temperature measurement (0x2A1C)
		    i. Field: Flags
		      • Format: 8 bit
		      • Value: 0000 0011 (MSB → LSB). Temperature measurement value in units of Fahrenheit, Time Stamp field is included and Temperature Type field is not included
		    ii. Field: Temperature Measurement Value (Celsius)
		      • This field is not included
		    iii. Field: Temperature Measurement Value (Fahrenheit)
		      • Format: FLOAT
		      • Value: 98.2
		    iv. Field: Time Stamp
		      • Format: Date and Time
		      • Value: August 2nd, 2012, 11:09:05
		    v. Field: Temperature Type
		      • This field is not included
		 7. Check that the manager accepts the measurement and decodes its value properly (temperature measurement value, temperature units and time stamp).		

Pass/Fail criteria		In step 5, the manager under test shows the following temperature measurement 35.8 ºC with the time stamp '2012-08-02 11:08:25'. In step 7, the manager under test shows the following temperature measurement 97.9F with the time stamp '2012-08-02 11:09:05'.		
Notes				

A.4 Subgroup 2.4.3 – Whitepaper Blood pressure requirements (BP)

TP Id		TP/LP-PAN/MAN/PHDTW/BPM/BV-000		
TP label		Whitepaper. Blood Pressure MDS Object - System-Type Attribute		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	BPM Specific MDS 1; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_003		
Initial condition		The manager under test and the simulated agent are in the standby state		
Test procedure		1. The simulated agent is configured with a Blood pressure profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 3. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test. 4. Check in manager transcoder output for the MDS object – System-Type attribute.		
Pass/Fail criteria		In step 4, the MDS object – System-Type attribute is not present.		
Notes		Possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes System-Type attribute is not present: ❑ Object: MDS object ❑ Attribute-id: MDC_ATTR_SYS_TYPE (2438) ❑ Attribute-type: TYPE ❑ Attribute-value: <NOT PRESENT> b) WAN PCD-01 message PCD-01 message does not include segments with a System-Type attribute value (67974^MDC_ATTR_SYS_TYPE^MDC).		

TP Id		TP/LP-PAN/MAN/PHDTW/BPM/BV-001		
TP label		Whitepaper. Blood Pressure MDS Object - Dev-Configuration-Id Attribute		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	BPM Specific MDS 2; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_003		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a Blood pressure profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 3. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test. 4. Check in manager transcoder output for the MDS object – Dev-Configuration-Id attribute.		
Pass/Fail criteria		In step 4, the MDS object – Dev-Configuration-Id attribute is present and its value is inside the range 0x4000 - 0x7FFF.		
Notes		Possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Dev-Configuration-Id attribute is present: ❑ Object: MDS object ❑ Attribute-id: MDC_ATTR_DEV_CONFIG_ID (2628) ❑ Attribute-type: INT-U16 ❑ Attribute-value: Any value inside the range 16384 - 32767 (dec) or 0x4000 – 0x7FFF (hex) b) WAN PCD-01 message According to [ITU-T H.810] (CDG 2013), the Dev-Configuration-Id shall not be transmitted in the PCD-01 message; therefore it is not possible to check this attribute.		

TP Id		TP/LP-PAN/MAN/PHDTW/BPM/BV-002		
TP label		Whitepaper. Blood Pressure MDS Object - System-Type-Spec-List Attribute		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	Common MDS 15; M	BPM Specific MDS 3; M	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_003		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a Blood pressure profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 3. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test. 4. Check in manager transcoder output for the MDS object – System-Type-Spec-List attribute.		
Pass/Fail criteria		In step 4, the MDS object – System-Type-Spec-List attribute is present and its value is (MDC_DEV_SPEC_PROFILE_BP, Version 1).		
Notes		Possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes System-Type-Spec-List attribute is present: ❑ Object: MDS object ❑ Attribute-id: MDC_ATTR_SYS_TYPE_SPEC_LIST (2650) ❑ Attribute-type: SEQUENCE OF [{type (INT-U16), version (INT-U16)}] ❑ Attribute-value: • type: MDC_DEV_SPEC_PROFILE_BP or 4103 (dec) or 10 07 (hex) • version: 1 (dec) or 00 01 (hex) b) WAN PCD-01 message PCD-01 message includes a segment like this with a System-Type-Spec-List attribute value (check OBX-5): OBX|?|NM|68186^MDC_ATTR_SYS_TYPE_SPEC_LIST^MDC|1.0.0.a| 528391^MDC_DEV_SPEC_PROFILE_BP ^MDC||||||R		

TP Id		TP/LP-PAN/MAN/PHDTW/BPM/BV-003		
TP label		Whitepaper. Blood Pressure MDS Object - Reg-Cert-Data-List Attribute		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	Common MDS 14; M	Regulatory Conv 1; M	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_003		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Blood pressure profile (device specialization) supported by the manager under test; it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		    a. IEEE 11073-20601 Regulatory Certification Data List (0x2A2A)
		      • Format: reg-cert-data-list (opaque structure)
		      • Value: 00 02 00 12 02 01 00 08 04 00 00 01 00 02 80 07 02 02 00 02 80 00 (hex)
		        i. Element:
		          • auth-body-and-struc-type:
		            - auth-body: 02 (hex) auth-body-continua(2)
		            - auth-body-struc-type: 01 (hex). continua-version-struct(1)
		          • auth-body-data:
		            - major-IG-version: 04 (hex)
		            - minor-IG-version: 00 (hex)
		            - certified-devices: 80 07 (hex). BLE Blood Pressure
		        ii. Element:
		          • auth-body-and-struc-type:
		            - auth-body: 02 (hex). auth-body-continua(2)
		            - auth-body-struc-type: 02 (hex). continua-reg-struct(2)
		          • auth-body-data:
		            - regulation-bit-field: 80 00 (hex). Unregulated device
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with simulated agent.
		 4. When the pairing has been completed (connection state), force the manager under test to read the IEEE 11073-20601 Regulatory Certification Data List characteristic.
		 5. The simulated agent sends the measurement to the manager under test.
		 6. Check in manager transcoder output for the MDS object – Reg-Cert-Data-List attribute.		

Pass/Fail criteria		In step 6, the MDS object – Reg-Cert-Data-List attribute is present and its value matches with the IEEE 11073-20601 Regulatory Certification Data List characteristic value.		

Notes		Possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Reg-Cert-Data-List attribute is present:
		   ❑ Object: MDS object
		   ❑ Attribute-id: MDC_ATTR_REG_CERT_DATA_LIST (2635)
		   ❑ Attribute-type: SEQUENCE OF [{auth-body-and-struc-type, auth-body-data}, {…}]
		   ❑ Attribute-value: 00 02 00 12 02 01 00 08 04 00 00 01 00 02 80 07 02 02 00 02 80 00 (hex)
		     [Note that 0x00 0x02 is the number of elements in the sequence and 0x00 12 is the length of the sequence]
		        i. Reg-Cert-Data Element:
		          • auth-body-and-struc-type:
		            - auth-body: 02 (hex) auth-body-continua(2)
		            - auth-body-struc-type: 01 (hex). continua-version-struct(1)
		          • auth-body-data:
		            - major-IG-version: 04 (hex)
		            - minor-IG-version: 00 (hex)
		            - certified-devices: 80 07 (hex). BLE Blood Pressure
		        ii. Reg-Cert-Data Element:
		          • auth-body-and-struc-type:
		            - auth-body: 02 (hex). auth-body-continua(2)
		            - auth-body-struc-type: 02 (hex). continua-reg-struct(2)
		          • auth-body-data:
		            - regulation-bit-field: 80 00 (hex). Unregulated device
		 b) WAN PCD-01 message
		 PCD-01 message includes five segments like these with Reg-Cert-Data-List attribute value (check OBX-5 in five segments):
		 OBX|?|CWE|68218^MDC_REG_CERT_DATA_AUTH_BODY^MDC|1.0.0.a| 2^auth-body-continua||||||R
		 OBX|?|ST| 532352^MDC_REG_CERT_DATA_CONTINUA_VERSION^MDC|1.0.0.a.x| 4.0||||||R
		 OBX|?|NA| 532353^MDC_REG_CERT_DATA_CONTINUA_CERT_DEV_LIST^MDC| 1.0.0.a.y|32775||||||R
		 OBX|?|CWE|68218^MDC_REG_CERT_DATA_AUTH_BODY^MDC|1.0.0.b|2^auth-body-continua||||||R
		 OBX|?|CWE| 532354^MDC_REG_CERT_DATA_CONTINUA_REG_STATUS^MDC| 1.0.0.b.z|1^unregulated-device(0)||||||R		

TP Id		TP/LP-PAN/MAN/PHDTW/BPM/BV-004
TP label		Whitepaper. Systolic/Diastolic/Map Compound Numeric Object - Handle Attribute
Coverage	Spec	[b-Bluetooth PHDT v1.3]
	Testable items	BP Numeric 1; O
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_003
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Blood pressure profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		    a. Blood pressure measurement (0x2A35)
		       i. Field: Flags
		          • Format: 8 bit
		          • Value: 0000 0010 (MSB → LSB). Blood pressure measurement value in units of mmHg and Time Stamp fields are included, Pulse Rate, User ID and measurement Status fields are not included
		       ii. Field: Blood Pressure Measurement Compound Value – Systolic (mmHg)
		          • Format: SFLOAT
		          • Value: Not relevant
		       iii. Field: Blood Pressure Measurement Compound Value – Diastolic (mmHg)
		          • Format: SFLOAT
		          • Value: Not relevant
		       iv. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (mmHg)
		          • Format: SFLOAT
		          • Value: Not relevant
		       v. Field: Blood Pressure Measurement Compound Value – Systolic (kPa)
		          • This field is not included
		       vi. Field: Blood Pressure Measurement Compound Value – Diastolic (kPa)
		          • This field is not included
		       vii. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (kPa)
		          • This field is not included
		       viii. Field: Time Stamp
		          • Format: Date and Time
		          • Value: Not relevant
		       ix. Field: Pulse Rate
		          • This field is not included
		       x. Field: User ID
		          • This field is not included
		       xi. Field: Measurement Status
		          • This field is not included
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test.
		 5. Check in manager transcoder output for the Systolic/Diastolic/Map compound numeric object – Handle attribute.

Pass/Fail criteria		In step 5, the Systolic/Diastolic/Map compound numeric object – Handle attribute is not present; however, if it is present then its value is different to 0.
Notes		Possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Handle attribute is not present, or if it is present then: ❑ Object: Systolic/Diastolic/Map compound numeric object ❑ Attribute-id: MDC_ATTR_ID_HANDLE (2337) ❑ Attribute-type: INT-U16 ❑ Attribute-value: Any value other than 0 b) WAN PCD-01 message PCD-01 message does not include segments with a Handle attribute value.

TP Id		TP/LP-PAN/MAN/PHDTW/BPM/BV-005
TP label		Whitepaper. Systolic/Diastolic/Map Compound Numeric Object - Type Attribute
Coverage	**Spec**	[b-Bluetooth PHDT v1.3]
	Testable items	BP Numeric 2; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_003
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Blood pressure profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		  a. Blood pressure measurement (0x2A35)
		    i. Field: Flags
		      • Format: 8 bit
		      • Value: 0000 0010 (MSB → LSB). Blood pressure measurement value in units of mmHg and Time Stamp fields are included, Pulse Rate, User ID and measurement Status fields are not included
		    ii. Field: Blood Pressure Measurement Compound Value – Systolic (mmHg)
		      • Format: SFLOAT
		      • Value: Not relevant
		    iii. Field: Blood Pressure Measurement Compound Value – Diastolic (mmHg)
		      • Format: SFLOAT
		      • Value: Not relevant
		    iv. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (mmHg)
		      • Format: SFLOAT
		      • Value: Not relevant
		    v. Field: Blood Pressure Measurement Compound Value – Systolic (kPa)
		      • This field is not included
		    vi. Field: Blood Pressure Measurement Compound Value – Diastolic (kPa)
		      • This field is not included
		    vii. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (kPa)
		      • This field is not included
		    viii. Field: Time Stamp
		      • Format: Date and Time
		      • Value: Not relevant
		    ix. Field: Pulse Rate
		      • This field is not included
		    x. Field: User ID
		      • This field is not included
		    xi. Field: Measurement Status
		      • This field is not included
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test.
		5. Check in manager transcoder output for the Systolic/Diastolic/Map compound numeric object – Type attribute.

Pass/Fail criteria		In step 5, the Systolic/Diastolic/Map compound numeric object – Type attribute is present and its value is {MDC_PART_SCADA, MDC_PRESS_BLD_NONINV}.

Notes		Possible values in typical points of observation after transcoder output are:
		a) IEEE 11073 Objects and Attributes
		Type attribute is present:
		  ❑ Object: Systolic/Diastolic/Map compound numeric object
		  ❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
		  ❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
		  ❑ Attribute-value:
		    • partition: MDC_PART_SCADA or 2 (dec) or 00 02 (hex)
		    • code: MDC_PRESS_BLD_NONINV or 18948 (dec) or 4A 04 (hex)
		b) WAN PCD-01 message
		PCD-01 message includes a segment like this with a Type attribute (check OBX-3):
		OBX|?||150020^MDC_PRESS_BLD_NONINV^MDC|1.0.a|||||||X|||[current_date_time].

TP Id		TP/LP-PAN/MAN/PHDTW/BPM/BV-006
TP label		Whitepaper. Systolic/Diastolic/Map Compound Numeric Object - Metric-Spec-Small Attribute
Coverage	Spec	[b-Bluetooth PHDT v1.3]
	Testable items	BP Numeric 3; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_003
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Blood pressure profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		    a. Blood pressure measurement (0x2A35)
		      i. Field: Flags
		         • Format: 8 bit
		         • Value: 0000 0010 (MSB → LSB). Blood pressure measurement value in units of mmHg and Time Stamp fields are included, Pulse Rate, User ID and measurement Status fields are not included
		      ii. Field: Blood Pressure Measurement Compound Value – Systolic (mmHg)
		         • Format: SFLOAT
		         • Value: Not relevant
		      iii. Field: Blood Pressure Measurement Compound Value – Diastolic (mmHg)
		         • Format: SFLOAT
		         • Value: Not relevant
		      iv. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (mmHg)
		         • Format: SFLOAT
		         • Value: Not relevant
		      v. Field: Blood Pressure Measurement Compound Value – Systolic (kPa)
		         • This field is not included
		      vi. Field: Blood Pressure Measurement Compound Value – Diastolic (kPa)
		         • This field is not included
		      vii. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (kPa)
		         • This field is not included
		      viii. Field: Time Stamp
		         • Format: Date and Time
		         • Value: Not relevant
		      ix. Field: Pulse Rate
		         • This field is not included
		      x. Field: User ID
		         • This field is not included
		      xi. Field: Measurement Status
		         • This field is not included
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test.
		 5. Check in manager transcoder output for the Systolic/Diastolic/Map compound numeric object – Metric-Spec-Small attribute.

Pass/Fail criteria		In step 5, the Systolic/Diastolic/Map compound numeric object – Metric-Spec-Small attribute is present and its value is {0xF040} (mss-avail-intermittent | mss-avail-stored-data | mss-upd-aperiodic | mss-msmt-aperiodic | mss-acc-agent-initiated).

Notes		Possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Metric-Spec-Small attribute is present:
		    ❑ Object: Systolic/Diastolic/Map compound numeric object
		    ❑ Attribute-id: MDC_ATTR_METRIC_SPEC_SMALL (2630)
		    ❑ Attribute-type: BITS-16
		    ❑ Attribute-value: F0 40 (hex) or BITS mss-avail-intermittent(0), mss-avail-stored-data(1), mss-upd-aperiodic(2), mss-msmt-aperiodic(3), mss-acc-agent-initiated(9) set to TRUE and remaining BITS set to FALSE
		 b) WAN PCD-01 message
		 PCD-01 message does not include segments with a Metric-Spec-Small attribute value.

TP Id		TP/LP-PAN/MAN/PHDTW/BPM/BV-007
TP label		Whitepaper. Systolic/Diastolic/Map Compound Numeric Object - Metric-Structure-Small Attribute
Coverage	Spec	[b-Bluetooth PHDT v1.3]
	Testable items	BP Numeric 4; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_003
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Blood pressure profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		   a) Blood pressure measurement (0x2A35)
		      i. Field: Flags
		        • Format: 8 bit
		        • Value: 0000 0010 (MSB → LSB). Blood pressure measurement value in units of mmHg and Time Stamp fields are included, Pulse Rate, User ID and measurement Status fields are not included
		      ii. Field: Blood Pressure Measurement Compound Value – Systolic (mmHg)
		        • Format: SFLOAT
		        • Value: Not relevant
		      iii. Field: Blood Pressure Measurement Compound Value – Diastolic (mmHg)
		        • Format: SFLOAT
		        • Value: Not relevant
		      iv. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (mmHg)
		        • Format: SFLOAT
		        • Value: Not relevant
		      v. Field: Blood Pressure Measurement Compound Value – Systolic (kPa)
		        • This field is not included
		      vi. Field: Blood Pressure Measurement Compound Value – Diastolic (kPa)
		        • This field is not included
		      vii. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (kPa)
		        • This field is not included
		      viii. Field: Time Stamp
		        • Format: Date and Time
		        • Value: Not relevant
		      ix. Field: Pulse Rate
		        • This field is not included
		      x. Field: User ID
		        • This field is not included
		      xi. Field: Measurement Status
		        • This field is not included
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test.
		 5. Check in manager transcoder output for the Systolic/Diastolic/Map compound numeric object – Metric-Structure-Small attribute.

Pass/Fail criteria		In step 5, the Systolic/Diastolic/Map compound numeric object – Metric-Structure-Small attribute is present and its value is {0x03, 0x03} (ms-struct-compound-fix, 3).

Notes		Possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Metric-Spec-Small attribute is present:
		   ❑ Object: Systolic/Diastolic/Map compound numeric object
		   ❑ Attribute-id: MDC_ATTR_METRIC_STRUCT_SMALL (2675)
		   ❑ Attribute-type: SEQUENCE {ms-struct (INT-U8), ms-comp-no (INT-U8)}
		   ❑ Attribute-value:
		      • ms-struct Element: 03 (hex), ms-struct-compound-fix(3)
		      • ms-comp-no Element: 03 (hex)
		 b) WAN PCD-01 message
		 PCD-01 message does not include segments with a Metric-Structure-Small attribute value.

TP Id		TP/LP-PAN/MAN/PHDTW/BPM/BV-008
TP label		Whitepaper. Systolic/Diastolic/Map Compound Numeric Object - Metric-Id-List Attribute
Coverage	Spec	[b-Bluetooth PHDT v1.3]
	Testable items	BP Numeric 5; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_003
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Blood pressure profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		   a. Blood pressure measurement (0x2A35)
		     i. Field: Flags
		       • Format: 8 bit
		       • Value: 0000 0010 (MSB → LSB). Blood pressure measurement value in units of mmHg and Time Stamp fields are included, Pulse Rate, User ID and measurement Status fields are not included
		     ii. Field: Blood Pressure Measurement Compound Value – Systolic (mmHg)
		       • Format: SFLOAT
		       • Value: Not relevant
		     iii. Field: Blood Pressure Measurement Compound Value – Diastolic (mmHg)
		       • Format: SFLOAT
		       • Value: Not relevant
		     iv. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (mmHg)
		       • Format: SFLOAT
		       • Value: Not relevant
		     v. Field: Blood Pressure Measurement Compound Value – Systolic (kPa)
		       • This field is not included
		     vi. Field: Blood Pressure Measurement Compound Value – Diastolic (kPa)
		       • This field is not included
		     vii. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (kPa)
		       • This field is not included
		     viii. Field: Time Stamp
		       • Format: Date and Time
		       • Value: Not relevant
		     ix. Field: Pulse Rate
		       • This field is not included
		     x. Field: User ID
		       • This field is not included
		     xi. Field: Measurement Status
		       • This field is not included
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test.
		 5. Check in manager transcoder output for the Systolic/Diastolic/Map compound numeric object – Metric-Id-List attribute.

Pass/Fail criteria		In step 5, the Systolic/Diastolic/Map compound numeric object – Metric-Id-List attribute is present and its value is {MDC_PRESS_BLD_NONINV_SYS, MDC_PRESS_BLD_NONINV_DIA, MDC_PRESS_BLD_NONINV_MEAN}.

Notes		Possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Metric-Id-List attribute is present:
		  ❑ Object: Systolic/Diastolic/Map compound numeric object
		  ❑ Attribute-id: MDC_ATTR_ID_PHYSIO_LIST (2678)
		  ❑ Attribute-type: SEQUENCE OF [{OID-Type(INT-U16)}]
		  ❑ Attribute-value: 00 03 00 06 4A 05 4A 06 4A 07 (hex) [Note that 0x00 0x03 is the number of elements in the sequence and 0x00 06 is the length of the sequence]
		     i. First Element: 4A 05 (hex) or 18949 (dec)
		     ii. Second Element: 4A 06 (hex) or 18950 (dec)
		     iii. Third Element: 4A 07 (hex) or 18951 (dec)
		 b) WAN PCD-01 message
		 PCD-01 message includes three segments like these with a Metric-Id-List attribute values (check OBX-3 in three segments):
		 OBX|?|NM|150021^MDC_PRESS_BLD_NONINV_SYS^MDC|1.0.a.x|100|
		  266016^MDC_DIM_MMHG^MDC|||||R
		 OBX|?|NM|150022^MDC_PRESS_BLD_NONINV_DIA^MDC|1.0.a.y|70|
		  266016^MDC_DIM_MMHG^MDC|||||R
		 OBX|?|NM|150023^MDC_PRESS_BLD_NONINV_MEAN^MDC|1.0.a.z|80|
		  266016^MDC_DIM_MMHG^MDC|||||R

TP Id		TP/LP-PAN/MAN/PHDTW/BP/BV-009		
TP label		Whitepaper. Systolic/Diastolic/Map Compound Numeric Object - Unit-Code Attribute		
Coverage	**Spec**	[b-Bluetooth PHDT v1.3]		
	Testable items	BP Numeric 6; M	BP Numeric 7; M	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_003		
Initial condition		The manager under test and the simulated agent are in the standby state		

Test procedure		1. The simulated agent is configured with a profile (device specialization) supported by the manager under test; it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		    a. Blood pressure measurement (0x2A35)
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test with the following value:
		    a. Blood pressure measurement (0x2A35)
		      i. Field: Flags
		        • Format: 8 bit
		        • Value: 0000 0010 (MSB → LSB). Blood pressure measurement value in units of mmHg and Time Stamp fields are included, Pulse Rate, User ID and measurement Status fields are not included
		      ii. Field: Blood Pressure Measurement Compound Value – Systolic (mmHg)
		        • Format: SFLOAT
		        • Value: 100.0
		      iii. Field: Blood Pressure Measurement Compound Value – Diastolic (mmHg)
		        • Format: SFLOAT
		        • Value: 70.0
		      iv. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (mmHg)
		        • Format: SFLOAT
		        • Value: 80.0
		      v. Field: Blood Pressure Measurement Compound Value – Systolic (kPa)
		        • This field is not included
		      vi. Field: Blood Pressure Measurement Compound Value – Diastolic (kPa)
		        • This field is not included
		      vii. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (kPa)
		        • This field is not included
		      viii. Field: Time Stamp
		        • Format: Date and Time
		        • Value: Not relevant
		      ix. Field: Pulse Rate
		        • This field is not included
		      x. Field: User ID
		        • This field is not included
		      xi. Field: Measurement Status
		        • This field is not included
		5. Check in manager transcoder output for the Systolic/Diastolic/Map compound numeric object – Unit-Code attribute.
		6. The simulated agent sends the measurement to the manager under test with the following value:
		    a. Blood pressure measurement (0x2A35)
		      i. Field: Flags
		        • Format: 8 bit
		        • Value: 0000 0011 (MSB → LSB). Blood pressure measurement value in units of kPa and Time Stamp fields are included, Pulse Rate, User ID and measurement Status fields are not included
		      ii. Field: Blood Pressure Measurement Compound Value – Systolic (mmHg)
		        • This field is not included
		      iii. Field: Blood Pressure Measurement Compound Value – Diastolic (mmHg)
		        • This field is not included

<table>
<tr><td></td><td>

   iv. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (mmHg)
- This field is not included

   v. Field: Blood Pressure Measurement Compound Value – Systolic (kPa)
- Format: SFLOAT
- Value: 13.33

   vi. Field: Blood Pressure Measurement Compound Value – Diastolic (kPa)
- Format: SFLOAT
- Value: 9.33

   vii. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (kPa)
- Format: SFLOAT
- Value: 10.67

   viii. Field: Time Stamp
- Format: Date and Time
- Value: Not relevant

   ix. Field: Pulse Rate
- This field is not included

   x. Field: User ID
- This field is not included

   xi. Field: Measurement Status
- This field is not included

7. Check in manager transcoder output for the Systolic/Diastolic/Map compound numeric object – Unit-Code attribute.

</td></tr>
<tr><td>Pass/Fail criteria</td><td>

In step 5, the Systolic/Diastolic/Map compound numeric object – Unit-Code attribute is present and its value is MDC_DIM_MMHG.

In step 7, the Systolic/Diastolic/Map compound numeric object – Unit-Code attribute is present and its value is MDC_DIM_KILO_PASCAL.

</td></tr>
<tr><td>Notes</td><td>

In step 5, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Unit-Code attribute is present:
- ❑ Object: Systolic/Diastolic/Map compound numeric object
- ❑ Attribute-id: MDC_ATTR_UNIT_CODE (2454)
- ❑ Attribute-type: INT-U16
- ❑ Attribute-value: MDC_DIM_MMHG or 3872 (dec) or 0F 20 (hex)

b) WAN PCD-01 message

PCD-01 message includes three segments like these with Unit-Code attribute value (check OBX-6 in three segments):

OBX|?|NM|150021^MDC_PRESS_BLD_NONINV_SYS^MDC|1.0.a.x|100|
  266016^MDC_DIM_MMHG^MDC|||||R|||[current_date_time]
OBX|?|NM|150022^MDC_PRESS_BLD_NONINV_DIA^MDC|1.0.a.y|70|
  266016^MDC_DIM_MMHG^MDC|||||R|||[current_date_time]
OBX|?|NM|150023^MDC_PRESS_BLD_NONINV_MEAN^MDC|1.0.a.z|80|
  266016^MDC_DIM_MMHG^MDC|||||R|||[current_date_time]

Note that "|||[current_date_time]" is optional at the end of each segment because the date and time can be specified in the parent segment (OBX|?||150020^MDC_PRESS_BLD_NONINV^MDC|1.0.a|||||||X|||[current_date_time])

In step 7, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Unit-Code attribute is present:
- ❑ Object: Systolic/Diastolic/Map compound numeric object
- ❑ Attribute-id: MDC_ATTR_UNIT_CODE (2454)
- ❑ Attribute-type: INT-U16
- ❑ Attribute-value: MDC_DIM_KILO_PASCAL or 3843 (dec) or 0F 03 (hex)

b) WAN PCD-01 message

PCD-01 message includes three segments like these with Unit-Code attribute value (check OBX-6 in three segments):

OBX|?|NM|150021^MDC_PRESS_BLD_NONINV_SYS^MDC|1.0.a.x|13.33|
  265987^MDC_DIM_KILO_PASCAL^MDC|||||R|||[current_date_time]
OBX|?|NM|150022^MDC_PRESS_BLD_NONINV_DIA^MDC|1.0.a.y|9.33|
  265987^MDC_DIM_KILO_PASCAL^MDC|||||R|||[current_date_time]
OBX|?|NM|150023^MDC_PRESS_BLD_NONINV_MEAN^MDC|1.0.a.z|10.67|
  265987^MDC_DIM_KILO_PASCAL^MDC|||||R|||[current_date_time]

Note that "|||[current_date_time]" is optional at the end of each segment because the date and time can be specified in the parent segment (OBX|?||150020^MDC_PRESS_BLD_NONINV^MDC|1.0.a|||||||X|||[current_date_time])

</td></tr>
</table>

TP Id		TP/LP-PAN/MAN/PHDTW/BPM/BV-010		
TP label		Whitepaper. Systolic/Diastolic/Map Compound Numeric Object - Absolute-Time-Stamp Attribute		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	BP Numeric 9; M	Date-Time Conv 2; M	Date-Time Conv 3; M
		Date-Time Conv 4; M	Date-Time Conv 5; M	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_003		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a profile (device specialization) supported by the manager under test; it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		 a. Blood pessure measurement (0x2A35)
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state)
		 4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test with the following value:
		 a. Blood pressure measurement (0x2A35)
		     i. Field: Flags
		       • Format: 8 bit
		       • Value: 0000 0010 (MSB → LSB). Blood pressure measurement value in units of mmHg and Time Stamp fields are included, Pulse Rate, User ID and measurement Status fields are not included
		     ii. Field: Blood Pressure Measurement Compound Value – Systolic (mmHg)
		       • Format: SFLOAT
		       • Value: 100.0
		     iii. Field: Blood Pressure Measurement Compound Value – Diastolic (mmHg)
		       • Format: SFLOAT
		       • Value: 70.0
		     iv. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (mmHg)
		       • Format: SFLOAT
		       • Value: 80.0
		     v. Field: Blood Pressure Measurement Compound Value – Systolic (kPa)
		       • This field is not included
		     vi. Field: Blood Pressure Measurement Compound Value – Diastolic (kPa)
		       • This field is not included
		     vii. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (kPa)
		       • This field is not included
		     viii. Field: Time Stamp
		       • Format: Date and Time
		       • Value: August 2nd, 2012, 10:39:27
		     ix. Field: Pulse Rate
		       • This field is not included
		     x. Field: User ID
		       • This field is not included
		     xi. Field: Measurement Status
		       • This field is not included
		 5. Check in manager transcoder output for the Systolic/Diastolic/Map compound numeric object – Absolute-Time-Stamp attribute		

Pass/Fail criteria		In step 5, the Systolic/Diastolic/Map compound numeric object – Absolute-Time-Stamp attribute is present, its value matches with the Time Stamp field of the Blood pressure measurement characteristic and the fraction of seconds is set to 0.		

Notes		Possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Absolute-Time-Stamp attribute is present:
		 ❑ Object: Systolic/Diastolic/Map compound numeric object
		 ❑ Attribute-id: MDC_ATTR_TIME_STAMP_ABS (2448)
		 ❑ Attribute-type: SEQUENCE {century (INT-U8), year (INT-U8), month (INT-U8), day (INT-U8), hour (INT-U8), minute (INT-U8), second (INT-U8), sec-fractions (INT-U8)} (BCD encoding)
		 ❑ Attribute-value:
		    • century: 20 (hex) or 32 (dec)
		    • year: 12 (hex) or 18 (dec)
		    • month: 08 (hex) or 8 (dec)
		    • day: 02 (hex) or 2 (dec)
		    • hour: 10 (hex) or 16 (dec)
		    • minute: 39 (hex) or 57 (dec)
		    • second: 27 (hex) or 39 (dec)
		    • sec-fractions: 00 (hex) or 0 (dec)
		 b) WAN PCD-01 message
		 PCD-01 message includes a segment like this with Absolute-Time-Stamp attribute value (check OBX-14):
		 OBX|?||150020^MDC_PRESS_BLD_NONINV^MDC|1.0.a||||||||X|||20120802103927+0000		

TP Id		TP/LP-PAN/MAN/PHDTW/BPM/BV-011		
TP label		Whitepaper. Systolic/Diastolic/Map Compound Numeric Object - Compound-Basic-Nu-Observed-Value Attribute 1		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	BP Numeric 10; M	Short Float Type 1; C	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_003		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a profile (device specialization) supported by the manager under test; it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		
		a. Blood pressure measurement (0x2A35)
		
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		
		4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test with the following value:
		
		a. Blood pressure measurement (0x2A35)
		
		   i. Field: Flags
		     • Format: 8 bit
		     • Value: 0000 0010 (MSB → LSB). Blood pressure measurement value in units of mmHg and Time Stamp fields are included, Pulse Rate, User ID and measurement Status fields are not included
		
		   ii. Field: Blood Pressure Measurement Compound Value – Systolic (mmHg)
		     • Format: SFLOAT
		     • Value: 100.0
		
		   iii. Field: Blood Pressure Measurement Compound Value – Diastolic (mmHg)
		     • Format: SFLOAT
		     • Value: 70.0
		
		   iv. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (mmHg)
		     • Format: SFLOAT
		     • Value: 80.0
		
		   v. Field: Blood Pressure Measurement Compound Value – Systolic (kPa)
		     • This field is not included
		
		   vi. Field: Blood Pressure Measurement Compound Value – Diastolic (kPa)
		     • This field is not included
		
		   vii. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (kPa)
		     • This field is not included
		
		   viii. Field: Time Stamp
		     • Format: Date and Time
		     • Value: Not relevant
		
		   ix. Field: Pulse Rate
		     • This field is not included
		
		   x. Field: User ID
		     • This field is not included
		
		   xi. Field: Measurement Status
		     • This field is not included		

	5. Check in manager transcoder output for the Systolic/Diastolic/Map compound numeric object – Compound-Basic-Nu-Observed-Value attribute.
	6. The simulated agent sends the measurement to the manager under test with the following value:
	a. Blood pressure measurement (0x2A35)
	i. Field: Flags
	• Format: 8 bit
	• Value: 0000 0011 (MSB → LSB). Blood pressure measurement value in units of kPa, Time Stamp field is included and Pulse Rate, User ID and measurement Status fields are not included
	ii. Field: Blood Pressure Measurement Compound Value – Systolic (mmHg)
	• This field is not included
	iii. Field: Blood Pressure Measurement Compound Value – Diastolic (mmHg)
	• This field is not included
	iv. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (mmHg)
	• This field is not included
	v. Field: Blood Pressure Measurement Compound Value – Systolic (kPa)
	• Format: SFLOAT
	• Value: 13.33
	vi. Field: Blood Pressure Measurement Compound Value – Diastolic (kPa)
	• Format: SFLOAT
	• Value: 9.33
	vii. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (kPa)
	viii. Format: SFLOAT
	• Value: 10.67
	ix. Field: Time Stamp
	• Format: Date and Time
	• Value: Not relevant
	x. Field: Pulse Rate
	• This field is not included
	xi. Field: User ID
	• This field is not included
	xii. Field: Measurement Status
	• This field is not included
	7. Check in manager transcoder output for the Systolic/Diastolic/Map compound numeric object – Compound-Basic-Nu-Observed-Value attribute.
Pass/Fail criteria	In step 5, the Systolic/Diastolic/Map compound numeric object – Compound-Basic-Nu-Observed-Value attribute is present and its value matches with the blood pressure measurement value (mmHg) fields of the Blood pressure measurement characteristic (Systolic: 100.0, Diastolic:70.0, MAP: 80.0).
	In step 7, the Systolic/Diastolic/Map compound numeric object – Compound-Basic-Nu-Observed-Value attribute is present and its value matches with the blood pressure measurement value (kPa) fields of the Blood pressure measurement characteristic (Systolic: 13.33, Diastolic:9.33, MAP: 10.67).

Notes	Possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Compound-Basic-Nu-Observed-Value attribute is present: ❑ Object: Systolic/Diastolic/Map compound numeric object ❑ Attribute-id: MDC_ATTR_NU_CMPD_VAL_OBS_BASIC (2677) ❑ Attribute-type: SEQUENCE OF [{SFLOAT}] ❑ Attribute-value: 00 03 00 06 xx xx yy yy zz zz (hex), where 'xx xx' is the Systolic value, 'yy yy' is the Diastolic value and 'zz zz' is the MAP value [Note that 0x00 0x03 is the number of elements in the sequence and 0x00 06 is the length of the sequence] • Systolic: F3 E8 (hex) or 00 64 (hex) or 10 0A (hex) or 20 01 (hex) or 100.0 (dec) • Diastolic: F2 BC (hex) or 00 46 (hex) or 10 07 (hex) or 70.0 (dec) • MAP: F3 20 (hex) or 00 50 (hex) or 10 08 (hex) or 80.0 (dec) b) WAN PCD-01 message PCD-01 message includes three segments like these with a Simple-Nu-Observed-Value attribute value (check OBX-5): OBX|?|NM|150021^MDC_PRESS_BLD_NONINV_SYS^MDC|1.0.a.x|100| 266016^MDC_DIM_MMHG^MDC|||||R|||[current_date_time] OBX|?|NM|150022^MDC_PRESS_BLD_NONINV_DIA^MDC|1.0.a.y|70| 266016^MDC_DIM_MMHG^MDC|||||R|||[current_date_time] OBX|?|NM|150023^MDC_PRESS_BLD_NONINV_MEAN^MDC|1.0.a.z|80| 266016^MDC_DIM_MMHG^MDC|||||R|||[current_date_time] Note that "|||[current_date_time]" is optional at the end of each segment because the date and time can be specified in the parent segment (OBX|?||150020^MDC_PRESS_BLD_NONINV^MDC|1.0.a|||||||X|||[current_date_time]) In step 7, possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Simple-Nu-Observed-Value attribute is present: ❑ Object: Systolic/Diastolic/Map compound numeric object ❑ Attribute-id: MDC_ATTR_NU_CMPD_VAL_OBS_BASIC (2677) ❑ Attribute-type: SEQUENCE OF [{SFLOAT}] ❑ Attribute-value: 00 03 00 06 E5 35 E3 A5 E4 2B (hex) [Note that 0x00 0x03 is the number of elements in the sequence and 0x00 06 is the length of the sequence] • Systolic: E5 35 (hex) or 13.33 (dec) • Diastolic: E3 A5 (hex) 9.33 (dec) • MAP: E4 2B (hex) 10.67 (dec) b) WAN PCD-01 message PCD-01 message includes three segments like these with a Simple-Nu-Observed-Value attribute value (check OBX-5): OBX|?|NM|150021^MDC_PRESS_BLD_NONINV_SYS^MDC|1.0.a.x|13.33| 265987^MDC_DIM_KILO_PASCAL^MDC|||||R|||[current_date_time] OBX|?|NM|150022^MDC_PRESS_BLD_NONINV_DIA^MDC|1.0.a.y|9.33| 265987^MDC_DIM_KILO_PASCAL^MDC|||||R|||[current_date_time] OBX|?|NM|150023^MDC_PRESS_BLD_NONINV_MEAN^MDC|1.0.a.z|10.67| 265987^MDC_DIM_KILO_PASCAL^MDC|||||R|||[current_date_time] Note that "|||[current_date_time]" is optional at the end of each segment because the date and time can be specified in the parent segment(OBX|?||150020^MDC_PRESS_BLD_NONINV^MDC|1.0.a|||||||X|||[current_date_time])

TP Id		TP/LP-PAN/MAN/PHDTW/BPM/BV-012		
TP label		Whitepaper. Systolic/Diastolic/Map Compound Numeric Object - Compound-Basic-Nu-Observed-Value Attribute 2		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	BP Numeric 10; M	Short Float Type 1; C	Short Float Type 2; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_003		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a profile (device specialization) supported by the manager under test; it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		
		   a. Blood pressure measurement (0x2A35)
		
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		
		4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test with the following value:
		
		   a. Blood pressure measurement (0x2A35)
		
		     i. Field: Flags
		       • Format: 8 bit
		       • Value: 0000 0010 (MSB → LSB). Blood pressure measurement value in units of mmHg and Time Stamp fields are included, Pulse Rate, User ID and measurement Status fields are not included
		
		     ii. Field: Blood Pressure Measurement Compound Value – Systolic (mmHg)
		       • Format: SFLOAT
		       • Value: 100.0
		
		     iii. Field: Blood Pressure Measurement Compound Value – Diastolic (mmHg)
		       • Format: SFLOAT
		       • Value: 70.0
		
		     iv. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (mmHg)
		       • Format: SFLOAT
		       • Value: 80.0
		
		     v. Field: Blood Pressure Measurement Compound Value – Systolic (kPa)
		       • This field is not included
		
		     vi. Field: Blood Pressure Measurement Compound Value – Diastolic (kPa)
		       • This field is not included
		
		     vii. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (kPa)
		       • This field is not included
		
		     viii. Field: Time Stamp
		       • Format: Date and Time
		       • Value: Not relevant
		
		     ix. Field: Pulse Rate
		       • This field is not included
		
		     x. Field: User ID
		       • This field is not included
		
		     xi. Field: Measurement Status
		       • This field is not included
		
		5. Check in manager transcoder output for the Systolic/Diastolic/Map compound numeric object – Compound-Basic-Nu-Observed-Value attribute.

6. The simulated agent sends the measurement to the manager under test with the following value:

    a. Blood pressure measurement (0x2A35)

        i. Field: Flags

            - Format: 8 bit

            - Value: 0000 0010 (MSB → LSB). Blood pressure measurement value in units of mmHg and Time Stamp fields are included, Pulse Rate, User ID and measurement Status fields are not included

        ii. Field: Blood Pressure Measurement Compound Value – Systolic (mmHg)

            - Format: SFLOAT

            - Value: 07 FF (hex). Special value: NaN

        iii. Field: Blood Pressure Measurement Compound Value – Diastolic (mmHg)

            - Format: SFLOAT

            - Value: 07 FF (hex). Special value: NaN

        iv. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (mmHg)

            - Format: SFLOAT

            - Value: 07 FF (hex). Special value: NaN

        v. Field: Blood Pressure Measurement Compound Value – Systolic (kPa)

            - This field is not included

        vi. Field: Blood Pressure Measurement Compound Value – Diastolic (kPa)

            - This field is not included

        vii. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (kPa)

            - This field is not included

        viii. Field: Time Stamp

            - Format: Date and Time

            - Value: Not relevant

        ix. Field: Pulse Rate

            - This field is not included

        x. Field: User ID

            - This field is not included

        xi. Field: Measurement Status

            - This field is not included

7. Check in manager transcoder output for the Systolic/Diastolic/Map compound numeric object – Compound-Basic-Nu-Observed-Value attribute.

8. The simulated agent sends the measurement to the manager under test with the following value:

    a. Blood pressure measurement (0x2A35)

        i. Field: Flags

            - Format: 8 bit

            - Value: 0000 0010 (MSB → LSB). Blood pressure measurement value in units of mmHg and Time Stamp fields are included, Pulse Rate, User ID and measurement Status fields are not included

        ii. Field: Blood Pressure Measurement Compound Value – Systolic (mmHg)

            - Format: SFLOAT

            - Value: 08 00 (hex). Special value: NRes

        iii. Field: Blood Pressure Measurement Compound Value – Diastolic (mmHg)

            - Format: SFLOAT

            - Value: 08 00 (hex). Special value: NRes

        iv. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (mmHg)

- Format: SFLOAT
- Value: 08 00 (hex). Special value: NRes

    v. Field: Blood Pressure Measurement Compound Value – Systolic (kPa)

- This field is not included

    vi. Field: Blood Pressure Measurement Compound Value – Diastolic (kPa)

- This field is not included

    vii. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (kPa)

- This field is not included

    viii. Field: Time Stamp

- Format: Date and Time
- Value: Not relevant

    ix. Field: Pulse Rate

- This field is not included

    x. Field: User ID

- This field is not included

    xi. Field: Measurement Status

- This field is not included

9. Check in manager transcoder output for the Systolic/Diastolic/Map compound numeric object – Compound-Basic-Nu-Observed-Value attribute.

10. The simulated agent sends the measurement to the manager under test with the following value:

    a. Blood pressure measurement (0x2A35)

      i. Field: Flags

- Format: 8 bit
- Value: 0000 0010 (MSB → LSB). Blood pressure measurement value in units of mmHg and Time Stamp fields are included, Pulse Rate, User ID and measurement Status fields are not included

      ii. Field: Blood Pressure Measurement Compound Value – Systolic (mmHg)

- Format: SFLOAT
- Value: 07 FE (hex). Special value: +INFINITY

      iii. Field: Blood Pressure Measurement Compound Value – Diastolic (mmHg)

- Format: SFLOAT
- Value: 07 FE (hex). Special value: +INFINITY

      iv. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (mmHg)

- Format: SFLOAT
- Value: 07 FE (hex). Special value: +INFINITY

      v. Field: Blood Pressure Measurement Compound Value – Systolic (kPa)

- This field is not included

      vi. Field: Blood Pressure Measurement Compound Value – Diastolic (kPa)

- This field is not included

      vii. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (kPa)

- This field is not included

      viii. Field: Time Stamp

- Format: Date and Time
- Value: Not relevant

      ix. Field: Pulse Rate

- This field is not included

      x. Field: User ID

<table>
<tr><td></td><td>

- This field is not included

  xi. Field: Measurement Status

- This field is not included

11. Check in manager transcoder output for the Systolic/Diastolic/Map compound numeric object – Compound-Basic-Nu-Observed-Value attribute.

12. The simulated agent sends the measurement to the manager under test with the following value:

  a. Blood pressure measurement (0x2A35)

    i. Field: Flags

- Format: 8 bit
- Value: 0000 0010 (MSB → LSB). Blood pressure measurement value in units of mmHg and Time Stamp fields are included, Pulse Rate, User ID and measurement Status fields are not included

    ii. Field: Blood Pressure Measurement Compound Value – Systolic (mmHg)

- Format: SFLOAT
- Value: 08 02 (hex). Special value: -INFINITY

    iii. Field: Blood Pressure Measurement Compound Value – Diastolic (mmHg)

- Format: SFLOAT
- Value: 08 02 (hex). Special value: -INFINITY

    iv. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (mmHg)

- Format: SFLOAT
- Value: 08 02 (hex). Special value: -INFINITY

    v. Field: Blood Pressure Measurement Compound Value – Systolic (kPa)

- This field is not included

    vi. Field: Blood Pressure Measurement Compound Value – Diastolic (kPa)

- This field is not included

    vii. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (kPa)

- This field is not included

    viii. Field: Time Stamp

- Format: Date and Time
- Value: Not relevant

    ix. Field: Pulse Rate

- This field is not included

    x. Field: User ID

- This field is not included

    xi. Field: Measurement Status

- This field is not included

13. Check in manager transcoder output for the Systolic/Diastolic/Map compound numeric object – Compound-Basic-Nu-Observed-Value attribute.

</td></tr>
<tr><td>**Pass/Fail criteria**</td><td>

In step 5, the Systolic/Diastolic/Map compound numeric object – Compound-Basic-Nu-Observed-Value attribute is present and its value is 100.0 for Systolic, 70.0 for Diastolic and 80.0 for MAP.

In step 7, the Systolic/Diastolic/Map compound numeric object – Compound-Basic-Nu-Observed-Value attribute is present and its value is 0x07FF for Systolic, Diastolic and MAP.

In step 9, the Systolic/Diastolic/Map compound numeric object – Compound-Basic-Nu-Observed-Value attribute is present and its value is 0x0800 for Systolic, Diastolic and MAP.

In step 11, the Systolic/Diastolic/Map compound numeric object – Compound-Basic-Nu-Observed-Value attribute is present and its value is 0x07FE for Systolic, Diastolic and MAP.

In step 13, the Systolic/Diastolic/Map compound numeric object – Compound-Basic-Nu-Observed-Value attribute is present and its value is 0x0802 for Systolic, Diastolic and MAP.

</td></tr>
<tr><td>**Notes**</td><td>In step 5, possible values in typical points of observation after transcoder output are:</td></tr>
</table>

	a) IEEE 11073 Objects and Attributes
	Compound-Basic-Nu-Observed-Value attribute is present:
	❑ Systolic/Diastolic/Map compound numeric object
	❑ Attribute-id: MDC_ATTR_NU_CMPD_VAL_OBS_BASIC (2677)
	❑ Attribute-type: SEQUENCE OF [{SFLOAT}]
	❑ Attribute-value: 00 03 00 06 xx xx yy yy zz zz (hex), where 'xx xx' is the Systolic value, 'yy yy' is the Diastolic value and 'zz zz' is the MAP value [Note that 0x00 0x03 is the number of elements in the sequence and 0x00 06 is the length of the sequence]
	• Systolic: F3 E8 (hex) or 00 64 (hex) or 10 0A (hex) or 20 01 (hex) or 100.0 (dec)
	• Diastolic: F2 BC (hex) or 00 46 (hex) or 10 07 (hex) or 70.0 (dec)
	• MAP: F3 20 (hex) or 00 50 (hex) or 10 08 (hex) or 80.0 (dec)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with a Simple-Nu-Observed-Value attribute value (check OBX-5):
	OBX|?|NM|150021^MDC_PRESS_BLD_NONINV_SYS^MDC|1.0.a.x|100|
	266016^MDC_DIM_MMHG^MDC|||||R|||[current_date_time]
	OBX|?|NM|150022^MDC_PRESS_BLD_NONINV_DIA^MDC|1.0.a.y|70|
	266016^MDC_DIM_MMHG^MDC|||||R|||[current_date_time]
	OBX|?|NM|150023^MDC_PRESS_BLD_NONINV_MEAN^MDC|1.0.a.z|80|
	266016^MDC_DIM_MMHG^MDC|||||R|||[current_date_time]
	Note that "|||[current_date_time]" is optional at the end of each segment because the date and time can be specified in the parent segment (OBX|?||150020^MDC_PRESS_BLD_NONINV^MDC|1.0.a|||||||X|||[current_date_time])
	In step 7, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Compound-Basic-Nu-Observed-Value attribute is present:
	❑ Systolic/Diastolic/Map compound numeric object
	❑ Attribute-id: MDC_ATTR_NU_CMPD_VAL_OBS_BASIC (2677)
	❑ Attribute-type: SEQUENCE OF [{SFLOAT}]
	❑ Attribute-value: 00 03 00 06 07 FF 07 FF 07 FF (hex) [Note that 0x00 0x03 is the number of elements in the sequence and 0x00 06 is the length of the sequence]
	• Systolic: 07 FF (hex) or NaN (note that is not allowed a decimal value)
	• Diastolic: 07 FF (hex) or NaN (note that is not allowed a decimal value)
	• MAP: 07 FF (hex) or NaN (note that is not allowed a decimal value)
	b) WAN PCD-01 message
	PCD-01 message does not include segments with a Simple-Nu-Observed-Value attribute value (150021^MDC_PRESS_BLD_NONINV_SYS^MDC, 150022^MDC_PRESS_BLD_NONINV_DIA^MDC and 150023^MDC_PRESS_BLD_NONINV_MEAN) because they have a special value and these values are not included in the PCD-01 message.
	In step 9, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Compound-Basic-Nu-Observed-Value attribute is present:
	❑ Systolic/Diastolic/Map compound numeric object
	❑ Attribute-id: MDC_ATTR_NU_CMPD_VAL_OBS_BASIC (2677)
	❑ Attribute-type: SEQUENCE OF [{SFLOAT}]
	❑ Attribute-value: 00 03 00 06 08 00 08 00 08 00(hex) [Note that 0x00 0x03 is the number of elements in the sequence and 0x00 06 is the length of the sequence]
	• Systolic: 08 00 (hex) or NRes (note that a decimal value is not allowed)
	• Diastolic: 08 00 (hex) or NRes (note that a decimal value is not allowed)
	• MAP: 08 00 (hex) or NRes (note that a decimal value is not allowed)

	b) WAN PCD-01 message
	PCD-01 message does not include segments with a Simple-Nu-Observed-Value attribute value (150021^MDC_PRESS_BLD_NONINV_SYS^MDC, 150022^MDC_PRESS_BLD_NONINV_DIA^MDC and 150023^MDC_PRESS_BLD_NONINV_MEAN) because they have a special value and these values are not included in the PCD-01 message.
	In step 11, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Compound-Basic-Nu-Observed-Value attribute is present:
	❑ Systolic/Diastolic/Map compound numeric object
	❑ Attribute-id: MDC_ATTR_NU_CMPD_VAL_OBS_BASIC (2677)
	❑ Attribute-type: SEQUENCE OF [{SFLOAT}]
	❑ Attribute-value: 00 03 00 06 07 FE 07 FE 07 FE (hex) [Note that 0x00 0x03 is the number of elements in the sequence and 0x00 06 is the length of the sequence]
	• Systolic: 07 FE (hex) or +INFINITY (note that a decimal value is not allowed)
	• Diastolic: 07 FE (hex) or +INFINITY (note that a decimal value is not allowed)
	• MAP: 07 FE (hex) or +INFINITY (note that a decimal value is not allowed)
	b) WAN PCD-01 message
	PCD-01 message does not include segments with a Simple-Nu-Observed-Value attribute value (150021^MDC_PRESS_BLD_NONINV_SYS^MDC, 150022^MDC_PRESS_BLD_NONINV_DIA^MDC and 150023^MDC_PRESS_BLD_NONINV_MEAN) because they have a special value and these values are not included in the PCD-01 message.
	In step 13, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Compound-Basic-Nu-Observed-Value attribute is present:
	❑ Systolic/Diastolic/Map compound numeric object
	❑ Attribute-id: MDC_ATTR_NU_CMPD_VAL_OBS_BASIC (2677)
	❑ Attribute-type: SEQUENCE OF [{SFLOAT}]
	❑ Attribute-value: 00 03 00 06 08 02 08 02 08 02 (hex) [Note that 0x00 0x03 is the number of elements in the sequence and 0x00 06 is the length of the sequence]
	• Systolic: 08 02 (hex) or -INFINITY (note that a decimal value is not allowed)
	• Diastolic: 08 02 (hex) or -INFINITY (note that a decimal value is not allowed)
	• MAP: 08 02 (hex) or -INFINITY (note that a decimal value is not allowed)
	b) WAN PCD-01 message
	PCD-01 message does not include segments with a Simple-Nu-Observed-Value attribute value (150021^MDC_PRESS_BLD_NONINV_SYS^MDC, 150022^MDC_PRESS_BLD_NONINV_DIA^MDC and 150023^MDC_PRESS_BLD_NONINV_MEAN) because they have a special value and these values are not included in the PCD-01 message.

TP Id		TP/LP-PAN/MAN/PHDTW/BPM/BV-013		
TP label		Whitepaper. Systolic/Diastolic/Map Compound Numeric Object - Blood Pressure measurement value		
Coverage	**Spec**	[b-Bluetooth PHDT v1.3]		
	Testable items	Short Float Type 1; C	Date-Time Conv 1; M	BP Numeric 9; M
		BP Numeric 10; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_003		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a profile (device specialization) supported by the manager under test; it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is: a. Blood pressure measurement (0x2A35) 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test with the following value: a. Blood pressure measurement (0x2A35) i. Field: Flags • Format: 8 bit • Value: 0000 0010 (MSB → LSB). Blood pressure measurement value in units of mmHg and Time Stamp fields are included, Pulse Rate, User ID and measurement Status fields are not included ii. Field: Blood Pressure Measurement Compound Value – Systolic (mmHg) • Format: SFLOAT • Value: 100.0 iii. Field: Blood Pressure Measurement Compound Value – Diastolic (mmHg) • Format: SFLOAT • Value: 70.0 iv. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (mmHg) • Format: SFLOAT • Value: 80.0 v. Field: Blood Pressure Measurement Compound Value – Systolic (kPa) • This field is not included vi. Field: Blood Pressure Measurement Compound Value – Diastolic (kPa) • This field is not included vii. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (kPa) • This field is not included viii. Field: Time Stamp • Format: Date and Time • Value: August 2nd, 2012, 11:08:25 ix. Field: Pulse Rate • This field is not included x. Field: User ID • This field is not included		

	xi. Field: Measurement Status
	• This field is not included
	5. Check that the manager accepts the measurement and decodes its value properly (measurement values, units and time stamp).
	6. The simulated agent sends the measurement to the manager under test with the following value:
	a. Blood pressure measurement (0x2A35)
	i. Field: Flags
	• Format: 8 bit
	• Value: 0000 0011 (MSB → LSB). Blood pressure measurement value in units of kPa and Time Stamp fields are included, Pulse Rate, User ID and measurement Status fields are not included
	ii. Field: Blood Pressure Measurement Compound Value – Systolic (mmHg)
	• This field is not included
	iii. Field: Blood Pressure Measurement Compound Value – Diastolic (mmHg)
	• This field is not included
	iv. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (mmHg)
	• This field is not included
	v. Field: Blood Pressure Measurement Compound Value – Systolic (kPa)
	• Format: SFLOAT
	• Value: 13.33
	vi. Field: Blood Pressure Measurement Compound Value – Diastolic (kPa)
	• Format: SFLOAT
	• Value: 9.33
	vii. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (kPa)
	• Format: SFLOAT
	• Value: 10.67
	viii. Field: Time Stamp
	• Format: Date and Time
	• Value: August 2nd, 2012, 11:09:05
	ix. Field: Pulse Rate
	• This field is not included
	x. Field: User ID
	• This field is not included
	xi. Field: Measurement Status
	• This field is not included
	7. Check that the manager under test accepts the measurement and decodes its value properly (measurement values, units and time stamp)
Pass/Fail criteria	In step 5, the manager under test shows the following measurement: 100.0 mmHg for Systolic, 70.0 mmHg for Diastolic and 80.0 mmHg for MAP, with the time stamp '2012-08-02 11:08:25'. In step 7, the manager under test shows the following measurement 13.33 kPa for Systolic, 9.33 kPa for Diastolic and 10.67 kPa for MAP, with the time stamp '2012-08-02 11:09:05'.
Notes	

TP Id		TP/LP-PAN/MAN/PHDTW/BPM/BV-014
TP label		Whitepaper. Pulse Rate Object - Handle Attribute
Coverage	Spec	[b-Bluetooth PHDT v1.3]
	Testable items	PR Numeric 1; O
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_003 AND C_MAN_BLE_005
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Blood pressure profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		    a. Blood pressure measurement (0x2A35)
		      i. Field: Flags
		        • Format: 8 bit
		        • Value: 0000 0110 (MSB → LSB). Blood pressure measurement value in units of mmHg, Time Stamp and Pulse Rate fields are included, User ID and measurement Status fields are not included
		      ii. Field: Blood Pressure Measurement Compound Value – Systolic (mmHg)
		        • Format: SFLOAT
		        • Value: Not relevant
		      iii. Field: Blood Pressure Measurement Compound Value – Diastolic (mmHg)
		        • Format: SFLOAT
		        • Value: Not relevant
		      iv. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (mmHg)
		        • Format: SFLOAT
		        • Value: Not relevant
		      v. Field: Blood Pressure Measurement Compound Value – Systolic (kPa)
		        • This field is not included
		      vi. Field: Blood Pressure Measurement Compound Value – Diastolic (kPa)
		        • This field is not included
		      vii. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (kPa)
		        • This field is not included
		      viii. Field: Time Stamp
		        • Format: Date and Time
		        • Value: Not relevant
		      ix. Field: Pulse Rate
		        • Format: SFLOAT
		        • Value: Not relevant
		      x. Field: User ID
		        • This field is not included
		      xi. Field: Measurement Status
		        • This field is not included
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test.
		 5. Check in manager transcoder output for the Pulse rate object – Handle attribute.

Pass/Fail criteria		In step 5, the Pulse rate object – Handle attribute is not present; however, if it is present then its value is different to 0.

Notes		Possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Handle attribute is not present, or if it is present then:
		   ❑ Object: Pulse rate object
		   ❑ Attribute-id: MDC_ATTR_ID_HANDLE (2337)
		   ❑ Attribute-type: INT-U16
		   ❑ Attribute-value: Any value other than 0
		 b) WAN PCD-01 message
		 PCD-01 message does not include segments with a Handle attribute value.

TP Id		TP/LP-PAN/MAN/PHDTW/BPM/BV-015
TP label		Whitepaper. Pulse Rate Object - Type Attribute
Coverage	Spec	[b-Bluetooth PHDT v1.3]
	Testable items	PR Numeric 2; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_003 AND C_MAN_BLE_005
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Blood pressure profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		    a. Blood pressure measurement (0x2A35)
		      i. Field: Flags
		        • Format: 8 bit
		        • Value: 0000 0110 (MSB → LSB). Blood pressure measurement value in units of mmHg, Time Stamp and Pulse Rate fields are included, User ID and measurement Status fields are not included
		      ii. Field: Blood Pressure Measurement Compound Value – Systolic (mmHg)
		        • Format: SFLOAT
		        • Value: Not relevant
		      iii. Field: Blood Pressure Measurement Compound Value – Diastolic (mmHg)
		        • Format: SFLOAT
		        • Value: Not relevant
		      iv. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (mmHg)
		        • Format: SFLOAT
		        • Value: Not relevant
		      v. Field: Blood Pressure Measurement Compound Value – Systolic (kPa)
		        • This field is not included
		      vi. Field: Blood Pressure Measurement Compound Value – Diastolic (kPa)
		        • This field is not included
		      vii. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (kPa)
		        • This field is not included
		      viii. Field: Time Stamp
		        • Format: Date and Time
		        • Value: Not relevant
		      ix. Field: Pulse Rate
		        • Format: SFLOAT
		        • Value: Not relevant
		      x. Field: User ID
		        • This field is not included
		      xi. Field: Measurement Status
		        • This field is not included
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test.
		 4. Check in manager transcoder output for the Pulse rate object – Type attribute.

Pass/Fail criteria		In step 5, the Pulse rate object – Type attribute is present and its value is {MDC_PART_SCADA, MDC_PULS_RATE_NON_INV}

Notes		Possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Type attribute is present:
		 ❑ Object: Pulse rate object
		 ❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
		 ❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
		 ❑ Attribute-value:
		   • partition: MDC_PART_SCADA or 2 (dec) or 00 02 (hex)
		   • code: MDC_PULS_RATE_NON_INV or 18474 (dec) or 48 2A (hex)
		 b) WAN PCD-01 message
		 PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):
		 OBX|?|NM|49546^MDC_PULS_RATE_NON_INV^MDC|1.0.0.a|110|
		   264864^MDC_DIM_BEAT_PER_MIN^MDC|||||R||||[current_date_time]

TP Id		TP/LP-PAN/MAN/PHDTW/BPM/BV-016
TP label		Whitepaper. Pulse Rate Object - Metric-Spec-Small Attribute
Coverage	**Spec**	[b-Bluetooth PHDT v1.3]
	Testable items	PR Numeric 3; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_003 AND C_MAN_BLE_005
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Blood pressure profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		  a. Blood pressure measurement (0x2A35)
		    i. Field: Flags
		      • Format: 8 bit
		      • Value: 0000 0110 (MSB → LSB). Blood pressure measurement value in units of mmHg, Time Stamp and Pulse Rate fields are included, User ID and measurement Status fields are not included
		    ii. Field: Blood Pressure Measurement Compound Value – Systolic (mmHg)
		      • Format: SFLOAT
		      • Value: Not relevant
		    iii. Field: Blood Pressure Measurement Compound Value – Diastolic (mmHg)
		      • Format: SFLOAT
		      • Value: Not relevant
		    iv. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (mmHg)
		      • Format: SFLOAT
		      • Value: Not relevant
		    v. Field: Blood Pressure Measurement Compound Value – Systolic (kPa)
		      • This field is not included
		    vi. Field: Blood Pressure Measurement Compound Value – Diastolic (kPa)
		      • This field is not included
		    vii. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (kPa)
		      • This field is not included
		    viii. Field: Time Stamp
		      • Format: Date and Time
		      • Value: Not relevant
		    ix. Field: Pulse Rate
		      • Format: SFLOAT
		      • Value: Not relevant
		    x. Field: User ID
		      • This field is not included
		    xi. Field: Measurement Status
		      • This field is not included
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test.
		 5. Check in manager transcoder output for the Pulse rate object – Metric-Spec-Small attribute.

Pass/Fail criteria		In step 4, the Pulse rate object – Metric-Spec-Small attribute is present and its value is {0xF040} (mss-avail-intermittent | mss-avail-stored-data | mss-upd-aperiodic | mss-msmt-aperiodic | mss-acc-agent-initiated).

Notes		Possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Metric-Spec-Small attribute is present:
		  ❑ Object: Pulse rate object
		  ❑ Attribute-id: MDC_ATTR_METRIC_SPEC_SMALL (2630)
		  ❑ Attribute-type: BITS-16
		  ❑ Attribute-value: F0 40 (hex) or BITS mss-avail-intermittent(0), mss-avail-stored-data(1), mss-upd-aperiodic(2), mss-msmt-aperiodic(3), mss-acc-agent-initiated(9) set to TRUE and remaining BITS set to FALSE
		 b) WAN PCD-01 message
		 PCD-01 message does not include segments with a Metric-Spec-Small attribute value.

TP Id		TP/LP-PAN/MAN/PHDTW/BPM/BV-017
TP label		Whitepaper. Pulse Rate Object - Unit-Code Attribute
Coverage	Spec	[b-Bluetooth PHDT v1.3]
	Testable items	PR Numeric 4; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_003 AND C_MAN_BLE_005
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Blood pressure profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		 a. Blood pressure measurement (0x2A35)
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test with the following value:
		 a. Blood pressure measurement (0x2A35)
		     i. Field: Flags
		       • Format: 8 bit
		       • Value: 0000 0110 (MSB → LSB). Blood pressure measurement value in units of mmHg, Time Stamp field and Pulse Rate field are included, User ID and measurement Status fields are not included
		     ii. Field: Blood Pressure Measurement Compound Value – Systolic (mmHg)
		       • Format: SFLOAT
		       • Value: Not relevant
		     iii. Field: Blood Pressure Measurement Compound Value – Diastolic (mmHg)
		       • Format: SFLOAT
		       • Value: Not relevant
		     iv. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (mmHg)
		       • Format: SFLOAT
		       • Value: Not relevant
		     v. Field: Blood Pressure Measurement Compound Value – Systolic (kPa)
		       • This field is not included
		     vi. Field: Blood Pressure Measurement Compound Value – Diastolic (kPa)
		       • This field is not included
		     vii. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (kPa)
		       • This field is not included
		     viii. Field: Time Stamp
		       • Format: Date and Time
		       • Value: Not relevant
		     ix. Field: Pulse Rate
		       • Format: SFLOAT
		       • Value: 110.0
		     x. Field: User ID
		       • This field is not included
		     xi. Field: Measurement Status
		       • This field is not included
		 5. Check in manager transcoder output for the Pulse rate object – Unit-Code attribute.

Pass/Fail criteria		In step 5, the Pulse rate object – Unit-Code attribute is present and its value is MDC_DIM_BEAT_PER_MIN.

Notes		In step 5, possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Unit-Code attribute is present:
		    ❑ Object: Pulse rate object
		    ❑ Attribute-id: MDC_ATTR_UNIT_CODE (2454)
		    ❑ Attribute-type: INT-U16
		    ❑ Attribute-value: MDC_DIM_BEAT_PER_MIN or 2720 (dec) or 0A A0 (hex)
		 b) WAN PCD-01 message
		 PCD-01 message includes a segment like this with Unit-Code attribute value (check OBX-6):
		 OBX|?|NM|149546^ MDC_PULS_RATE_NON_INV ^MDC|1.0.0.a|110|
		   264864^MDC_DIM_BEAT_PER_MIN^MDC|||||R|||[current_date_time]

TP Id		TP/LP-PAN/MAN/PHDTW/BPM/BV-018		
TP label		Whitepaper. Pulse Rate Object - Absolute-Time-Stamp Attribute		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	PR Numeric 6; M	Date-Time Conv 2; M	Date-Time Conv 3; M
		Date-Time Conv 4; M	Date-Time Conv 5; M	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_003 AND C_MAN_BLE_005		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a Blood pressure profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is: a. Blood pressure measurement (0x2A35) 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test with the following value: a. Blood pressure measurement (0x2A35) i. Field: Flags • Format: 8 bit • Value: 0000 0110 (MSB → LSB). Blood pressure measurement value in units of mmHg, Time Stamp and Pulse Rate fields are included, User ID and measurement Status fields are not included ii. Field: Blood Pressure Measurement Compound Value – Systolic (mmHg) • Format: SFLOAT • Value: Not relevant iii. Field: Blood Pressure Measurement Compound Value – Diastolic (mmHg) • Format: SFLOAT • Value: Not relevant iv. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (mmHg) • Format: SFLOAT • Value: Not relevant v. Field: Blood Pressure Measurement Compound Value – Systolic (kPa) • This field is not included vi. Field: Blood Pressure Measurement Compound Value – Diastolic (kPa) • This field is not included vii. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (kPa) • This field is not included viii. Field: Time Stamp • Format: Date and Time • Value: August 2nd, 2012, 10:39:27 ix. Field: Pulse Rate • Format: SFLOAT • Value: 110.0 x. Field: User ID • This field is not included xi. Field: Measurement Status • This field is not included 5. Check in manager transcoder output for the SystolicPulse rate object – Absolute-Time-Stamp attribute.		
Pass/Fail criteria		In step 5, the Pulse rate object – Absolute-Time-Stamp attribute is present, its value matches with the Time Stamp field of the Blood pressure measurement characteristic and the fraction of seconds is set to 0.		
Notes		Possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Absolute-Time-Stamp attribute is present: ❑ Object: Pulse rate object ❑ Attribute-id: MDC_ATTR_TIME_STAMP_ABS (2448) ❑ Attribute-type: SEQUENCE {century (INT-U8), year (INT-U8), month (INT-U8), day (INT-U8), hour (INT-U8), minute (INT-U8), second (INT-U8), sec-fractions (INT-U8)} (BCD encoding) ❑ Attribute-value: • century: 20 (hex) or 32 (dec) • year: 12 (hex) or 18 (dec) • month: 08 (hex) or 8 (dec) • day: 02 (hex) or 2 (dec) • hour: 10 (hex) or 16 (dec) • minute: 39 (hex) or 57 (dec) • second: 27 (hex) or 39 (dec) • sec-fractions: 00 (hex) or 0 (dec) b) WAN PCD-01 message PCD-01 message includes a segment like this with Absolute-Time-Stamp attribute value (check OBX-14): OBX|?|NM|149546^ MDC_PULS_RATE_NON_INV ^MDC|1.0.0.a|110| 264864^MDC_DIM_BEAT_PER_MIN^MDC|||||R|||20120802103927+0000		

TP Id		TP/LP-PAN/MAN/PHDTW/BPM/BV-019		
TP label		Whitepaper. Pulse Rate Object - Basic-Nu-Observed-Value Attribute 1		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	PR Numeric 7; M	Short Float Type 1; C	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_003 AND C_MAN_BLE_005		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Blood pressure profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		 a. Blood Pressure Measurment (0x2A35)
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test with the following value:
		 a. Blood pressure measurement (0x2A35)
		     i. Field: Flags
		       • Format: 8 bit
		       • Value: 0000 0110 (MSB → LSB). Blood pressure measurement value in units of mmHg, Time Stamp and Pulse Rate fields are included, User ID and measurement Status fields are not included
		     ii. Field: Blood Pressure Measurement Compound Value – Systolic (mmHg)
		       • Format: SFLOAT
		       • Value: Not relevant
		     iii. Field: Blood Pressure Measurement Compound Value – Diastolic (mmHg)
		       • Format: SFLOAT
		       • Value: Not relevant
		     iv. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (mmHg)
		       • Format: SFLOAT
		       • Value: Not relevant
		     v. Field: Blood Pressure Measurement Compound Value – Systolic (kPa)
		       • This field is not included
		     vi. Field: Blood Pressure Measurement Compound Value – Diastolic (kPa)
		       • This field is not included
		     vii. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (kPa)
		       • This field is not included
		     viii. Field: Time Stamp
		       • Format: Date and Time
		       • Value: Not relevant
		     ix. Field: Pulse Rate
		       • Format: SFLOAT
		       • Value: 110.0
		     x. Field: User ID
		       • This field is not included
		     xi. Field: Measurement Status
		       • This field is not included
		 5. Check the output of the manager transcoder for the Pulse rate object – Basic-Nu-Observed-Value attribute.		

Pass/Fail criteria		In step 5, the Heart rate object – Basic-Nu-Observed-Value attribute is present and its value matches with the Blood Pressure Measurement – Heart Rate Value (bpm) field of the Blood pressure measurement characteristic (110).		
Notes		Possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Basic-Nu-Observed-Value attribute is present: ❑ Object: Pulse rate object ❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636) ❑ Attribute-type: SFLOAT ❑ Attribute-value: F4 4C (hex) or 00 6E (hex) or 01 0B (hex) or 110 (dec) b) WAN PCD-01 message PCD-01 message includes a segment like this with a Basic-Nu-Observed-Value attribute value (check OBX-5): OBX|?|NM|149546^ MDC_PULS_RATE_NON_INV ^MDC|1.0.0.a|110| 264864^MDC_DIM_BEAT_PER_MIN^MDC|||||R|||[current_date_time]		

TP Id		TP/LP-PAN/MAN/PHDTW/BPM/BV-020		
TP label		Whitepaper. Pulse Rate Object - Basic-Nu-Observed-Value Attribute 2		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	PR Numeric 7; M	Short Float Type 1; C	Short Float Type 2; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_003 AND C_;;MAN_BLE_005		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a Blood pressure profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is: a. Blood pressure measurement (0x2A35) 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test with the following value: 　a. Blood pressure measurement (0x2A35) 　　i. Field: Flags 　　　• Format: 8 bit 　　　• Value: 0000 0110 (MSB → LSB). Blood pressure measurement value in units of mmHg, Time Stamp and Pulse Rate fields are included, User ID and measurement Status fields are not included 　　ii. Field: Blood Pressure Measurement Compound Value – Systolic (mmHg) 　　　• Format: SFLOAT 　　　• Value: Not relevant 　　iii. Field: Blood Pressure Measurement Compound Value – Diastolic (mmHg) 　　　• Format: SFLOAT 　　　• Value: Not relevant 　　iv. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (mmHg) 　　　• Format: SFLOAT 　　　• Value: Not relevant 　　v. Field: Blood Pressure Measurement Compound Value – Systolic (kPa) 　　　• This field is not included 　　vi. Field: Blood Pressure Measurement Compound Value – Diastolic (kPa) 　　　• This field is not included 　　vii. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (kPa) 　　　• This field is not included 　　viii. Field: Time Stamp 　　　• Format: Date and Time 　　　• Value: Not relevant 　　ix. Field: Pulse Rate 　　　• Format: SFLOAT 　　　• Value: 110.0 　　x. Field: User ID 　　　• This field is not included 　　xi. Field: Measurement Status 　　　• This field is not included 5. Check in manager transcoder output for the Pulse rate object – Basic-Nu-Observed-Value attribute. 6. The simulated agent sends the measurement to the manager under test with the following value: 　a. Blood pressure measurement (0x2A35) 　　i. Field: Flags 　　　• Format: 8 bit 　　　• Value: 0000 0110 (MSB → LSB). Blood pressure measurement value in units of mmHg, Time Stamp and Pulse Rate fields are included, User ID and measurement Status fields are not included 　　ii. Field: Blood Pressure Measurement Compound Value – Systolic (mmHg) 　　　• Format: SFLOAT 　　　• Value: Not relevant 　　iii. Field: Blood Pressure Measurement Compound Value – Diastolic (mmHg) 　　　• Format: SFLOAT

- • Value: Not relevant
    - iv. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (mmHg)
        - • Format: SFLOAT
        - • Value: Not relevant
    - v. Field: Blood Pressure Measurement Compound Value – Systolic (kPa)
        - • This field is not included
    - vi. Field: Blood Pressure Measurement Compound Value – Diastolic (kPa)
        - • This field is not included
    - vii. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (kPa)
        - • This field is not included
    - viii. Field: Time Stamp
        - • Format: Date and Time
        - • Value: Not relevant
    - ix. Field: Pulse Rate
        - • Format: SFLOAT
        - • Value: 07 FF (hex). Special value: NaN
    - x. Field: User ID
        - • This field is not included
    - xi. Field: Measurement Status
        - • This field is not included
7. Check in manager transcoder output for the Pulse rate object – Basic-Nu-Observed-Value attribute.
8. The simulated agent sends the measurement to the manager under test with the following value:
    - a. Blood pressure measurement (0x2A35)
        - i. Field: Flags
            - • Format: 8 bit
            - • Value: 0000 0110 (MSB → LSB). Blood pressure measurement value in units of mmHg, Time Stamp and Pulse Rate fields are included, User ID and measurement Status fields are not included
        - ii. Field: Blood Pressure Measurement Compound Value – Systolic (mmHg)
            - • Format: SFLOAT
            - • Value: Not relevant
        - iii. Field: Blood Pressure Measurement Compound Value – Diastolic (mmHg)
            - • Format: SFLOAT
            - • Value: Not relevant
        - iv. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (mmHg)
            - • Format: SFLOAT
            - • Value: Not relevant
        - v. Field: Blood Pressure Measurement Compound Value – Systolic (kPa)
            - • This field is not included
        - vi. Field: Blood Pressure Measurement Compound Value – Diastolic (kPa)
            - • This field is not included
        - vii. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (kPa)
            - • This field is not included
        - viii. Field: Time Stamp
            - • Format: Date and Time
            - • Value: Not relevant
        - ix. Field: Pulse Rate
            - • Format: SFLOAT
            - • Value: 08 00 (hex). Special value: NRes
        - x. Field: User ID
            - • This field is not included
        - xi. Field: Measurement Status
            - • This field is not included
9. Check in manager transcoder output for the Pulse rate object – Basic-Nu-Observed-Value attribute.
10. The simulated agent sends the measurement to the manager under test with the following value:
    - a. Blood pressure measurement (0x2A35)
        - i. Field: Flags
            - • Format: 8 bit

- Value: 0000 0110 (MSB → LSB). Blood pressure measurement value in units of mmHg, Time Stamp and Pulse Rate fields are included, User ID and measurement Status fields are not included
    ii. Field: Blood Pressure Measurement Compound Value – Systolic (mmHg)
        - Format: SFLOAT
        - Value: Not relevant
    iii. Field: Blood Pressure Measurement Compound Value – Diastolic (mmHg)
        - Format: SFLOAT
        - Value: Not relevant
    iv. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (mmHg)
        - Format: SFLOAT
        - Value: Not relevant
    v. Field: Blood Pressure Measurement Compound Value – Systolic (kPa)
        - This field is not included
    vi. Field: Blood Pressure Measurement Compound Value – Diastolic (kPa)
        - This field is not included
    vii. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (kPa)
        - This field is not included
    viii. Field: Time Stamp
        - Format: Date and Time
        - Value: Not relevant
    ix. Field: Pulse Rate
        - Format: SFLOAT
        - Value: 07 FE (hex). Special value: +INFINITY
    x. Field: User ID
        - This field is not included
    xi. Field: Measurement Status
        - This field is not included
11. Check in manager transcoder output for the Pulse rate object – Basic-Nu-Observed-Value attribute.
12. The simulated agent sends the measurement to the manager under test with the following value:
    a. Blood pressure measurement (0x2A35)
        i. Field: Flags
            - Format: 8 bit
            - Value: 0000 0110 (MSB → LSB). Blood pressure measurement value in units of mmHg, Time Stamp and Pulse Rate fields are included, User ID and measurement Status fields are not included
        ii. Field: Blood Pressure Measurement Compound Value – Systolic (mmHg)
            - Format: SFLOAT
            - Value: Not relevant
        iii. Field: Blood Pressure Measurement Compound Value – Diastolic (mmHg)
            - Format: SFLOAT
            - Value: Not relevant
        iv. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (mmHg)
            - Format: SFLOAT
            - Value: Not relevant
        v. Field: Blood Pressure Measurement Compound Value – Systolic (kPa)
            - This field is not included
        vi. Field: Blood Pressure Measurement Compound Value – Diastolic (kPa)
            - This field is not included
        vii. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (kPa)
            - This field is not included
        viii. Field: Time Stamp
            - Format: Date and Time
            - Value: Not relevant
        ix. Field: Pulse Rate
            - Format: SFLOAT
            - Value: 08 02 (hex). Special value: -INFINITY
        x. Field: User ID
            - This field is not included
        xi. Field: Measurement Status
            - This field is not included

	13. Check in manager transcoder output for the Pulse rate object – Basic-Nu-Observed-Value attribute.
Pass/Fail criteria	In step 5, the Pulse rate object – Basic-Nu-Observed-Value attribute is present and its value is 110. In step 7, the Pulse rate object – Basic-Nu-Observed-Value attribute is present and its value is 0x07FF. In step 9, the Pulse rate object – Basic -Nu-Observed-Value attribute is present and its value is 0x0800. In step 11, the Pulse rate object – Basic -Nu-Observed-Value attribute is present and its value is 0x07FE. In step 13, the Pulse rate object – Basic -Nu-Observed-Value attribute is present and its value is 0x0802.
Notes	In step 5, possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Basic-Nu-Observed-Value attribute is present: ❑ Object: Pulse rate object ❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636) ❑ Attribute-type: SFLOAT ❑ Attribute-value: F4 4C (hex) or 00 6E (hex) or 01 0B (hex) or 110 (dec) b) WAN PCD-01 message PCD-01 message includes a segment like this with a Simple-Nu-Observed-Value attribute value (check OBX-5): OBX|?|NM|149546^ MDC_PULS_RATE_NON_INV ^MDC|1.0.0.a|110| 264864^MDC_DIM_BEAT_PER_MIN^MDC|||||R|||[current_date_time] In step 7, possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Basic-Nu-Observed-Value attribute is present: ❑ Object: Pulse rate object ❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636) ❑ Attribute-type: SFLOAT ❑ Attribute-value: 07 FF (hex) or NaN (note that a decimal value is not allowed) b) WAN PCD-01 message PCD-01 message does not include segments with a Simple-Nu-Observed-Value attribute value (149546^ MDC_PULS_RATE_NON_INV ^MDC) because it has a special value and these values are not included in the PCD-01 message. In step 9, possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Basic-Nu-Observed-Value attribute is present: ❑ Object: Pulse rate object ❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636) ❑ Attribute-type: SFLOAT ❑ Attribute-value: 08 00 (hex) or NRes (note that a decimal value is not allowed) b) WAN PCD-01 message PCD-01 message does not include segments with a Simple-Nu-Observed-Value attribute value (149546^MDC_PULS_RATE_NON_INV^MDC) because it has a special value and these values are not included in the PCD-01 message. In step 11, possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Basic-Nu-Observed-Value attribute is present: ❑ Object: Pulse rate object ❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636) ❑ Attribute-type: SFLOAT ❑ Attribute-value: 07 FF (hex) or +INFINITY (note that a decimal value is not allowed) b) WAN PCD-01 message PCD-01 message does not include segments with a Simple-Nu-Observed-Value attribute value (149546^MDC_PULS_RATE_NON_INV^MDC) because it has a special value and these values are not included in the PCD-01 message. In step 13, possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Basic-Nu-Observed-Value attribute is present: ❑ Object: Pulse rate object ❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636) ❑ Attribute-type: SFLOAT ❑ Attribute-value: 08 02 (hex) or -INFINITY (note that a decimal value is not allowed) b) WAN PCD-01 message PCD-01 message does not include segments with a Simple-Nu-Observed-Value attribute value (149546^MDC_PULS_RATE_NON_INV^MDC) because it has a special value and these values are not included in the PCD-01 message.

TP Id		TP/LP-PAN/MAN/PHDTW/BPM/BV-021		
TP label		Whitepaper. Pulse Rate measurement value		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	Short Float Type 1; C	Date-Time Conv 1; M	PR Numeric 6; M
		PR Numeric 7; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_003 AND C_MAN_BLE_005		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Blood pressure profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		a. Blood pressure measurement (0x2A35)
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test with the following value:
		a. Blood pressure measurement (0x2A35)
		    i. Field: Flags
		      • Format: 8 bit
		      • Value: 0000 0110 (MSB → LSB). Blood pressure measurement value in units of mmHg, Time Stamp and Pulse Rate fields are included, User ID and measurement Status fields are not included
		    ii. Field: Blood Pressure Measurement Compound Value – Systolic (mmHg)
		      • Format: SFLOAT
		      • Value: Not relevant
		    iii. Field: Blood Pressure Measurement Compound Value – Diastolic (mmHg)
		      • Format: SFLOAT
		      • Value: Not relevant
		    iv. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (mmHg)
		      • Format: SFLOAT
		      • Value: Not relevant
		    v. Field: Blood Pressure Measurement Compound Value – Systolic (kPa)
		      • This field is not included
		    vi. Field: Blood Pressure Measurement Compound Value – Diastolic (kPa)
		      • This field is not included
		    vii. Field: Blood Pressure Measurement Compound Value – Mean Arterial Pressure (kPa)
		      • This field is not included
		    viii. Field: Time Stamp
		      • Format: Date and Time
		      • Value: August 2nd, 2012, 10:39:27
		    ix. Field: Pulse Rate
		      • Format: SFLOAT
		      • Value: 110.0
		    x. Field: User ID
		      • This field is not included
		    xi. Field: Measurement Status
		      • This field is not included
		5. Check that the manager accepts the measurement and decodes its value properly (pulse rate measurement value, pulse rate units and time stamp.		

Pass/Fail criteria		In step 5, the manager under test shows the following measurement Pulse Rate = 110 beats per minute (bpm) with the time stamp '2012-08-02 10:39:27'.		
Notes				

A.5   Subgroup 2.4.4 – Whitepaper Heart-rate requirements (HR)

TP Id		TP/LP-PAN/MAN/PHDTW/HR/BV-000		
TP label		Whitepaper. Heart Rate MDS Object - System-Type Attribute		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	HR Specific MDS 1; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_004		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a Heart rate profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 3. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test. 4. Check in manager transcoder output for the MDS object – System-Type attribute.		
Pass/Fail criteria		In step 4, the MDS object – System-Type attribute is not present.		
Notes		Possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes System-Type attribute is not present: ❑ Object: MDS object ❑ Attribute-id: MDC_ATTR_SYS_TYPE (2438) ❑ Attribute-type: TYPE ❑ Attribute-value: <NOT PRESENT> b) WAN PCD-01 message PCD-01 message does not include segments with a System-Type attribute value (67974^MDC_ATTR_SYS_TYPE^MDC).		

TP Id		TP/LP-PAN/MAN/PHDTW/HR/BV-001		
TP label		Whitepaper. Heart Rate MDS Object - Dev-Configuration-Id Attribute		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	HR Specific MDS 2; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_004		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a Heart rate profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 3. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test. 4. Check in manager transcoder output for the MDS object – Dev-Configuration-Id attribute.		
Pass/Fail criteria		In step 4, the MDS object – Dev-Configuration-Id attribute is present, its value is inside the range 0x4000 - 0x7FFF.		
Notes		Possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Dev-Configuration-Id attribute is present: ❑ Object: MDS object ❑ Attribute-id: MDC_ATTR_DEV_CONFIG_ID (2628) ❑ Attribute-type: INT-U16 ❑ Attribute-value: Any value inside the range 16384 - 32767 (dec) or 0x4000 – 0x7FFF (hex) b) WAN PCD-01 message According to [ITU-T H.810] (CDG 2013), the Dev-Configuration-Id shall not be transmitted in the PCD-01 message; therefore it is not possible to check this attribute.		

TP Id		TP/LP-PAN/MAN/PHDTW/HR/BV-002		
TP label		Whitepaper. Heart Rate MDS Object - System-Type-Spec-List Attribute		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	Common MDS 15; M	HR Specific MDS 3; M	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_004		
Initial condition		The manager under test and the simulated agent are in the standby state		
Test procedure		1. The simulated agent is configured with a Heart rate profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 3. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test. 4. Check in manager transcoder output for the MDS object – System-Type-Spec-List attribute.		
Pass/Fail criteria		In step 4, the MDS object – System-Type-Spec-List attribute is present, its value is (MDC_DEV_SPEC_PROFILE_ECG, Version 1), (MDC_DEV_SUB_SPEC_PROFILE_HR, Version 1).		
Notes		Possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes System-Type-Spec-List attribute is present: ❑ Object: MDS object ❑ Attribute-id: MDC_ATTR_SYS_TYPE_SPEC_LIST (2650) ❑ Attribute-type: SEQUENCE OF [{type (INT-U16), version (INT-U16)}] ❑ Attribute-value: • type: MDC_DEV_SPEC_PROFILE_ECG or 4102 (dec) or 10 06 (hex) • version: 1 (dec) or 00 01 (hex) • type: MDC_DEV_SUB_SPEC_PROFILE_HR or 4237 (dec) or 10 8D (hex) • version: 1 (dec) or 00 01 (hex) b) WAN PCD-01 message PCD-01 message includes a segment like this with a System-Type-Spec-List attribute value (check OBX-5): OBX|?|NM|68186^MDC_ATTR_SYS_TYPE_SPEC_LIST^MDC|1.0.0.a| 528390^MDC_DEV_SPEC_PROFILE_ECG^MDC~ 528525^MDC_DEV_SUB_SPEC_PROFILE_HR^MDC ||||||R		

TP Id		TP/LP-PAN/MAN/PHDTW/HR/BV-003		
TP label		Whitepaper. Heart Rate MDS Object - Reg-Cert-Data-List Attribute		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	Common MDS 14; M	Regulatory Conv 1; M	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_004		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a Heart rate profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is: a. IEEE 11073-20601 Regulatory Certification Data List (0x2A2A) • Format: reg-cert-data-list (opaque structure) • Value: 00 02 00 14 02 01 00 0A 04 00 00 02 00 04 80 06 80 8D 02 02 00 02 80 00 (hex) i. Element: • auth-body-and-struc-type: - auth-body: 02 (hex) auth-body-continua(2) - auth-body-struc-type: 01 (hex). continua-version-struct(1) • auth-body-data: - major-IG-version: 04 (hex) - minor-IG-version: 00 (hex) - certified-devices: 80 06 80 8D (hex). BLE ECG and BLE Heart Rate ii. Element: • auth-body-and-struc-type: - auth-body: 02 (hex). auth-body-continua(2) - auth-body-struc-type: 02 (hex). continua-reg-struct(2) • auth-body-data: - regulation-bit-field: 80 00 (hex). Unregulated device 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent. 4. When the pairing has been completed (connection state), force the manager under test to read the IEEE 11073-20601 Regulatory Certification Data List characteristic. 5. The simulated agent sends the measurement to the manager under test. 6. Check in manager transcoder output for the MDS object – Reg-Cert-Data-List attribute.		
Pass/Fail criteria		In step 6, the MDS object – Reg-Cert-Data-List attribute is present and its value matches with the IEEE 11073-20601 Regulatory Certification Data List characteristic value.		
Notes		Possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Reg-Cert-Data-List attribute is present: ❑ Object: MDS object ❑ Attribute-id: MDC_ATTR_REG_CERT_DATA_LIST (2635) ❑ Attribute-type: SEQUENCE OF [{auth-body-and-struc-type, auth-body-data}, {…}] ❑ Attribute-value: 00 02 00 14 02 01 00 0A 04 00 00 02 00 04 80 06 80 8D 02 02 00 02 80 00 i. Reg-Cert-Data Element: • auth-body-and-struc-type: - auth-body: 02 (hex) auth-body-continua(2) - auth-body-struc-type: 01 (hex). continua-version-struct(1) • auth-body-data: - major-IG-version: 04 (hex) - minor-IG-version: 00 (hex) - certified-devices: 80 06 80 8D (hex). BLE ECG and BLE Heart Rate ii. Reg-Cert-Data Element: • auth-body-and-struc-type: - auth-body: 02 (hex). auth-body-continua(2) - auth-body-struc-type: 02 (hex). continua-reg-struct(2) • auth-body-data: - regulation-bit-field: 80 00 (hex). Unregulated device b) WAN PCD-01 message PCD-01 message includes five segments like these with Reg-Cert-Data-List attribute value (check OBX-5 in four segments): OBX|?|CWE|68218^MDC_REG_CERT_DATA_AUTH_BODY^MDC|1.0.0.a| 2^auth-body-continua||||||R OBX|?|ST|532352^MDC_REG_CERT_DATA_CONTINUA_VERSION^MDC|1.0.0.a.x| 4.0||||||R OBX|?|NA|532353^MDC_REG_CERT_DATA_CONTINUA_CERT_DEV_LIST^MDC| 1.0.0.a.y|32774~32909||||||R OBX|?|CWE|68218^MDC_REG_CERT_DATA_AUTH_BODY^MDC|1.0.0.b| 2^auth-body-continua||||||R OBX|?|CWE|532354^MDC_REG_CERT_DATA_CONTINUA_REG_STATUS^MDC| 1.0.0.b.z|1^unregulated-device(0)||||||R		

TP Id		TP/LP-PAN/MAN/PHDTW/HR/BV-004		
TP label		Whitepaper. Heart Rate MDS Object - Tick Resolution Attribute		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	HR Specific MDS 5; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_004 AND C_MAN_BLE_006		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Heart rate profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		
		   a. Heart rate measurement (0x2A37)
		
		     i. Field: Flags
		
		       • Format: 8 bit
		
		       • Value: 0001 0000 (MSB → LSB). Heart rate measurement value in uint8 format and RR-Interval fields are present, Energy Expended field is not included
		
		     ii. Field: Heart Rate Measurement Value (uint8)
		
		       • Format: uint8
		
		       • Value: Not relevant
		
		     iii. Field: Heart Rate Measurement Value (uint16)
		
		       • This field is not included
		
		     iv. Field: Energy Expended
		
		       • This field is not included
		
		     v. Field: RR-Interval
		
		       • Format: List of uint16
		
		       • Value: Not relevant
		
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		
		4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test.
		
		5. Check in manager transcoder output for the MDS object – Tick Resolution attribute.		

Pass/Fail criteria		In step 5, the MDS object – Tick Resolution attribute is present and its value is 1024 ticks per second.		

Notes		Possible values in typical points of observation after transcoder output are:
		
		a) IEEE 11073 Objects and Attributes
		
		Tick Resolution attribute is present:
		
		  ❑ Object: MDS object
		
		  ❑ Attribute-id: MDC_ATTR_TICK_RES (2693)
		
		  ❑ Attribute-type: FLOAT
		
		  ❑ Attribute-value: 00 00 04 00 (hex) or FF 00 28 00 (hex) or FE 01 90 00 (hex) or FD 0F A0 00 (hex) or FC 9C 40 00 (hex) or 1024 (dec)
		
		b) WAN PCD-01 message
		
		OBX|?|NM|68229^MDC_ATTR_TICK_RES^MDC|1.0.0.a|1024|
		
		  265842^MDC_DIM_PER_SEC^MDC|||||R		

TP Id		TP/LP-PAN/MAN/PHDTW/HR/BV-005		
TP label		Whitepaper. Heart Rate Measurement Object - Handle Attribute		
Coverage	**Spec**	[b-Bluetooth PHDT v1.3]		
	Testable items	HR Numeric 1; O		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_004		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Heart rate profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		
		   a. Heart rate measurement (0x2A37)
		
		      i. Field: Flags
		
		         • Format: 8 bit
		
		         • Value: 0000 0000 (MSB → LSB). Heart rate measurement value in uint8 format field is included, RR-Interval and Energy Expended fields are not included
		
		      ii. Field: Heart Rate Measurement Value (uint8)
		
		         • Format: uint8
		
		         • Value: Not relevant
		
		      iii. Field: Heart Rate Measurement Value (uint16)
		
		         • This field is not included
		
		      iv. Field: Energy Expended
		
		         • This field is not included
		
		      v. Field: RR-Interval
		
		         • This field is not included
		
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		
		4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test.
		
		5. Check in manager transcoder output for the Heart rate measurement object – Handle attribute.		

Pass/Fail criteria		In step 5, the Body temperature object – Handle attribute is not present; however, if it is present then its value is different to 0.		

Notes		Possible values in typical points of observation after transcoder output are:
		
		a) IEEE 11073 Objects and Attributes
		
		Handle attribute is not present, or if it is present then:
		
		  ❑ Object: Heart rate measurement object
		
		  ❑ Attribute-id: MDC_ATTR_ID_HANDLE (2337)
		
		  ❑ Attribute-type: INT-U16
		
		  ❑ Attribute-value: Any value other than 0
		
		b) WAN PCD-01 message
		
		PCD-01 message does not include segments with a Handle attribute value.		

TP Id		TP/LP-PAN/MAN/PHDTW/HR/BV-006		
TP label		Whitepaper. Heart Rate Measurement Object - Type Attribute		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	HR Numeric 2; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_004		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Heart rate profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		
		    a. Heart rate measurement (0x2A37)
		
		       i. Field: Flags
		
		          • Format: 8 bit
		
		          • Value: 0000 0000 (MSB → LSB). Heart rate measurement value in uint8 format field is included, RR-Interval and Energy Expended fields are not included
		
		       ii. Field: Heart Rate Measurement Value (uint8)
		
		          • Format: uint8
		
		          • Value: Not relevant
		
		       iii. Field: Heart Rate Measurement Value (uint16)
		
		          • This field is not included
		
		       iv. Field: Energy Expended
		
		          • This field is not included
		
		       v. Field: RR-Interval
		
		          • This field is not included
		
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		
		 4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test.
		
		 5. Check in manager transcoder output for the Heart rate measurement object – Type attribute.		

Pass/Fail criteria		In step 5, the Heart rate measurement object – Type attribute is present and its value is {MDC_PART_SCADA, MDC_ECG_HEART_RATE_INSTANT}.		

Notes		Possible values in typical points of observation after transcoder output are:
		
		 a) IEEE 11073 Objects and Attributes
		
		 Type attribute is present:
		
		   ❑ Object: Heart rate measurement object
		
		   ❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
		
		   ❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
		
		   ❑ Attribute-value:
		
		      • partition: MDC_PART_SCADA or 2 (dec) or 00 02 (hex)
		
		      • code: MDC_ECG_HEART_RATE_INSTANT or 21982 (dec) or 55 DE (hex)
		
		 b) WAN PCD-01 message
		
		 PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):
		
		 OBX|?|NM|8410590^MDC_ECG_HEART_RATE_INSTANT^MDC |1.0.0.a|90|
		
		   264864^MDC_DIM_BEAT_PER_MIN^MDC |||||R		

TP Id		TP/LP-PAN/MAN/PHDTW/HR/BV-007
TP label		Whitepaper. Heart Rate Measurement Object - Metric-Spec-Small Attribute
Coverage	Spec	[b-Bluetooth PHDT v1.3]
	Testable items	HR Numeric 3; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_004
Initial condition		The manager under test and the simulated agent are in the standby state.
Test procedure		1. The simulated agent is configured with a Heart rate profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		a. Heart rate measurement (0x2A37)
		i. Field: Flags
		• Format: 8 bit
		• Value: 0000 0000 (MSB → LSB). Heart rate measurement value in uint8 format field is included, RR-Interval and Energy Expended fields are not included
		ii. Field: Heart Rate Measurement Value (uint8)
		• Format: uint8
		• Value: Not relevant
		iii. Field: Heart Rate Measurement Value (uint16)
		• This field is not included
		iv. Field: Energy Expended
		• This field is not included
		v. Field: RR-Interval
		• This field is not included
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test.
		5. Check in manager transcoder output for the Heart rate measurement object – Metric-Spec-Small attribute.
Pass/Fail criteria		In step 5, the Heart rate measurement object – Metric-Spec-Small attribute is present and its value is {0x4040} (mss-avail-stored-data, mss-acc-agent-initiated).
Notes		Possible values in typical points of observation after transcoder output are:
		a) IEEE 11073 Objects and Attributes
		Metric-Spec-Small attribute is present:
		❑ Object: Heart rate measurement object
		❑ Attribute-id: MDC_ATTR_METRIC_SPEC_SMALL (2630)
		❑ Attribute-type: BITS-16
		❑ Attribute-value: 40 40 (hex) or BITS mss-avail-stored-data(1), mss-acc-agent-initiated(9) set to TRUE and remaining BITS set to FALSE
		b) WAN PCD-01 message
		PCD-01 message does not include segments with a Metric-Spec-Small attribute value.

TP Id		TP/LP-PAN/MAN/PHDTW/HR/BV-008		
TP label		Whitepaper. Heart Rate Measurement Object - Unit-Code Attribute		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	HR Numeric 4; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_004		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Heart rate profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		 a. Heart rate measurement (0x2A37)
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test with the following value:
		 a. Heart rate measurement (0x2A37)
		   i. Field: Flags
		     • Format: 8 bit
		     • Value: 0000 0000 (MSB → LSB). Heart rate measurement value in uint8 format fies is included, Energy Expended and RR-Inteval fields are not included
		   ii. Field: Heart Rate Measurement Value (uint8)
		     • Format: uint8
		     • Value: 90
		   iii. Field: Heart Rate Measurement Value (uint16)
		     • This field is not included
		   iv. Field: Energy Expended
		     • This field is not included
		   v. Field: RR-Interval
		     • This field is not included
		 5. Check in manager transcoder output for the Heart rate measurement object – Unit-Code attribute.
		 6. The simulated agent sends the measurement to the manager under test with the following value:
		 a. Heart rate measurement (0x2A37)
		   i. Field: Flags
		     • Format: 8 bit
		     • Value: 0000 0001 (MSB → LSB). Heart rate measurement value in uint16 format field is included, Energy Expended and RR-Inteval fields are not included
		   ii. Field: Heart Rate Measurement Value (uint8)
		     • This field is not included
		   iii. Field: Heart Rate Measurement Value (uint16)
		     • Format: uint16
		     • Value: 110
		   iv. Field: Energy Expended
		     • This field is not included
		   v. Field: RR-Interval
		     • This field is not included
		 7. Check in manager transcoder output for the Heart rate measurement object – Unit-Code attribute.		

Pass/Fail criteria		In step 5, the Heart rate measurement object – Unit-Code attribute is present and its value is MDC_DIM_BEAT_PER_MIN. In step 7, the Heart rate measurement object – Unit-Code attribute is present and its value is MDC_DIM_BEAT_PER_MIN.		

Notes		In step 5, possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Unit-Code attribute is present:
		 ❑ Object: Heart rate measurement object
		 ❑ Attribute-id: MDC_ATTR_UNIT_CODE (2454)
		 ❑ Attribute-type: INT-U16
		 ❑ Attribute-value: MDC_DIM_BEAT_PER_MIN or 2720 (dec) or 0A A0 (hex)
		 b) WAN PCD-01 message
		 PCD-01 message includes a segment like this with Unit-Code attribute value (check OBX-6):
		 OBX|?|NM|8410590^MDC_ECG_HEART_RATE_INSTANT^MDC|1.0.0.a|90|
		   264864^MDC_DIM_BEAT_PER_MIN ^MDC|||||R
		 In step 7, possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Unit-Code attribute is present:
		 ❑ Object: Heart rate measurement object
		 ❑ Attribute-id: MDC_ATTR_UNIT_CODE (2454)
		 ❑ Attribute-type: INT-U16
		 ❑ Attribute-value: MDC_DIM_BEAT_PER_MIN or 2720 (dec) or 0A A0 (hex)
		 b) WAN PCD-01 message
		 PCD-01 message includes a segment like this with Unit-Code attribute value (check OBX-6):
		 OBX|?|NM|8410590^MDC_ECG_HEART_RATE_INSTANT^MDC|1.0.0.a|110|
		   264864^MDC_DIM_BEAT_PER_MIN ^MDC|||||R		

TP Id		TP/LP-PAN/MAN/PHDTW/HR/BV-009		
TP label		Whitepaper. Heart Rate Measurement Object - Simple-Nu-Observed-Value Attribute		
Coverage	**Spec**	[b-Bluetooth PHDT v1.3]		
	Testable items	HR Numeric 6; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_004		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a Heart rate profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).		
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:		
		a. Heart rate measurement (0x2A37)		
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).		
		4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test with the following value:		
		a. Heart rate measurement (0x2A37)		
		i. Field: Flags		
		• Format: 8 bit		
		• Value: 0000 0000 (MSB $\rightarrow$ LSB). Heart Rate Measurement Value in uint8 format fied is included, Energy Expended and RR-Inteval fields are not included		
		ii. Field: Heart Rate Measurement Value (uint8)		
		• Format: uint8		
		• Value: 90		
		iii. Field: Heart Rate Measurement Value (uint16)		
		• This field is not included		
		iv. Field: Energy Expended		
		• This field is not included		
		v. Field: RR-Interval		
		• This field is not included		
		5. Check in manager transcoder output for the Heart rate measurement object – Simple-Nu-Observed-Value attribute.		
		6. The simulated agent sends the measurement to the manager under test with the following value:		
		i. Field: Flags		
		• Format: 8 bit		
		• Value: 0000 0001 (MSB $\rightarrow$ LSB). Heart rate measurement value in uint16 format fied is included, Energy Expended and RR-Inteval fields are not included		
		ii. Field: Heart Rate Measurement Value (uint8)		
		• This field is not included		
		iii. Field: Heart Rate Measurement Value (uint16)		
		• Format: uint16		
		• Value: 110		

	iv. Field: Energy Expended
	
	        • This field is not included
	
	    v. Field: RR-Interval
	
	        • This field is not included
	
	7. Check in manager transcoder output for the Heart rate measurement object – Simple-Nu-Observed-Value attribute.

Pass/Fail criteria	In step 5, the Heart rate measurement object – Simple-Nu-Observed-Value attribute is present and its value matches with the Heart Rate Measurement Value (INT-U8) field of the Heart rate measurement characteristic (90). In step 7, the Heart rate measurement object – Simple-Nu-Observed-Value attribute is present and its value matches with the Heart Rate Measurement Value (INT-U16) field of the Heart rate measurement characteristic (110).

Notes	Possible values in typical points of observation after transcoder output are:
	
	a) IEEE 11073 Objects and Attributes
	
	Simple-Nu-Observed-Value attribute is present:
	
	    ❑ Object: Heart rate measurement object
	
	    ❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_SIMP (2646)
	
	    ❑ Attribute-type: FLOAT
	
	    ❑ Attribute-value: 00 00 00 5A (hex) or 90 (dec) [Note that exponent value for this FLOAT value must be 0]
	
	b) WAN PCD-01 message
	
	PCD-01 message includes a segment like this with a Simple-Nu-Observed-Value attribute value (check OBX-5):
	
	OBX|?|NM|8410590^MDC_ECG_HEART_RATE_INSTANT^MDC|1.0.0.a|90|
	
	  264864^ MDC_DIM_BEAT_PER_MIN ^MDC|||||R
	
	In step 7, possible values in typical points of observation after transcoder output are:
	
	a) IEEE 11073 Objects and Attributes
	
	Simple-Nu-Observed-Value attribute is present:
	
	    ❑ Object: Heart rate measurement object
	
	    ❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_SIMP (2646)
	
	    ❑ Attribute-type: FLOAT
	
	    ❑ Attribute-value: 00 00 00 6E (hex) or 110 (dec) [Note that exponent value for this FLOAT value must be 0]
	
	b) WAN PCD-01 message
	
	PCD-01 message includes a segment like this with a Simple-Nu-Observed-Value attribute value (check OBX-5):
	
	OBX|?|NM|8410590^MDC_ECG_HEART_RATE_INSTANT^MDC|1.0.0.a|110|
	
	  264864^ MDC_DIM_BEAT_PER_MIN ^MDC|||||R

TP Id		TP/LP-PAN/MAN/PHDTW/HR/BV-010
TP label		Whitepaper. RR-Interval Object - Handle Attribute
Coverage	**Spec**	[b-Bluetooth PHDT v1.3]
	Testable items	RR Numeric 1; O
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_004 AND C_MAN_BLE_006
Initial condition		The manager under test and the simulated agent are in the standby state
Test procedure		1. The simulated agent is configured with a Heart rate profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		a. Heart rate measurement (0x2A37)
		i. Field: Flags
		• Format: 8 bit
		• Value: 0001 0000 (MSB → LSB). Heart rate measurement value in uint8 format and RR-Interval fields are included, Energy Expended field is not included
		ii. Field: Heart Rate Measurement Value (uint8)
		• Format: uint8
		• Value: Not relevant
		iii. Field: Heart Rate Measurement Value (uint16)
		• This field is not included
		iv. Field: Energy Expended
		• This field is not included
		v. Field: RR-Interval
		• Format: List of uint16
		• Value: Not relevant
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test.
		5. Check in manager transcoder output for the RR-Interval object – Handle attribute.
Pass/Fail criteria		In step 5, the RR-Interval object – Handle attribute is not present; however, if it is present then its value is different to 0.
Notes		Possible values in typical points of observation after transcoder output are:
		a) IEEE 11073 Objects and Attributes
		Handle attribute is not present, or if it is present then:
		❑ Object: RR-Interval object
		❑ Attribute-id: MDC_ATTR_ID_HANDLE (2337)
		❑ Attribute-type: INT-U16
		❑ Attribute-value: Any value other than 0
		b) WAN PCD-01 message
		PCD-01 message does not include segments with a Handle attribute value.

TP Id		TP/LP-PAN/MAN/PHDTW/HR/BV-011
TP label		Whitepaper. RR-Interval Object - Type Attribute
Coverage	Spec	[b-Bluetooth PHDT v1.3]
	Testable items	RR Numeric 2; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_004 AND C_MAN_BLE_006
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Heart rate profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		
		   a. Heart rate measurement (0x2A37)
		
		     i. Field: Flags
		      • Format: 8 bit
		      • Value: 0001 0000 (MSB → LSB). Heart rate measurement value in uint8 format and RR-Interval fields are included, Energy Expended field is not included
		
		     ii. Field: Heart Rate Measurement Value (uint8)
		      • Format: uint8
		      • Value: Not relevant
		
		     iii. Field: Heart Rate Measurement Value (uint8)
		      • This field is not included
		
		     iv. Field: Energy Expended
		      • This field is not included
		
		     v. Field: RR-Interval
		      • Format: List of uint16
		      • Value: Not relevant
		
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		
		 4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test.
		
		 5. Check in manager transcoder output for the RR-Interval object – Type attribute.

Pass/Fail criteria		In step 5, the RR-Interval object – Type attribute is present and its value is {MDC_PART_SCADA, MDC_ECG_TIME_PD_RR_GL}.

Notes		Possible values in typical points of observation after transcoder output are:
		
		 a) IEEE 11073 Objects and Attributes
		
		 Type attribute is present:
		   ❑ Object: RR-Interval object
		   ❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
		   ❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
		   ❑ Attribute-value:
		     • partition: MDC_PART_SCADA or 2 (dec) or 00 02 (hex)
		     • code: MDC_ECG_TIME_PD_RR_GL or 16168 (dec) or 3F 28 (hex)
		
		 b) WAN PCD-01 message
		
		 PCD-01 message includes two segments like these with a Type attribute value (check OBX-3):
		
		 OBX|?|NM|147240^MDC_ECG_TIME_PD_RR_GL^MDC|1.0.0.a|
		   600268992^MDC_DIM_TICK^MDC |||||R
		
		 OBX|?|NM|147240^MDC_ECG_TIME_PD_RR_GL^MDC|1.0.0.b|
		   900268992^MDC_DIM_TICK^MDC |||||R

TP Id		TP/LP-PAN/MAN/PHDTW/HR/BV-012
TP label		Whitepaper. RR-Interval Object - Metric-Spec-Small Attribute
Coverage	Spec	[b-Bluetooth PHDT v1.3]
	Testable items	RR Numeric 3; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_004 AND C_MAN_BLE_006
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Heart rate profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		
		   a. Heart rate measurement (0x2A37)
		
		     i. Field: Flags
		       • Format: 8 bit
		       • Value: 0001 0000 (MSB → LSB). Heart rate measurement value in uint8 format and RR-Interval fields are included, Energy Expended field is not included
		
		     ii. Field: Heart Rate Measurement Value (uint8)
		       • Format: uint8
		       • Value: Not relevant
		
		     iii. Field: Heart Rate Measurement Value (uint16)
		       • This field is not included
		
		     iv. Field: Energy Expended
		       • This field is not included
		
		     v. Field: RR-Interval
		       • Format: List of uint16
		       • Value: Not relevant
		
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		
		4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test.
		
		5. Check in manager transcoder output for the RR-Interval object – Metric-Spec-Small attribute.

Pass/Fail criteria		In step 5, the RR-Interval object – Metric-Spec-Small attribute is present and its value is {0x5440} (mss-avail-stored-data, mss-acc-agent-initiated, mss-msmt-btb-metric, mss-msmt-aperiodic).

Notes		Possible values in typical points of observation after transcoder output are:
		
		a) IEEE 11073 Objects and Attributes
		
		Metric-Spec-Small attribute is present:
		
		  ❑ Object: RR-Interval object
		  ❑ Attribute-id: MDC_ATTR_METRIC_SPEC_SMALL (2630)
		  ❑ Attribute-type: BITS-16
		  ❑ Attribute-value: 54 40 (hex) or BITS mss-avail-stored-data(1), mss-msmt-aperiodic (3), mss-msmt-btb-metric (5), mss-acc-agent-initiated(9) set to TRUE and remaining BITS set to FALSE
		
		b) WAN PCD-01 message
		
		PCD-01 message does not include segments with a Metric-Spec-Small attribute value.

TP Id		TP/LP-PAN/MAN/PHDTW/HR/BV-013
TP label		Whitepaper. RR-Interval Object - Unit-Code Attribute
Coverage	**Spec**	[b-Bluetooth PHDT v1.3]
	Testable items	RR Numeric 5; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_004 AND C_MAN_BLE_006
Initial condition		The manager under test and the simulated agent are in the standby state.
Test procedure		1. The simulated agent is configured with a Heart rate profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is: a. Heart rate measurement (0x2A37) 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test with the following value: i. Heart rate measurement (0x2A37) i. Field: Flags • Format: 8 bit • Value: 0001 0000 (MSB → LSB). Heart rate measurement value in uint8 format and RR-Interval fields are included, Energy Expended field is not included ii. Field: Heart Rate Measurement Value (uint8) • Format: uint8 • Value: Not relevant iii. Field: Heart Rate Measurement Value (uint16) • This field is not included iv. Field: Energy Expended • This field is not included v. Field: RR-Interval • Format: List of uint16 • Value: Not relevant 5. Check in manager transcoder output for the RR-Interval object – Unit-Code attribute.
Pass/Fail criteria		In step 5, the RR-Interval object – Unit-Code attribute is present and its value is MDC_DIM_TICK.
Notes		In step 5, possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Unit-Code attribute is present: ❑ Object: RR Interval object ❑ Attribute-id: MDC_ATTR_UNIT_CODE (2454) ❑ Attribute-type: INT-U16 ❑ Attribute-value: MDC_DIM_TICK or 6848 (dec) or 1A C0 (hex) b) WAN PCD-01 message PCD-01 message includes two segments like these with Unit-Code attribute value (check OBX-6): OBX|?|NM|147240^ MDC_ECG_TIME_PD_RR_GL^MDC|1.0.0.a|600| 268992^ MDC_DIM_TICK ^MDC|||||R OBX|?|NM|147240^ MDC_ECG_TIME_PD_RR_GL^MDC|1.0.0.b|900| 268992^ MDC_DIM_TICK ^MDC|||||R

TP Id		TP/LP-PAN/MAN/PHDTW/HR/BV-014
TP label		Whitepaper. RR-Interval Object -Simple-Nu-Observed-Value Attribute
Coverage	Spec	[b-Bluetooth PHDT v1.3]
	Testable items	RR Numeric 6; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_004 AND C_MAN_BLE_006
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a profile (device specialization) supported by the manager under test; it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		    a. Heart rate measurement (0x2A37)
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test with the following value:
		    a. Heart rate measurement (0x2A37)
		      i. Field: Flags
		        • Format: 8 bit
		        • Value: 0001 0000 (MSB → LSB). Heart rate measurement value in uint8 format and RR-Interval fields are included, Energy Expended field is not included
		      ii. Field: Heart Rate Measurement Value (uint8)
		        • Format: uint8
		        • Value: Not relevant
		      iii. Field: Heart Rate Measurement Value (uint16)
		        • This field is not included
		      iv. Field: Energy Expended
		        • This field is not included
		      v. Field: RR-Interval
		        • Format: List of uint16
		        • Value: {600, 900}
		 5. Check in manager transcoder output for the RR-Interval object – Compound-Simple-Nu-Observed-Value attribute.

Pass/Fail criteria		In step 5, the RR-Interval object – Simple-Nu-Observed-Value attribute is present and its value matches with RR-Interval field of Heart rate measurement {600, 900}.

Notes		Possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Simple-Nu-Observed-Value attribute is present two times:
		   ❑ Object: RR-Interval object
		   ❑ Attribute-id: MDC_ATTR_NU_ VAL_OBS_SIMP (2646)
		   ❑ Attribute-type: FLOAT
		   ❑ Attribute-value:
		     • First occurrence: 00 00 02 58 (hex) or FF 00 17 70 (hex) or FE 00 EA 60 (hex) or FD 09 27 C0 (hex) or FC 5B 8D 80 (hex) or 600 (dec)
		     • Second occurrence: 00 00 03 84 (hex) or FF 00 23 28 (hex) or FE 01 5F 90 (hex) or FD 0D BB A0 (hex) or FC 89 54 40 (hex) or 900 (dec)
		 b) WAN PCD-01 message
		 PCD-01 message includes a segment like this with a Simple-Nu-Observed-Value attribute value (check OBX-5):
		 OBX|?|NM|147240^MDC_ECG_TIME_PD_RR_GL^MDC|1.0.0.a|600|
		   268992^MDC_DIM_TICK ^MDC|||||R
		 OBX|?|NM|147240^MDC_ECG_TIME_PD_RR_GL^MDC|1.0.0.b|900|
		   268992^ MDC_DIM_TICK ^MDC|||||R

TP Id		TP/LP-PAN/MAN/PHDTW/HR/BV-015		
TP label		Whitepaper. Heart Rate measurement value		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	HR Numeric 6; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_004		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a profile (device specialization) supported by the manager under test; it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is: a. Heart rate measurement (0x2A37) 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test with the following value: a. Heart rate measurement (0x2A37) i. Field: Flags • Format: 8 bit • Value: 0000 0000 (MSB → LSB). Heart rate measurement value in uint8 format fied is included, Energy Expended and RR-Inteval fields are not included ii. Field: Heart Rate Measurement Value (uint8) • Format: uint8 • Value: 90 iii. Field: Heart Rate Measurement Value (uint16) • This field is not included iv. Field: Energy Expended • This field is not included v. Field: RR-Interval • This field is not included 5. Check that the manager accepts the measurement and decodes its value properly (pulse rate measurement). 6. The simulated agent sends the measurement to the manager under test with the following value: i. Field: Flags • Format: 8 bit • Value: 0000 0001 (MSB → LSB). Heart rate measurement value in uint16 format is included, Energy Expended and RR-Inteval fields are not included ii. Field: Heart Rate Measurement Value (uint8) • This field is not included iii. Field: Heart Rate Measurement Value (uint16) • Format: uint16 • Value: 110 iv. Field: Energy Expended • This field is not included v. Field: RR-Interval • This field is not included 7. Check that the manager accepts the measurement and decodes its value properly (pulse rate measurement).		
Pass/Fail criteria		In step 5, the manager under test shows the following measurement Heart Rate = 90 beats per minute (bpm). In step 7, the manager under test shows the following measurement Heart Rate = 110 beats per minute (bpm).		
Notes				

TP Id		TP/LP-PAN/MAN/PHDTW/HR/BV-016		
TP label		Whitepaper. RR-Interval measurement value		
Coverage	Spec	[b-Bluetooth PHDT v1.3]		
	Testable items	RR Numeric 6; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_004 AND C_MAN_BLE_006		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a profile (device specialization) supported by the manager under test; it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is: a. Heart rate measurement (0x2A37) 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test with the following value: a. Heart rate measurement (0x2A37) i. Field: Flags • Format: 8 bit • Value: 0001 0000 (MSB → LSB). Heart rate measurement value in uint8 format and RR-Interval fields are present, Energy Expended field is not included ii. Field: Heart Rate Measurement Value (uint8) • Format: uint8 • Value: Not relevant iii. Field: Heart Rate Measurement Value (uint16) • This field is not included iv. Field: Energy Expended • This field is not included v. Field: RR-Interval • Format: List of uint16 • Value: {600, 900} 5. Check that the manager accepts the measurement and decodes its value properly (RR-Interval measurement value).		
Pass/Fail criteria		In step 5, the manager under test shows the following measurements: • Measurement #1: RR-Interval = 586 ms or 600 ticks (1 tick = 1/1024 s) • Measurement #2: RR-Interval = 879 ms or 900 ticks (1 tick = 1/1024 s)		
Notes				

A.6   Subgroup 2.4.5 – Whitepaper Glucose requirements (GL)

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-000		
TP label		Whitepaper. Glucosemeter MDS Object - System-Type Attribute		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	GL Specific MDS 1; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 3. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated agent sends the measurement to the manager under test. 4. Check in manager transcoder output for the MDS object – System-Type attribute.		
Pass/Fail criteria		In step 4, the MDS object – System-Type attribute is not present.		
Notes		Possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes System-Type attribute is not present: ❑ Object: MDS object ❑ Attribute-id: MDC_ATTR_SYS_TYPE (2438) ❑ Attribute-type: TYPE ❑ Attribute-value: <NOT PRESENT> b) WAN PCD-01 message PCD-01 message does not include segments with a System-Type attribute value (67974^MDC_ATTR_SYS_TYPE^MDC).		

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-001		
TP label		Whitepaper. Glucosemeter MDS Object - Dev-Configuration-Id Attribute		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	GL Specific MDS 2; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a Glucosemeter profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 3. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends the measurement to the manager under test. 4. Check in manager transcoder output for the MDS object – Dev-Configuration-Id attribute.		
Pass/Fail criteria		In step 4, the MDS object – Dev-Configuration-Id attribute is present and its value is inside the range 0x4000 - 0x7FFF.		
Notes		Possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Dev-Configuration-Id attribute is present: ❑ Object: MDS object ❑ Attribute-id: MDC_ATTR_DEV_CONFIG_ID (2628) ❑ Attribute-type: INT-U16 ❑ Attribute-value: Any value inside the range 16384 - 32767 (dec) or 0x4000 – 0x7FFF (hex) b) WAN PCD-01 message According to [ITU-T H.810] (CDG 2013), the Dev-Configuration-Id shall not be transmitted in the PCD-01 message; therefore it is not possible to check this attribute.		

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-002		
TP label		Whitepaper. Glucosemeter MDS Object - System-Type-Spec-List Attribute		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	Common MDS 15; M	GL Specific MDS 3; M	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a Glucosemeter profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 3. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends the measurement to the manager under test. 4. Check in manager transcoder output for the MDS object – System-Type-Spec-List attribute.		
Pass/Fail criteria		In step 4, the MDS object – System-Type-Spec-List attribute is present and its value is (MDC_DEV_SPEC_PROFILE_GLUCOSE, Version 2).		
Notes		Possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes System-Type-Spec-List attribute is present: ❑ Object: MDS object ❑ Attribute-id: MDC_ATTR_SYS_TYPE_SPEC_LIST (2650) ❑ Attribute-type: SEQUENCE OF [{type (INT-U16), version (INT-U16)}] ❑ Attribute-value: • type: MDC_DEV_SPEC_PROFILE_GLUCOSE or 4113 (dec) or 10 11 (hex) • version: 2 (dec) or 00 02 (hex) b) WAN PCD-01 message PCD-01 message includes a segment like this with a System-Type-Spec-List attribute value (check OBX-5): OBX|?|NM|68186^MDC_ATTR_SYS_TYPE_SPEC_LIST^MDC|1.0.0.a| 528401^MDC_DEV_SPEC_PROFILE_GLUCOSE^MDC||||||R		

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-003		
TP label		Whitepaper. Glucosemeter MDS Object - Reg-Cert-Data-List Attribute		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	Common MDS 14; M	Regulatory Conv 1; M	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a Glucosemeter profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is: 　　a. IEEE 11073-20601 Regulatory Certification Data List (0x2A2A) 　　　• Format: reg-cert-data-list (opaque structure) 　　　• Value: 00 02 00 12 02 01 00 08 04 00 00 01 00 02 80 11 02 02 00 02 80 00 (hex) 　　　　　i. Element: 　　　　　　• auth-body-and-struc-type: 　　　　　　　- auth-body: 02 (hex) auth-body-continua(2) 　　　　　　　- auth-body-struc-type: 01 (hex). continua-version-struct(1) 　　　　　　• auth-body-data: 　　　　　　　- major-IG-version: 04 (hex) 　　　　　　　- minor-IG-version: 00 (hex) 　　　　　　　- certified-devices: 80 11 (hex). BLE Glucosemeter 　　　　　ii. Element: 　　　　　　• auth-body-and-struc-type: 　　　　　　　- auth-body: 02 (hex). auth-body-continua(2) 　　　　　　　- auth-body-struc-type: 02 (hex). continua-reg-struct(2) 　　　　　　• auth-body-data: 　　　　　　　- regulation-bit-field: 80 00 (hex). Unregulated device 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent. 4. When the pairing has been completed (connection state), force the manager under test to read the IEEE 11073-20601 Regulatory Certification Data List characteristic. 5. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and simulated agent sends the measurement to the manager under test. 6. Check in manager transcoder output for the MDS object – Reg-Cert-Data-List attribute.		
Pass/Fail criteria		In step 6, the MDS object – Reg-Cert-Data-List attribute is present and its value matches with the IEEE 11073-20601 Regulatory Certification Data List characteristic value.		
Notes		Possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Reg-Cert-Data-List attribute is present: 　❑ Object: MDS object 　❑ Attribute-id: MDC_ATTR_REG_CERT_DATA_LIST (2635) 　❑ Attribute-type: SEQUENCE OF [{auth-body-and-struc-type, auth-body-data}, {…}] 　❑ Attribute-value: 00 02 00 12 02 01 00 08 04 00 00 01 00 02 80 11 02 02 00 02 80 00 (hex) 　　[Note that 0x00 0x02 is the number of elements in the sequence and 0x00 0x12 is the length of the sequence] 　　　i. Reg-Cert-Data Element: 　　　　• auth-body-and-struc-type: 　　　　　- auth-body: 02 (hex) auth-body-continua(2) 　　　　　- auth-body-struc-type: 01 (hex). continua-version-struct(1) 　　　　• auth-body-data: 　　　　　- major-IG-version: 04 (hex) 　　　　　- minor-IG-version: 00 (hex) 　　　　　- certified-devices: 80 11 (hex). BLE Glucosemeter 　　　ii. Reg-Cert-Data Element: 　　　　• auth-body-and-struc-type: 　　　　　- auth-body: 02 (hex). auth-body-continua(2) 　　　　　- auth-body-struc-type: 02 (hex). continua-reg-struct(2) 　　　　• auth-body-data: 　　　　　- regulation-bit-field: 80 00 (hex). Unregulated device b) WAN PCD-01 message PCD-01 message includes five segments like these with Reg-Cert-Data-List attribute value (check OBX-5 in five segments): OBX|?|CWE|68218^MDC_REG_CERT_DATA_AUTH_BODY^MDC|1.0.0.a|2^auth-body-continua||||||R OBX|?|ST|532352^MDC_REG_CERT_DATA_CONTINUA_VERSION^MDC|1.0.0.a.x| 4.0||||||R OBX|?|NA|532353^MDC_REG_CERT_DATA_CONTINUA_CERT_DEV_LIST^MDC|1.0.0.a.y|32785||||||R OBX|?|CWE|68218^MDC_REG_CERT_DATA_AUTH_BODY^MDC|1.0.0.b|2^auth-body-continua||||||R OBX|?|CWE|532354^MDC_REG_CERT_DATA_CONTINUA_REG_STATUS^MDC|1.0.0.b.z|1^unregulated-device(0)||||||R		

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-004
TP label		Whitepaper. Glucosemeter Blood Glucose Object - Handle Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Numeric 1; O
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007
Initial condition		The manager under test and the simulated agent are in the standby state
Test procedure		1. The simulated agent is configured with a Glucosemeter profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		a. Glucose measurement (0x2A18)
		i. Field: Flags
		• Format: 8 bit
		• Value: 0000 0010 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location fields are included, Time Offset and Sensor Status Annunciation fields are not included
		ii. Field: Sequence number
		• Format: uint16
		• Value: Not relevant
		iii. Field: Base Time
		• Format: Date and Time
		• Value: Not relevant
		iv. Field: Time Offset
		• This field is not included
		v. Field: Glucose Concentration - units of kg/L
		• Format: SFLOAT
		• Value: Not relevant
		vi. Field: Glucose Concentration - units of mol/L
		• This field is not included
		vii. Field: Type
		• Format: nibble
		• Value: Not relevant
		viii. Field: Sample Location
		• Format: nibble
		• Value: Not relevant
		ix. Field: Sensor Status Annunciation
		• This field is not included
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state)
		4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends the measurement to the manager under test.
		5. Check in manager transcoder output for the Blood glucose object – Handle attribute.
Pass/Fail criteria		In step 5, the Blood glucose object – Handle attribute is not present; however, if it is present then its value is different to 0.
Notes		Possible values in typical points of observation after transcoder output are:
		a) IEEE 11073 Objects and Attributes
		Handle attribute is not present, or if it is present then:
		❑ Object: Blood glucose numeric object
		❑ Attribute-id: MDC_ATTR_ID_HANDLE (2337)
		❑ Attribute-type: INT-U16
		❑ Attribute-value: Any value other than 0
		b) WAN PCD-01 message
		PCD-01 message does not include segments with a Handle attribute value.

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-005		
TP label		Whitepaper. Glucosemeter Blood Glucose Object - Type Attribute		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	GL Numeric 2; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		2. The simulated agent implements several BLE characteristics. The characteristics of interest for this test case are:
		
		   a. Glucose measurement (0x2A18)
		
		      i. Field: Flags
		        • Format: 8 bit
		        • Value: 0000 0010 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location fields are included, Time Offset and Sensor Status Annunciation fields are not included
		
		      ii. Field: Sequence number
		        • Format: uint16
		        • Value: Not relevant
		
		      iii. Field: Base Time
		        • Format: Date and Time
		        • Value: Not relevant
		
		      iv. Field: Time Offset
		        • This field is not included
		
		      v. Field: Glucose Concentration - units of kg/L
		        • Format: SFLOAT
		        • Value: Not relevant
		
		      vi. Field: Glucose Concentration - units of mol/L
		        • This field is not included
		
		      vii. Field: Type
		        • Format: nibble
		        • Value: Several values are checked in this test case
		
		      viii. Field: Sample Location
		        • Format: nibble
		        • Value: Not relevant
		
		      ix. Field: Sensor Status Annunciation
		        • This field is not included
		
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		
		4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends the measurement to the manager under test with the field Type set to Capillary Whole blood (0x01).
		
		5. Check in manager transcoder output for the Blood glucose object – Type.
		
		6. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends the measurement to the manager under test with field Type set to Capillary Plasma (0x02).
		
		7. Check in manager transcoder output for the Blood glucose object – Type.		

	8. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends the measurement to the manager under test with field Type set to Venous Whole blood (0x03).
	9. Check in manager transcoder output for the Blood glucose object – Type.
	10. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends the measurement to the manager under test with field Type set to Venous Plasma (0x04).
	11. Check in manager transcoder output for the Blood glucose object – Type.
	12. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends the measurement to the manager under test with field Type set to Arterial Whole blood (0x05).
	13. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the Check in manager transcoder output for the Blood glucose object – Type.
	14. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends the measurement to the manager under test with field Type set to Arterial Plasma (0x06).
	15. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the Check in manager transcoder output for the Blood glucose object – Type.
	16. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends the measurement to the manager under test with field Type set to Undetermined Whole blood (0x07).
	17. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the Check in manager transcoder output for the Blood glucose object – Type.
	18. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends the measurement to the manager under test with field Type set to Undetermined Plasma (0x08).
	19. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the Check in manager transcoder output for the Blood glucose object – Type.
	20. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends the measurement to the manager under test with field Type set to Interstitial Fluid (ISF) (0x09).
	21. Check in manager transcoder output for the Blood glucose object – Type.
	22. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends the measurement to the manager under test with field Type set to Control Solution (0x0A).
	23. Check in manager transcoder output for the Blood glucose object – Type.
Pass/Fail criteria	In step 5, the Blood glucose object – Type attribute is present and its value is {MDC_PART_SCADA, MDC_CONC_GLU_CAPILLARY_WHOLEBLOOD}.
	In step 7, the Blood glucose object – Type attribute is present and its value is {MDC_PART_SCADA, MDC_CONC_GLU_CAPILLARY_PLASMA}.
	In step 9, the Blood glucose object – Type attribute is present and its value is {MDC_PART_SCADA, MDC_CONC_GLU_VENOUS_WHOLEBLOOD}.
	In step 11, the Blood glucose object – Type attribute is present and its value is {MDC_PART_SCADA, MDC_CONC_GLU_VENOUS_PLASMA}.
	In step 13, the Blood glucose object – Type attribute is present and its value is {MDC_PART_SCADA, MDC_CONC_GLU_ARTERIAL_WHOLEBLOOD}.
	In step 15, the Blood glucose object – Type attribute is present and its value is {MDC_PART_SCADA, MDC_CONC_GLU_ARTERIAL_PLASMA}.

	In step 17, the Blood glucose object – Type attribute is present and its value is {MDC_PART_SCADA, MDC_CONC_GLU_UNDETERMINED_WHOLEBLOOD}.
	In step 19, the Blood glucose object – Type attribute is present and its value is {MDC_PART_SCADA, MDC_CONC_GLU_UNDETERMINED_PLASMA}.
	In step 21, the Blood glucose object – Type attribute is present and its value is {MDC_PART_SCADA, MDC_CONC_GLU_ISF}.
	In step 23, the Blood glucose object – Type attribute is present and its value is {MDC_PART_SCADA, MDC_CONC_GLU_CONTROL}.
Notes	In step 5, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Type attribute is present:
	❑ Object: Blood glucose object
	❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
	❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
	❑ Attribute-value:
	• partition: MDC_PART_SCADA or 2 (dec) or 00 02 (hex)
	• code: MDC_CONC_GLU_CAPILLARY_WHOLEBLOOD or 29112 (dec) or 71 B8 (hex)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):
	OBX|?|NM|160184^MDC_CONC_GLU_CAPILLARY_WHOLEBLOOD^MDC|1.0.0.a|160|264274^MDC_DIM_MILLI_G_PER_DL^MDC|||||R|||[current_date_time]
	In step 7, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Type attribute is present:
	❑ Object: Blood glucose object
	❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
	❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
	❑ Attribute-value:
	• partition: MDC_PART_SCADA or 2 (dec) or 00 02 (hex)
	• code: MDC_CONC_GLU_CAPILLARY_PLASMA or 29116 (dec) or 71 BC (hex)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):
	OBX|?|NM|160188^MDC_CONC_GLU_CAPILLARY_PLASMA^MDC|1.0.0.a|160|264274^MDC_DIM_MILLI_G_PER_DL^MDC|||||R|||[current_date_time]
	In step 9, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Type attribute is present:
	❑ Object: Blood glucose object
	❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
	❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
	❑ Attribute-value:
	• partition: MDC_PART_SCADA or 2 (dec) or 00 02 (hex)
	• code: MDC_CONC_GLU_VENOUS_WHOLEBLOOD or 29120 (dec) or 71 C0 (hex)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):
	OBX|?|NM|160192^MDC_CONC_GLU_VENOUS_WHOLEBLOOD^MDC|1.0.0.a|160|264274^MDC_DIM_MILLI_G_PER_DL^MDC|||||R|||[current_date_time]
	In step 11, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Type attribute is present:

- ❑ Object: Blood glucose object
- ❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
- ❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
- ❑ Attribute-value:
  - partition: MDC_PART_SCADA or 2 (dec) or 00 02 (hex)
  - code: MDC_CONC_GLU_VENOUS_PLASMA or 29124 (dec) or 71 C4 (hex)

b)   WAN PCD-01 message

PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):

OBX|?|NM|160196^MDC_CONC_GLU_VENOUS_PLASMA^MDC|1.0.0.a|160| 264274^MDC_DIM_MILLI_G_PER_DL^MDC|||||R|||[current_date_time]

In step 13, possible values in typical points of observation after transcoder output are:

a)   IEEE 11073 Objects and Attributes

Type attribute is present:

- ❑ Object: Blood glucose object
- ❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
- ❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
- ❑ Attribute-value:
  - partition: MDC_PART_SCADA or 2 (dec) or 00 02 (hex)
  - code: MDC_CONC_GLU_ARTERIAL_WHOLEBLOOD or 29128 (dec) or 71 C8 (hex)

b)   WAN PCD-01 message

PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):

OBX|?|NM|160200^MDC_CONC_GLU_ARTERIAL_WHOLEBLOOD^MDC|1.0.0.a|160| 264274^MDC_DIM_MILLI_G_PER_DL^MDC|||||R|||[current_date_time]

In step 15, possible values in typical points of observation after transcoder output are:

a)   IEEE 11073 Objects and Attributes

Type attribute is present:

- ❑ Object: Blood glucose object
- ❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
- ❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
- ❑ Attribute-value:
  - partition: MDC_PART_SCADA or 2 (dec) or 00 02 (hex)
  - code: MDC_CONC_GLU_ARTERIAL_PLASMA or 29132 (dec) or 71 CC (hex)

b)   WAN PCD-01 message

PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):

OBX|?|NM|160204^CONC_GLU_ARTERIAL_PLASMA^MDC|1.0.0.a|160| 264274^MDC_DIM_MILLI_G_PER_DL^MDC|||||R|||[current_date_time]

In step 17, possible values in typical points of observation after transcoder output are:

a)   IEEE 11073 Objects and Attributes

Type attribute is present:

- ❑ Object: Blood glucose object
- ❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
- ❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
- ❑ Attribute-value:
  - partition: MDC_PART_SCADA or 2 (dec) or 00 02 (hex)
  - code: MDC_CONC_GLU_UNDETERMINED_WHOLEBLOOD or 29292 (dec) or 72 6C (hex)

b)   WAN PCD-01 message

PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):

OBX|?|NM|160364^MDC_CONC_GLU_UNDETERMINED_WHOLEBLOOD^MDC|
1.0.0.a|160|264274^MDC_DIM_MILLI_G_PER_DL^MDC|||||R||||[current_date_time]

In step 19, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Type attribute is present:

- ❑ Object: Blood glucose object
- ❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
- ❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
- ❑ Attribute-value:
    - partition: MDC_PART_SCADA or 2 (dec) or 00 02 (hex)
    - code: MDC_CONC_GLU_UNDETERMINED_PLASMA or 29296 (dec) or 72 70 (hex)

b) WAN PCD-01 message

PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):

OBX|?|NM|160368^MDC_CONC_GLU_UNDETERMINED_PLASMA^MDC|1.0.0.a|160|
264274^MDC_DIM_MILLI_G_PER_DL^MDC|||||R||||[current_date_time]

In step 21, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Type attribute is present:

- ❑ Object: Blood glucose object
- ❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
- ❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
- ❑ Attribute-value:
    - partition: MDC_PART_SCADA or 2 (dec) or 00 02 (hex)
    - code: MDC_CONC_GLU_ISF or 29140 (dec) or 71 D4 (hex)

b) WAN PCD-01 message

PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):

OBX|?|NM|160212^MDC_CONC_GLU_ISF^MDC|1.0.0.a|160|
264274^MDC_DIM_MILLI_G_PER_DL^MDC|||||R||||[current_date_time]

In step 23, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Type attribute is present:

- ❑ Object: Blood glucose object
- ❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
- ❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
- ❑ Attribute-value:
    - partition: MDC_PART_SCADA or 2 (dec) or 00 02 (hex)
    - code: MDC_CONC_GLU_CONTROL or 29136 (dec) or 71 D0 (hex)

b) WAN PCD-01 message

PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):

OBX|?|NM|160208^MDC_CONC_GLU_CONTROL^MDC|1.0.0.a|160|
264274^MDC_DIM_MILLI_G_PER_DL^MDC|||||R||||[current_date_time]

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-006
TP label		Whitepaper. Glucosemeter Blood Glucose Object - Metric-Spec-Small Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Numeric 3; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007
Initial condition		The manager under test and the simulated agent are in the standby state

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		   a. Glucose measurement (0x2A18)
		      i. Field: Flags
		         • Format: 8 bit
		         • Value: 0000 0010 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location fields are included, Time Offset and Sensor Status Annunciation fields are not included
		      ii. Field: Sequence number
		         • Format: uint16
		         • Value: Not relevant
		      iii. Field: Base Time
		         • Format: Date and Time
		         • Value: Not relevant
		      iv. Field: Time Offset
		         • This field is not included
		      v. Field: Glucose Concentration - units of kg/L
		         • Format: SFLOAT
		         • Value: Not relevant
		      vi. Field: Glucose Concentration - units of mol/L
		         • This field is not included
		      vii. Field: Type
		         • Format: nibble
		         • Value: Not relevant
		      viii. Field: Sample Location
		         • Format: nibble
		         • Value: Not relevant
		      ix. Field: Sensor Status Annunciation
		         • This field is not included
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends the measurement to the manager under test.
		5. Check in manager transcoder output for the Blood glucose numeric object – Metric-Spec-Small attribute.

Pass/Fail criteria		In step 5, the Blood glucose numeric object – Metric-Spec-Small attribute is present and its value is {0xF040} (mss-avail-intermittent | mss-avail-stored-data | mss-upd-aperiodic | mss-msmt-aperiodic | mss-acc-agent-initiated).

Notes		Possible values in typical points of observation after transcoder output are:
		a) IEEE 11073 Objects and Attributes
		Metric-Spec-Small attribute is present:
		   ❑ Object: Blood glucose numeric object
		   ❑ Attribute-id: MDC_ATTR_METRIC_SPEC_SMALL (2630)
		   ❑ Attribute-type: BITS-16
		   ❑ Attribute-value: F0 40 (hex) or BITS mss-avail-intermittent(0), mss-avail-stored-data(1), mss-upd-aperiodic(2), mss-msmt-aperiodic(3), mss-acc-agent-initiated(9) set to TRUE and remaining BITS set to FALSE
		b) WAN PCD-01 message
		PCD-01 message does not include segments with a Metric-Spec-Small attribute value.

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-007		
TP label		Whitepaper. Glucosemeter Blood Glucose Object - Unit-Code Attribute		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	GL Numeric 4; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		 a. Glucose measurement (0x2A18)
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends the measurement to the manager under test with the following value:
		 a. Glucose measurement (0x2A18)
		    i. Field: Flags
		      • Format: 8 bit
		      • Value: 0000 0010 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location fields are included, Time Offset and Sensor Status Annunciation fields are not included
		    ii. Field: Sequence number
		      • Format: uint16
		      • Value: Not relevant
		    iii. Field: Base Time
		      • Format: Date and Time
		      • Value: Not relevant
		    iv. Field: Time Offset
		      • This field is not included
		    v. Field: Glucose Concentration - units of kg/L
		      • Format: SFLOAT
		      • Value: Not relevant
		    vi. Field: Glucose Concentration - units of mol/L
		      • This field is not included
		    vii. Field: Type
		      • Format: nibble
		      • Value: Undetermined Plasma (0x08)
		    viii. Field: Sample Location
		      • Format: nibble
		      • Value: Not relevant
		    ix. Field: Sensor Status Annunciation
		      • This field is not included
		 5. Check in manager transcoder output for the Blood glucose object – Unit-Code attribute.
		 6. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends the measurement to the manager under test with the following value:
		 a. Glucose measurement (0x2A18)
		    i. Field: Flags
		      • Format: 8 bit
		      • Value: 0000 0110 (MSB → LSB). Glucose concentration in units of mol/L, Type and Sample Location fields are included, Time Offset and Sensor Status Annunciation fields are not included
		    ii. Field: Sequence number
		      • Format: uint16
		      • Value: Not relevant
		    iii. Field: Base Time
		      • Format: Date and Time
		      • Value: Not relevant
		    iv. Field: Time Offset
		      • This field is not included
		    v. Field: Glucose Concentration - units of kg/L
		      • This field is not included
		    vi. Field: Glucose Concentration - units of mol/L
		      • Format: SFLOAT		

	• Value: Not relevant
	vii. Field: Type
	• Format: nibble
	• Value: Undetermined Plasma (0x08)
	viii. Field: Sample Location
	• Format: nibble
	• Value: Not relevant
	ix. Field: Sensor Status Annunciation
	• This field is not included
	7. Check in manager transcoder output for the Blood glucose object – Unit-Code attribute.
Pass/Fail criteria	In step 5, the Blood glucose object – Unit-Code attribute is present and its value is MDC_DIM_MILLI_G_PER_DL. In step 7, the Blood glucose object – Unit-Code attribute is present and its value is MDC_DIM_MILLI_MOLE_PER_L.
Notes	In step 5, possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Unit-Code attribute is present: ❑ Object: Blood glucose object ❑ Attribute-id: MDC_ATTR_UNIT_CODE (2454) ❑ Attribute-type: INT-U16 ❑ Attribute-value: MDC_DIM_MILLI_G_PER_DL or 2130 (dec) or 08 52 (hex) b) WAN PCD-01 message PCD-01 message includes a segment like this with Unit-Code attribute value (check OBX-6): OBX|?|NM|160368^MDC_CONC_GLU_UNDETERMINED_PLASMA^MDC|1.0.0.a|160 264274^MDC_DIM_MILLI_G_PER_DL ^MDC|||||R|||[current_date_time] In step 7, possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Unit-Code attribute is present: ❑ Object: Blood glucose object ❑ Attribute-id: MDC_ATTR_UNIT_CODE (2454) ❑ Attribute-type: INT-U16 ❑ Attribute-value: MDC_DIM_MILLI_MOLE_PER_L or 4722 (dec) or 12 72 (hex) b) WAN PCD-01 message PCD-01 message includes a segment like this with Unit-Code attribute value (check OBX-6): OBX|?|NM|160368^MDC_CONC_GLU_UNDETERMINED_PLASMA^MDC|1.0.0.a|9 266866^MDC_DIM_MILLI_MOLE_PER_L^MDC|||||R|||[current_date_time]

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-008		
TP label		Whitepaper. Glucosemeter Blood Glucose Object - Absolute-Time-Stamp Attribute		
Coverage	**Spec**	[Bluetooth PHDT v1.4]		
	Testable items	GL Numeric 5; M	Date-Time Conv 2; M	Date-Time Conv 3; M
		Date-Time Conv 4; M	Date-Time Conv 5; M	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		 a. Glucose measurement (0x2A18)
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends the measurement to the manager under test with the following value:
		 a. Glucose measurement (0x2A18)
		  i. Field: Flags
		   • Format: 8 bit
		   • Value: 00000011 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location and Time Offset fields are included, Sensor Status Annunciation field is not included
		  ii. Field: Sequence number
		   • Format: uint16
		   • Value: Not relevant
		  iii. Field: Base Time
		   • Format: Date and Time
		   • Value: August 2nd, 2012, 10:59:27
		  iv. Field: Time Offset
		   • Format: sint16
		   • Value: 120 minutes
		  v. Field: Glucose Concentration - units of kg/L
		   • Format: SFLOAT
		   • Value: Not relevant
		  vi. Field: Glucose Concentration - units of mol/L
		   • This field is not included
		  vii. Field: Type
		   • Format: nibble
		   • Value: Undetermined Plasma (0x08)
		  viii. Field: Sample Location
		   • Format: nibble
		   • Value: Not relevant
		  ix. Field: Sensor Status Annunciation
		   • This field is not included
		 5. Check in manager transcoder output for the Blood glucose object – Absolute-Time-Stamp attribute.		

Pass/Fail criteria		In step 5, the Blood glucose object – Absolute-Time-Stamp attribute is present, its value matches with the Base Time field in conjunction with the Time Offset and a fraction of seconds which is set to 0.		

Notes		Possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Absolute-Time-Stamp attribute is present:
		  ❑ Object: Blood glucose object
		  ❑ Attribute-id: MDC_ATTR_TIME_STAMP_ABS (2448)
		  ❑ Attribute-type: SEQUENCE {century (INT-U8), year (INT-U8), month (INT-U8), day (INT-U8), hour (INT-U8), minute (INT-U8), second (INT-U8), sec-fractions (INT-U8)} (BCD encoding)
		  ❑ Attribute-value:
		   • century: 20 (hex) or 32 (dec)
		   • year: 12 (hex) or 18 (dec)
		   • month: 08 (hex) or 8 (dec)
		   • day: 02 (hex) or 2 (dec)
		   • hour: 12 (hex) or 18 (dec)
		   • minute: 59 (hex) or 89 (dec)
		   • second: 27 (hex) or 39 (dec)
		   • sec-fractions: 00 (hex) or 0 (dec)
		 b) WAN PCD-01 message
		 PCD-01 message includes a segment like this with Absolute-Time-Stamp attribute value (check OBX-14):
		 OBX|?|NM|160368^MDC_CONC_GLU_UNDETERMINED_PLASMA^MDC|1.0.0.a|160| 264274^MDC_DIM_MILLI_G_PER_DL^MDC|||||R|||20120802125927+0000		

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-009		
TP label		Whitepaper. Glucosemeter Blood Glucose Object - Basic-Nu-Observed-Value Attribute 1		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	GL Numeric 6; M	Short Float Type 1; C	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		   a. Glucose measurement (0x2A18)
		
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		
		4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends the measurement to the manager under test with the following value:
		   a. Glucose measurement (0x2A18)
		      i. Field: Flags
		         • Format: 8 bit
		         • Value: 00000010 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location fields are included, Time Offset and Sensor Status Annunciation fields are not included
		      ii. Field: Sequence number
		         • Format: uint16
		         • Value: Not relevant
		      iii. Field: Base Time
		         i. Format: Date and Time
		         • Value: Not relevant
		      iv. Field: Time Offset
		         • This field is not included
		      v. Field: Glucose Concentration - units of kg/L
		         • Format: SFLOAT
		         • Value: 0.0016 kg/L (160 mg/dL)
		      vi. Field: Glucose Concentration - units of mol/L
		         • This field is not included
		      vii. Field: Type
		         • Format: nibble
		         • Value: Undetermined Plasma (0x08)
		      viii. Field: Sample Location
		         • Format: nibble
		         • Value: Not relevant
		      ix. Field: Sensor Status Annunciation
		         • This field is not included
		
		5. Check in manager transcoder output for the Blood glucose object– Basic-Nu-Observed-Value attribute.
		
		6. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends the measurement to the manager under test with the following value:
		   a. Glucose measurement (0x2A18)
		      i. Field: Flags
		         • Format: 8 bit		

- • Value: 00000110 (MSB → LSB). Glucose concentration units of mol/L, Type and Sample Location fields are included, Time Offset and Sensor Status Annunciation fields are not included
  - ii. Field: Sequence number
    - • Format: uint16
    - • Value: Not relevant
  - iii. Field: Base Time
    - • Format: Date and Time
    - • Value: Not relevant
  - iv. Field: Time Offset
    - • This field is not included
  - v. Field: Glucose Concentration - units of kg/L
    - • This field is not included
  - vi. Field: Glucose Concentration - units of mol/L
    - • Format: SFLOAT
    - • Value: Value: 0.009 mol/L (9 mmol/L)
  - vii. Field: Type
    - • Format: nibble
    - • Value: Undetermined Plasma (0x08)
  - viii. Field: Sample Location
    - • Format: nibble
    - • Value: Not relevant
  - ix. Field: Sensor Status Annunciation
    - • This field is not included
7. Check in manager transcoder output for the Blood glucose object – Basic-Nu-Observed-Value attribute.

Pass/Fail criteria	In step 5, the Blood glucose object – Basic-Nu-Observed-Value attribute is present and its value matches with the Glucose measurement value (kg/L) field of the Glucose measurement characteristic: 0.0016 kg/L (160 mg/dL).
	In step 7, the Blood glucose object – Basic-Nu-Observed-Value attribute is present and its value matches with the Glucose Measurement Value (mol/L) field of the Glucose Measurement characteristic: 0.009 mol/L (9 mmol/L).
Notes	Possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Basic-Nu-Observed-Value attribute is present:
	❑ Object: Blood glucose object
	❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636)
	❑ Attribute-type: SFLOAT
	❑ Attribute-value: F6 40 (hex) or 160 (dec)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with a Basic-Nu-Observed-Value attribute value (check OBX-5):
	OBX|?|NM|160368^MDC_CONC_GLU_UNDETERMINED_PLASMA^MDC|1.0.0.a|160.0|264274^MDC_DIM_MILLI_G_PER_DL ^MDC|||||R|||[current_date_time]
	In step 7, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Basic-Nu-Observed-Value attribute is present:
	❑ Object: Blood glucose object
	❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636)
	❑ Attribute-type: SFLOAT
	❑ Attribute-value: E3 84 (hex) or 9 (dec)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with a Basic -Nu-Observed-Value attribute value (check OBX-5):
	OBX|?|NM|160368^MDC_CONC_GLU_UNDETERMINED_PLASMA^MDC|1.0.0.a|9.0|266866^MDC_DIM_MILLI_MOLE_PER_L^MDC|||||R|||[current_date_time]

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-010		
TP label		Whitepaper. Glucosemeter Blood Glucose Object - Basic-Nu-Observed-Value Attribute 2		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	GL Numeric 6; M	Short Float Type 1; C	Short Float Type 2; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		
		   a. Glucose measurement (0x2A18)
		
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		
		4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends the measurement to the manager under test with the following value:
		
		   a. Glucose measurement (0x2A18)
		
		      i. Field: Flags
		        • Format: 8 bit
		        • Value: 00000010 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location fields are included, Time Offset and Sensor Status Annunciation fields are not included
		
		      ii. Field: Sequence number
		        • Format: uint16
		        • Value: Not relevant
		
		      iii. Field: Base Time
		        • Format: Date and Time
		        • Value: Not relevant
		
		      iv. Field: Time Offset
		        • This field is not included
		
		      v. Field: Glucose Concentration - units of kg/L
		        • Format: SFLOAT
		        • Value: 0.0016 kg/L (160 mg/dL)
		
		      vi. Field: Glucose Concentration - units of mol/L
		        • This field is not included
		
		      vii. Field: Type
		        • Format: nibble
		        • Value: Undetermined Plasma (0x08)
		
		      viii. Field: Sample Location
		        • Format: nibble
		        • Value: Not relevant
		
		      ix. Field: Sensor Status Annunciation
		        • This field is not included
		
		5. Check in manager transcoder output for the Blood glucose object – Basic-Nu-Observed-Value attribute.		

6. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends the measurement to the manager under test with the following value:

    a. Glucose measurement (0x2A18)

        i. Field: Flags

            • Format: 8 bit

            • Value: 00000010 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location fields are included, Time Offset and Sensor Status Annunciation fields are not included

        ii. Field: Sequence number

            • Format: uint16

            • Value: Not relevant

        iii. Field: Base Time

            • Format: Date and Time

            • Value: Not relevant

        iv. Field: Time Offset

            • This field is not included

        v. Field: Glucose Concentration - units of kg/L

            • Format: SFLOAT

            • Value: 07 FF(hex). Special value: NaN

        vi. Field: Glucose Concentration - units of mol/L

            • This field is not included

        vii. Field: Type

            • Format: nibble

            • Value: Undetermined Plasma (0x08)

        viii. Field: Sample Location

            • Format: nibble

            • Value: Not relevant

        ix. Field: Sensor Status Annunciation

            • This field is not included

7. Check in manager transcoder output for the Blood glucose object – Basic-Nu-Observed-Value attribute.

8. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends the measurement to the manager under test with the following value:

    a. Glucose measurement (0x2A18)

        i. Field: Flags

             • Format: 8 bit

            • Value: 00000010 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location fields are included, Time Offset and Sensor Status Annunciation fields are not included

        ii. Field: Sequence number

            • Format: uint16

            • Value: Not relevant

        iii. Field: Base Time

            • Format: Date and Time

            • Value: Not relevant

        iv. Field: Time Offset

            • This field is not included

      v. Field: Glucose Concentration - units of kg/

- Format: SFLOAT
- Value: 00 80 (hex). Special value: NRes

     vi. Field: Glucose Concentration - units of mol/L

- This field is not included

   vii. Field: Type

- Format: nibble
- Value: Undetermined Plasma (0x08)

  viii. Field: Sample Location

- Format: nibble
- Value: Not relevant

    ix. Field: Sensor Status Annunciation

- This field is not included

9. Check in manager transcoder output for the Blood glucose object – Basic-Nu-Observed-Value attribute.

10. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends the measurement to the manager under test with the following value:

   a. Glucose measurement (0x2A18)

      i. Field: Flags

- Format: 8 bit
- Value: 00000010 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location fields are included, Time Offset and Sensor Status Annunciation fields are not included

     ii. Field: Sequence number

- Format: uint16
- Value: Not relevant

   iii. Field: Base Time

- Format: Date and Time
- Value: Not relevant

   iv. Field: Time Offset

- This field is not included

    v. Field: Glucose Concentration - units of kg/L

- Format: SFLOAT
- Value: 07 FE (hex). Special value: +INFINITY

   vi. Field: Glucose Concentration - units of mol/L

- This field is not included

   vii. Field: Type

- Format: nibble
- Value: Undetermined Plasma (0x08)

  viii. Field: Sample Location

- Format: nibble
- Value: Not relevant

   ix. Field: Sensor Status Annunciation

- This field is not included

11. Check in manager transcoder output for the Blood glucose object – Basic-Nu-Observed-Value attribute.

	12. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends the measurement to the manager under test with the following value:
	
	   a. Glucose measurement (0x2A18)
	
	      i. Field: Flags
	         • Format: 8 bit
	         • Value: 00000010 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location fields are included, Time Offset and Sensor Status Annunciation fields are not included
	
	      ii. Field: Sequence number
	         • Format: uint16
	         • Value: Not relevant
	
	      iii. Field: Base Time
	         • Format: Date and Time
	         • Value: Not relevant
	
	      iv. Field: Time Offset
	         • This field is not included
	
	      v. Field: Glucose Concentration - units of kg/L
	         • Format: SFLOAT
	         • Value: 08 02 (hex). Special value: -INFINITY
	
	      vi. Field: Glucose Concentration - units of mol/L
	         • This field is not included
	
	      vii. Field: Type
	         • Format: nibble
	         • Value: Undetermined Plasma (0x08)
	
	      viii. Field: Sample Location
	         • Format: nibble
	         • Value: Not relevant
	
	      ix. Field: Sensor Status Annunciation
	         • This field is not included
	
	13. Check in manager transcoder output for the Blood glucose object – Basic-Nu-Observed-Value attribute.

Pass/Fail criteria	In step 5, the Blood glucose object – Basic-Nu-Observed-Value attribute is present and its value is 0.0016 kg/L (160 mg/dL). In step 7, the Blood glucose object – Basic -Nu-Observed-Value attribute is present and its value is 0x07FF. In step 9, the Blood glucose object – Basic -Nu-Observed-Value attribute is present and its value is 0x0800. In step 11, the Blood glucose object – Basic -Nu-Observed-Value attribute is present and its value is 0x07FE. In step 13, the Blood glucose object – Basic -Nu-Observed-Value attribute is present and its value is 0x0802.

Notes	In step 5, possible values in typical points of observation after transcoder output are:
	
	a) IEEE 11073 Objects and Attributes
	
	Basic-Nu-Observed-Value attribute is present:
	
	   ❑ Object: Blood glucose object
	   ❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636)
	   ❑ Attribute-type: SFLOAT
	   ❑ Attribute-value: F6 40 (hex) or 160 (dec)
	
	b) WAN PCD-01 message

PCD-01 message includes a segment like this with a Basic-Nu-Observed-Value attribute value (check OBX-5):

OBX|?|NM|160368^MDC_CONC_GLU_UNDETERMINED_PLASMA^MDC|1.0.0.a|160.0| 264274^MDC_DIM_MILLI_G_PER_DL ^MDC|||||R||||[current_date_time]

In step 7, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Basic -Nu-Observed-Value attribute is present:

- ❑ Object: Blood glucose object
- ❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636)
- ❑ Attribute-type: SFLOAT
- ❑ Attribute-value: 07 FF(hex) or NaN (note that is not allowed a decimal value)

b) WAN PCD-01 message

PCD-01 message does not include segments with a Basic -Nu-Observed-Value attribute value (160368^MDC_CONC_GLU_UNDETERMINED_PLASMA^MDC) because it has a special value and these values are not included in the PCD-01 message.

In step 9, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Basic -Nu-Observed-Value attribute is present:

- ❑ Object: Blood glucose object
- ❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636)
- ❑ Attribute-type: SFLOAT
- ❑ Attribute-value: 08 00 (hex) or NRes (note that a decimal value is not allowed)

b) WAN PCD-01 message

PCD-01 message does not include segments with a Basic -Nu-Observed-Value attribute value (160368^MDC_CONC_GLU_UNDETERMINED_PLASMA^MDC) because it has a special value and these values are not included in the PCD-01 message.

In step 11, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Basic -Nu-Observed-Value attribute is present:

- ❑ Object: Blood glucose object
- ❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636)
- ❑ Attribute-type: SFLOAT
- ❑ Attribute-value: 07 FE (hex) or +INFINITY (note that a decimal value is not allowed)

b) WAN PCD-01 message

PCD-01 message does not include segments with a Basic -Nu-Observed-Value attribute value (160368^MDC_CONC_GLU_UNDETERMINED_PLASMA^MDC) because it has a special value and these values are not included in the PCD-01 message.

In step 13, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Basic -Nu-Observed-Value attribute is present:

- ❑ Object: Blood glucose object
- ❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636)
- ❑ Attribute-type: SFLOAT
- ❑ Attribute-value: 08 02 (hex) or -INFINITY (note that a decimal value is not allowed)

b) WAN PCD-01 message

PCD-01 message does not include segments with a Basic -Nu-Observed-Value attribute value (160368^MDC_CONC_GLU_UNDETERMINED_PLASMA^MDC) because it has a special value and these values are not included in the PCD-01 message.

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-011		
TP label		Whitepaper. Glucosemeter measurement value		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	GL Numeric 5; M	GL Numeric 6; M	Short Float Type 1; C
		Date-Time Conv 1; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_007		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		
		   a. Glucose measurement (0x2A18)
		
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		
		4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends the measurement to the manager under test with the following value:
		
		   a. Glucose measurement (0x2A18)
		
		      i. Field: Flags
		         • Format: 8 bit
		         • Value: 00000010 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location fields are included, Time Offset and Sensor Status Annunciation fields are not included
		
		      ii. Field: Sequence number
		         • Format: uint16
		         • Value: Not relevant
		
		      iii. Field: Base Time
		         • Format: Date and Time
		         • Value: August 2nd, 2012, 11:08:25
		
		      iv. Field: Time Offset
		         • This field is not included
		
		      v. Field: Glucose Concentration - units of kg/L
		         • Format: SFLOAT
		         • Value: 0.0016 kg/L (160 mg/dL)
		
		      vi. Field: Glucose Concentration - units of mol/L
		         • This field is not included
		
		      vii. Field: Type
		         • Format: nibble
		         • Value: Not relevant
		
		      viii. Field: Sample Location
		         • Format: nibble
		         • Value: Not relevant
		
		      ix. Field: Sensor Status Annunciation
		         • This field is not included		

5. Check that the manager under test accepts the measurement and decodes its value properly (glucose measurement value, glucose units and base time).

6. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends the measurement to the manager under test with the following value:

   a. Glucose measurement (0x2A18)

      i. Field: Flags

         - Format: 8 bit

         - Value: 00000111 (MSB → LSB). Glucose concentration in units of mol/L Type and Sample Location and Time Offset fields are included, Sensor Status Annunciation field is not included

      ii. Field: Sequence number

         - Format: uint16

         - Value: Not relevant

      iii. Field: Base Time

         - Format: Date and Time

         - Value: August 2nd, 2012, 11:09:05

      iv. Field: Time Offset

         - Format: sint16

         - Value: 120 minutes

      v. Field: Glucose Concentration - units of kg/L

         - This field is not included

      vi. Field: Glucose Concentration - units of mol/L

         - Format: SFLOAT

         - Value: Value: 0.009 mol/L (9 mmol/L)

      vii. Field: Type

         - Format: nibble

         - Value: Undetermined Plasma (0x08)

      viii. Field: Sample Location

         - Format: nibble

         - Value: Not relevant

      ix. Field: Sensor Status Annunciation

         - This field is not included

7. Check that the manager under test accepts the measurement and decodes its value properly (glucose measurement value, glucose units and base time).

Pass/Fail criteria	In step 5, the manager under test shows the following glucose measurement 160.0 mg/dL with the time stamp '2012-08-02 11:08:25'. In step 7, the manager under test shows the following glucose measurement 9.0 mmol/L with the time stamp '2012-08-02 13:09:05'.
Notes	

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-012
TP label		Whitepaper. Glucosemeter HbA1c Object - Handle Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Numeric 7; O
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_008
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Glucosemeter profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		     a. Glucose measurement context (0x2A34)
		        i. Field: Flags
		           • Format: 8 bit
		           • Value: 0100 0000 (MSB → LSB). HbA1c field is included and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Exercise Duration and Exercise Intensity, Medication ID, Medication Value and Extended Flags fields are not included
		        ii. Field: Sequence number
		           • Format: uint16
		           • Value: Not relevant
		        iii. Field: Extended Flags
		           • This field is not included
		        iv. Field: Carbohydrate ID
		           • This field is not included
		        v. Field: Carbohydrate
		           • This field is not included
		        vi. Field: Meal
		           • This field is not included
		        vii. Field: Tester
		           • This field is not included
		        viii. Field: Health
		           • This field is not included
		        ix. Field: Exercise Duration
		           • This field is not included
		        x. Field: Exercise Intensity
		           • This field is not included
		        xi. Field: Medication ID
		           • This field is not included
		        xii. Field: Medication
		           • This field is not included
		        xiii. Field: HbA1c
		           • Format: SFLOAT
		           • Value: Not relevant
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test.
		 5. Check in manager transcoder output for the HbA1c object – Handle attribute.

Pass/Fail criteria		In step 5, the HbA1c object – Handle attribute is not present; however, if it is present then its value is different to 0.

Notes		Possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Handle attribute is not present, or if it is present then:
		   ❑ Object: HbA1c numeric object
		   ❑ Attribute-id: MDC_ATTR_ID_HANDLE (2337)
		   ❑ Attribute-type: INT-U16
		   ❑ Attribute-value: Any value other than 0
		 b) WAN PCD-01 message
		 PCD-01 message does not include segments with a Handle attribute value.

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-013
TP label		Whitepaper. Glucosemeter HbA1c Object - Type Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Numeric 8; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_008
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristics of interest for this test case are:
		    a. Glucose measurement context (0x2A34)
		      i. Field: Flags
		        • Format: 8 bit
		        • Value: 0100 0000 (MSB → LSB). HbA1c field is included and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Exercise Duration and Exercise Intensity, Medication ID, Medication Value and Extended Flags fields are not included
		      ii. Field: Sequence number
		        • Format: uint16
		        • Value: Not relevant
		      iii. Field: Extended Flags
		        • This field is not included
		      iv. Field: Carbohydrate ID
		        • This field is not included
		      v. Field: Carbohydrate
		        • This field is not included
		      vi. Field: Meal
		        • This field is not included
		      vii. Field: Tester
		        • This field is not included
		      viii. Field: Health
		        • This field is not included
		      ix. Field: Exercise Duration
		        • This field is not included
		      x. Field: Exercise Intensity
		        • This field is not included
		      xi. Field: Medication ID
		        • This field is not included
		      xii. Field: Medication
		        • This field is not included
		      xiii. Field: HbA1c
		        • Format: SFLOAT
		        • Value: Not relevant
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test.
		 5. Check in manager transcoder output for the HbA1c object – Type attribute.

Pass/Fail criteria		In step 5, the HbA1c object – Type attribute is present and its value is {MDC_PART_SCADA, MDC_CONC_HBA1C}.

Notes		In step 5, possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Type attribute is present:
		   ❑ Object: HbA1c object
		   ❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
		   ❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
		   ❑ Attribute-value:
		     • partition: MDC_PART_SCADA or 2 (dec) or 00 02 (hex)
		     • code: MDC_CONC_HBA1C or 29148 (dec) or 71 DC (hex)
		 b) WAN PCD-01 message
		 PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):
		 OBX|?|NM|160220^MDC_CONC_HBA1C^MDC|1.0.0.a|5.1|
		 262688^MDC_DIM_PERCENT^MDC|||||R||||[current_date_time]

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-014
TP label		Whitepaper. Glucosemeter HbA1c Object - Metric-Spec-Small Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Numeric 8a; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_008
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		   a. Glucose measurement context (0x2A34)
		     i. Field: Flags
		       • Format: 8 bit
		       • Value: 0100 0000 (MSB → LSB). HbA1c field is included and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Exercise Duration and Exercise Intensity, Medication ID, Medication Value and Extended Flags fields are not included
		     ii. Field: Sequence number
		       • Format: uint16
		       • Value: Not relevant
		     iii. Field: Extended Flags
		       • This field is not included
		     iv. Field: Carbohydrate ID
		       • This field is not included
		     v. Field: Carbohydrate
		       • This field is not included
		     vi. Field: Meal
		       • This field is not included
		     vii. Field: Tester
		       • This field is not included
		     viii. Field: Health
		       • This field is not included
		     ix. Field: Exercise Duration
		       • This field is not included
		     x. Field: Exercise Intensity
		       • This field is not included
		     xi. Field: Medication ID
		       • This field is not included
		     xii. Field: Medication
		       • This field is not included
		     xiii. Field: HbA1c
		       • Format: SFLOAT
		       • Value: Not relevant
		 4. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 5. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test.
		 6. Check in manager transcoder output for the HbA1c numeric object – Metric-Spec-Small attribute.

Pass/Fail criteria		In step 5, the HbA1c numeric object – Metric-Spec-Small attribute is present and its value is {0xF048} (mss-avail-intermittent | mss-avail-stored-data | mss-upd-aperiodic | mss-msmt-aperiodic | mss-acc-agent-initiated | mss-cat-manual).

Notes		Possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Metric-Spec-Small attribute is present:
		   ❑ Object: HbA1c numeric object
		   ❑ Attribute-id: MDC_ATTR_METRIC_SPEC_SMALL (2630)
		   ❑ Attribute-type: BITS-16
		   ❑ Attribute-value: F0 48 (hex) or BITS mss-avail-intermittent(0), mss-avail-stored-data(1), mss-upd-aperiodic(2), mss-msmt-aperiodic(3), mss-acc-agent-initiated(9), mss-cat-manual(12) set to TRUE and remaining BITS set to FALSE
		 b) WAN PCD-01 message
		 PCD-01 message does not include segments with a Metric-Spec-Small attribute value.

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-015
TP label		Whitepaper. Glucosemeter HbA1c Object - Unit-Code Attribute
Coverage	**Spec**	[Bluetooth PHDT v1.4]
	Testable items	GL Numeric 9; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_008
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		a. Glucose measurement context (0x2A34)
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test. The measurement of interest for this test case is:
		a. Glucose measurement context (0x2A34)
		   i. Field: Flags
		     • Format: 8 bit
		     • Value: 0100 0000 (MSB → LSB). HbA1c field is included and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Exercise Duration and Exercise Intensity, Medication ID, Medication Value and Extended Flags fields are not included
		   ii. Field: Sequence number
		     • Format: uint16
		     • Value: Not relevant
		   iii. Field: Extended Flags
		     • This field is not included
		   iv. Field: Carbohydrate ID
		     • This field is not included
		   v. Field: Carbohydrate
		     • This field is not included
		   vi. Field: Meal
		     • This field is not included
		   vii. Field: Tester
		     • This field is not included
		   viii. Field: Health
		     • This field is not included
		   ix. Field: Exercise Duration
		     • This field is not included
		   x. Field: Exercise Intensity
		     • This field is not included
		   xi. Field: Medication ID
		     • This field is not included
		   xii. Field: Medication
		     • This field is not included
		   xiii. Field: HbA1c
		     • Format: SFLOAT
		     • Value: Not relevant
		5. Check in manager transcoder output for the HbA1c object – Unit-Code attribute.

Pass/Fail criteria		In step 5, the HbA1c object – Unit-Code attribute is present and its value is MDC_DIM_PERCENT.

Notes		In step 5, possible values in typical points of observation after transcoder output are:
		a) IEEE 11073 Objects and Attributes
		Unit-Code attribute is present:
		  ❑ Object: HbA1c object
		  ❑ Attribute-id: MDC_ATTR_UNIT_CODE (2454)
		  ❑ Attribute-type: INT-U16
		  ❑ Attribute-value: MDC_DIM_PERCENT or 544 (dec) or 02 20 (hex)
		b) WAN PCD-01 message
		PCD-01 message includes a segment like this with Unit-Code attribute value (check OBX-6):
		OBX|?|NM|160220^MDC_CONC_HBA1C^MDC|1.0.0.a|5.1|
		262688^MDC_DIM_PERCENT^MDC|||||R|||[current_date_time]

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-016		
TP label		Whitepaper. Glucosemeter HbA1c Object - Absolute-Time-Stamp Attribute		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	GL Numeric 10; M	Date-Time Conv 2; M	Date-Time Conv 3; M
		Date-Time Conv 4; M	Date-Time Conv 5; M	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_008		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The simulated agent implements several BLE characteristics. The characteristics of interest for this test case are: a. Glucose measurement (0x2A18) b. Glucose measurement context (0x2A34) 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test. The measurement of interest for this test case are: a. Glucose measurement (0x2A18)		

4. (continued)

a. Glucose measurement (0x2A18)

    i. Field: Flags
- Format: 8 bit
- Value: 00010011 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location and Time Offset fields are included. Sensor Status Annunciation field is not included and Context Information follows

    ii. Field: Sequence number
- Format: uint16
- Value: Not relevant

    iii. Field: Base Time
- Format: Date and Time
- Value: August 2nd, 2012, 10:59:27

    iv. Field: Time Offset
- Format: sint16
- Value: 120 minutes

    v. Field: Glucose Concentration - units of kg/L
- Format: SFLOAT
- Value: Not relevant

    vi. Field: Glucose Concentration - units of mol/L
- This field is not included

    vii. Field: Type
- This field is not included

    viii. Field: Sample Location
- This field is not included

    ix. Field: Sensor Status Annunciation
- This field is not included

b. Glucose measurement context (0x2A34)

    i. Field: Flags
- Format: 8 bit
- Value: 0100 0000 (MSB → LSB). HbA1c field is included and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Exercise Duration and Exercise Intensity, Medication ID, Medication Value and Extended Flags fields are not included

	ii. Field: Sequence number
	• Format: uint16
	• Value: Not relevant
	iii. Field: Extended Flags
	• This field is not included
	iv. Field: Carbohydrate ID
	• This field is not included
	v. Field: Carbohydrate
	• This field is not included
	vi. Field: Meal
	• This field is not included
	vii. Field: Tester
	• This field is not included
	viii. Field: Health
	• This field is not included
	ix. Field: Exercise Duration
	• This field is not included
	x. Field: Exercise Intensity
	• This field is not included
	xi. Field: Medication ID
	• This field is not included
	xii. Field: Medication
	• This field is not included
	xiii. Field: HbA1c
	• Format: SFLOAT
	• Value: Not relevant
	5. Check in manager transcoder output for the HbA1c object – Absolute-Time-Stamp attribute.
Pass/Fail criteria	In step 5, the HbA1c object – Absolute-Time-Stamp attribute is present, its value matches with the Time Stamp field in conjunction with the Time Offset field of the Glucose measurement characteristic and the fraction of seconds is set to 0.
Notes	Possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Absolute-Time-Stamp attribute is present:
	❑ Object: HbA1c object
	❑ Attribute-id: MDC_ATTR_TIME_STAMP_ABS (2448)
	❑ Attribute-type: SEQUENCE {century (INT-U8), year (INT-U8), month (INT-U8), day (INT-U8), hour (INT-U8), minute (INT-U8), second (INT-U8), sec-fractions (INT-U8)} (BCD encoding)
	❑ Attribute-value:
	• century: 20 (hex) or 32 (dec)
	• year: 12 (hex) or 18 (dec)
	• month: 08 (hex) or 8 (dec)
	• day: 02 (hex) or 2 (dec)
	• hour: 12 (hex) or 18 (dec)
	• minute: 59 (hex) or 89 (dec)
	• second: 27 (hex) or 39 (dec)
	• sec-fractions: 00 (hex) or 0 (dec)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with Absolute-Time-Stamp attribute value (check OBX-14):
	OBX|?|NM|160220^MDC_CONC_HBA1C^MDC|1.0.0.a|5.1| 262688^MDC_DIM_PERCENT^MDC|||||R|||20120802125927+0000

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-017		
TP label		Whitepaper. Glucosemeter HbA1c Object - Basic-Nu-Observed-Value Attribute 1		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	GL Numeric 11; M	Short Float Type 1; C	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_008		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		   a. Glucose measurement context (0x2A34)
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test. The measurement of interest for this test case is:
		   a. Glucose measurement context (0x2A34)
		     i. Field: Flags
		       • Format: 8 bit
		       • Value: 0100 0000 (MSB → LSB). HbA1c field is included and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Exercise Duration and Exercise Intensity, Medication ID, Medication Value and Extended Flags fields are not included
		     ii. Field: Sequence number
		       • Format: uint16
		       • Value: Not relevant
		     iii. Field: Extended Flags
		       • This field is not included
		     iv. Field: Carbohydrate ID
		       • This field is not included
		     v. Field: Carbohydrate
		       • This field is not included
		     vi. Field: Meal
		       • This field is not included
		     vii. Field: Tester
		       • This field is not included
		     viii. Field: Health
		       • This field is not included
		     ix. Field: Exercise Duration
		       • This field is not included
		     x. Field: Exercise Intensity
		       • This field is not included
		     xi. Field: Medication ID
		       • This field is not included
		     xii. Field: Medication
		       • This field is not included
		     xiii. Field: HbA1c
		       • Format: SFLOAT
		       • Value: 5.1 %
		5. Check in manager transcoder output for the HbA1c object– Basic-Nu-Observed-Value attribute.		

Pass/Fail criteria		In step 5, the HbA1c object – Basic-Nu-Observed-Value attribute is present and its value matches with the HbA1c Value field of Glucose measurement context characteristic: 5.1 %.		

Notes		Possible values in typical points of observation after transcoder output are:
		a) IEEE 11073 Objects and Attributes
		Basic-Nu-Observed-Value attribute is present:
		   ❏ Object: HbA1c object
		   ❏ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636)
		   ❏ Attribute-type: SFLOAT
		   ❏ Attribute-value: F0 33 (hex) or E1 FE (hex) or 5.1 (dec)
		b) WAN PCD-01 message
		PCD-01 message includes a segment like this with a Basic-Nu-Observed-Value attribute value (check OBX-5):
		OBX|?|NM|160220^MDC_CONC_HBA1C^MDC |1.0.0.a|5.1|
		262688^MDC_DIM_PERCENT^MDC|||||R|||[current_date_time]		

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-018		
TP label		Whitepaper. Glucosemeter HbA1c Object - Basic-Nu-Observed-Value Attribute 2		
Coverage	**Spec**	[Bluetooth PHDT v1.4]		
	Testable items	GL Numeric 11; M	Short Float Type 1; C	Short Float Type 2; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_008		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement context (0x2A34) 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test. The measurement of interest for this test case is: a. Glucose measurement context (0x2A34) i. Field: Flags • Format: 8 bit • Value: 0100 0000 (MSB → LSB). HbA1c field is included and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Exercise Duration and Exercise Intensity, Medication ID, Medication Value and Extended Flags fields are not included ii. Field: Sequence number • Format: uint16 • Value: Not relevant iii. Field: Extended Flags • This field is not included iv. Field: Carbohydrate ID • This field is not included v. Field: Carbohydrate • This field is not included vi. Field: Meal • This field is not included vii. Field: Tester • This field is not included viii. Field: Health • This field is not included ix. Field: Exercise Duration • This field is not included x. Field: Exercise Intensity • This field is not included		

<div style="margin-left: 35%;">

     xi.   Field: Medication ID

- This field is not included

    xii.   Field: Medication

- This field is not included

    xiii.   Field: HbA1c

- Format: SFLOAT

- Value: 5.1 %

</div>

5. Check in manager transcoder output for the HbA1c object – Basic-Nu-Observed-Value attribute.

6. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test. The measurement of interest for this test case is:

    a.   Glucose measurement context (0x2A34)

        i.   Field: Flags

- Format: 8 bit

- Value: 0100 0000 (MSB → LSB). HbA1c field is included and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Exercise Duration and Exercise Intensity, Medication ID, Medication Value and Extended Flags fields are not included

        ii.   Field: Sequence number

- Format: uint16

- Value: Not relevant

        iii.   Field: Extended Flags

- This field is not included

        iv.   Field: Carbohydrate ID

- This field is not included

        v.   Field: Carbohydrate

- This field is not included

        vi.   Field: Meal

- This field is not included

        vii.   Field: Tester

- This field is not included

        viii.   Field: Health

- This field is not included

        ix.   Field: Exercise Duration

- This field is not included

        x.   Field: Exercise Intensity

- This field is not included

        xi.   Field: Medication ID

- This field is not included

        xii.   Field: Medication

- This field is not included

        xiii.   Field: HbA1c

- Format: SFLOAT

- Value: 07 FF(hex). Special value: NaN

7. Check in manager transcoder output for the HbA1c object – Basic-Nu-Observed-Value attribute.

8. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test. The measurement of interest for this test case is:

    a. Glucose measurement context (0x2A34)

        i. Field: Flags

            • Format: 8 bit

            • Value: 0100 0000 (MSB → LSB). HbA1c field is included and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Exercise Duration and Exercise Intensity, Medication ID, Medication Value and Extended Flags fields are not included

        ii. Field: Sequence number

            • Format: uint16

            • Value: Not relevant

        iii. Field: Extended Flags

            • This field is not included

        iv. Field: Carbohydrate ID

            • This field is not included

        v. Field: Carbohydrate

            • This field is not included

        vi. Field: Meal

            • This field is not included

        vii. Field: Tester

            • This field is not included

        viii. Field: Health

            • This field is not included

        ix. Field: Exercise Duration

            • This field is not included

        x. Field: Exercise Intensity

            • This field is not included

        xi. Field: Medication ID

            • This field is not included

        xii. Field: Medication

            • This field is not included

        xiii. Field: HbA1c

            • Format: SFLOAT

            • Value: 00 80 (hex). Special value: NRes

9. Check in manager transcoder output for the HbA1c object – Basic-Nu-Observed-Value attribute.

10. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test. The measurement of interest for this test case is:

    a. Glucose measurement context (0x2A34)

        i. Field: Flags

- Format: 8 bit

- Value: 0100 0000 (MSB → LSB). HbA1c field is included and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Exercise Duration and Exercise Intensity, Medication ID, Medication Value and Extended Flags fields are not included

  ii. Field: Sequence number

    - Format: uint16

    - Value: Not relevant

  iii. Field: Extended Flags

    - This field is not included

  iv. Field: Carbohydrate ID

    - This field is not included

  v. Field: Carbohydrate

    - This field is not included

  vi. Field: Meal

    - This field is not included

  vii. Field: Tester

    - This field is not included

  viii. Field: Health

    - This field is not included

  ix. Field: Exercise Duration

    - This field is not included

  x. Field: Exercise Intensity

    - This field is not included

  xi. Field: Medication ID

    - This field is not included

  xii. Field: Medication

    - This field is not included

  xiii. Field: HbA1c

    - Format: SFLOAT

    - Value: 07 FE (hex). Special value: +INFINITY

11. Check in manager transcoder output for the HbA1c object – Basic-Nu-Observed-Value attribute.

12. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test. The measurement of interest for this test case is:

    a. Glucose measurement context (0x2A34)

        i. Field: Flags

            - Format: 8 bit

            - Value: 0100 0000 (MSB → LSB). HbA1c field is included and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Exercise Duration and Exercise Intensity, Medication ID, Medication Value and Extended Flags fields are not included

        ii. Field: Sequence number

            - Format: uint16

            - Value: Not relevant

iii. Field: Extended Flags
- This field is not included

iv. Field: Carbohydrate ID
- This field is not included

v. Field: Carbohydrate
- This field is not included

vi. Field: Meal
- This field is not included

vii. Field: Tester
- This field is not included

viii. Field: Health
- This field is not included

ix. Field: Exercise Duration
- This field is not included

x. Field: Exercise Intensity
- This field is not included

xi. Field: Medication ID
- This field is not included

xii. Field: Medication
- This field is not included

xiii. Field: HbA1c
- Format: SFLOAT
- Value: 08 02 (hex). Special value: -INFINITY

13. Check in manager transcoder output for the HbA1c object – Basic-Nu-Observed-Value attribute.

Pass/Fail criteria	In step 5, the HbA1c object – Basic-Nu-Observed-Value attribute is present and its value is 5.1 %.
	In step 7, the HbA1c object – Basic -Nu-Observed-Value attribute is present and its value is 0x07FF.
	In step 9, the HbA1c object – Basic -Nu-Observed-Value attribute is present and its value is 0x0800.
	In step 11, the HbA1c object – Basic -Nu-Observed-Value attribute is present and its value is 0x07FE.
	In step 13, the HbA1c object – Basic -Nu-Observed-Value attribute is present and its value is 0x0802.
Notes	In step 5, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Basic-Nu-Observed-Value attribute is present:
	❑ Object: HbA1c object
	❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636)
	❑ Attribute-type: SFLOAT
	❑ Attribute-value: F0 33 (hex) or E1 FE (hex) or 5.1 (dec)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with a Basic-Nu-Observed-Value attribute value (check OBX-5):

OBX|?|NM|160220^MDC_CONC_HBA1C^MDC |1.0.0.a|5.1|
262688^MDC_DIM_PERCENT^MDC|||||R|||[current_date_time]

In step 7, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Basic -Nu-Observed-Value attribute is present:

- ❑ Object: HbA1c object
- ❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636)
- ❑ Attribute-type: SFLOAT
- ❑ Attribute-value: 07 FF(hex) or NaN (note that is not allowed a decimal value)

b) WAN PCD-01 message

PCD-01 message does not include segments with a Basic -Nu-Observed-Value attribute value (160220^MDC_CONC_HBA1C^MDC) because it has a special value and these values are not included in the PCD-01 message.

In step 9, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Basic -Nu-Observed-Value attribute is present:

- ❑ Object: HbA1c object
- ❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636)
- ❑ Attribute-type: SFLOAT
- ❑ Attribute-value: 08 00 (hex) or NRes (note that a decimal value is not allowed)

b) WAN PCD-01 message

PCD-01 message does not include segments with a Basic -Nu-Observed-Value attribute value (160220^MDC_CONC_HBA1C^MDC) because it has a special value and these values are not included in the PCD-01 message.

In step 11, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Basic -Nu-Observed-Value attribute is present:

- ❑ Object: HbA1c object
- ❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636)
- ❑ Attribute-type: SFLOAT
- ❑ Attribute-value: 07 FE (hex) or +INFINITY (note that a decimal value is not allowed)

b) WAN PCD-01 message

PCD-01 message does not include segments with a Basic -Nu-Observed-Value attribute value (160220^MDC_CONC_HBA1C^MDC) because it has a special value and these values are not included in the PCD-01 message.

In step 13, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Basic -Nu-Observed-Value attribute is present:

- ❑ Object: HbA1c object
- ❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636)
- ❑ Attribute-type: SFLOAT
- ❑ Attribute-value: 08 02 (hex) or -INFINITY (note that a decimal value is not allowed)

b) WAN PCD-01 message

PCD-01 message does not include segments with a Basic -Nu-Observed-Value attribute value (160220^MDC_CONC_HBA1C^MDC) because it has a special value and these values are not included in the PCD-01 message.

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-019		
TP label		Whitepaper. Glucosemeter HbA1c value		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	GL Numeric 10; M	GL Numeric 11; M	Short Float Type 1; C
		Date-Time Conv 1; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_007 AND C_MAN_BLE_008		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		
		   a. Glucose measurement (0x2A18)
		
		   b. Glucose measurement context (0x2A34)
		
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		
		4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test. The measurement of interest for this test case are:
		
		   a. Glucose measurement (0x2A18)
		
		      i. Field: Flags
		
		        • Format: 8 bit
		
		        • Value: 00010010 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location fields are included, Time Offset fields and Sensor Status Annunciation field are not included and Context Information follows
		
		      ii. Field: Sequence number
		
		        • Format: uint16
		
		        • Value: Not relevant
		
		      iii. Field: Base Time
		
		        • Format: Date and Time
		
		        • Value: August 2nd, 2012, 11:08:25
		
		      iv. Field: Time Offset
		
		        • This field is not included
		
		      v. Field: Glucose Concentration - units of kg/L
		
		        • Format: SFLOAT
		
		        • Value: Not relevant
		
		      vi. Field: Glucose Concentration - units of mol/L
		
		        • This field is not included
		
		      vii. Field: Type
		
		        • Format: nibble
		
		        • Value: Not relevant
		
		      viii. Field: Sample Location
		
		        • Format: nibble
		
		        • Value: Not relevant		

    ix. Field: Sensor Status Annunciation

     • This field is not included

  b. Glucose measurement context (0x2A34)

    i. Field: Flags

     • Format: 8 bit

     • Value: 0100 0000 (MSB → LSB). HbA1c field is included and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Exercise Duration and Exercise Intensity, Medication ID, Medication Value and Extended Flags fields are not included

    ii. Field: Sequence number

     • Format: uint16

     • Value: Not relevant

    iii. Field: Extended Flags

     • This field is not included

    iv. Field: Carbohydrate ID

     • This field is not included

    v. Field: Carbohydrate

     • This field is not included

    vi. Field: Meal

     • This field is not included

    vii. Field: Tester

     • This field is not included

    viii. Field: Health

     • This field is not included

    ix. Field: Exercise Duration

     • This field is not included

    x. Field: Exercise Intensity

     • This field is not included

    xi. Field: Medication ID

     • This field is not included

    xii. Field: Medication

     • This field is not included

    xiii. Field: HbA1c

     • Format: SFLOAT

     • Value: 5.1 %

5. Check that the manager accepts the measurement and decodes its value properly (HbA1c value, HbA1c units and base time).

Pass/Fail criteria	In step 5, the manager under test shows the following HbA1c 5.1 % with the time stamp '2012-08-02 11:08:25'.
Notes	

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-020
TP label		Whitepaper. Glucosemeter Context Exercise Object - Handle Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Numeric 12; O
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_009
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Glucosemeter profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		   a. Glucose measurement context (0x2A34)
		     i. Field: Flags
		       • Format: 8 bit
		       • Value: 0000 1000 (MSB → LSB). Exercise Duration And Exercise Intensity fields are included and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Medication ID, Medication Value and HbA1c fields are not included
		     ii. Field: Sequence number
		       • Format: uint16
		       • Value: Not relevant
		     iii. Field: Extended Flags
		       • This field is not included
		     iv. Field: Carbohydrate ID
		       • This field is not included
		     v. Field: Carbohydrate
		       • This field is not included
		     vi. Field: Meal
		       • This field is not included
		     vii. Field: Tester
		       • This field is not included
		     viii. Field: Health
		       • This field is not included
		     ix. Field: Exercise Duration
		       • Format: uint16
		       • Value: Not relevant
		     x. Field: Exercise Intensity
		       • Format: uint8
		       • Value: Not relevant
		     xi. Field: Medication ID
		       • This field is not included
		     xii. Field: Medication
		       • This field is not included
		     xiii. Field: HbA1c
		       • This field is not included
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test.
		 5. Check in manager transcoder output for the Context exercise object – Handle attribute.

Pass/Fail criteria		In step 5, the Context exercise object – Handle attribute is not present; however, if it is present then its value is different to 0.

Notes		Possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Handle attribute is not present, or if it is present then:
		  ❑ Object: Context exercise numeric object
		  ❑ Attribute-id: MDC_ATTR_ID_HANDLE (2337)
		  ❑ Attribute-type: INT-U16
		  ❑ Attribute-value: Any value other than 0
		 b) WAN PCD-01 message
		 PCD-01 message does not include segments with a Handle attribute value.

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-021
TP label		Whitepaper. Glucosemeter Context Exercise Object - Type Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Numeric 13; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_009
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristics of interest for this test case are:
		    a. Glucose measurement context (0x2A34)
		       i. Field: Flags
		          • Format: 8 bit
		          • Value: 0000 1000 (MSB → LSB). Exercise Duration And Exercise Intensity fields are included and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Medication ID, Medication Value and HbA1c fields are not included
		       ii. Field: Sequence number
		          • Format: uint16
		          • Value: Not relevant
		       iii. Field: Extended Flags
		          • This field is not included
		       iv. Field: Carbohydrate ID
		          • This field is not included
		       v. Field: Carbohydrate
		          • This field is not included
		       vi. Field: Meal
		          • This field is not included
		       vii. Field: Tester
		          • This field is not included
		       viii. Field: Health
		          • This field is not included
		       ix. Field: Exercise Duration
		          • Format: uint16
		          • Value: Not relevant
		       x. Field: Exercise Intensity
		          • Format: uint8
		          • Value: Not relevant
		       xi. Field: Medication ID
		          • This field is not included
		       xii. Field: Medication
		          • This field is not included
		       xiii. Field: HbA1c
		          • This field is not included
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test.
		 5. Check in manager transcoder output for the Context exercise object – Type attribute.

Pass/Fail criteria		In step 5, the Context exercise object – Type attribute is present and its value is { MDC_PART_PHD_DM	MDC_CTXT_GLU_EXERCISE}.

Notes		In step 5, possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Type attribute is present:
		    ❑ Object: Context exercise object
		    ❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
		    ❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
		    ❑ Attribute-value:
		       • partition: MDC_PART_PHD_DM or 128 (dec) or 00 80 (hex)
		       • code: MDC_CTXT_GLU_EXERCISE or 29152 (dec) or 71 E0 (hex)
		 b) WAN PCD-01 message
		 PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):
		 OBX|?|NM|8417760^MDC_CTXT_GLU_EXERCISE^MDC|1.0.0.a|33| 262688^MDC_DIM_PERCENT^MDC|||||R|||[current_date_time]

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-022
TP label		Whitepaper. Glucosemeter Context Exercise Object - Metric-Spec-Small Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Numeric 13a; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_009
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		   a. Glucose measurement context (0x2A34)
		     i. Field: Flags
		       • Format: 8 bit
		       • Value: 0000 1000 (MSB → LSB). Exercise Duration And Exercise Intensity fields are included and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Medication ID, Medication Value and HbA1c fields are not included
		     ii. Field: Sequence number
		       • Format: uint16
		       • Value: Not relevant
		     iii. Field: Extended Flags
		       • This field is not included
		     iv. Field: Carbohydrate ID
		       • This field is not included
		     v. Field: Carbohydrate
		       • This field is not included
		     vi. Field: Meal
		       • This field is not included
		     vii. Field: Tester
		       • This field is not included
		     viii. Field: Health
		       • This field is not included
		     ix. Field: Exercise Duration
		       • Format: uint16
		       • Value: Not relevant
		     x. Field: Exercise Intensity
		       • Format: uint8
		       • Value: Not relevant
		     xi. Field: Medication ID
		       • This field is not included
		     xii. Field: Medication
		       • This field is not included
		     xiii. Field: HbA1c
		       • This field is not included
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test.
		 5. Check in manager transcoder output for the Context exercise numeric object – Metric-Spec-Small attribute.

Pass/Fail criteria		In step 5, the Context exercise numeric object – Metric-Spec-Small attribute is present and its value is {0xF048} (mss-avail-intermittent | mss-avail-stored-data | mss-upd-aperiodic | mss-msmt-aperiodic | mss-acc-agent-initiated | mss-cat-manual).

Notes		Possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Metric-Spec-Small attribute is present:
		  ❑ Object: Context exercise numeric object
		  ❑ Attribute-id: MDC_ATTR_METRIC_SPEC_SMALL (2630)
		  ❑ Attribute-type: BITS-16
		  ❑ Attribute-value: F0 48 (hex) or BITS mss-avail-intermittent(0), mss-avail-stored-data(1), mss-upd-aperiodic(2), mss-msmt-aperiodic(3), mss-acc-agent-initiated(9), mss-cat-manual(12) set to TRUE and remaining BITS set to FALSE
		 b) WAN PCD-01 message
		 PCD-01 message does not include segments with a Metric-Spec-Small attribute value.

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-023
TP label		Whitepaper. Glucosemeter Context Exercise Object - Unit-Code Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Numeric 14; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_009
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		 a. Glucose measurement context (0x2A34)
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test. The measurement of interest for this test case is:
		 a. Glucose measurement context (0x2A34)
		     i. Field: Flags
		       • Format: 8 bit
		       • Value: 0000 1000 (MSB → LSB). Exercise Duration And Exercise Intensity fields are included and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Medication ID, Medication Value and HbA1c fields are not included
		     ii. Field: Sequence number
		       • Format: uint16
		       • Value: Not relevant
		     iii. Field: Extended Flags
		       • This field is not included
		     iv. Field: Carbohydrate ID
		       • This field is not included
		     v. Field: Carbohydrate
		       • This field is not included
		     vi. Field: Meal
		       • This field is not included
		     vii. Field: Tester
		       • This field is not included
		     viii. Field: Health
		       • This field is not included
		     ix. Field: Exercise Duration
		       • Format: uint16
		       • Value: Not relevant
		     x. Field: Exercise Intensity
		       • Format: uint8
		       • Value: Not relevant
		     xi. Field: Medication ID
		       • This field is not included
		     xii. Field: Medication
		       • This field is not included
		     xiii. Field: HbA1c
		       • This field is not included
		 5. Check in manager transcoder output for the Context exercise object – Unit-Code attribute.

Pass/Fail criteria		In step 5, the Context exercise object – Unit-Code attribute is present and its value is MDC_DIM_PERCENT.
Notes		In step 5, possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Unit-Code attribute is present: ❏ Object: Context exercise object ❏ Attribute-id: MDC_ATTR_UNIT_CODE (2454) ❏ Attribute-type: INT-U16 ❏ Attribute-value: MDC_DIM_PERCENT or 544 (dec) or 02 20 (hex) b) WAN PCD-01 message PCD-01 message includes a segment like this with Unit-Code attribute value (check OBX-6): OBX|?|NM|8417760^MDC_CTXT_GLU_EXERCISE^MDC|1.0.0.a|33| 262688^MDC_DIM_PERCENT^MDC|||||R|||[current_date_time]

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-024		
TP label		Whitepaper. Glucosemeter Context Exercise Object - Absolute-Time-Stamp Attribute		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	GL Numeric 15; M	Date-Time Conv 2; M	Date-Time Conv 3; M
		Date-Time Conv 4; M	Date-Time Conv 5; M	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_009		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		2. The simulated agent implements several BLE characteristics. The characteristics of interest for this test case are:
		
		  a. Glucose measurement (0x2A18)
		
		  b. Glucose measurement context (0x2A34)
		
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		
		4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test. The measurement of interest for this test case are:
		
		  a. Glucose measurement (0x2A18)
		
		    i. Field: Flags
		      • Format: 8 bit
		      • Value: 00010011 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location and Time Offset fields are included. Sensor Status Annunciation field is not included and Context Information follows
		
		    ii. Field: Sequence number
		      • Format: uint16
		      • Value: Not relevant
		
		    iii. Field: Base Time
		      • Format: Date and Time
		      • Value: August 2nd, 2012, 10:59:27
		
		    iv. Field: Time Offset
		      • Format: sint16
		      • Value: 120 minutes
		
		    v. Field: Glucose Concentration - units of kg/L
		      • Format: SFLOAT
		      • Value: Not relevant
		
		    vi. Field: Glucose Concentration - units of mol/L
		      • This field is not included
		
		    vii. Field: Type
		      • This field is not included
		
		    viii. Field: Sample Location
		      • This field is not included
		
		    ix. Field: Sensor Status Annunciation
		      • This field is not included
		
		  b. Glucose measurement context (0x2A34)
		
		    i. Field: Flags
		      • Format: 8 bit
		      • Value: 0000 1000 (MSB → LSB). Exercise Duration And Exercise Intensity fields are included and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Medication ID, Medication Value, Hb1Ac, and Extended Flags fields are not included

	ii. Field: Sequence number
	    • Format: uint16
	    • Value: Not relevant
	  iii. Field: Extended Flags
	    • This field is not included
	  iv. Field: Carbohydrate ID
	    • This field is not included
	  v. Field: Carbohydrate
	    • This field is not included
	  vi. Field: Meal
	    • This field is not included
	  vii. Field: Tester
	    • This field is not included
	  viii. Field: Health
	    • This field is not included
	  ix. Field: Exercise Duration
	    • Format: uint16
	    • Value: Not relevant
	  x. Field: Exercise Intensity
	    • Format: uint8
	    • Value: Not relevant
	  xi. Field: Medication ID
	    • This field is not included
	  xii. Field: Medication
	    • This field is not included
	  xiii. Field: HbA1c
	    • This field is not included
	5. Check in manager transcoder output for the Context exercise object – Absolute-Time-Stamp attribute.

Pass/Fail criteria	In step 6, the Context exercise object – Absolute-Time-Stamp attribute is present, its value matches with the Time Stamp field in conjunction with the Time Offset field of the Glucose measurement characteristic and the fraction of seconds is set to 0.

Notes	Possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Absolute-Time-Stamp attribute is present:
	 ❑ Object: Context exercise object
	 ❑ Attribute-id: MDC_ATTR_TIME_STAMP_ABS (2448)
	 ❑ Attribute-type: SEQUENCE {century (INT-U8), year (INT-U8), month (INT-U8), day (INT-U8), hour (INT-U8), minute (INT-U8), second (INT-U8), sec-fractions (INT-U8)} (BCD encoding)
	 ❑ Attribute-value:
	   • century: 20 (hex) or 32 (dec)
	   • year: 12 (hex) or 18 (dec)
	   • month: 08 (hex) or 8 (dec)
	   • day: 02 (hex) or 2 (dec)
	   • hour: 12 (hex) or 18 (dec)
	   • minute: 59 (hex) or 89 (dec)
	   • second: 27 (hex) or 39 (dec)
	   • sec-fractions: 00 (hex) or 0 (dec)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with Absolute-Time-Stamp attribute value (check OBX-14):
	OBX|?|NM|8417760^MDC_CTXT_GLU_EXERCISE^MDC|1.0.0.a|33| 262688^MDC_DIM_PERCENT^MDC|||||R||| 20120802125927+0000

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-025
TP label		Whitepaper. Glucosemeter Context Exercise Object - Measure-Active-Period Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Numeric 16; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_009
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		 a. Glucose measurement context (0x2A34)
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test. The measurement of interest for this test case are:
		 a. Glucose measurement context (0x2A34)
		     i. Field: Flags
		       • Format: 8 bit
		       • Value: 0000 1000 (MSB → LSB). Exercise Duration And Exercise Intensity fields are included and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Medication ID, Medication Value and HbA1c fields are not included
		     ii. Field: Sequence number
		       • Format: uint16
		       • Value: Not relevant
		     iii. Field: Extended Flags
		       • This field is not included
		     iv. Field: Carbohydrate ID
		       • This field is not included
		     v. Field: Carbohydrate
		       • This field is not included
		     vi. Field: Meal
		       • This field is not included
		     vii. Field: Tester
		       • This field is not included
		     viii. Field: Health
		       • This field is not included
		     ix. Field: Exercise Duration
		       • Format: uint16
		       • Value: 666 seconds
		     x. Field: Exercise Intensity
		       • Format: uint8
		       • Value: Not relevant
		     xi. Field: Medication ID
		       • This field is not included
		     xii. Field: Medication
		       • This field is not included
		     xiii. Field: HbA1c
		       • This field is not included
		 5. Check in manager transcoder output for the Context exercise object – Measure-Active-Period attribute.

Pass/Fail criteria		In step 5, the Context exercise object – Measure-Active-Period attribute is present and its value is 666 seconds.
Notes		In step 5, possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Measure-Active-Period attribute is present: ❑ Object: Context exercise object ❑ Attribute-id: MDC_ATTR_TIME_PD_MSMT_ACTIVE (2649) ❑ Attribute-type: FLOAT ❑ Attribute-value: 666 (dec) or 0000029A (hex) [Note that exponent value for this FLOAT value must be 0] b) WAN PCD-01 message PCD-01 message includes two segments like these, one of them with a Measure-Active-Period attribute value (check OBX-5 in MDC_ATTR_TIME_PD_MSMT_ACTIVE segment): OBX|?|NM|8417760^MDC_CTXT_GLU_EXERCISE^MDC|1.0.0.a|33| 262688^MDC_DIM_PERCENT^MDC|||||R|||[current_date_time] OBX|?|NM|68185^MDC_ATTR_TIME_PD_MSMT_ACTIVE^MDC|1.0.0.a.b|666.0| 264320^MDC_DIM_SEC^MDC|||||R|||[current_date_time]

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-026		
TP label		Whitepaper. Glucosemeter Context Exercise Object - Basic-Nu-Observed-Value Attribute		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	GL Numeric 17; M	Short Float Type 1; C	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_009		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		    a. Glucose measurement context (0x2A34)
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the simulated agent sends the measurement to the manager under test with the following value:
		    a. Glucose measurement context (0x2A34)
		       i. Field: Flags
		        • Format: 8 bit
		        • Value: 0000 1000 (MSB → LSB). Exercise Duration And Exercise Intensity fields are included and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Medication ID, Medication Value and HbA1c fields are not included
		       ii. Field: Sequence number
		        • Format: uint16
		        • Value: Not relevant
		       iii. Field: Extended Flags
		        • This field is not included
		       iv. Field: Carbohydrate ID
		        • This field is not included
		       v. Field: Carbohydrate
		        • This field is not included
		       vi. Field: Meal
		        • This field is not included
		       vii. Field: Tester
		        • This field is not included
		       viii. Field: Health
		        • This field is not included
		       ix. Field: Exercise Duration
		        • Format: uint16
		        • Value: Not relevant
		       x. Field: Exercise Intensity
		        • Format: uint8
		        • Value: 33%
		       xi. Field: Medication ID
		        • This field is not included
		       xii. Field: Medication
		        • This field is not included
		       xiii. Field: HbA1c
		        • This field is not included
		 5. Check in manager transcoder output for the Context exercise object– Basic-Nu-Observed-Value attribute.		

Pass/Fail criteria		In step 5, the Context exercise object – Basic-Nu-Observed-Value attribute is present and its value matches with the Exercise Intensity Value field of Glucose measurement context characteristic: 33%.		

Notes		Possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Basic-Nu-Observed-Value attribute is present:
		   ❑ Object: Context exercise object
		   ❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636)
		   ❑ Attribute-type: SFLOAT
		   ❑ Attribute-value: 33 (dec) or 00000021 (hex) [Note that exponent value for this FLOAT value must be 0]
		 b) WAN PCD-01 message
		 PCD-01 message includes a segment like this with a Basic-Nu-Observed-Value attribute value (check OBX-5):
		 OBX|?|NM|8417760^MDC_CTXT_GLU_EXERCISE^MDC|1.0.0.a|33.0|
		 262688^MDC_DIM_PERCENT^MDC|||||R|||[current_date_time]		

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-027		
TP label		Whitepaper. Glucosemeter Context Exercise value		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	GL Numeric 15; M	GL Numeric 17; M	Short Float Type 1; C
		Date-Time Conv 1; M		
Applicability		C_MAN_BLE_000 AND AND C_MAN_BLE_007 AND C_MAN_BLE_009		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement (0x2A18) b. Glucose measurement context (0x2A34) 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test. The measurement of interest for this test case are: a. Glucose measurement (0x2A18) i. Field: Flags • Format: 8 bit • Value: 00010010 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location fields are included, Time Offset fields and Sensor Status Annunciation field are not included and Context Information follows ii. Field: Sequence number • Format: uint16 • Value: Not relevant iii. Field: Base Time • Format: Date and Time • Value: August 2nd, 2012, 11:08:25 iv. Field: Time Offset • This field is not included v. Field: Glucose Concentration - units of kg/L • Format: SFLOAT • Value: Not relevant vi. Field: Glucose Concentration - units of mol/L • This field is not included vii. Field: Type • Format: nibble • Value: Not relevant viii. Field: Sample Location • Format: nibble • Value: Not relevant		

ix. Field: Sensor Status Annunciation

- This field is not included

b. Glucose measurement context (0x2A34)

i. Field: Flags

- Format: 8 bit
- Value: 0000 1000 (MSB → LSB). Exercise Duration And Exercise Intensity fields are included and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Medication ID, Medication Value and HbA1c fields are not included

ii. Field: Sequence number

- Format: uint16
- Value: Not relevant

iii. Field: Extended Flags

- This field is not included

iv. Field: Carbohydrate ID

- This field is not included

v. Field: Carbohydrate

- This field is not included

vi. Field: Meal

- This field is not included

vii. Field: Tester

- This field is not included

viii. Field: Health

- This field is not included

ix. Field: Exercise Duration

- Format: uint16
- Value: Not relevant

x. Field: Exercise Intensity

- Format: uint8
- Value: 33%

xi. Field: Medication ID

- This field is not included

xii. Field: Medication

- This field is not included

xiii. Field: HbA1c

- This field is not included

5. Check that the manager accepts the measurement and decodes its value properly (Context exercise value, Context exercise units and base time).

Pass/Fail criteria	In step 5, the manager under test shows the following Context exercise 33 % with the time stamp '2012-08-02 11:08:25'.
Notes	

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-028
TP label		Whitepaper. Glucosemeter Context Medication Object - Handle Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Numeric 18; O
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_010
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Glucosemeter profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		    a. Glucose measurement context (0x2A34)
		      i. Field: Flags
		        • Format: 8 bit
		        • Value: 0001 0000 (MSB → LSB). Medication ID and Medication in units of kilograms fields are included, and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Exercise Duration and Exercise Intensity and HbA1c fields are not included
		      ii. Field: Sequence number
		        • Format: uint16
		        • Value: Not relevant
		      iii. Field: Extended Flags
		        • This field is not included
		      iv. Field: Carbohydrate ID
		        • This field is not included
		      v. Field: Carbohydrate
		        • This field is not included
		      vi. Field: Meal
		        • This field is not included
		      vii. Field: Tester
		        • This field is not included
		      viii. Field: Health
		        • This field is not included
		      ix. Field: Exercise Duration
		        • This field is not included
		      x. Field: Exercise Intensity
		        • This field is not included
		      xi. Field: Medication ID
		        • Format: uint8
		        • Value: Not relevant
		      xii. Field: Medication - units of kilograms
		        • Format: SFLOAT
		        • Value: Not relevant
		      xiii. Field: Medication - units of litres
		        • This field is not included
		      xiv. Field: HbA1c
		        • This field is not included
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test.
		 5. Check in manager transcoder output for the Context exercise object – Handle attribute.

Pass/Fail criteria		In step 5, the Context medication object – Handle attribute is not present; however, if it is present then its value is different to 0.
Notes		Possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Handle attribute is not present, or if it is present then: ❑ Object: Context Medication numeric object ❑ Attribute-id: MDC_ATTR_ID_HANDLE (2337) ❑ Attribute-type: INT-U16 ❑ Attribute-value: Any value other than 0 b) WAN PCD-01 message PCD-01 message does not include segments with a Handle attribute value.

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-029
TP label		Whitepaper. Glucosemeter Context Medication Object - Type Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Numeric 19; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_010
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristics of interest for this test case are:
		    a. Glucose measurement context (0x2A34)
		       i. Field: Flags
		         • Format: 8 bit
		         • Value: 0001 0000 (MSB → LSB). Medication ID and Medication in units of kilograms fields are included, and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Exercise Duration and Exercise Intensity and HbA1c fields are not included
		       ii. Field: Sequence number
		         • Format: uint16
		         • Value: Not relevant
		       iii. Field: Extended Flags
		         • This field is not included
		       iv. Field: Carbohydrate ID
		         • This field is not included
		       v. Field: Carbohydrate
		         • This field is not included
		       vi. Field: Meal
		         • This field is not included
		       vii. Field: Tester
		         • This field is not included
		       viii. Field: Health
		         • This field is not included
		       ix. Field: Exercise Duration
		         • This field is not included
		       x. Field: Exercise Intensity
		         • This field is not included
		       xi. Field: Medication ID
		         • Format: uint8
		         • Value: Not relevant
		       xii. Field: Medication - units of kilograms
		         • Format: SFLOAT
		         • Value: Not relevant
		       xiii. Field: Medication - units of litres
		         • This field is not included
		       xiv. Field: HbA1c
		         • This field is not included
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test.
		 5. Check in manager transcoder output for the Context medication object – Type attribute.

Pass/Fail criteria		In step 5, the Context medication object – Type attribute is present and its value is { MDC_PART_PHD_DM | MDC_CTXT_MEDICATION}.

Notes		In step 5, possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Type attribute is present:
		   ❏ Object: Context exercise object
		   ❏ Attribute-id: MDC_ATTR_ID_TYPE (2351)
		   ❏ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
		   ❏ Attribute-value:
		     • partition: MDC_PART_PHD_DM or 128 (dec) or 00 80 (hex)
		     • code: MDC_CTXT_MEDICATION or 29188 (dec) or 72 04 (hex)
		 b) WAN PCD-01 message
		 PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):
		 OBX|?|NM|8417800^MDC_CTXT_MEDICATION_RAPIDACTING^MDC|
		 1.0.0.a|0.17|263890^MDC_DIM_MILLI_G^MDC|||||R|||[current_date_time]

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-030
TP label		Whitepaper. Glucosemeter Context Medication Object - Metric-Spec-Small Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Numeric 20; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_010
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		    a. Glucose measurement context (0x2A34)
		      i. Field: Flags
		        • Format: 8 bit
		        • Value: 0001 0000 (MSB → LSB). Medication ID and Medication in units of kilograms fields are included, and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Exercise Duration and Exercise Intensity and HbA1c fields are not included
		      ii. Field: Sequence number
		        • Format: uint16
		        • Value: Not relevant
		      iii. Field: Extended Flags
		        • This field is not included
		      iv. Field: Carbohydrate ID
		        • This field is not included
		      v. Field: Carbohydrate
		        • This field is not included
		      vi. Field: Meal
		        • This field is not included
		      vii. Field: Tester
		        • This field is not included
		      viii. Field: Health
		        • This field is not included
		      ix. Field: Exercise Duration
		        • This field is not included
		      x. Field: Exercise Intensity
		        • This field is not included
		      xi. Field: Medication ID
		        • Format: uint8
		        • Value: Not relevant
		      xii. Field: Medication - units of kilograms
		        • Format: SFLOAT
		        • Value: Not relevant
		      xiii. Field: Medication - units of litres
		        • This field is not included
		      xiv. Field: HbA1c
		        • This field is not included
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test.
		 5. Check in manager transcoder output for the Context Medication numeric object – Metric-Spec-Small attribute.

Pass/Fail criteria		In step 5, the Context Medication numeric object – Metric-Spec-Small attribute is present and its value is {0xF048} (mss-avail-intermittent | mss-avail-stored-data | mss-upd-aperiodic | mss-msmt-aperiodic | mss-acc-agent-initiated | mss-cat-manual).

Notes		Possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Metric-Spec-Small attribute is present:
		   ❑ Object: Context Medication numeric object
		   ❑ Attribute-id: MDC_ATTR_METRIC_SPEC_SMALL (2630)
		   ❑ Attribute-type: BITS-16
		   ❑ Attribute-value: F0 48 (hex) or BITS mss-avail-intermittent(0), mss-avail-stored-data(1), mss-upd-aperiodic(2), mss-msmt-aperiodic(3), mss-acc-agent-initiated(9), mss-cat-manual(12) set to TRUE and remaining BITS set to FALSE
		 b) WAN PCD-01 message
		 PCD-01 message does not include segments with a Metric-Spec-Small attribute value.

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-031
TP label		Whitepaper. Glucosemeter Context Medication Object - Metric-Id Attribute
Coverage	**Spec**	[Bluetooth PHDT v1.4]
	Testable items	GL Numeric 21; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_010
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		2. The simulated agent implements several BLE characteristics. The characteristics of interest for this test case are:
		
		   a. Glucose measurement context (0x2A34)
		
		     i. Field: Flags
		       • Format: 8 bit
		       • Value: 0001 0000 (MSB → LSB). Medication ID and Medication in units of kilograms fields are included, and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Exercise Duration and Exercise Intensity and HbA1c fields are not included
		
		     ii. Field: Sequence number
		       • Format: uint16
		       • Value: Not relevant
		
		     iii. Field: Extended Flags
		       • This field is not included
		
		     iv. Field: Carbohydrate ID
		       • This field is not included
		
		     v. Field: Carbohydrate
		       • This field is not included
		
		     vi. Field: Meal
		       • This field is not included
		
		     vii. Field: Tester
		       • This field is not included
		
		     viii. Field: Health
		       • This field is not included
		
		     ix. Field: Exercise Duration
		       • This field is not included
		
		     x. Field: Exercise Intensity
		       • This field is not included
		
		     xi. Field: Medication ID
		       • Format: uint8
		       • Value: Several values are checked in this test case
		
		     xii. Field: Medication - units of kilograms
		       • Format: SFLOAT
		       • Value: Not relevant
		
		     xiii. Field: Medication - units of litres
		       • This field is not included
		
		     xiv. Field: HbA1c
		       • This field is not included
		
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).

	4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context (Medication ID field set to 0x01 = Rapid acting insulin) to the manager under test.
	5. Check in manager transcoder output for the Context Medication numeric object – Metric-Id attribute.
	6. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context (Medication ID field set to 0x02 = Short acting insulin) to the manager under test.
	7. Check in manager transcoder output for the Context Medication numeric object – Metric-Id attribute.
	8. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context (Medication ID field set to 0x03 = Intermediate acting insulin) to the manager under test.
	9. Check in manager transcoder output for the Context Medication numeric object – Metric-Id attribute.
	10. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context (Medication ID field set to 0x04 = Long acting insulin) to the manager under test.
	11. Check in manager transcoder output for the Context Medication numeric object – Metric-Id attribute.
	12. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context (Medication ID field set to 0x05 = Pre-mixed insulin) to the manager under test.
	13. Check in manager transcoder output for the Context Medication numeric object – Metric-Id attribute.
Pass/Fail criteria	In step 5, the Context medication object – Metric-Id attribute is present and its value is MDC_CTXT_MEDICATION_RAPIDACTING.
	In step 7, the Context medication object – Metric-Id attribute is present and its value is MDC_CTXT_MEDICATION_SHORTACTING.
	In step 9, the Context medication object – Metric-Id attribute is present and its value is MDC_CTXT_MEDICATION_INTERMEDIATEACTING.
	In step 11, the Context medication object – Metric-Id attribute is present and its value is MDC_CTXT_MEDICATION_LONGACTING.
	In step 13, the Context medication object – Metric-Id attribute is present and its value is MDC_CTXT_MEDICATION_PREMIX.
Notes	In step 5, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Metric-Id attribute is present:
	❑ Object: Context medication object
	❑ Attribute-id: MDC_ATTR_ID_PHYSIO (2347)
	❑ Attribute-type: code (INT-U16)
	❑ Attribute-value: code: MDC_CTXT_MEDICATION_RAPIDACTING or 29192 (dec) or 72 08 (hex)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with a Metric-Id attribute value (check OBX-3):
	OBX|?|NM|8417800^MDC_CTXT_MEDICATION_RAPIDACTING^MDC| 1.0.0.a|0.17|263890^MDC_DIM_MILLI_G^MDC|||||R||| [current_date_time]
	In step 7, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Metric-Id attribute is present:
	❑ Object: Context medication object

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    ❏ Attribute-id: MDC_ATTR_ID_PHYSIO (2347)

    ❏ Attribute-type: code (INT-U16)

    ❏ Attribute-value: code: MDC_CTXT_MEDICATION_SHORTACTING or 29196 (dec) or 72 0C (hex)

b)   WAN PCD-01 message

PCD-01 message includes a segment like this with a Metric-Id attribute value (check OBX-3):

OBX|?|NM|8417804^ MDC_CTXT_MEDICATION_SHORTACTING ^MDC| 1.0.0.a|0.18|263890^MDC_DIM_MILLI_G^MDC|||||R||| [current_date_time]

In step 9, possible values in typical points of observation after transcoder output are:

a)   IEEE 11073 Objects and Attributes

Metric-Id attribute is present:

    ❏ Object: Context medication object

    ❏ Attribute-id: MDC_ATTR_ID_PHYSIO (2347)

    ❏ Attribute-type: code (INT-U16)

    ❏ Attribute-value: code: MDC_CTXT_MEDICATION_INTERMEDIATEACTING or 29200 (dec) or 72 10 (hex)

b)   WAN PCD-01 message

PCD-01 message includes a segment like this with a Metric-Id attribute value (check OBX-3):

OBX|?|NM|8417808^ MDC_CTXT_MEDICATION_INTERMEDIATEACTING ^MDC| 1.0.0.a|0.19|263890^MDC_DIM_MILLI_G^MDC|||||R||| [current_date_time]

In step 11, possible values in typical points of observation after transcoder output are:

a)   IEEE 11073 Objects and Attributes

Metric-Id attribute is present:

    ❏ Object: Context medication object

    ❏ Attribute-id: MDC_ATTR_ID_PHYSIO (2347)

    ❏ Attribute-type: code (INT-U16)

    ❏ Attribute-value: code: MDC_CTXT_MEDICATION_LONGACTING or 29204 (dec) or 72 14 (hex)

b)   WAN PCD-01 message

PCD-01 message includes a segment like this with a Metric-Id attribute value (check OBX-3):

OBX|?|NM|8417812^ MDC_CTXT_MEDICATION_LONGACTING ^MDC| 1.0.0.a|0.20|263890^MDC_DIM_MILLI_G^MDC|||||R||| [current_date_time]

In step 13, possible values in typical points of observation after transcoder output are:

a)   IEEE 11073 Objects and Attributes

Metric-Id attribute is present:

    ❏ Object: Context medication object

    ❏ Attribute-id: MDC_ATTR_ID_PHYSIO (2347)

    ❏ Attribute-type: code (INT-U16)

    ❏ Attribute-value: code: MDC_CTXT_MEDICATION_PREMIX or 29208 (dec) or 72 18 (hex)

b)   WAN PCD-01 message

PCD-01 message includes a segment like this with a Metric-Id attribute value (check OBX-3):

OBX|?|NM|8417816^ MDC_CTXT_MEDICATION_PREMIX ^MDC| 1.0.0.a|0.21263890^MDC_DIM_MILLI_G^MDC|||||R||| [current_date_time]

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TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-032
TP label		Whitepaper. Glucosemeter Context Medication Object - Unit-Code Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Numeric 22; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_010
Initial condition		The manager under test and the simulated agent are in the standby state.
Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement context (0x2A34)
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test: a. Glucose measurement context (0x2A34)
		i. Field: Flags
		• Format: 8 bit
		• Value: 0001 0000 (MSB → LSB). Medication ID and Medication in units of kilograms fields are included, and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Exercise Duration and Exercise Intensity and HbA1c fields are not included
		ii. Field: Sequence number
		• Format: uint16
		• Value: Not relevant
		iii. Field: Extended Flags
		• This field is not included
		iv. Field: Carbohydrate ID
		• This field is not included
		v. Field: Carbohydrate
		• This field is not included
		vi. Field: Meal
		• This field is not included
		vii. Field: Tester
		• This field is not included
		viii. Field: Health
		• This field is not included
		ix. Field: Exercise Duration
		• This field is not included
		x. Field: Exercise Intensity
		• This field is not included
		xi. Field: Medication ID
		• Format: uint8
		• Value: 0x01 (Rapid action insulin)
		xii. Field: Medication - units of kilograms
		• Format: SFLOAT
		• Value: Not relevant
		xiii. Field: Medication - units of litres
		• This field is not included
		xiv. Field: HbA1c
		• This field is not included
		5. Check in manager transcoder output for the Context medication object – Unit-Code attribute.
		6. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test. The measurement of interest for this test case is: a. Glucose measurement context (0x2A34)
		i. Field: Flags
		• Format: 8 bit
		• Value: 0011 0000 (MSB → LSB). Medication ID and Medication in units of litres fields are included, and Carbohydrate ID, Carbohydrate, Meal,

<div style="text-align: right;">

Tester-Health, Exercise Duration and Exercise Intensity and HbA1c fields are not included

</div>

    ii. Field: Sequence number
- Format: uint16
- Value: Not relevant

    iii. Field: Extended Flags
- This field is not included

    iv. Field: Carbohydrate ID
- This field is not included

    v. Field: Carbohydrate
- This field is not included

    vi. Field: Meal
- This field is not included

    vii. Field: Tester
- This field is not included

    viii. Field: Health
- This field is not included

    ix. Field: Exercise Duration
- This field is not included

    x. Field: Exercise Intensity
- This field is not included

    xi. Field: Medication ID
- Format: uint8
- Value: 0x01 (Rapid action insulin)

    xii. Field: Medication - units of kilograms
- This field is not included

    xiii. Field: Medication - units of litres
- Format: SFLOAT
- Value: Not relevant

    xiv. Field: HbA1c
- This field is not included

7. Check in manager transcoder output for the Context medication object – Unit-Code attribute.

Pass/Fail criteria	In step 5, the Context medication object – Unit-Code attribute is present and its value is MDC_DIM_MILLI_G. In step 7, the Context medication object – Unit-Code attribute is present and its value is MDC_DIM_MILLI_L.

Notes	In step 5, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Unit-Code attribute is present:
	  ❑ Object: Context medication object
	  ❑ Attribute-id: MDC_ATTR_UNIT_CODE (2454)
	  ❑ Attribute-type: INT-U16
	  ❑ Attribute-value: MDC_DIM_MILLI_G or 1746 (dec) or 06 D2 (hex)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with Unit-Code attribute value (check OBX-6):
	OBX|?|NM|8417800^MDC_CTXT_MEDICATION_RAPIDACTING^MDC|1.0.0.a|0.17|263890^MDC_DIM_MILLI_G^MDC|||||R|||[current_date_time]
	In step 7, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Unit-Code attribute is present:
	  ❑ Object: Context medication object
	  ❑ Attribute-id: MDC_ATTR_UNIT_CODE (2454)
	  ❑ Attribute-type: INT-U16
	  ❑ Attribute-value: MDC_DIM_MILLI_L or 1618 (dec) or 06 52 (hex)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with Unit-Code attribute value (check OBX-6):
	OBX|?|NM|8417800^MDC_CTXT_MEDICATION_RAPIDACTING^MDC|1.0.0.a|0.05|263762^MDC_DIM_MILLI_L^MDC|||||R|||[current_date_time]

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-033		
TP label		Whitepaper. Glucosemeter Context Medication Object - Absolute-Time-Stamp Attribute		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	GL Numeric 23; M	Date-Time Conv 2; M	Date-Time Conv 3; M
		Date-Time Conv 4; M	Date-Time Conv 5; M	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_010		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The simulated agent implements several BLE characteristics. The characteristics of interest for this test case are: a. Glucose measurement (0x2A18) b. Glucose measurement context (0x2A34) 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test. The measurement of interest for this test case are: a. Glucose measurement (0x2A18) i. Field: Flags • Format: 8 bit • Value: 00010011 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location and Time Offset fields are included Sensor Status Annunciation field is not included and Context information follows ii. Field: Sequence number • Format: uint16 • Value: Not relevant iii. Field: Base Time • Format: Date and Time • Value: August 2nd, 2012, 10:59:27 iv. Field: Time Offset • Format: sint16 • Value: 120 minutes v. Field: Glucose Concentration - units of kg/L • Format: SFLOAT • Value: Not relevant vi. Field: Glucose Concentration - units of mol/L • This field is not included vii. Field: Type • This field is not included viii. Field: Sample Location • This field is not included ix. Field: Sensor Status Annunciation • This field is not included b. Glucose measurement context (0x2A34) i. Field: Flags • Format: 8 bit • Value: 0001 0000 (MSB → LSB). Medication ID and Medication in units of kilograms fields are included, and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Exercise Duration and Exercise Intensity and HbA1c fields are not included ii. Field: Sequence number • Format: uint16 • Value: Not relevant iii. Field: Extended Flags

- This field is not included
 iv. Field: Carbohydrate ID
- This field is not included
 v. Field: Carbohydrate
- This field is not included
 vi. Field: Meal
- This field is not included
 vii. Field: Tester
- This field is not included
 viii. Field: Health
- This field is not included
 ix. Field: Exercise Duration
- This field is not included
 x. Field: Exercise Intensity
- This field is not included
 xi. Field: Medication ID
- Format: uint8
- Value: 0x01 (Rapid action insulin)
 xii. Field: Medication - units of kilograms
- Format: SFLOAT
- Value: Not relevant
 xiii. Field: Medication - units of litres
- This field is not included
 xiv. Field: HbA1c
- This field is not included

5. Check in manager transcoder output for the Context medication object – Absolute-Time-Stamp attribute.

Pass/Fail criteria	In step 6, the Context medication object – Absolute-Time-Stamp attribute is present, its value matches with the Time Stamp field in conjunction with the Time Offset field of the Glucose measurement characteristic and the fraction of seconds is set to 0.

Notes	Possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Absolute-Time-Stamp attribute is present:
	 ❑ Object: Context medication object
	 ❑ Attribute-id: MDC_ATTR_TIME_STAMP_ABS (2448)
	 ❑ Attribute-type: SEQUENCE {century (INT-U8), year (INT-U8), month (INT-U8), day (INT-U8), hour (INT-U8), minute (INT-U8), second (INT-U8), sec-fractions (INT-U8)} (BCD encoding)
	 ❑ Attribute-value:
	  • century: 20 (hex) or 32 (dec)
	  • year: 12 (hex) or 18 (dec)
	  • month: 08 (hex) or 8 (dec)
	  • day: 02 (hex) or 2 (dec)
	  • hour: 12 (hex) or 18 (dec)
	  • minute: 59 (hex) or 89 (dec)
	  • second: 27 (hex) or 39 (dec)
	  • sec-fractions: 00 (hex) or 0 (dec)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with Absolute-Time-Stamp attribute value (check OBX-14):
	OBX|?|NM|8417800^MDC_CTXT_MEDICATION_RAPIDACTING^MDC|1.0.0.a|0.17|263890^MDC_DIM_MILLI_G^MDC|||||R|||20120802125927+0000

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-034		
TP label		Whitepaper. Glucosemeter Context Medication Object - Basic-Nu-Observed-Value Attribute 1		
Coverage	**Spec**	[Bluetooth PHDT v1.4]		
	Testable items	GL Numeric 24; M	Short Float Type 1; C	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_010		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement context (0x2A34) 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test. The measurement of interest for this test case is: a. Glucose measurement context (0x2A34) i. Field: Flags • Format: 8 bit • Value: 0001 0000 (MSB → LSB). Medication ID and Medication in units of kilograms fields are included, and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Exercise Duration and Exercise Intensity and HbA1c fields are not included ii. Field: Sequence number • Format: uint16 • Value: Not relevant iii. Field: Extended Flags • This field is not included iv. Field: Carbohydrate ID • This field is not included v. Field: Carbohydrate • This field is not included vi. Field: Meal • This field is not included vii. Field: Tester • This field is not included viii. Field: Health • This field is not included ix. Field: Exercise Duration • This field is not included x. Field: Exercise Intensity • This field is not included		

xi. Field: Medication ID

- Format: uint8

- Value: 0x01 (Rapid action insulin)

xii. Field: Medication - units of kilograms

- Format: SFLOAT

- Value: 0.00000017 kg (0.17 mg)

xiii. Field: Medication - units of litres

- This field is not included

xiv. Field: HbA1c

- This field is not included

5. Check in manager transcoder output for the Context medication object– Basic-Nu-Observed-Value attribute.

6. The simulated agent sends the measurement to the manager under test with the following value:

a. Glucose measurement context (0x2A34)

i. Field: Flags

- Format: 8 bit

- Value: 0011 0000 (MSB → LSB). Medication ID and Medication in units of litres fields are included, and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Exercise Duration and Exercise Intensity and HbA1c fields are not included

ii. Field: Sequence number

- Format: uint16

- Value: Not relevant

iii. Field: Extended Flags

- This field is not included

iv. Field: Carbohydrate ID

- This field is not included

v. Field: Carbohydrate

- This field is not included

vi. Field: Meal

- This field is not included

vii. Field: Tester

- This field is not included

viii. Field: Health

- This field is not included

ix. Field: Exercise Duration

- This field is not included

x. Field: Exercise Intensity

- This field is not included

xi. Field: Medication ID

- Format: uint8

- Value: 0x01 (Rapid action insulin)

xii. Field: Medication - units of kilograms

- This field is not included

	xiii. Field: Medication - units of litres
	
	    • Format: SFLOAT
	
	    • Value: 0.00005 litres (0.05 ml)
	
	xiv. Field: HbA1c
	
	    • This field is not included
	
	7. Check in manager transcoder output for the Context medication object– Basic-Nu-Observed-Value attribute.

Pass/Fail criteria	In step 5, the Context medication object – Basic-Nu-Observed-Value attribute is present and its value matches with the Medication Value field of the Glucose measurement context characteristic: 0.17 mg. In step 7, the Context medication object – Basic-Nu-Observed-Value attribute is present and its value matches with the Medication Value field of the Glucose measurement context characteristic: 0.05 ml.

Notes	In step 5, possible values in typical points of observation after transcoder output are:
	
	a) IEEE 11073 Objects and Attributes
	
	Basic-Nu-Observed-Value attribute is present:
	
	    ❑ Object: Context medication object
	
	    ❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636)
	
	    ❑ Attribute-type: SFLOAT
	
	    ❑ Attribute-value: E0 11 (hex) or 0.17 (dec)
	
	b) WAN PCD-01 message
	
	PCD-01 message includes a segment like this with a Basic-Nu-Observed-Value attribute value (check OBX-5):
	
	OBX|?|NM|8417800^MDC_CTXT_MEDICATION_RAPIDACTING^MDC |1.0.0.a|0.17| 263890^MDC_DIM_MILLI_G ^MDC|||||R|||[current_date_time]
	
	In step 7, possible values in typical points of observation after transcoder output are:
	
	a) IEEE 11073 Objects and Attributes
	
	Basic-Nu-Observed-Value attribute is present:
	
	    ❑ Object: Context medication object
	
	    ❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636)
	
	    ❑ Attribute-type: SFLOAT
	
	    ❑ Attribute-value: E0 05 (hex) or 0.05 (dec)
	
	b) WAN PCD-01 message
	
	PCD-01 message includes a segment like this with a Basic-Nu-Observed-Value attribute value (check OBX-5):
	
	OBX|?|NM|8417800^MDC_CTXT_MEDICATION_RAPIDACTING^MDC |1.0.0.a|0.05| 263762^MDC_DIM_MILLI_L^MDC |||||R|||[current_date_time]

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-035		
TP label		Whitepaper. Glucosemeter Context Medication Object - Basic-Nu-Observed-Value Attribute 2		
Coverage	**Spec**	[Bluetooth PHDT v1.4]		
	Testable items	GL Numeric 24; M	Short Float Type 1; C	Short Float Type 2; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_010		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement context (0x2A34) 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test: a. Glucose measurement context (0x2A34) i. Field: Flags • Format: 8 bit • Value: 0001 0000 (MSB → LSB). Medication ID and Medication in units of kilograms fields are included, and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Exercise Duration and Exercise Intensity and HbA1c fields are not included ii. Field: Sequence number • Format: uint16 • Value: Not relevant iii. Field: Extended Flags • This field is not included iv. Field: Carbohydrate ID • This field is not included v. Field: Carbohydrate • This field is not included vi. Field: Meal • This field is not included vii. Field: Tester • This field is not included viii. Field: Health • This field is not included ix. Field: Exercise Duration • This field is not included x. Field: Exercise Intensity • This field is not included		

        xi. Field: Medication ID

- Format: uint8
- Value: 0x01 (Rapid action insulin)

        xii. Field: Medication - units of kilograms

- Format: SFLOAT
- Value: 0.00000017 kg (0.17 mg)

        xiii. Field: Medication - units of litres

- This field is not included

        xiv. Field: HbA1c

- This field is not included

5. Check in manager transcoder output for the Context medication object – Basic-Nu-Observed-Value attribute.

6. The simulated agent sends the measurement to the manager under test with the following value:

    a. Glucose measurement context (0x2A34)

        i. Field: Flags

- Format: 8 bit
- Value: 0001 0000 (MSB → LSB). Medication ID and Medication in units of kilograms fields are included, and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Exercise Duration and Exercise Intensity and HbA1c fields are not included

        ii. Field: Sequence number

- Format: uint16
- Value: Not relevant

        iii. Field: Extended Flags

- This field is not included

        iv. Field: Carbohydrate ID

- This field is not included

        v. Field: Carbohydrate

- This field is not included

        vi. Field: Meal

- This field is not included

        vii. Field: Tester

- This field is not included

        viii. Field: Health

- This field is not included

        ix. Field: Exercise Duration

- This field is not included

        x. Field: Exercise Intensity

- This field is not included

        xi. Field: Medication ID

- Format: uint8
- Value: 0x01 (Rapid action insulin)

        xii. Field: Medication - units of kilograms

- Format: SFLOAT

- Value: 07 FF (hex). Special value: NaN

xiii. Field: Medication - units of litres

- This field is not included

xiv. Field: HbA1c

- This field is not included

7. Check in manager transcoder output for the Context medication object – Basic-Nu-Observed-Value attribute.

8. The simulated agent sends the measurement to the manager under test with the following value:

a. Glucose measurement context (0x2A34)

i. Field: Flags

- Format: 8 bit

- Value: 0001 0000 (MSB → LSB). Medication ID and Medication in units of kilograms fields are included, and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Exercise Duration and Exercise Intensity and HbA1c fields are not included

ii. Field: Sequence number

- Format: uint16

- Value: Not relevant

iii. Field: Extended Flags

- This field is not included

iv. Field: Carbohydrate ID

- This field is not included

v. Field: Carbohydrate

- This field is not included

vi. Field: Meal

- This field is not included

vii. Field: Tester

- This field is not included

viii. Field: Health

- This field is not included

ix. Field: Exercise Duration

- This field is not included

x. Field: Exercise Intensity

- This field is not included

xi. Field: Medication ID

- Format: uint8

- Value: 0x01 (Rapid action insulin)

xii. Field: Medication - units of kilograms

- Format: SFLOAT

- Value: 00 80 (hex). Special value: NRes

xiii. Field: Medication - units of litres

- This field is not included

xiv. Field: HbA1c

- This field is not included

9. Check in manager transcoder output for the Context medication object – Basic-Nu-Observed-Value attribute.

10. The simulated agent sends the measurement to the manager under test with the following value:

   a. Glucose measurement context (0x2A34)

      i. Field: Flags

         - Format: 8 bit

         - Value: 0001 0000 (MSB → LSB). Medication ID and Medication in units of kilograms fields are included, and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Exercise Duration and Exercise Intensity and HbA1c fields are not included

      ii. Field: Sequence number

         - Format: uint16

         - Value: Not relevant

      iii. Field: Extended Flags

         - This field is not included

      iv. Field: Carbohydrate ID

         - This field is not included

      v. Field: Carbohydrate

         - This field is not included

      vi. Field: Meal

         - This field is not included

      vii. Field: Tester

         - This field is not included

      viii. Field: Health

         - This field is not included

      ix. Field: Exercise Duration

         - This field is not included

      x. Field: Exercise Intensity

         - This field is not included

      xi. Field: Medication ID

         - Format: uint8

         - Value: 0x01 (Rapid action insulin)

      xii. Field: Medication - units of kilograms

         - Format: SFLOAT

         - Value: 07 FE (hex). Special value: +INFINITY

      xiii. Field: Medication - units of litres

         - This field is not included

      xiv. Field: HbA1c

         - This field is not included

11. Check in manager transcoder output for the Context medication object – Basic-Nu-Observed-Value attribute.

12. The simulated agent sends the measurement to the manager under test with the following value:

   a. Glucose measurement context (0x2A34)

      i. Field: Flags

	• Format: 8 bit
	
	• Value: 0001 0000 (MSB → LSB). Medication ID and Medication in units of kilograms fields are included, and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Exercise Duration and Exercise Intensity and HbA1c fields are not included
	
	   ii. Field: Sequence number
	
	      • Format: uint16
	
	      • Value: Not relevant
	
	   iii. Field: Extended Flags
	
	      • This field is not included
	
	   iv. Field: Carbohydrate ID
	
	      • This field is not included
	
	   v. Field: Carbohydrate
	
	      • This field is not included
	
	   vi. Field: Meal
	
	      • This field is not included
	
	   vii. Field: Tester
	
	      • This field is not included
	
	   viii. Field: Health
	
	      • This field is not included
	
	   ix. Field: Exercise Duration
	
	      • This field is not included
	
	   x. Field: Exercise Intensity
	
	      • This field is not included
	
	   xv. Field: Medication ID
	
	      • Format: uint8
	
	      • Value: 0x01 (Rapid action insulin)
	
	   xvi. Field: Medication - units of kilograms
	
	      • Format: SFLOAT
	
	      • Value: 08 02 (hex). Special value: -INFINITY
	
	   xvii. Field: Medication - units of litres
	
	      • This field is not included
	
	   xviii. Field: HbA1c
	
	      • This field is not included
	
	13. Check in manager transcoder output for the Context medication object – Basic-Nu-Observed-Value attribute.

Pass/Fail criteria	In step 5, the Context medication object – Basic-Nu-Observed-Value attribute is present and its value is 0.17 mg. In step 7, the Context medication object – Basic -Nu-Observed-Value attribute is present and its value is 0x07FF. In step 9, the Context medication object – Basic -Nu-Observed-Value attribute is present and its value is 0x0800. In step 11, the Context medication object – Basic -Nu-Observed-Value attribute is present and its value is 0x07FE. In step 13, the Context medication object – Basic -Nu-Observed-Value attribute is present and its value is 0x0802.

Notes	In step 5, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Basic-Nu-Observed-Value attribute is present:
	❑ Object: Context medication object
	❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636)
	❑ Attribute-type: SFLOAT
	❑ Attribute-value: E0 11 (hex) or 0.17 (dec)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with a Basic-Nu-Observed-Value attribute value (check OBX-5):
	OBX|?|NM|8417800^MDC_CTXT_MEDICATION_RAPIDACTING^MDC |1.0.0.a|0.17| 263890^MDC_DIM_MILLI_G ^MDC |||||R|||[current_date_time]
	In step 7, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Basic -Nu-Observed-Value attribute is present:
	❑ Object: Context medication object
	❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636)
	❑ Attribute-type: SFLOAT
	❑ Attribute-value: 07 FF(hex) or NaN (note that is not allowed a decimal value)
	b) WAN PCD-01 message
	PCD-01 message does not include segments with a Basic -Nu-Observed-Value attribute value (8417800^MDC_CTXT_MEDICATION_RAPIDACTING^MDC) because it has a special value and these values are not included in the PCD-01 message.
	In step 9, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Basic -Nu-Observed-Value attribute is present:
	❑ Object: Context medication object
	❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636)
	❑ Attribute-type: SFLOAT
	❑ Attribute-value: 08 00 (hex) or NRes (note that a decimal value is not allowed)
	b) WAN PCD-01 message
	PCD-01 message does not include segments with a Basic -Nu-Observed-Value attribute value (8417800^MDC_CTXT_MEDICATION_RAPIDACTING^MDC) because it has a special value and these values are not included in the PCD-01 message.
	In step 11, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Basic -Nu-Observed-Value attribute is present:
	❑ Object: Context medication object
	❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636)
	❑ Attribute-type: SFLOAT
	❑ Attribute-value: 07 FE (hex) or +INFINITY (note that a decimal value is not allowed)
	b) WAN PCD-01 message
	PCD-01 message does not include segments with a Basic -Nu-Observed-Value attribute value (8417800^MDC_CTXT_MEDICATION_RAPIDACTING^MDC) because it has a special value and these values are not included in the PCD-01 message.
	In step 13, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Basic -Nu-Observed-Value attribute is present:
	❑ Object: Context medication object
	❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636)
	❑ Attribute-type: SFLOAT
	❑ Attribute-value: 08 02 (hex) or -INFINITY (note that a decimal value is not allowed)
	b) WAN PCD-01 message
	PCD-01 message does not include segments with a Basic -Nu-Observed-Value attribute value (8417800^MDC_CTXT_MEDICATION_RAPIDACTING^MDC) because it has a special value and these values are not included in the PCD-01 message.

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-036		
TP label		Whitepaper. Glucosemeter Context Medication value		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	GL Numeric 23; M	GL Numeric 24; M	Short Float Type 1; C
		Date-Time Conv 1; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_007 AND C_MAN_BLE_010		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		 a. Glucose measurement (0x2A18)
		 b. Glucose measurement context (0x2A34)
		
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		
		 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test:
		 a. Glucose measurement (0x2A18)
		     i. Field: Flags
		        • Format: 8 bit
		        • Value: 00010010 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location are included, Time Offset and Sensor Status Annunciation fields are not included and Context information follows
		     ii. Field: Sequence number
		        • Format: uint16
		        • Value: Not relevant
		     iii. Field: Base Time
		        • Format: Date and Time
		        • Value: August 2nd, 2012, 11:08:25
		     iv. Field: Time Offset
		        • This field is not included
		     v. Field: Glucose Concentration - units of kg/L
		        • Format: SFLOAT
		        • Value: Not relevant
		     vi. Field: Glucose Concentration - units of mol/L
		        • This field is not included
		     vii. Field: Type
		        • Format: nibble
		        • Value: Not relevant
		     viii. Field: Sample Location
		        • Format: nibble
		        • Value: Not relevant
		     ix. Field: Sensor Status Annunciation
		        • This field is not included
		 b. Glucose measurement context (0x2A34)
		     i. Field: Flags
		        • Format: 8 bit
		        • Value: 0001 0000 (MSB → LSB). Medication ID and Medication in units of kilograms fields are included, and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Exercise Duration and Exercise Intensity and HbA1c fields are not included
		     ii. Field: Sequence number

- Format: uint16
- Value: Not relevant

   iii. Field: Extended Flags
- This field is not included

   iv. Field: Carbohydrate ID
- This field is not included

   v. Field: Carbohydrate
- This field is not included

   vi. Field: Meal
- This field is not included

   vii. Field: Tester
- This field is not included

   viii. Field: Health
- This field is not included

   ix. Field: Exercise Duration
- This field is not included

   x. Field: Exercise Intensity
- This field is not included

   xi. Field: Medication ID
- Format: uint8
- Value: 0x01 (Rapid action insulin)

   xii. Field: Medication - units of kilograms
- Format: SFLOAT
- Value: 0.00000017 kg (0.17 mg)

   xiii. Field: Medication - units of litres
- This field is not included

   xiv. Field: HbA1c
- This field is not included

5. Check that the manager accepts the measurement and decodes its value properly (Context Medication value, Context Medication units and base time).

6. The simulated agent sends the Glucose measurement followed by the Glucose measurement context to the manager under test with the following value:

   a. Glucose measurement (0x2A18)

      i. Field: Flags
- Format: 8 bit
- Value: 00010010 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location are included, Time Offset and Sensor Status Annunciation fields are not included and Context information follows

      ii. Field: Sequence number
- Format: uint16
- Value: Not relevant

      i. Field: Base Time
- Format: Date and Time
- Value: August 2nd, 2012, 11:09:05

      ii. Field: Time Offset
- This field is not included

      iii. Field: Glucose Concentration - units of kg/L
- Format: SFLOAT
- Value: Not relevant

      iv. Field: Glucose Concentration - units of mol/L
- This field is not included

      v. Field: Type
- This field is not included

      vi. Field: Sample Location

- This field is not included
   vii. Field: Sensor Status Annunciation
- This field is not included

   b. Glucose measurement context (0x2A34)

     i. Field: Flags
- Format: 8 bit
- Value: 0011 0000 (MSB → LSB). Medication ID and Medication in units of litres fields are included, and Carbohydrate ID, Carbohydrate, Meal, Tester-Health, Exercise Duration and Exercise Intensity and HbA1c fields are not included

     ii. Field: Sequence number
- Format: uint16
- Value: Not relevant

     iii. Field: Extended Flags
- This field is not included

     iv. Field: Carbohydrate ID
- This field is not included

     v. Field: Carbohydrate
- This field is not included

     vi. Field: Meal
- This field is not included

     vii. Field: Tester
- This field is not included

     viii. Field: Health
- This field is not included

     ix. Field: Exercise Duration
- This field is not included

     x. Field: Exercise Intensity
- This field is not included

     xi. Field: Medication ID
- Format: uint8
- Value: 0x01 (Rapid action insulin)

     xii. Field: Medication - units of kilograms
- This field is not included

     xiii. Field: Medication - units of litres
- Format: SFLOAT
- Value: 0.00005 litres (0.05 ml)

     xiv. Field: HbA1c
- This field is not included

7. Check that the manager accepts the measurement and decodes its value properly (Context Medication value, Context Medication units and base time).

Pass/Fail criteria	In step 5, the manager under test shows the following Context Medication 0.17 mg with the time stamp '2012-08-02 11:08:25'.
	In step 7, the manager under test shows the following Context Medication 0.05 ml with the time stamp '2012-08-02 11:09:05'.
Notes	

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-037
TP label		Whitepaper. Glucosemeter Context Carbohydrates Object - Handle Attribute
Coverage	**Spec**	[Bluetooth PHDT v1.4]
	Testable items	GL Numeric 25; O
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_011
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Glucosemeter profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		    a. Glucose measurement context (0x2A34)
		       i. Field: Flags
		          • Format: 8 bit
		          • Value: 0000 0001 (MSB → LSB). Carbohydrate ID and Carbohydrate is included and Meal, Tester-Health, Exercise Duration and Exercise Intensity, Medication ID, Medication Value and HbA1c fields are not included
		       ii. Field: Sequence number
		          • Format: uint16
		          • Value: Not relevant
		       iii. Field: Extended Flags
		          • This field is not included
		       iv. Field: Carbohydrate ID
		          • Format: uint8
		          • Value: Not relevant
		       v. Field: Carbohydrate
		          • Format: SFLOAT
		          • Value: Not relevant
		       vi. Field: Meal
		          • This field is not included
		       vii. Field: Tester
		          • This field is not included
		       viii. Field: Health
		          • This field is not included
		       ix. Field: Exercise Duration
		          • This field is not included
		       x. Field: Exercise Intensity
		          • This field is not included
		       xi. Field: Medication ID
		          • This field is not included
		       xii. Field: Medication
		          • This field is not included
		       xiii. Field: HbA1c
		          • This field is not included
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test.
		 5. Check in manager transcoder output for the Blood glucose object – Handle attribute.

Pass/Fail criteria		In step 5, the Context carbohydrates object – Handle attribute is not present; however, if it is present then its value is different to 0.

Notes		Possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Handle attribute is not present, or if it is present then:
		   ❑ Object: Context carbohydrates numeric object
		   ❑ Attribute-id: MDC_ATTR_ID_HANDLE (2337)
		   ❑ Attribute-type: INT-U16
		   ❑ Attribute-value: Any value other than 0
		 b) WAN PCD-01 message
		 PCD-01 message does not include segments with a Handle attribute value.

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-038
TP label		Whitepaper. Glucosemeter Context Carbohydrates Object - Type Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Numeric 26; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_011
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristics of interest for this test case are:
		    a. Glucose measurement context (0x2A34)
		      i. Field: Flags
		        • Format: 8 bit
		        • Value: 0000 0001 (MSB → LSB). Carbohydrate ID and Carbohydrate is included and Meal, Tester-Health, Exercise Duration and Exercise Intensity, Medication ID, Medication Value and HbA1c fields are not included
		      ii. Field: Sequence number
		        • Format: uint16
		        • Value: Not relevant
		      iii. Field: Extended Flags
		        • This field is not included
		      iv. Field: Carbohydrate ID
		        • Format: uint8
		        • Value: Not relevant
		      v. Field: Carbohydrate
		        • Format: SFLOAT
		        • Value: Not relevant
		      vi. Field: Meal
		        • This field is not included
		      vii. Field: Tester
		        • This field is not included
		      viii. Field: Health
		        • This field is not included
		      ix. Field: Exercise Duration
		        • This field is not included
		      x. Field: Exercise Intensity
		        • This field is not included
		      xi. Field: Medication ID
		        • This field is not included
		      xii. Field: Medication
		        • This field is not included
		      xiii. Field: HbA1c
		        • This field is not included
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test.
		 5. Check in manager transcoder output for the Context carbohydrates object – Type attribute.

Pass/Fail criteria		In step 5, the Context carbohydrates object – Type attribute is present and its value is { MDC_PART_PHD_DM	MDC_CTXT_GLU_CARB}.

Notes		In step 5, possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Type attribute is present:
		   ❑ Object: Context carbohydrates object
		   ❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
		   ❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
		   ❑ Attribute-value:
		     • partition: MDC_PART_PHD_DM or 128 (dec) or 00 80 (hex)
		     • code: MDC_CTXT_GLU_CARB or 29156 (dec) or 71 E4 (hex)
		 b) WAN PCD-01 message
		 PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):
		 OBX|?|NM|8417768^MDC_CTXT_GLU_CARB_BREAKFAST^MDC|1.0.0.a|75|
		 263872^MDC_DIM_G^MDC|||||R||||[current_date_time]

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-039		
TP label		Whitepaper. Glucosemeter Context Carbohydrates Object - Metric-Spec-Small Attribute		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	GL Numeric 27; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_011		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		    a. Glucose measurement context (0x2A34)
		       i. Field: Flags
		         • Format: 8 bit
		         • Value: 0000 0001 (MSB → LSB). Carbohydrate ID and Carbohydrate is included and Meal, Tester-Health, Exercise Duration and Exercise Intensity, Medication ID, Medication Value and HbA1c fields are not included
		       ii. Field: Sequence number
		         • Format: uint16
		         • Value: Not relevant
		       iii. Field: Extended Flags
		         • This field is not included
		       iv. Field: Carbohydrate ID
		         • Format: uint8
		         • Value: Not relevant
		       v. Field: Carbohydrate - units of kilograms
		         • Format: SFLOAT
		         • Value: Not relevant
		       vi. Field: Meal
		         • This field is not included
		       vii. Field: Tester
		         • This field is not included
		       viii. Field: Health
		         • This field is not included
		       ix. Field: Exercise Duration
		         • This field is not included
		       x. Field: Exercise Intensity
		         • This field is not included
		       xi. Field: Medication ID
		         • This field is not included
		       xii. Medication – units of kilograms
		         • This field is not included
		       xiii. Medication – units of litres
		         • This field is not included
		       xiv. Field: HbA1c
		         • This field is not included
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test.
		 5. Check in manager transcoder output for the Context carbohydrate numeric object – Metric-Spec-Small attribute.		

Pass/Fail criteria		In step 5, the Context carbohydrate numeric object – Metric-Spec-Small attribute is present and its value is {0xF048} (mss-avail-intermittent | mss-avail-stored-data | mss-upd-aperiodic | mss-msmt-aperiodic | mss-acc-agent-initiated | mss-cat-manual).		

Notes		Possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Metric-Spec-Small attribute is present:
		   ❑ Object: Context carbohydrates numeric object
		   ❑ Attribute-id: MDC_ATTR_METRIC_SPEC_SMALL (2630)
		   ❑ Attribute-type: BITS-16
		   ❑ Attribute-value: F0 48 (hex) or BITS mss-avail-intermittent(0), mss-avail-stored-data(1), mss-upd-aperiodic(2), mss-msmt-aperiodic(3), mss-acc-agent-initiated(9), mss-cat-manual(12) set to TRUE and remaining BITS set to FALSE
		 b) WAN PCD-01 message
		 PCD-01 message does not include segments with a Metric-Spec-Small attribute value.		

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-040
TP label		Whitepaper. Glucosemeter Context Carbohydrates Object - Metric-Id Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Numeric 28; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_011
Initial condition		The manager under test and the simulated agent are in the standby state.
Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		2. The simulated agent implements several BLE characteristics. The characteristics of interest for this test case are:
		a. Glucose measurement context (0x2A34)
		i. Field: Flags
		• Format: 8 bit
		• Value: 0000 0001 (MSB → LSB). Carbohydrate ID and Carbohydrate is included and Meal, Tester-Health, Exercise Duration and Exercise Intensity, Medication ID, Medication Value and HbA1c fields are not included
		ii. Field: Sequence number
		• Format: uint16
		• Value: Not relevant
		iii. Field: Extended Flags
		• This field is not included
		iv. Field: Carbohydrate ID
		• Format: uint8
		• Value: Several values are checked in this test case
		v. Field: Carbohydrate - units of kilograms
		• Format: SFLOAT
		• Value: Not relevant
		vi. Field: Meal
		• This field is not included
		vii. Field: Tester
		• This field is not included
		viii. Field: Health
		• This field is not included
		ix. Field: Exercise Duration
		• This field is not included
		x. Field: Exercise Intensity
		• This field is not included
		xi. Field: Medication ID
		• This field is not included
		xii. Medication – units of kilograms
		• This field is not included
		xiii. Medication – units of litres
		• This field is not included
		xiv. Field: HbA1c
		• This field is not included
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context (Carbohydrate ID field set to 0x01 = Breakfast) to the manager under test.
		5. Check in manager transcoder output for the Context carbohydrate numeric object – Metric-Id attribute.
		6. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context (Carbohydrate ID field set to 0x02 = Lunch) to the manager under test
		7. Check in manager transcoder output for the Context carbohydrate numeric object – Metric-Id attribute.
		8. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a

	Glucose measurement followed by the Glucose measurement context (Carbohydrate ID field set to 0x03 = Dinner) to the manager under test
	9. Check in manager transcoder output for the Context carbohydrate numeric object – Metric-Id attribute.
	10. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context (Carbohydrate ID field set to 0x04 = Snack) to the manager under test
	11. Check in manager transcoder output for the Context carbohydrate numeric object – Metric-Id attribute.
	12. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context (Carbohydrate ID field set to 0x05 = Drink) to the manager under test.
	13. Check in manager transcoder output for the Context carbohydrate numeric object – Metric-Id attribute.
	14. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context (Carbohydrate ID field set to 0x06 = Supper) to the manager under test.
	15. Check in manager transcoder output for the Context carbohydrate numeric object – Metric-Id attribute.
	16. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context (Carbohydrate ID field set to 0x07 = Brunch) to the manager under test.
	17. Check in manager transcoder output for the Context carbohydrate numeric object – Metric-Id attribute.
Pass/Fail criteria	In step 5, the Context carbohydrate object – Metric-Id attribute is present and its value is MDC_CTXT_GLU_CARB_BREAKFAST. In step 7, the Context carbohydrate object – Metric-Id attribute is present and its value is MDC_CTXT_GLU_CARB_LUNCH. In step 9, the Context carbohydrate object – Metric-Id attribute is present and its value is MDC_CTXT_GLU_CARB_DINNER. In step 11, the Context carbohydrate object – Metric-Id attribute is present and its value is MDC_CTXT_GLU_CARB_SNACK In step 13, the Context carbohydrate object – Metric-Id attribute is present and its value is MDC_CTXT_GLU_CARB_DRINK. In step 15, the Context carbohydrate object – Metric-Id attribute is present and its value is MDC_CTXT_GLU_CARB_SUPPER. In step 17, the Context carbohydrate object – Metric-Id attribute is present and its value is MDC_CTXT_GLU_CARB_BRUNCH.
Notes	In step 5, possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Metric-Id attribute is present: ❑ Object: Context carbohydrate object ❑ Attribute-id: MDC_ATTR_ID_PHYSIO (2347) ❑ Attribute-type: code (INT-U16) ❑ Attribute-value: code: MDC_CTXT_GLU_CARB_BREAKFAST or 29160 (dec) or 71 E8 (hex) b) WAN PCD-01 message PCD-01 message includes a segment like this with a Metric-Id attribute value (check OBX-3): OBX|?|NM|8417768^MDC_CTXT_GLU_CARB_BREAKFAST^MDC| 1.0.0.a|130| 263872^MDC_DIM_G^MDC|||||R|||[current_date_time] In step 7, possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Metric-Id attribute is present: ❑ Object: Context carbohydrate object ❑ Attribute-id: MDC_ATTR_ID_PHYSIO (2347) ❑ Attribute-type: code (INT-U16) ❑ Attribute-value: code: MDC_CTXT_GLU_CARB_LUNCH or 29164 (dec) or 71 EC (hex) b) WAN PCD-01 message PCD-01 message includes a segment like this with a Metric-Id attribute value (check OBX-3): OBX|?|NM|8417772^MDC_CTXT_GLU_CARB_LUNCH^MDC| 1.0.0.a|130| 263872^MDC_DIM_G^MDC|||||R|||[current_date_time] In step 9, possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes

Metric-Id attribute is present:
- ❑ Object: Context carbohydrate object
- ❑ Attribute-id: MDC_ATTR_ID_PHYSIO (2347)
- ❑ Attribute-type: code (INT-U16)
- ❑ Attribute-value: code: MDC_CTXT_GLU_CARB_DINNER or 29168 (dec) or 71 F0 (hex)

b) WAN PCD-01 message

PCD-01 message includes a segment like this with a Metric-Id attribute value (check OBX-3):

OBX|?|NM|8417776^MDC_CTXT_GLU_CARB_DINNER^MDC| 1.0.0.a|130| 263872^MDC_DIM_G^MDC |||||R||||[current_date_time]

In step 11, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Metric-Id attribute is present:
- ❑ Object: Context carbohydrate object
- ❑ Attribute-id: MDC_ATTR_ID_PHYSIO (2347)
- ❑ Attribute-type: code (INT-U16)
- ❑ Attribute-value: code: MDC_CTXT_GLU_CARB_SNACK or 29172 (dec) or 71 F4 (hex)

b) WAN PCD-01 message

PCD-01 message includes a segment like this with a Metric-Id attribute value (check OBX-3):

OBX|?|NM|8417780^MDC_CTXT_GLU_CARB_SNACK^MDC| 1.0.0.a|130| 263872^MDC_DIM_G^MDC|||||R||||[current_date_time]

In step 13, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Metric-Id attribute is present:
- ❑ Object: Context carbohydrate object
- ❑ Attribute-id: MDC_ATTR_ID_PHYSIO (2347)
- ❑ Attribute-type: code (INT-U16)
- ❑ Attribute-value: code: MDC_CTXT_GLU_CARB_DRINK or 29176 (dec) or 71 F8 (hex)

b) WAN PCD-01 message

PCD-01 message includes a segment like this with a Metric-Id attribute value (check OBX-3):

OBX|?|NM|8417784^MDC_CTXT_GLU_CARB_DRINK^MDC| 1.0.0.a|130| 263872^MDC_DIM_G^MDC|||||R||||[current_date_time]

In step 15, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Metric-Id attribute is present:
- ❑ Object: Context carbohydrate object
- ❑ Attribute-id: MDC_ATTR_ID_PHYSIO (2347)
- ❑ Attribute-type: code (INT-U16)
- ❑ Attribute-value: code: MDC_CTXT_GLU_CARB_SUPPER or 29180 (dec) or 71 FC (hex)

b) WAN PCD-01 message

PCD-01 message includes a segment like this with a Metric-Id attribute value (check OBX-3):

OBX|?|NM|8417788^MDC_CTXT_GLU_CARB_SUPPER^MDC| 1.0.0.a|130| 263872^MDC_DIM_G^MDC|||||R||||[current_date_time]

In step 17, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Metric-Id attribute is present:
- ❑ Object: Context carbohydrate object
- ❑ Attribute-id: MDC_ATTR_ID_PHYSIO (2347)
- ❑ Attribute-type: code (INT-U16)
- ❑ Attribute-value: code: MDC_CTXT_GLU_CARB_BRUNCH or 29184 (dec) or 72 00 (hex)

b) WAN PCD-01 message

PCD-01 message includes a segment like this with a Metric-Id attribute value (check OBX-3):

OBX|?|NM|8417792^MDC_CTXT_GLU_CARB_BRUNCH^MDC| 1.0.0.a|130|263872^MDC_DIM_G^MDC|||||R||||[current_date_time]

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-041
TP label		Whitepaper. Glucosemeter Context Carbohydrates Object - Unit-Code Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Numeric 29; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_011
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		    a. Glucose measurement context (0x2A34)
		       i. Field: Flags
		         • Format: 8 bit
		         • Value: 0000 0001 (MSB → LSB). Carbohydrate ID and Carbohydrate is included and Meal, Tester-Health, Exercise Duration and Exercise Intensity, Medication ID, Medication Value and HbA1c fields are not included
		       ii. Field: Sequence number
		         • Format: uint16
		         • Value: Not relevant
		       iii. Field: Extended Flags
		         • This field is not included
		       iv. Field: Carbohydrate ID
		         • Format: uint8
		         • Value: Not relevant
		       v. Field: Carbohydrate - units of kilograms
		         • Format: SFLOAT
		         • Value: Not relevant
		       vi. Field: Meal
		         • This field is not included
		       vii. Field: Tester
		         • This field is not included
		       viii. Field: Health
		         • This field is not included
		       ix. Field: Exercise Duration
		         • This field is not included
		       x. Field: Exercise Intensity
		         • This field is not included
		       xi. Field: Medication ID
		         • This field is not included
		       xii. Medication – units of kilograms
		         • This field is not included
		       xiii. Medication – units of litres
		         • This field is not included
		       xiv. Field: HbA1c
		         This field is not included
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test.
		 5. Check in manager transcoder output for the Context carbohydrate object – Unit-Code attribute

Pass/Fail criteria		In step 5, the Context carbohydrate object – Unit-Code attribute is present and its value is MDC_DIM_X_G

Notes		In step 5, possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Unit-Code attribute is present:
		    ❑ Object: Context carbohydrates object
		    ❑ Attribute-id: MDC_ATTR_UNIT_CODE (2454)
		    ❑ Attribute-type: INT-U16
		    ❑ Attribute-value: MDC_DIM_X_G or 1728 (dec) or 06 C0 (hex)
		 b) WAN PCD-01 message
		 PCD-01 message includes a segment like this with Unit-Code attribute value (check OBX-6):
		 OBX|?|NM|8417768^MDC_CTXT_GLU_CARB_BREAKFAST^MDC|1.0.0.a|130|263872^MDC_DIM_G^MDC|||||R|||[current_date_time]

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-042		
TP label		Whitepaper. Glucosemeter Context Carbohydrates Object - Absolute-Time-Stamp Attribute		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	GL Numeric 30; M	Date-Time Conv 2; M	Date-Time Conv 3; M
		Date-Time Conv 4; M	Date-Time Conv 5; M	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_011		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		2. The simulated agent implements several BLE characteristics. The characteristics of interest for this test case are:
		  a. Glucose measurement (0x2A18)
		  b. Glucose measurement context (0x2A34)
		
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		
		4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test. The measurement of interest for this test case are:
		  a. Glucose measurement (0x2A18)
		    i. Field: Flags
		      • Format: 8 bit
		      • Value: 00010011 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location and Time Offset fields are included Sensor Status Annunciation field is not included and Context information follows
		    ii. Field: Sequence number
		      • Format: uint16
		      • Value: Not relevant
		    iii. Field: Base Time
		      • Format: Date and Time
		      • Value: August 2nd, 2012, 10:59:27
		    iv. Field: Time Offset
		      • Format: sint16
		      • Value: 120 minutes
		    v. Field: Glucose Concentration - units of kg/L
		      • Format: SFLOAT
		      • Value: Not relevant
		    vi. Field: Glucose Concentration - units of mol/L
		      • This field is not included
		    vii. Field: Type
		      • This field is not included
		    viii. Field: Sample Location
		      • This field is not included
		    ix. Field: Sensor Status Annunciation
		      • This field is not included
		  b. Glucose measurement context (0x2A34)
		    i. Field: Flags
		      • Format: 8 bit
		      • Value: 0000 0001 (MSB → LSB). Carbohydrate ID and Carbohydrate is included and Meal, Tester-Health, Exercise Duration and Exercise Intensity, Medication ID, Medication Value and HbA1c fields are not included
		    ii. Field: Sequence number
		      • Format: uint16

	- Value: Not relevant iii. Field: Extended Flags - This field is not included iv. Field: Carbohydrate ID - Format: uint8 - Value: Not relevant v. Field: Carbohydrate - units of kilograms - Format: SFLOAT - Value: Not relevant vi. Field: Meal - This field is not included vii. Field: Tester - This field is not included viii. Field: Health - This field is not included ix. Field: Exercise Duration - This field is not included x. Field: Exercise Intensity - This field is not included xi. Field: Medication ID - This field is not included xii. Medication – units of kilograms - This field is not included xiii. Medication – units of litres - This field is not included xiv. Field: HbA1c - This field is not included 5. Check in manager transcoder output for the Context carbohydrate object – Absolute-Time-Stamp attribute.
Pass/Fail criteria	In step 5, the Context carbohydrate object – Absolute-Time-Stamp attribute is present, its value matches with the Time Stamp field in conjunction with the Time Offset field of the Glucose measurement characteristic and the fraction of seconds is set to 0.
Notes	Possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Absolute-Time-Stamp attribute is present: - Object: Context carbohydrates object - Attribute-id: MDC_ATTR_TIME_STAMP_ABS (2448) - Attribute-type: SEQUENCE {century (INT-U8), year (INT-U8), month (INT-U8), day (INT-U8), hour (INT-U8), minute (INT-U8), second (INT-U8), sec-fractions (INT-U8)} (BCD encoding) - Attribute-value: - century: 20 (hex) or 32 (dec) - year: 12 (hex) or 18 (dec) - month: 08 (hex) or 8 (dec) - day: 02 (hex) or 2 (dec) - hour: 12 (hex) or 18 (dec) - minute: 59 (hex) or 89 (dec) - second: 27 (hex) or 39 (dec) - sec-fractions: 00 (hex) or 0 (dec) b) WAN PCD-01 message PCD-01 message includes a segment like this with Absolute-Time-Stamp attribute value (check OBX-14): OBX|?|NM|8417768^MDC_CTXT_GLU_CARB_BREAKFAST^MDC|1.0.0.a| 130|263872^MDC_DIM_G^MDC|||||R|||20120802125927+0000

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-043		
TP label		Whitepaper. Glucosemeter Context Carbohydrates Object - Basic-Nu-Observed-Value Attribute 1		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	GL Numeric 31; M	Short Float Type 1; C	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_011		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		 a. Glucose measurement context (0x2A34)
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test. The measurement of interest for this test case is:
		 a. Glucose measurement context (0x2A34)
		     i. Field: Flags
		       • Format: 8 bit
		       • Value: 0000 0001 (MSB → LSB). Carbohydrate ID and Carbohydrate is included and Meal, Tester-Health, Exercise Duration and Exercise Intensity, Medication ID, Medication Value and HbA1c fields are not included
		     ii. Field: Sequence number
		       • Format: uint16
		       • Value: Not relevant
		     iii. Field: Extended Flags
		       • This field is not included
		     iv. Field: Carbohydrate ID
		       • Format: uint8
		       • Value: Not relevant
		     v. Field: Carbohydrate - units of kilograms
		       • Format: SFLOAT
		       • Value: 0.130 kg
		     vi. Field: Meal
		       • This field is not included
		     vii. Field: Tester
		       • This field is not included
		     viii. Field: Health
		       • This field is not included
		     ix. Field: Exercise Duration
		       • This field is not included
		     x. Field: Exercise Intensity
		       • This field is not included
		     xi. Field: Medication ID
		       • This field is not included
		     xii. Medication – units of kilograms
		       • This field is not included
		     xiii. Medication – units of litres
		       • This field is not included
		     xiv. Field: HbA1c
		       • This field is not included
		 5. Check in manager transcoder output for the Context carbohydrate object– Basic-Nu-Observed-Value attribute.		

Pass/Fail criteria		In step 5, the Context carbohydrate object – Basic-Nu-Observed-Value attribute is present and its value matches with Carbohydrate Value field of Glucose measurement context characteristic: 130 g.		
Notes		In step 5, possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Basic-Nu-Observed-Value attribute is present: ❑ Object: Context carbohydrates object ❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636) ❑ Attribute-type: SFLOAT ❑ Attribute-value: 0082 (hex) or F514 (hex) or 130 (dec) b) WAN PCD-01 message PCD-01 message includes a segment like this with a Basic-Nu-Observed-Value attribute value (check OBX-5): OBX|?|NM|8417768^MDC_CTXT_GLU_CARB_BREAKFAST^MDC|1.0.0.a| 130|263872^MDC_DIM_G^MDC|||||R|||[current_date_time]		

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-044		
TP label		Whitepaper. Glucosemeter Context Carbohydrates Object - Basic-Nu-Observed-Value Attribute 2		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	GL Numeric 31; M	Short Float Type 1; C	Short Float Type 2; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_011		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		   a. Glucose measurement context (0x2A34)
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test:
		   a. Glucose measurement context (0x2A34)
		     i. Field: Flags
		       • Format: 8 bit
		       • Value: 0000 0001 (MSB → LSB). Carbohydrate ID and Carbohydrate is included and Meal, Tester-Health, Exercise Duration and Exercise Intensity, Medication ID, Medication Value and HbA1c fields are not included
		     ii. Field: Sequence number
		       • Format: uint16
		       • Value: Not relevant
		     iii. Field: Extended Flags
		       • This field is not included
		     iv. Field: Carbohydrate ID
		       • Format: uint8
		       • Value: Not relevant
		     v. Field: Carbohydrate - units of kilograms
		       • Format: SFLOAT
		       • Value: 0.130 kg
		     vi. Field: Meal
		       • This field is not included
		     vii. Field: Tester
		       • This field is not included
		     viii. Field: Health
		       • This field is not included
		     ix. Field: Exercise Duration
		       • This field is not included
		     x. Field: Exercise Intensity
		       • This field is not included
		     xi. Field: Medication ID
		       • This field is not included
		     xii. Medication – units of kilograms
		       • This field is not included
		     xiii. Medication – units of litres
		       • This field is not included
		     xiv. Field: HbA1c
		       • This field is not included
		 5. Check in manager transcoder output for the Context carbohydrate object – Basic-Nu-Observed-Value attribute.
		 6. The simulated agent sends the measurement to the manager under test with the following value:
		   a. Glucose measurement context (0x2A34)
		     i. Field: Flags
		       • Format: 8 bit
		       • Value: 0000 0001 (MSB → LSB). Carbohydrate ID and Carbohydrate is included and Meal, Tester-Health, Exercise Duration and Exercise Intensity, Medication ID, Medication Value and HbA1c fields are not included
		     ii. Field: Sequence number
		       • Format: uint16
		       • Value: Not relevant
		     iii. Field: Extended Flags
		       • This field is not included

iv.   Field: Carbohydrate ID
- Format: uint8
- Value: Not relevant

v.   Field: Carbohydrate - units of kilograms
- Format: SFLOAT
- Value: 07 FF (hex). Special value: NaN

vi.   Field: Meal
- This field is not included

vii.   Field: Tester
- This field is not included

viii.   Field: Health
- This field is not included

ix.   Field: Exercise Duration
- This field is not included

x.   Field: Exercise Intensity
- This field is not included

xi.   Field: Medication ID
- This field is not included

xii.   Medication – units of kilograms
- This field is not included

xiii.   Medication – units of litres
- This field is not included

xiv.   Field: HbA1c
- This field is not included

7.   Check in manager transcoder output for the Context carbohydrate object – Basic-Nu-Observed-Value attribute.

8.   The simulated agent sends the measurement to the manager under test with the following value:

a.   Glucose measurement context (0x2A34)

i.   Field: Flags
- Format: 8 bit
- Value: 0000 0001 (MSB → LSB). Carbohydrate ID and Carbohydrate is included and Meal, Tester-Health, Exercise Duration and Exercise Intensity, Medication ID, Medication Value and HbA1c fields are not included

ii.   Field: Sequence number
- Format: uint16
- Value: Not relevant

iii.   Field: Extended Flags
- This field is not included

iv.   Field: Carbohydrate ID
- Format: uint8
- Value: Not relevant

v.   Field: Carbohydrate - units of kilograms
- Format: SFLOAT
- Value: 00 80 (hex). Special value: NRes

vi.   Field: Meal
- This field is not included

vii.   Field: Tester
- This field is not included

viii.   Field: Health
- This field is not included

ix.   Field: Exercise Duration
- This field is not included

x.   Field: Exercise Intensity
- This field is not included

xi.   Field: Medication ID
- This field is not included

xii.   Medication – units of kilograms
- This field is not included

xiii.   Medication – units of litres
- This field is not included

xiv.   Field: HbA1c
- This field is not included

9.   Check in manager transcoder output for the Context carbohydrate object – Basic-Nu-Observed-Value attribute.

10.   The simulated agent sends the measurement to the manager under test with the following value:

a.   Glucose measurement context (0x2A34)

i.   Field: Flags
- Format: 8 bit

- Value: 0000 0001 (MSB → LSB). Carbohydrate ID and Carbohydrate is included and Meal, Tester-Health, Exercise Duration and Exercise Intensity, Medication ID, Medication Value and HbA1c fields are not included

    ii.   Field: Sequence number
- Format: uint16
- Value: Not relevant

    iii.   Field: Extended Flags
- This field is not included

    iv.   Field: Carbohydrate ID
- Format: uint8
- Value: Not relevant

    v.   Field: Carbohydrate - units of kilograms
- Format: SFLOAT
- Value: 07 FE (hex). Special value: +INFINITY

    vi.   Field: Meal
- This field is not included

    vii.   Field: Tester
- This field is not included

    viii.   Field: Health
- This field is not included

    ix.   Field: Exercise Duration
- This field is not included

    x.   Field: Exercise Intensity
- This field is not included

    xi.   Field: Medication ID
- This field is not included

    xii.   Medication – units of kilograms
- This field is not included

    xiii.   Medication – units of litres
- This field is not included

    xiv.   Field: HbA1c
- This field is not included

11. Check in manager transcoder output for the Context carbohydrate object – Basic-Nu-Observed-Value attribute.
12. The simulated agent sends the measurement to the manager under test with the following value:
    a.   Glucose measurement context (0x2A34)

    i.   Field: Flags
- Format: 8 bit
- Value: 0000 0001 (MSB → LSB). Carbohydrate ID and Carbohydrate is included and Meal, Tester-Health, Exercise Duration and Exercise Intensity, Medication ID, Medication Value and HbA1c fields are not included

    ii.   Field: Sequence number
- Format: uint16
- Value: Not relevant

    iii.   Field: Extended Flags
- This field is not included

    iv.   Field: Carbohydrate ID
- Format: uint8
- Value: Not relevant

    v.   Field: Carbohydrate - units of kilograms
- Format: SFLOAT
- Value: 08 02 (hex). Special value: -INFINITY

    vi.   Field: Meal
- This field is not included

    vii.   Field: Tester
- This field is not included

    viii.   Field: Health
- This field is not included

    ix.   Field: Exercise Duration
- This field is not included

    x.   Field: Exercise Intensity
- This field is not included

    xi.   Field: Medication ID
- This field is not included

    xii.   Medication – units of kilograms
- This field is not included

    xiii.   Medication – units of litres
- This field is not included

    xiv.   Field: HbA1c
- This field is not included

	13. Check in manager transcoder output for the Context carbohydrate object – Basic-Nu-Observed-Value attribute.
Pass/Fail criteria	In step 5, the Context carbohydrate object – Basic-Nu-Observed-Value attribute is present and its value is 130 g. In step 7, the Context carbohydrate object – Basic -Nu-Observed-Value attribute is present and its value is 0x07FF. In step 9, the Context carbohydrate object – Basic -Nu-Observed-Value attribute is present and its value is 0x0800. In step 11, the Context carbohydrate object – Basic -Nu-Observed-Value attribute is present and its value is 0x07FE. In step 13, the Context carbohydrate object – Basic -Nu-Observed-Value attribute is present and its value is 0x0802.
Notes	In step 5, possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Basic-Nu-Observed-Value attribute is present: ❑ Object: Context carbohydrates object ❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636) ❑ Attribute-type: SFLOAT ❑ Attribute-value: 0082 (hex) or F514 (hex) or 130 (dec) b) WAN PCD-01 message PCD-01 message includes a segment like this with a Basic-Nu-Observed-Value attribute value (check OBX-5): OBX|?|NM|8417768^MDC_CTXT_GLU_CARB_BREAKFAST^MDC|1.0.0.a| 130|263872^MDC_DIM_G^MDC|||||R|||[current_date_time] In step 7, possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Basic -Nu-Observed-Value attribute is present: ❑ Object: Context carbohydrates object ❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636) ❑ Attribute-type: SFLOAT ❑ Attribute-value: 07 FF(hex) or NaN (note that is not allowed a decimal value) b) WAN PCD-01 message PCD-01 message does not include segments with a Basic -Nu-Observed-Value attribute value (8417768^MDC_CTXT_GLU_CARB_BREAKFAST^MDC) because it has a special value and these values are not included in the PCD-01 message. In step 9, possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Basic -Nu-Observed-Value attribute is present: ❑ Object: Context carbohydrates object ❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636) ❑ Attribute-type: SFLOAT ❑ Attribute-value: 08 00 (hex) or NRes (note that a decimal value is not allowed) b) WAN PCD-01 message PCD-01 message does not include segments with a Basic -Nu-Observed-Value attribute value (8417768^MDC_CTXT_GLU_CARB_BREAKFAST^MDC) because it has a special value and these values are not included in the PCD-01 message. In step 11, possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Basic -Nu-Observed-Value attribute is present: ❑ Object: Context carbohydrates object ❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636) ❑ Attribute-type: SFLOAT ❑ Attribute-value: 07 FE (hex) or +INFINITY (note that a decimal value is not allowed) b) WAN PCD-01 message PCD-01 message does not include segments with a Basic -Nu-Observed-Value attribute value (8417768^MDC_CTXT_GLU_CARB_BREAKFAST^MDC) because it has a special value and these values are not included in the PCD-01 message. In step 13, possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Basic -Nu-Observed-Value attribute is present: ❑ Object: Context carbohydrates object ❑ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636) ❑ Attribute-type: SFLOAT ❑ Attribute-value: 08 02 (hex) or -INFINITY (note that a decimal value is not allowed) b) WAN PCD-01 message PCD-01 message does not include segments with a Basic -Nu-Observed-Value attribute value (8417768^MDC_CTXT_GLU_CARB_BREAKFAST^MDC) because it has a special value and these values are not included in the PCD-01 message.

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-045		
TP label		Whitepaper. Glucosemeter Context Carbohydrates value		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	Short Float Type 1; C	Date-Time Conv 1; M	GL Numeric 30; M
		GL Numeric 31; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_007 AND C_MAN_BLE_011		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).		
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:		
		a. Glucose measurement (0x2A18)		
		b. Glucose measurement context (0x2A34)		
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).		
		4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test:		
		a. Glucose measurement (0x2A18)		
		i. Field: Flags		
		• Format: 8 bit		
		• Value: 00010010 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location are included, Time Offset and Sensor Status Annunciation fields are not included and Context information follows		
		ii. Field: Sequence number		
		• Format: uint16		
		• Value: Not relevant		
		iii. Field: Base Time		
		• Format: Date and Time		
		• Value: August 2nd, 2012, 11:08:25		
		iv. Field: Time Offset		
		• This field is not included		
		v. Field: Glucose Concentration - units of kg/L		
		• Format: SFLOAT		
		• Value: Not relevant		
		vi. Field: Glucose Concentration - units of mol/L		
		• This field is not included		
		vii. Field: Type		
		• Format: nibble		
		• Value: Not relevant		
		viii. Field: Sample Location		
		• Format: nibble		
		• Value: Not relevant		
		ix. Field: Sensor Status Annunciation		

	• This field is not included
	b. Glucose measurement context (0x2A34)
	i. Field: Flags
	• Format: 8 bit
	• Value: 0000 0001 (MSB → LSB). Carbohydrate ID and Carbohydrate is included and Meal, Tester-Health, Exercise Duration and Exercise Intensity, Medication ID, Medication Value and HbA1c fields are not included
	ii. Field: Sequence number
	• Format: uint16
	• Value: Not relevant
	iii. Field: Extended Flags
	• This field is not included
	iv. Field: Carbohydrate ID
	• Format: uint8
	• Value: 0x01 (Breakfast)
	v. Field: Carbohydrate - units of kilograms
	• Format: SFLOAT
	• Value: 0.130 kg
	vi. Field: Meal
	• This field is not included
	vii. Field: Tester
	• This field is not included
	viii. Field: Health
	• This field is not included
	ix. Field: Exercise Duration
	• This field is not included
	x. Field: Exercise Intensity
	• This field is not included
	xi. Field: Medication ID
	• This field is not included
	xii. Medication – units of kilograms
	• This field is not included
	xiii. Medication – units of litres
	• This field is not included
	xiv. Field: HbA1c
	• This field is not included
	5. Check that the manager accepts the measurement and decodes its value properly (Context carbohydrates value, Context carbohydrates units and base time).
Pass/Fail criteria	In step 5, the manager under test shows the following Context carbohydrate 130 g with the time stamp '2012-08-02 11:08:25'.
Notes	

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-046
TP label		Whitepaper. Glucosemeter Device & Sensor Annunciation Enumeration Object - Handle Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Enumeration 1; O
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_012
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Glucosemeter profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		    a. Glucose measurement (0x2A18)
		       i. Field: Flags
		          • Format: 8 bit
		          • Value: 00001010 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location, Sensor Status Annunciation fields are included. Time Offset field is not included. Context information does not follow
		       ii. Field: Sequence number
		          • Format: uint16
		          • Value: Not relevant
		       iii. Field: Base Time
		          • Format: Date and Time
		          • Value: Not relevant
		       iv. Field: Time Offset
		          • This field is not included
		       v. Field: Glucose Concentration - units of kg/L
		          • Format: SFLOAT
		          • Value: Not relevant
		       vi. Field: Glucose Concentration - units of mol/L
		          • This field is not included
		       vii. Field: Type
		          • Format: nibble
		          • Value: Not relevant
		       viii. Field: Sample Location
		          • Format: nibble
		          • Value: Not relevant
		       ix. Field: Sensor Status Annunciation
		          • Format: 16bit
		          • Value: Not relevant
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement to the manager under test.
		 5. Check in manager transcoder output for the Device & Sensor annunciation enumeration object – Handle attribute.

Pass/Fail criteria		In step 5, the Device & Sensor annunciation enumeration object – Handle attribute is not present; however, if it is present then its value is different to 0.

Notes		Possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Handle attribute is not present, or if it is present then:
		   ❑ Object: Device & Sensor annunciation enumeration object
		   ❑ Attribute-id: MDC_ATTR_ID_HANDLE (2337)
		   ❑ Attribute-type: INT-U16
		   ❑ Attribute-value: Any value other than 0
		 b) WAN PCD-01 message
		 PCD-01 message does not include segments with a Handle attribute value.

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-047
TP label		Whitepaper. Glucosemeter Device & Sensor Annunciation Enumeration Object - Type Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Enumeration 2; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_012
Initial condition		The manager under test and the simulated agent are in the standby state.
Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		2. The simulated agent implements several BLE characteristics. The characteristics of interest for this test case are:
		a. Glucose measurement (0x2A18)
		i. Field: Flags
		• Format: 8 bit
		• Value: 00001010 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location, Sensor Status Annunciation fields are included. Time Offset field is not included. Context information does not follow
		ii. Field: Sequence number
		• Format: uint16
		• Value: Not relevant
		iii. Field: Base Time
		• Format: Date and Time
		• Value: Not relevant
		iv. Field: Time Offset
		• This field is not included
		v. Field: Glucose Concentration - units of kg/L
		• Format: SFLOAT
		• Value: Not relevant
		vi. Field: Glucose Concentration - units of mol/L
		• This field is not included
		vii. Field: Type
		• Format: nibble
		• Value: Not relevant
		viii. Field: Sample Location
		• Format: nibble
		• Value: Not relevant
		ix. Field: Sensor Status Annunciation
		• Format: 16bit
		• Value: Not relevant
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement to the manager under test.
		5. Check in manager transcoder output for the Device & Sensor annunciation enumeration object – Type attribute.
Pass/Fail criteria		In step 5, the Device & Sensor annunciation enumeration object – Type attribute is present and its value is { MDC_PART_PHD_DM	MDC_GLU_METER_DEV_STATUS }.
Notes		In step 5, possible values in typical points of observation after transcoder output are:
		a) IEEE 11073 Objects and Attributes
		Type attribute is present:
		❑ Object: Device & Sensor annunciation enumeration object
		❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
		❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
		❑ Attribute-value:
		• partition: MDC_PART_PHD_DM or 128 (dec) or 00 80 (hex)
		• code: MDC_GLU_METER_DEV_STATUS or 29144 (dec) or 71D8 (hex)
		b) WAN PCD-01 message
		PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):
		OBX|?|NM| 8417752^MDC_GLU_METER_DEV_STATUS^MDC |1.0.0.a|1^device-battery-low(0) ||||||R||||[current_date_time]

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-048
TP label		Whitepaper. Glucosemeter Device & Sensor Annunciation Enumeration Object - Metric-Spec-Small Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Enumeration 3; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_012
Initial condition		The manager under test and the simulated agent are in the standby state.
Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		a. Glucose measurement (0x2A18)
		i. Field: Flags
		• Format: 8 bit
		• Value: 00001010 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location, and Sensor Status Annunciation fields are included. Time Offset field is not included. Context information does not follow
		ii. Field: Sequence number
		• Format: uint16
		• Value: Not relevant
		iii. Field: Base Time
		• Format: Date and Time
		• Value: Not relevant
		iv. Field: Time Offset
		• This field is not included
		v. Field: Glucose Concentration - units of kg/L
		• Format: SFLOAT
		• Value: Not relevant
		vi. Field: Glucose Concentration - units of mol/L
		• This field is not included
		vii. Field: Type
		• Format: nibble
		• Value: Not relevant
		viii. Field: Sample Location
		• Format: nibble
		• Value: Not relevant
		ix. Field: Sensor Status Annunciation
		• Format: 16bit
		• Value: Not relevant
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement to the manager under test.
		5. Check in manager transcoder output for the Device & Sensor annunciation enumeration object – Metric-Spec-Small attribute.
Pass/Fail criteria		In step 5, the Device & Sensor annunciation enumeration object – Metric-Spec-Small attribute is present and its value is {0xF040} (mss-avail-intermittent | mss-avail-stored-data | mss-upd-aperiodic | mss-msmt-aperiodic | mss-acc-agent-initiated).
Notes		Possible values in typical points of observation after transcoder output are:
		a) IEEE 11073 Objects and Attributes
		Metric-Spec-Small attribute is present:
		❑ Object: Device & Sensor annunciation enumeration object
		❑ Attribute-id: MDC_ATTR_METRIC_SPEC_SMALL (2630)
		❑ Attribute-type: BITS-16
		❑ Attribute-value: F0 40 (hex) or BITS mss-avail-intermittent(0), mss-avail-stored-data(1), mss-upd-aperiodic(2), mss-msmt-aperiodic(3), mss-acc-agent-initiated(9) set to TRUE and remaining BITS set to FALSE
		b) WAN PCD-01 message
		PCD-01 message does not include segments with a Metric-Spec-Small attribute value.

TP Id	TP/LP-PAN/MAN/PHDTW/GL/BV-049		
TP label	Whitepaper. Glucosemeter Device & Sensor Annunciation Enumeration Object - Absolute-Time-Stamp Attribute		
Coverage	Spec	[Bluetooth PHDT v1.4]	
	Testable items	GL Enumeration 4; M	Date-Time Conv 2; M	Date-Time Conv 3; M
		Date-Time Conv 4; M	Date-Time Conv 5; M	
Applicability	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_012		
Initial condition	The manager under test and the simulated agent are in the standby state.		

Test procedure	1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
	
	2. The simulated agent implements several BLE characteristics. The characteristics of interest for this test case are:
	
	   a. Glucose measurement (0x2A18)
	
	3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
	
	4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test. The measurement of interest for this test case are:
	
	   a. Glucose measurement (0x2A18)
	
	      i. Field: Flags
	
	         • Format: 8 bit
	
	         • Value: 00001011 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location, Time Offset fields and Sensor Status Annunciation field are included. Context information does not follow
	
	      ii. Field: Sequence number
	
	         • Format: uint16
	
	         • Value: Not relevant
	
	      iii. Field: Base Time
	
	         • Format: Date and Time
	
	         • Value: August 2nd, 2012, 10:59:27
	
	      iv. Field: Time Offset
	
	         • Format: sint16
	
	         • Value: 120 minutes
	
	      v. Field: Glucose Concentration - units of kg/L
	
	         • Format: SFLOAT
	
	         • Value: Not relevant
	
	      vi. Field: Glucose Concentration - units of mol/L
	
	         • This field is not included
	
	      vii. Field: Type
	
	         • Format: nibble
	
	         • Value: Not relevant		

	viii. Field: Sample Location
	• Format: nibble
	• Value: Not relevant
	ix. Field: Sensor Status Annunciation
	• Format: 16bit
	• Value: Not relevant
	5. Check in manager transcoder output for the Device & Sensor annunciation enumeration object – Absolute-Time-Stamp attribute.
Pass/Fail criteria	In step 5, the Device & Sensor annunciation enumeration object – Absolute-Time-Stamp attribute is present, its value matches with the Time Stamp field in conjunction with the Time Offset field of the Glucose measurement characteristic and the fraction of seconds is set to 0.

Notes	Possible values in typical points of observation after transcoder output are:
	
	 a) IEEE 11073 Objects and Attributes
	
	 Absolute-Time-Stamp attribute is present:
	
	    ❑ Object: Device & Sensor annunciation enumeration object
	
	    ❑ Attribute-id: MDC_ATTR_TIME_STAMP_ABS (2448)
	
	    ❑ Attribute-type: SEQUENCE {century (INT-U8), year (INT-U8), month (INT-U8), day (INT-U8), hour (INT-U8), minute (INT-U8), second (INT-U8), sec-fractions (INT-U8)} (BCD encoding)
	
	    ❑ Attribute-value:
	
	     • century: 20 (hex) or 32 (dec)
	
	     • year: 12 (hex) or 18 (dec)
	
	     • month: 08 (hex) or 8 (dec)
	
	     • day: 02 (hex) or 2 (dec)
	
	     • hour: 12 (hex) or 18 (dec)
	
	     • minute: 59 (hex) or 89 (dec)
	
	     • second: 27 (hex) or 39 (dec)
	
	     • sec-fractions: 00 (hex) or 0 (dec)
	
	 b) WAN PCD-01 message
	
	 PCD-01 message includes a segment like this with Absolute-Time-Stamp attribute value (check OBX-14):
	
	 OBX|?|NM| 8417752^MDC_GLU_METER_DEV_STATUS^MDC|1.0.0.a|1^device-battery-low(0)||||||R|||20120802125927+0000

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-050		
TP label		Whitepaper. Glucosemeter Device & Sensor Annunciation Enumeration Object - Enum-Observed-Value-Basic-Bit-Str Attribute		
Coverage	**Spec**	[Bluetooth PHDT v1.4]		
	Testable items	GL Enumeration 5; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_012		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		
		  a. Glucose measurement (0x2A18)
		
		    i. Field: Flags
		      • Format: 8 bit
		      • Value: 00001010 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location, and Sensor Status Annunciation fields are included. Time Offset field is not included. Context information does not follow
		
		    ii. Field: Sequence number
		      • Format: uint16
		      • Value: Not relevant
		
		    iii. Field: Base Time
		      • Format: Date and Time
		      • Value: Not relevant
		
		    iv. Field: Time Offset
		      • This field is not included
		
		    v. Field: Glucose Concentration - units of kg/L
		      • Format: SFLOAT
		      • Value: Not relevant
		
		    vi. Field: Glucose Concentration - units of mol/L
		      • This field is not included
		
		    vii. Field: Type
		      • Format: nibble
		      • Value: Not relevant
		
		    viii. Field: Sample Location
		      • Format: nibble
		      • Value: Not relevant
		
		    ix. Field: Sensor Status Annunciation
		      • Format: 16bit
		      • Value: Several values are checked in this test case
		
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		
		4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement [Sensor Status Annunciation ID field set to 0000000000000001 0x0001 (MSB → LSB) = device battery low] to the manager under test.
		
		5. Check in manager transcoder output for the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute.
		
		6. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement [Sensor Status Annunciation ID field set to 0000000000000010 0x0002 (MSB → LSB) = sensor malfunction] to the manager under test.

7. Check in manager transcoder output for the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute.

8. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement [Sensor Status Annunciation ID field set to 0000000000000100 0x0004 (MSB → LSB) = sample size insufficient, not enough blood or control solution] to the manager under test.

9. Check in manager transcoder output for the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute.

10. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement [Sensor Status Annunciation ID field set to 0000000000001000 0x0008 (MSB → LSB) = stripo insertion error] to the manager under test.

11. Check in manager transcoder output for the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute.

12. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement [Sensor Status Annunciation ID field set to 0000000000010000 0x0010 (MSB → LSB) = strip type is incorrect] to the manager under test.

13. Check in manager transcoder output for the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute.

14. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement [Sensor Status Annunciation ID field set to 0000000000100000 0x0020 (MSB → LSB) = sensor result higher than device can process] to the manager under test.

15. Check in manager transcoder output for the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute.

16. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement [Sensor Status Annunciation ID field set to 0000000001000000 0x0040 (MSB → LSB) = sensor result lower than device can process] to the manager under test.

17. Check in manager transcoder output for the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute.

18. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement [Sensor Status Annunciation ID field set to 0000000010000000 0x0080 (MSB → LSB) = ambient temperature too high for a valid test/result] to the manager under test.

19. Check in manager transcoder output for the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute.

20. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement [Sensor Status Annunciation ID field set to 0000000100000000 0x0100 (MSB → LSB) = ambient temperature too low for a valid test/result] to the manager under test.

21. Check in manager transcoder output for the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute.

22. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement [Sensor Status Annunciation ID field set to 0000001000000000 0x0200 (MSB → LSB) = reading was interrupted and/or strip was pulled too soon] to the manager under test.

23. Check in manager transcoder output for the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute.

24. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement [Sensor Status Annunciation ID field set to 0000010000000000 0x0400 (MSB → LSB) = general device fault] to the manager under test.

25. Check in manager transcoder output for the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute.

Pass/Fail criteria	In step 5, the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute is present and its value matches with the Sensor Status Annunciation Value field of the Glucose measurement characteristic: device-battery-low(0) → 0x8000.
	In step 7, the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute is present and its value matches with the Sensor Status Annunciation Value field of the Glucose measurement characteristic: sensor-malfunction(1) → 0x4000.
	In step 9, the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute is present and its value matches with the Sensor Status Annunciation Value field of the Glucose measurement characteristic: sensor-sample-size-insufficient(2) → 0x2000.
	In step 11, the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute is present and its value matches with the Sensor Status Annunciation Value field of the Glucose measurement characteristic: sensor -strip-insertion(3) → 0x1000.
	In step 13, the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute is present and its value matches with the Sensor Status Annunciation Value field of the Glucose measurement characteristic: sensor -strip-type-incorrect(4) → 0x0800.
	In step 15, the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute is present and its value matches with the Sensor Status Annunciation Value field of the Glucose measurement characteristic: sensor-result-too-high(5) → 0x0400.
	In step 17, the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute is present and its value matches with the Sensor Status Annunciation Value field of the Glucose measurement characteristic: sensor-result-too-low(6) → 0x0200.
	In step 19, the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute is present and its value matches with the Sensor Status Annunciation Value field of the Glucose measurement characteristic: sensor-temp-too-high(7) → 0x0100.
	In step 21, the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute is present and its value matches with the Sensor Status Annunciation Value field of the Glucose measurement characteristic: sensor-temp-too-low(8) → 0x0080.
	In step 23, the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute is present and its value matches with the Sensor Status Annunciation Value field of the Glucose measurement characteristic: sensor-read-interrupt(9) → 0x0040.
	In step 25, the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute is present and its value matches with the Sensor Status Annunciation Value field of the Glucose measurement characteristic: sensor-gen-fault(10) → 0x0020.
Notes	In step 5, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Enum-Observed-Value-Basic-Bit-Str attribute is present:
	❑ Object: Device & Sensor annunciation enumeration object
	❑ Attribute-id: MDC_ATTR_ENUM_OBS_VAL_BASIC_BIT_STR (2662)
	❑ Attribute-type: BITS-16
	❑ Attribute-value: 32768 (dec) or 0x8000 (hex)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with an Enum-Observed-Value-Basic-Bit-Str attribute value. Check
	OBX|?|NM|8417752^MDC_GLU_METER_DEV_STATUS^MDC|1.0.0.a|1^device-battery-low(0)||||||R|||[current_date_time]
	In step 7, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Enum-Observed-Value-Basic-Bit-Str attribute is present:
	❑ Object: Device & Sensor annunciation enumeration object
	❑ Attribute-id: MDC_ATTR_ENUM_OBS_VAL_BASIC_BIT_STR (2662)
	❑ Attribute-type: BITS-16
	❑ Attribute-value: 16384 (dec) or 0x4000 (hex)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with an Enum-Observed-Value-Basic-Bit-Str attribute value. Check
	OBX|?|NM| 8417752^MDC_GLU_METER_DEV_STATUS^MDC|1.0.0.a|1^sensor-malfunction(1)||||||R|||[current_date_time]
	In step 9, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Enum-Observed-Value-Basic-Bit-Str attribute is present:

- ❑ Object: Device & Sensor annunciation enumeration object
- ❑ Attribute-id: MDC_ATTR_ENUM_OBS_VAL_BASIC_BIT_STR (2662)
- ❑ Attribute-type: BITS-16
- ❑ Attribute-value: 8192 (dec) or 0x2000 (hex)

b) WAN PCD-01 message

PCD-01 message includes a segment like this with an Enum-Observed-Value-Basic-Bit-Str attribute value. Check

OBX|?|NM| 8417752^MDC_GLU_METER_DEV_STATUS^MDC|1.0.0.a|1^sensor-sample-size-insufficient(2)||||||R||||[current_date_time]

In step 11, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Enum-Observed-Value-Basic-Bit-Str attribute is present:

- ❑ Object: Device & Sensor annunciation enumeration object
- ❑ Attribute-id: MDC_ATTR_ENUM_OBS_VAL_BASIC_BIT_STR (2662)
- ❑ Attribute-type: BITS-16
- ❑ Attribute-value: 4096 (dec) or 0x1000 (hex)

b) WAN PCD-01 message

PCD-01 message includes a segment like this with an Enum-Observed-Value-Basic-Bit-Str attribute value. Check

OBX|?|NM| 8417752^MDC_GLU_METER_DEV_STATUS^MDC|1.0.0.a|1^sensor-strip-insertion(3)||||||R||||[current_date_time]

In step 13, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Enum-Observed-Value-Basic-Bit-Str attribute is present:

- ❑ Object: Device & Sensor annunciation enumeration object
- ❑ Attribute-id: MDC_ATTR_ENUM_OBS_VAL_BASIC_BIT_STR (2662)
- ❑ Attribute-type: BITS-16
- ❑ Attribute-value: 2048(dec) or 0x0800 (hex)

b) WAN PCD-01 message

PCD-01 message includes a segment like this with an Enum-Observed-Value-Basic-Bit-Str attribute value. Check

OBX|?|NM| 8417752^MDC_GLU_METER_DEV_STATUS^MDC|1.0.0.a|1^sensor-strip-type-incorrect(4)||||||R||||[current_date_time]

In step 15, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Enum-Observed-Value-Basic-Bit-Str attribute is present:

- ❑ Object: Device & Sensor annunciation enumeration object
- ❑ Attribute-id: MDC_ATTR_ENUM_OBS_VAL_BASIC_BIT_STR (2662)
- ❑ Attribute-type: BITS-16
- ❑ Attribute-value: 1024 (dec) or 0x0400 (hex)

b) WAN PCD-01 message

PCD-01 message includes a segment like this with an Enum-Observed-Value-Basic-Bit-Str attribute value. Check

OBX|?|NM| 8417752^MDC_GLU_METER_DEV_STATUS^MDC|1.0.0.a|1^sensor-result-too-high(5)||||||R||||[current_date_time] 1^(5)

In step 17, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Enum-Observed-Value-Basic-Bit-Str attribute is present:

- ❑ Object: Device & Sensor annunciation enumeration object
- ❑ Attribute-id: MDC_ATTR_ENUM_OBS_VAL_BASIC_BIT_STR (2662)
- ❑ Attribute-type: BITS-16
- ❑ Attribute-value: 512(dec) or 0x0200 (hex)

b) WAN PCD-01 message

PCD-01 message includes a segment like this with an Enum-Observed-Value-Basic-Bit-Str attribute value. Check

OBX|?|NM| 8417752^MDC_GLU_METER_DEV_STATUS^MDC|1.0.0.a|1^sensor-result-too-low(6)|||||||R||||[current_date_time]

In step 19, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Enum-Observed-Value-Basic-Bit-Str attribute is present:

- ❑ Object: Device & Sensor annunciation enumeration object
- ❑ Attribute-id: MDC_ATTR_ENUM_OBS_VAL_BASIC_BIT_STR (2662)
- ❑ Attribute-type: BITS-16
- ❑ Attribute-value: 256 (dec) or 0x0100 (hex)

b) WAN PCD-01 message

PCD-01 message includes a segment like this with an Enum-Observed-Value-Basic-Bit-Str attribute value. Check

OBX|?|NM| 8417752^MDC_GLU_METER_DEV_STATUS^MDC|1.0.0.a|1^sensor-temp-too-high(7)|||||||R||||[current_date_time]

In step 21, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Enum-Observed-Value-Basic-Bit-Str attribute is present:

- ❑ Object: Device & Sensor annunciation enumeration object
- ❑ Attribute-id: MDC_ATTR_ENUM_OBS_VAL_BASIC_BIT_STR (2662)
- ❑ Attribute-type: BITS-16
- ❑ Attribute-value: 128 (dec) or 0x0080 (hex)

b) WAN PCD-01 message

PCD-01 message includes a segment like this with an Enum-Observed-Value-Basic-Bit-Str attribute value. Check

OBX|?|NM| 8417752^MDC_GLU_METER_DEV_STATUS^MDC|1.0.0.a|1^sensor-temp-too-low(8)|||||||R||||[current_date_time]

In step 23, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Enum-Observed-Value-Basic-Bit-Str attribute is present:

- ❑ Object: Device & Sensor annunciation enumeration object
- ❑ Attribute-id: MDC_ATTR_ENUM_OBS_VAL_BASIC_BIT_STR (2662)
- ❑ Attribute-type: BITS-16
- ❑ Attribute-value: 64 (dec) or 0x0040 (hex)

b) WAN PCD-01 message

PCD-01 message includes a segment like this with an Enum-Observed-Value-Basic-Bit-Str attribute value. Check

OBX|?|NM| 8417752^MDC_GLU_METER_DEV_STATUS^MDC|1.0.0.a|1^sensor-read-interrupt(9)|||||||R||||[current_date_time]

In step 25, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Enum-Observed-Value-Basic-Bit-Str attribute is present:

- ❑ Object: Device & Sensor annunciation enumeration object
- ❑ Attribute-id: MDC_ATTR_ENUM_OBS_VAL_BASIC_BIT_STR (2662)
- ❑ Attribute-type: BITS-16
- ❑ Attribute-value: 32 (dec) or 0x0020 (hex)

b) WAN PCD-01 message

PCD-01 message includes a segment like this with an Enum-Observed-Value-Basic-Bit-Str attribute value. Check

OBX|?|NM| 8417752^MDC_GLU_METER_DEV_STATUS^MDC|1.0.0.a|1^device-gen-fault(10)|||||||R||||[current_date_time]

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-051		
TP label		Whitepaper. Glucosemeter Device & Sensor Annunciation Enumeration Object value		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	GL Enumeration 4; M	GL Enumeration 5; M	Date-Time Conv 1; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_007 AND C_MAN_BLE_012		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		
		a. Glucose measurement (0x2A18)
		
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		
		4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends the measurement to the manager under test with the following value:
		
		a. Glucose measurement (0x2A18)
		
		    i. Field: Flags
		      • Format: 8 bit
		      • Value: 00001010 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location, and Sensor Status Annunciation fields are included. Time Offset field is not included. Context information does not follow
		
		    ii. Field: Sequence number
		      • Format: uint16
		      • Value: Not relevant
		
		    iii. Field: Base Time
		      • Format: Date and Time
		      • Value: August 2nd, 2012, 11:08:25
		
		    iv. Field: Time Offset
		      • This field is not included
		
		    v. Field: Glucose Concentration - units of kg/L
		      • Format: SFLOAT
		      • Value: Not relevant
		
		    vi. Field: Glucose Concentration - units of mol/L
		      • This field is not included
		
		    vii. Field: Type
		      • Format: nibble
		      • Value: Not relevant
		
		    viii. Field: Sample Location
		      • Format: nibble
		      • Value: Not relevant
		
		    ix. Field: Sensor Status Annunciation
		      • Format: 16bit
		      • Value: device battery low (0000000000000001 MSB → LSB)
		
		5. Check that the manager accepts the measurement and decodes its value properly (sensor status annunciation and base time).		

Pass/Fail criteria		In step 5, the manager under test shows the following 'Sensor Status Annunciation' device battery low (0000000000000001) with the time stamp '2012-08-02 11:08:25'.		
Notes				

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-052
TP label		Whitepaper. Glucosemeter Context Meal Enumeration Object - Handle Attribute
Coverage	**Spec**	[Bluetooth PHDT v1.4]
	Testable items	GL Enumeration 6; O
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_013
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Glucosemeter profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		    a. Glucose measurement context (0x2A34)
		      i. Field: Flags
		        • Format: 8 bit
		        • Value: 0000 0010 (MSB → LSB). Meal is included and Carbohydrate ID, Carbohydrate, Tester-Health, Exercise Duration, Exercise Intensity, Medication ID, Medication Value and HbA1c fields are not included
		      ii. Field: Sequence number
		        • Format: uint16
		        • Value: Not relevant
		      iii. Field: Extended Flags
		        • This field is not included
		      iv. Field: Carbohydrate ID
		        • This field is not included
		      v. Field: Carbohydrate - units of kilograms
		        • This field is not included
		      vi. Field: Meal
		        • Format: uint8
		        • Value: Not relevant
		      vii. Field: Tester
		        • This field is not included
		      viii. Field: Health
		        • This field is not included
		      ix. Field: Exercise Duration
		        • This field is not included
		      x. Field: Exercise Intensity
		        • This field is not included
		      xi. Field: Medication ID
		        • This field is not included
		      xii. Medication – units of kilograms
		        • This field is not included
		      xiii. Medication – units of litres
		        • This field is not included
		      xiv. Field: HbA1c
		        • This field is not included
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test.
		 5. Check in manager transcoder output for the Context meal enumeration object – Handle attribute.

Pass/Fail criteria		In step 5, the Context meal enumeration object – Handle attribute is not present; however, if it is present then its value is different to 0.

Notes		Possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Handle attribute is not present, or if it is present then:
		   ❑ Object: Context meal enumeration object
		   ❑ Attribute-id: MDC_ATTR_ID_HANDLE (2337)
		   ❑ Attribute-type: INT-U16
		   ❑ Attribute-value: Any value other than 0
		 b) WAN PCD-01 message
		 PCD-01 message does not include segments with a Handle attribute value.

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-053
TP label		Whitepaper. Glucosemeter Context Meal Enumeration Object - Type Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Enumeration 7; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_013
Initial condition		The manager under test and the simulated agent are in the standby state.
Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The simulated agent implements several BLE characteristics. The characteristics of interest for this test case are: a. Glucose measurement context (0x2A34) i. Field: Flags • Format: 8 bit • Value: 0000 0010 (MSB → LSB). Meal is included and Carbohydrate ID, Carbohydrate, Tester-Health, Exercise Duration, Exercise Intensity, Medication ID, Medication Value and HbA1c fields are not included ii. Field: Sequence number • Format: uint16 • Value: Not relevant iii. Field: Extended Flags • This field is not included iv. Field: Carbohydrate ID • This field is not included v. Field: Carbohydrate - units of kilograms • This field is not included vi. Field: Meal • Format: uint8 • Value: Not relevant vii. Field: Tester • This field is not included viii. Field: Health • This field is not included ix. Field: Exercise Duration • This field is not included x. Field: Exercise Intensity • This field is not included xi. Field: Medication ID • This field is not included xii. Medication – units of kilograms • This field is not included xiii. Medication – units of litres • This field is not included xiv. Field: HbA1c • This field is not included 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test. 5. Check in manager transcoder output for the Context meal enumeration object – Type attribute.
Pass/Fail criteria		In step 5, the Context meal enumeration object – Type attribute is present and its value is { MDC_PART_PHD_DM | MDC_CTXT_GLU_MEAL }.
Notes		In step 5, possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Type attribute is present: ❑ Object: Context meal object ❑ Attribute-id: MDC_ATTR_ID_TYPE (2351) ❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)} ❑ Attribute-value: • partition: MDC_PART_PHD_DM or 128 (dec) or 00 80 (hex) • code: MDC_CTXT_GLU_MEAL or 29256 (dec) or 7248 (hex) b) WAN PCD-01 message PCD-01 message includes a segment like this with a Type attribute value (check OBX-3): OBX|?|CWE|8417864^MDC_CTXT_GLU_MEAL^MDC|1.0.0.7| 8417868^ MDC_CTXT_GLU_MEAL_PREPRANDIAL^MDC |||||R|||[current_date_time]

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-054
TP label		Whitepaper. Glucosemeter Context Meal Enumeration Object - Metric-Spec-Small Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Enumeration 8; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_013
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		    a. Glucose measurement context (0x2A34)
		       i. Field: Flags
		         • Format: 8 bit
		         • Value: 0000 0010 (MSB → LSB). Meal is included and Carbohydrate ID, Carbohydrate, Tester-Health, Exercise Duration, Exercise Intensity, Medication ID, Medication Value and HbA1c fields are not included
		       ii. Field: Sequence number
		         • Format: uint16
		         • Value: Not relevant
		       iii. Field: Extended Flags
		         • This field is not included
		       iv. Field: Carbohydrate ID
		         • This field is not included
		       v. Field: Carbohydrate - units of kilograms
		         • This field is not included
		       vi. Field: Meal
		         • Format: uint8
		         • Value: Not relevant
		       vii. Field: Tester
		         • This field is not included
		       viii. Field: Health
		         • This field is not included
		       ix. Field: Exercise Duration
		         • This field is not included
		       x. Field: Exercise Intensity
		         • This field is not included
		       xi. Field: Medication ID
		         • This field is not included
		       xii. Medication – units of kilograms
		         • This field is not included
		       xiii. Medication – units of litres
		         • This field is not included
		       xiv. Field: HbA1c
		         • This field is not included
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test.
		 5. Check in manager transcoder output for the Context meal enumeration object – Metric-Spec-Small attribute.

Pass/Fail criteria		In step 5, the Context meal enumeration object – Metric-Spec-Small attribute is present and its value is {0xF048} (mss-avail-intermittent | mss-avail-stored-data | mss-upd-aperiodic | mss-msmt-aperiodic | mss-acc-agent-initiated | mss-cat-manual).

Notes		Possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Metric-Spec-Small attribute is present:
		   ❑ Object: Context meal numeric object
		   ❑ Attribute-id: MDC_ATTR_METRIC_SPEC_SMALL (2630)
		   ❑ Attribute-type: BITS-16
		   ❑ Attribute-value: F0 48 (hex) or BITS mss-avail-intermittent(0), mss-avail-stored-data(1), mss-upd-aperiodic(2), mss-msmt-aperiodic(3), mss-acc-agent-initiated(9), mss-cat-manual(12) set to TRUE and remaining BITS set to FALSE
		 b) WAN PCD-01 message
		 PCD-01 message does not include segments with a Metric-Spec-Small attribute value.

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-055		
TP label		Whitepaper. Glucosemeter Context Meal Enumeration Object - Absolute-Time-Stamp Attribute		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	GL Enumeration 9; M	Date-Time Conv 2; M	Date-Time Conv 3; M
		Date-Time Conv 4; M	Date-Time Conv 5; M	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_013		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The simulated agent implements several BLE characteristics. The characteristics of interest for this test case are: 　a. Glucose measurement (0x2A18) 　b. Glucose measurement context (0x2A34) 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test. The measurement of interest for this test case are: 　a. Glucose measurement (0x2A18) 　　i. Field: Flags 　　　• Format: 8 bit 　　　• Value: 00010011 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location and Time Offset fields are included. Sensor Status Annunciation field is not included. Context information follows 　　ii. Field: Sequence number 　　　• Format: uint16 　　　• Value: Not relevant 　　iii. Field: Base Time 　　　• Format: Date and Time 　　　• Value: August 2nd, 2012, 10:59:27 　　iv. Field: Time Offset 　　　• Format: sint16 　　　• Value: 120 minutes 　　v. Field: Glucose Concentration - units of kg/L 　　　• Format: SFLOAT 　　　• Value: Not relevant 　　vi. Field: Glucose Concentration - units of mol/L 　　　• This field is not included 　　vii. Field: Type 　　　• Format: nibble 　　　• Value: Not relevant 　　viii. Field: Sample Location 　　　• Format: nibble 　　　• Value: Not relevant 　　ix. Field: Sensor Status Annunciation 　　　• This field is not included 　b. Glucose measurement context (0x2A34) 　　i. Field: Flags 　　　• Format: 8 bit 　　　• Value: 0000 0010 (MSB → LSB). Meal is included and Carbohydrate ID, Carbohydrate, Tester-Health, Exercise Duration, Exercise Intensity, Medication ID, Medication Value and HbA1c fields are not included 　　ii. Field: Sequence number

	- Format: uint16 - Value: Not relevant iii. Field: Extended Flags - This field is not included iv. Field: Carbohydrate ID - This field is not included v. Field: Carbohydrate - units of kilograms - This field is not included vi. Field: Meal - Format: uint8 - Value: Not relevant vii. Field: Tester - This field is not included viii. Field: Health - This field is not included ix. Field: Exercise Duration - This field is not included x. Field: Exercise Intensity - This field is not included xi. Field: Medication ID - This field is not included xii. Medication – units of kilograms - This field is not included xiii. Medication – units of litres - This field is not included xiv. Field: HbA1c - This field is not included 5. Check in manager transcoder output for the Context meal enumeration object – Absolute-Time-Stamp attribute.
Pass/Fail criteria	In step 5, the Context meal enumeration object – Absolute-Time-Stamp attribute is present, its value matches with the Time Stamp field in conjunction with the Time Offset field of the Glucose measurement characteristic and the fraction of seconds is set to 0.
Notes	Possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Absolute-Time-Stamp attribute is present: - Object: Context meal object - Attribute-id: MDC_ATTR_TIME_STAMP_ABS (2448) - Attribute-type: SEQUENCE {century (INT-U8), year (INT-U8), month (INT-U8), day (INT-U8), hour (INT-U8), minute (INT-U8), second (INT-U8), sec-fractions (INT-U8)} (BCD encoding) - Attribute-value: - century: 20 (hex) or 32 (dec) - year: 12 (hex) or 18 (dec) - month: 08 (hex) or 8 (dec) - day: 02 (hex) or 2 (dec) - hour: 12 (hex) or 18 (dec) - minute: 59 (hex) or 89 (dec) - second: 27 (hex) or 39 (dec) - sec-fractions: 00 (hex) or 0 (dec) b) WAN PCD-01 message PCD-01 message includes a segment like this with Absolute-Time-Stamp attribute value: OBX|?|CWE|8417864^MDC_CTXT_GLU_MEAL^MDC|1.0.0.7|8417868^ MDC_CTXT_GLU_MEAL_PREPRANDIAL^MDC |||||R|||20120802125927+0000

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-056		
TP label		Whitepaper. Glucosemeter Context Meal Enumeration Object - Enum-Observed-Value-Simple-OID Attribute		
Coverage	**Spec**	[Bluetooth PHDT v1.4]		
	Testable items	GL Enumeration 10; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_013		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		
		    a. Glucose measurement context (0x2A34)
		
		       i. Field: Flags
		           • Format: 8 bit
		           • Value: 0000 0010 (MSB → LSB). Meal is included and Carbohydrate ID, Carbohydrate, Tester-Health, Exercise Duration, Exercise Intensity, Medication ID, Medication Value and HbA1c fields are not included
		
		       ii. Field: Sequence number
		           • Format: uint16
		           • Value: Not relevant
		
		       iii. Field: Extended Flags
		           • This field is not included
		
		       iv. Field: Carbohydrate ID
		           • This field is not included
		
		       v. Field: Carbohydrate - units of kilograms
		           • This field is not included
		
		       vi. Field: Meal
		           • Format: uint8
		           • Value: Several values are checked in this test case
		
		       vii. Field: Tester
		           • This field is not included
		
		       viii. Field: Health
		           • This field is not included
		
		       ix. Field: Exercise Duration
		           • This field is not included
		
		       x. Field: Exercise Intensity
		           • This field is not included
		
		       xi. Field: Medication ID
		           • This field is not included
		
		       xii. Medication – units of kilograms
		           • This field is not included
		
		       xiii. Medication – units of litres
		           • This field is not included
		
		       xiv. Field: HbA1c
		           • This field is not included		

	3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
	4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context [Meal field set to 0x01 = Preprandial (before meal)] to the manager under test.
	5. Check in manager transcoder output for the Context meal enumeration object - Enum-Observed-Value-Simple-OID attribute.
	6. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement context [Meal field set to 0x02 = Postprandial (after meal)] to the manager under test.
	7. Check in manager transcoder output for the Context meal enumeration object - Enum-Observed-Value-Simple-OID attribute.
	8. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement context [Meal field set to 0x03 = Fasting] to the manager under test.
	9. Check in manager transcoder output for the Context meal enumeration object - Enum-Observed-Value-Simple-OID attribute.
	10. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement context [Meal field set to 0x04 = Casual] to the manager under test.
	11. Check in manager transcoder output for the Context meal enumeration object - Enum-Observed-Value-Simple-OID attribute.
	12. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement context [Meal field set to 0x05 = Bedtime] to the manager under test.
	13. Check in manager transcoder output for the Context meal enumeration object - Enum-Observed-Value-Simple-OID attribute.
Pass/Fail criteria	In step 5, the Context meal enumeration object - Enum-Observed-Value-Simple-OID attribute is present and its value matches with the Context Meal Value field of the Glucose measurement context characteristic: 0x1 (preprandial – before meal).
	In step 7, the Context meal enumeration object - Enum-Observed-Value-Simple-OID attribute is present and its value matches with the Context Meal Value field of the Glucose measurement context characteristic: 0x2 (postprandial – after meal).
	In step 9, the Context meal enumeration object - Enum-Observed-Value-Simple-OID attribute is present and its value matches with the Context Meal Value field of the Glucose measurement context characteristic: 0x3 (fasting).
	In step 11, the Context meal enumeration object - Enum-Observed-Value-Simple-OID attribute is present and its value matches with the Context Meal Value field of the Glucose measurement context characteristic: 0x4 (casual – snacks, drinks etc.).
	In step 13, the Context meal enumeration object - Enum-Observed-Value-Simple-OID attribute is present and its value matches with the Context Meal Value field of the Glucose measurement context characteristic: 0x5 (bedtime).
Notes	In step 5, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Enum-Observed-Value-Simple-OID attribute is present:
	❑ Object: Context meal enumeration object
	❑ Attribute-id: MDC_ATTR_ENUM_OBS_VAL_SIMP_OID (2633)
	❑ Attribute-type: OID-Type(INT-U16)
	❑ Attribute-value: MDC_CTXT_GLU_MEAL_PREPRANDIAL (29260) or 1 (dec)
	b) WAN PCD-01 message

PCD-01 message includes a segment like this with an Enum-Observed-Value-Simple-OID attribute value. Check OBX-2 = CWE AND OBX-5 = 8417868^MDC_CTXT_GLU_MEAL_PREPRANDIAL^MDC

In step 7, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Enum-Observed-Value-Simple-OID attribute is present:

- ❑ Object: Context meal enumeration object
- ❑ Attribute-id: MDC_ATTR_ENUM_OBS_VAL_SIMP_OID (2633)
- ❑ Attribute-type: OID-Type(INT-U16)
- ❑ Attribute-value: MDC_CTXT_GLU_MEAL_POSTPRANDIAL (29264) or 2 (dec)

b) WAN PCD-01 message

PCD-01 message includes a segment like this with an Enum-Observed-Value-Simple-OID attribute value. Check OBX-2 = CWE AND OBX-5 = 8417872^MDC_CTXT_GLU_MEAL_POSTPRANDIAL^MDC

In step 9, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Enum-Observed-Value-Simple-OID attribute is present:

- ❑ Object: Context meal enumeration object
- ❑ Attribute-id: MDC_ATTR_ENUM_OBS_VAL_SIMP_OID (2633)
- ❑ Attribute-type: OID-Type(INT-U16)
- ❑ Attribute-value: MDC_CTXT_GLU_MEAL_FASTING (29268) or 3 (dec)

b) WAN PCD-01 message

PCD-01 message includes a segment like this with an Enum-Observed-Value-Simple-OID attribute value. Check OBX-2 = CWE AND OBX-5 = 8417876^MDC_CTXT_GLU_MEAL_FASTING^MDC

In step 11, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Enum-Observed-Value-Simple-OID attribute is present:

- ❑ Object: Context meal enumeration object
- ❑ Attribute-id: MDC_ATTR_ENUM_OBS_VAL_SIMP_OID (2633)
- ❑ Attribute-type: OID-Type(INT-U16)
- ❑ Attribute-value: MDC_CTXT_GLU_MEAL_CASUAL (29272) or 4 (dec)

b) WAN PCD-01 message

PCD-01 message includes a segment like this with an Enum-Observed-Value-Simple-OID attribute value. Check OBX-2 = CWE AND OBX-5 = 8417880^MDC_CTXT_GLU_MEAL_CASUAL^MDC

In step 13, possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Enum-Observed-Value-Simple-OID attribute is present:

- ❑ Object: Context meal enumeration object
- ❑ Attribute-id: MDC_ATTR_ENUM_OBS_VAL_SIMP_OID (2633)
- ❑ Attribute-type: OID-Type(INT-U16)
- ❑ Attribute-value: MDC_CTXT_GLU_MEAL_BEDTIME (29300) or 5 (dec)

b) WAN PCD-01 message

PCD-01 message includes a segment like this with an Enum-Observed-Value-Simple-OID attribute value. Check OBX-2 = CWE AND OBX-5 = 8417908^MDC_CTXT_GLU_MEAL_BEDTIME^MDC

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-057		
TP label		Whitepaper. Glucosemeter Context Meal Enumeration Object value		
Coverage	**Spec**	[Bluetooth PHDT v1.4]		
	Testable items	GL Enumeration 9; M	GL Enumeration 10; M	Date-Time Conv 1; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_007 AND C_MAN_BLE_013		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).		

2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:

    a. Glucose measurement (0x2A18)

    b. Glucose measurement context (0x2A34)

3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).

4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test. The measurement of interest for this test case are:

    a. Glucose measurement (0x2A18)

        i. Field: Flags

            • Format: 8 bit

            • Value: 00010010 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location fields are included, Time Offset fields and Sensor Status Annunciation field are not included and Context Information follows

        ii. Field: Sequence number

            • Format: uint16

            • Value: Not relevant

        iii. Field: Base Time

            • Format: Date and Time

            • Value: August 2nd, 2012, 11:08:25

        iv. Field: Time Offset

            • This field is not included

        v. Field: Glucose Concentration - units of kg/L

            • Format: SFLOAT

            • Value: Not relevant

        vi. Field: Glucose Concentration - units of mol/L

            • This field is not included

        vii. Field: Type

            • Format: nibble

            • Value: Not relevant

        viii. Field: Sample Location

            • Format: nibble

            • Value: Not relevant

	ix. Field: Sensor Status Annunciation
	• This field is not included
	b. Glucose measurement context (0x2A34)
	i. Field: Flags
	• Format: 8 bit
	• Value: 0000 0010 (MSB → LSB). Meal field is included and Carbohydrate ID, Carbohydrate, Tester-Health, Exercise Duration and Exercise Intensity, Medication ID, Medication Value, Extended Flags and HbA1c fields are not included
	ii. Field: Sequence number
	• Format: uint16
	• Value: Not relevant
	iii. Field: Extended Flags
	• This field is not included
	iv. Field: Carbohydrate ID
	• This field is not included
	v. Field: Carbohydrate
	• This field is not included
	vi. Field: Meal
	• Format: uint8
	• Value: preprandial – before meal (1)
	vii. Field: Tester
	• This field is not included
	viii. Field: Health
	• This field is not included
	ix. Field: Exercise Duration
	• This field is not included
	x. Field: Exercise Intensity
	• This field is not included
	xi. Field: Medication ID
	• This field is not included
	xii. Field: Medication
	• This field is not included
	xiii. Field: HbA1c
	• This field is not included
	5. Check that the manager accepts the measurement and decodes its value properly (Meal value and base time).
Pass/Fail criteria	In step 5, the manager under test shows the following Meal preprandial – before meal (MDC_CTXT_GLU_MEAL_PREPRANDIAL or 29260) with the time stamp '2012-08-02 11:08:25'.
Notes	

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-058
TP label		Whitepaper. Glucosemeter Context Sample Location Enumeration Object - Handle Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Enumeration 11; O
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_014
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Glucosemeter profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		    a. Glucose measurement (0x2A18)
		       i. Field: Flags
		         • Format: 8 bit
		         • Value: 00000010 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location fields are included. Time Offset and Sensor Status Annunciation fields are not included. Context information does not follow
		       ii. Field: Sequence number
		         • Format: uint16
		         • Value: Not relevant
		       iii. Field: Base Time
		         • Format: Date and Time
		         • Value: Not relevant
		       iv. Field: Time Offset
		         • Value: Not relevant
		       v. Field: Glucose Concentration - units of kg/L
		         • Format: SFLOAT
		         • Value: Not relevant
		       vi. Field: Glucose Concentration - units of mol/L
		         • This field is not included
		       vii. Field: Type
		         • Format: nibble
		         • Value: Not relevant
		       viii. Field: Sample Location
		         • Format: nibble
		         • Value: Not relevant
		       ix. Field: Sensor Status Annunciation
		         • This field is not included
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement to the manager under test.
		 5. Check in manager transcoder output for the Context Sample Location Enumeration object – Handle attribute.

Pass/Fail criteria		In step 5, the Context Sample Location Enumeration object – Handle attribute is not present; however, if it is present then its value is different to 0.

Notes		Possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Handle attribute is not present, or if it is present then:
		   ❑ Object: Context Sample Location Enumeration object
		   ❑ Attribute-id: MDC_ATTR_ID_HANDLE (2337)
		   ❑ Attribute-type: INT-U16
		   ❑ Attribute-value: Any value other than 0
		 b) WAN PCD-01 message
		 PCD-01 message does not include segments with a Handle attribute value.

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-059
TP label		Whitepaper. Glucosemeter Context Sample Location Enumeration Object - Type Attribute
Coverage	**Spec**	[Bluetooth PHDT v1.4]
	Testable items	GL Enumeration 12; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_014
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristics of interest for this test case are:
		    a. Glucose measurement (0x2A18)
		      i. Field: Flags
		        • Format: 8 bit
		        • Value: 00000010 (MSB $\rightarrow$ LSB). Glucose concentration in units of kg/L, Type and Sample Location fields are included. Time Offset and Sensor Status Annunciation fields are not included. Context information does not follow
		      ii. Field: Sequence number
		        • Format: uint16
		        • Value: Not relevant
		      iii. Field: Base Time
		        • Format: Date and Time
		        • Value: Not relevant
		      iv. Field: Time Offset
		        • This field is not included
		      v. Field: Glucose Concentration - units of kg/L
		        • Format: SFLOAT
		        • Value: Not relevant
		      vi. Field: Glucose Concentration - units of mol/L
		        • This field is not included
		      vii. Field: Type
		        • Format: nibble
		        • Value: Not relevant
		      viii. Field: Sample Location
		        • Format: nibble
		        • Value: Not relevant
		      ix. Field: Sensor Status Annunciation
		        • This field is not included
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement to the manager under test.
		 5. Check in manager transcoder output for the Context Sample Location Enumeration object – Type attribute.

Pass/Fail criteria		In step 5, the Context Sample Location Enumeration object – Type attribute is present and its value is { MDC_PART_PHD_DM | MDC_CTXT_GLU_SAMPLELOCATION }.

Notes		In step 5, possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Type attribute is present:
		   ❑ Object: Context Sample Location Enumeration object
		   ❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
		   ❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
		   ❑ Attribute-value:
		     • partition: MDC_PART_PHD_DM or 128 (dec) or 00 80 (hex)
		     • code: MDC_CTXT_GLU_SAMPLELOCATION or 29236 (dec) or 7234 (hex)
		 b) WAN PCD-01 message
		 PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):
		 OBX|?|?|8417844^MDC_CTXT_GLU_SAMPLELOCATION^MDC|1.0.0.a|[value]| 263872^MDC_DIM_G^MDC|||||R|||[current_date_time]

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-060
TP label		Whitepaper. Glucosemeter Context Sample Location Enumeration Object - Metric-Spec-Small Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Enumeration 13; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_014
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		 a. Glucose measurement (0x2A18)
		   i. Field: Flags
		    • Format: 8 bit
		    • Value: 00000010 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location fields are included. Time Offset and Sensor Status Annunciation are not included. Context information does not follow
		   ii. Field: Sequence number
		    • Format: uint16
		    • Value: Not relevant
		   iii. Field: Base Time
		    • Format: Date and Time
		    • Value: Not relevant
		   iv. Field: Time Offset
		    • This field is not included
		   v. Field: Glucose Concentration - units of kg/L
		    • Format: SFLOAT
		    • Value: Not relevant
		   vi. Field: Glucose Concentration - units of mol/L
		    • This field is not included
		   vii. Field: Type
		    • Format: nibble
		    • Value: Not relevant
		   viii. Field: Sample Location
		    • Format: nibble
		    • Value: Not relevant
		   ix. Field: Sensor Status Annunciation
		    • This field is not included
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement to the manager under test.
		5. Check in manager transcoder output for the Context Sample Location Enumeration object – Metric-Spec-Small attribute.

Pass/Fail criteria		In step 5, the Context Sample Location Enumeration object – Metric-Spec-Small attribute is present and its value is {0xF048} (mss-avail-intermittent | mss-avail-stored-data | mss-upd-aperiodic | mss-msmt-aperiodic | mss-acc-agent-initiated | mss-cat-manual).
Notes		Possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Metric-Spec-Small attribute is present: ❑ Object: Context Sample Location Enumeration object ❑ Attribute-id: MDC_ATTR_METRIC_SPEC_SMALL (2630) ❑ Attribute-type: BITS-16 ❑ Attribute-value: F0 48 (hex) or BITS mss-avail-intermittent(0), mss-avail-stored-data(1), mss-upd-aperiodic(2), mss-msmt-aperiodic(3), mss-acc-agent-initiated(9), mss-cat-manual(12) set to TRUE and remaining BITS set to FALSE b) WAN PCD-01 message PCD-01 message does not include segments with a Metric-Spec-Small attribute value.

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-061		
TP label		Whitepaper. Glucosemeter Context Sample Location Enumeration Object - Absolute-Time-Stamp Attribute		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	GL Enumeration 14; M	Date-Time Conv 2; M	Date-Time Conv 3; M
		Date-Time Conv 4; M	Date-Time Conv 5; M	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_014		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		 2. The simulated agent implements several BLE characteristics. The characteristics of interest for this test case are:
		
		 a. Glucose measurement (0x2A18)
		
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		
		 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test. The measurement of interest for this test case are:
		
		 a. Glucose measurement (0x2A18)
		
		      i. Field: Flags
		
		         • Format: 8 bit
		
		         • Value: 00000011 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location, Time Offset fields are included. Sensor Status Annunciation field is not included. Context information does not follow
		
		      ii. Field: Sequence number
		
		         • Format: uint16
		
		         • Value: Not relevant
		
		      iii. Field: Base Time
		
		         • Format: Date and Time
		
		         • Value: August 2nd, 2012, 10:59:27
		
		      iv. Field: Time Offset
		
		         • Format: sint16
		
		         • Value: 120 minutes
		
		      v. Field: Glucose Concentration - units of kg/L
		
		         • Format: SFLOAT
		
		         • Value: Not relevant
		
		      vi. Field: Glucose Concentration - units of mol/L
		
		         • This field is not included
		
		      vii. Field: Type
		
		         • Format: nibble
		
		         • Value: Not relevant
		
		      viii. Field: Sample Location		

	• Format: nibble
	• Value: Not relevant
	ix. Field: Sensor Status Annunciation
	• This field is not included
	5. Check in manager transcoder output for the Context Sample Location Enumeration object – Absolute-Time-Stamp attribute.
Pass/Fail criteria	In step 5, the Context Sample Location Enumeration object – Absolute-Time-Stamp attribute is present, its value matches with the Time Stamp field in conjunction with the Time Offset field of the Glucose measurement characteristic and the fraction of seconds is set to 0.

Notes	Possible values in typical points of observation after transcoder output are:
	
	a) IEEE 11073 Objects and Attributes
	
	Absolute-Time-Stamp attribute is present:
	
	❑ Object: Context Sample Location Enumeration object
	
	❑ Attribute-id: MDC_ATTR_TIME_STAMP_ABS (2448)
	
	❑ Attribute-type: SEQUENCE {century (INT-U8), year (INT-U8), month (INT-U8), day (INT-U8), hour (INT-U8), minute (INT-U8), second (INT-U8), sec-fractions (INT-U8)} (BCD encoding)
	
	❑ Attribute-value:
	
	  • century: 20 (hex) or 32 (dec)
	  • year: 12 (hex) or 18 (dec)
	  • month: 08 (hex) or 8 (dec)
	  • day: 02 (hex) or 2 (dec)
	  • hour: 12 (hex) or 18 (dec)
	  • minute: 59 (hex) or 89 (dec)
	  • second: 27 (hex) or 39 (dec)
	  • sec-fractions: 00 (hex) or 0 (dec)
	
	b) WAN PCD-01 message
	
	PCD-01 message includes a segment like this with Absolute-Time-Stamp attribute value (check OBX-14):
	
	OBX|?|?|8417844^MDC_CTXT_GLU_SAMPLELOCATION^MDC |1.0.0.a| 130|263872^MDC_DIM_G^MDC|||||R|||20120802 125927+0000

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-062
TP label		Whitepaper. Glucosemeter Context Sample Location Enumeration Object - Enum-Observed-Value-Simple-OID Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Enumeration 15; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_014
Initial condition		The manager under test and the simulated agent are in the standby state.
Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement (0x2A18) i. Field: Flags • Format: 8 bit • Value: 00000010 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location fields are included. Time Offset and Sensor Status Annunciation fields are not included. Context information follows ii. Field: Sequence number • Format: uint16 • Value: Not relevant iii. Field: Base Time • Format: Date and Time • Value: Not relevant iv. Field: Time Offset • This field is not included v. Field: Glucose Concentration - units of kg/L • Format: SFLOAT • Value: Not relevant vi. Field: Glucose Concentration - units of mol/L • This field is not included vii. Field: Type • Format: nibble • Value: Not relevant viii. Field: Sample Location • Format: nibble • Value: Several values are checked in this test case ix. Field: Sensor Status Annunciation • This field is not included 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement [Sample Location ID field set to 0x01 = Finger] to the manager under test. 5. Check in manager transcoder output for the Context Sample Location Enumeration object - Enum-Observed-Value-Simple-OID attribute. 6. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement [Sample Location ID field set to 0x02 = Alternate Site Test (AST)] to the manager under test. 7. Check in manager transcoder output for the Context Sample Location Enumeration object - Enum-Observed-Value-Simple-OID attribute. 8. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement [Sample Location ID field set to 0x03 = Earlobe] to the manager under test. 9. Check in manager transcoder output for the Context Sample Location Enumeration object - Enum-Observed-Value-Simple-OID attribute. 10. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement [Sample Location ID field set to 0x04 = Control Solution] to the manager under test. 11. Check in manager transcoder output for the Context Sample Location Enumeration object - Enum-Observed-Value-Simple-OID attribute.

Pass/Fail criteria	In step 5, the Context Sample Location Enumeration object - Enum-Observed-Value-Simple-OID attribute is present and its value matches with the Context Sample Location Value field of the Glucose measurement characteristic: 0x1 (finger). In step 7, the Context Sample Location Enumeration object - Enum-Observed-Value-Simple-OID attribute is present and its value matches with the Context Sample Location Value field of the Glucose measurement characteristic: 0x2 (alternate site test). In step 9, the Context Sample Location Enumeration object - Enum-Observed-Value-Simple-OID attribute is present and its value matches with the Context Sample Location Value field of the Glucose measurement characteristic: 0x3 (earlobe). In step 11, the Context Sample Location Enumeration object - Enum-Observed-Value-Simple-OID attribute is present and its value matches with the Context Sample Location Value field of the Glucose measurement characteristic: 0x4 (control solution).
Notes	In step 5, possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Enum-Observed-Value-Simple-OID attribute is present: ❑ Object: Context Sample Location Enumeration object ❑ Attribute-id: MDC_ATTR_ENUM_OBS_VAL_SIMP_OID (2633) ❑ Attribute-type: OID-Type(INT-U16) ❑ Attribute-value: MDC_CTXT_GLU_SAMPLELOCATION_FINGER (29240) or 1 (dec) b) WAN PCD-01 message PCD-01 message includes a segment like this with an Enum-Observed-Value-Simple-OID attribute value. Check OBX-3 = 8417848^MDC_CTXT_GLU_ SAMPLELOCATION _ FINGER ^MDC In step 7, possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Enum-Observed-Value-Simple-OID attribute is present: ❑ Object: Context Sample Location Enumeration object ❑ Attribute-id: MDC_ATTR_ENUM_OBS_VAL_SIMP_OID (2633) ❑ Attribute-type: OID-Type(INT-U16) ❑ Attribute-value: MDC_CTXT_GLU_ SAMPLELOCATION _AST (29244) or 2 (dec) b) WAN PCD-01 message PCD-01 message includes a segment like this with an Enum-Observed-Value-Simple-OID attribute value. Check OBX-3 = 8417852^MDC_CTXT_GLU_SAMPLELOCATION_AST^MDC In step 9, possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Enum-Observed-Value-Simple-OID attribute is present: ❑ Object: Context Sample Location Enumeration object ❑ Attribute-id: MDC_ATTR_ENUM_OBS_VAL_SIMP_OID (2633) ❑ Attribute-type: OID-Type(INT-U16) ❑ Attribute-value: MDC_CTXT_GLU_ SAMPLELOCATION _EARLOBE (29248) or 3 (dec) b) WAN PCD-01 message PCD-01 message includes a segment like this with an Enum-Observed-Value-Simple-OID attribute value. Check OBX-3 = 8417856^MDC_CTXT_GLU_SAMPLELOCATION_EARLOBE^MDC In step 11, possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Enum-Observed-Value-Simple-OID attribute is present: ❑ Object: Context Sample Location Enumeration object ❑ Attribute-id: MDC_ATTR_ENUM_OBS_VAL_SIMP_OID (2633) ❑ Attribute-type: OID-Type(INT-U16) ❑ Attribute-value: MDC_CTXT_GLU_ SAMPLELOCATION _CTRLSOLUTION(29252) or 4 (dec) b) WAN PCD-01 message PCD-01 message includes a segment like this with an Enum-Observed-Value-Simple-OID attribute value. Check OBX-3 = 8417860^MDC_CTXT_GLU_SAMPLELOCATION_CTLSOLUTION^MDC

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-063		
TP label		Whitepaper. Glucosemeter Context Sample Location Enumeration Object value		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	GL Enumeration 14; M	GL Enumeration 15; M	Date-Time Conv 1; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_007 AND C_MAN_BLE_014		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement (0x2A18) 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state). 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement [Sample Location field set to 0x0001 = Finger] followed by the Glucose measurement context to the manager under test: a. Glucose measurement (0x2A18) i. Field: Flags • Format: 8 bit • Value: 00000010 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location fields are included. Time Offset and Sensor Status Annunciation fields are not included. Context information does not follow ii. Field: Sequence number • Format: uint16 • Value: Not relevant iii. Field: Base Time • Format: Date and Time • Value: August 2nd, 2012, 11:08:25 iv. Field: Time Offset • This field is not included v. Field: Glucose Concentration - units of kg/L • Format: SFLOAT • Value: Not relevant vi. Field: Glucose Concentration - units of mol/L • This field is not included vii. Field: Type • Format: nibble • Value: Not relevant viii. Field: Sample Location • Format: nibble • Value: finger (0001 MSB → LSB) ix. Field: Sensor Status Annunciation • This field is not included 5. Check that the manager accepts the measurement and decodes its value properly (sample location and base time).		
Pass/Fail criteria		In step 5, the manager under test shows the following Sample Location finger (MDC_CTXT_GLU_SAMPLELOCATION_FINGER or 29240) with the time stamp '2012-08-02 11:08:25'.		
Notes				

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-064
TP label		Whitepaper. Glucosemeter Context Tester Enumeration Object - Handle Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Enumeration 16; O
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_015
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Glucosemeter profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		    a. Glucose measurement context (0x2A34)
		        i. Field: Flags
		          • Format: 8 bit
		          • Value: 0000 0100 (MSB → LSB). Tester-Health is included and Meal, Carbohydrate ID, Carbohydrate, Exercise Duration, Exercise Intensity, Medication ID, Medication Value and HbA1c fields are not included
		        ii. Field: Sequence number
		          • Format: uint16
		          • Value: Not relevant
		        iii. Field: Extended Flags
		          • This field is not included
		        iv. Field: Carbohydrate ID
		          • This field is not included
		        v. Field: Carbohydrate - units of kilograms
		          • This field is not included
		        vi. Field: Meal
		          • This field is not included
		        vii. Field: Tester
		          • Format: nibble
		          • Value: Not relevant
		        viii. Field: Health
		          • Format: nibble
		          • Value: Not relevant
		        ix. Field: Exercise Duration
		          • This field is not included
		        x. Field: Exercise Intensity
		          • This field is not included
		        xi. Field: Medication ID
		          • This field is not included
		        xii. Medication – units of kilograms
		          • This field is not included
		        xiii. Medication – units of litres
		          • This field is not included
		        xiv. Field: HbA1c
		          • This field is not included
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test.
		5. Check in manager transcoder output for the Context tester enumeration object – Handle attribute.

Pass/Fail criteria		In step 5, the Context tester enumeration object – Handle attribute is not present; however, if it is present then its value is different to 0.

Notes		Possible values in typical points of observation after transcoder output are:
		a) IEEE 11073 Objects and Attributes
		Handle attribute is not present, or if it is present then:
		    ❑ Object: Context tester enumeration object
		    ❑ Attribute-id: MDC_ATTR_ID_HANDLE (2337)
		    ❑ Attribute-type: INT-U16
		    ❑ Attribute-value: Any value other than 0
		b) WAN PCD-01 message
		PCD-01 message does not include segments with a Handle attribute value.

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-065
TP label		Whitepaper. Glucosemeter Context Tester Enumeration Object - Type Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Enumeration 17; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_015
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristics of interest for this test case are:
		    a. Glucose measurement context (0x2A34)
		       i. Field: Flags
		         • Format: 8 bit
		         • Value: 0000 0100 (MSB → LSB). Tester-Health is included and Meal, Carbohydrate ID, Carbohydrate, Exercise Duration, Exercise Intensity, Medication ID, Medication Value and HbA1c fields are not included
		       ii. Field: Sequence number
		         • Format: uint16
		         • Value: Not relevant
		       iii. Field: Extended Flags
		         • This field is not included
		       iv. Field: Carbohydrate ID
		         • This field is not included
		       v. Field: Carbohydrate - units of kilograms
		         • This field is not included
		       vi. Field: Meal
		         • This field is not included
		       vii. Field: Tester
		         • Format: nibble
		         • Value: Not relevant
		       viii. Field: Health
		         • Format: nibble
		         • Value: Not relevant
		       ix. Field: Exercise Duration
		         • This field is not included
		       x. Field: Exercise Intensity
		         • This field is not included
		       xi. Field: Medication ID
		         • This field is not included
		       xii. Medication – units of kilograms
		         • This field is not included
		       xiii. Medication – units of litres
		         • This field is not included
		       xiv. Field: HbA1c
		         • This field is not included
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test.
		 5. Check in manager transcoder output for the Context tester enumeration object – Type attribute.

Pass/Fail criteria		In step 5, the Context tester enumeration object – Type attribute is present and its value is { MDC_PART_PHD_DM	MDC_CTXT_GLU_TESTER }.

Notes		In step 5, possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Type attribute is present:
		   ❑ Object: Context Tester object
		   ❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
		   ❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
		   ❑ Attribute-value:
		     • partition: MDC_PART_PHD_DM or 128 (dec) or 00 80 (hex)
		     • code: MDC_CTXT_GLU_TESTER or 29276 (dec) or 72 5C (hex)
		 b) WAN PCD-01 message
		 PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):
		 OBX|?|CWE|8417884^MDC_CTXT_GLU_TESTER^MDC|1.0.0.7| 8417888^ MDC_CTXT_GLU_TESTER_SELF^MDC |||||R|||[current_date_time]

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-066
TP label		Whitepaper. Glucosemeter Context Tester Enumeration Object - Metric-Spec-Small Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Enumeration 18; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_015
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		   a. Glucose measurement context (0x2A34)
		     i. Field: Flags
		       • Format: 8 bit
		       • Value: 0000 0100 (MSB → LSB). Tester-Health is included and Meal, Carbohydrate ID, Carbohydrate, Exercise Duration, Exercise Intensity, Medication ID, Medication Value and HbA1c fields are not included
		     ii. Field: Sequence number
		       • Format: uint16
		       • Value: Not relevant
		     iii. Field: Extended Flags
		       • This field is not included
		     iv. Field: Carbohydrate ID
		       • This field is not included
		     v. Field: Carbohydrate - units of kilograms
		       • This field is not included
		     vi. Field: Meal
		       • This field is not included
		     vii. Field: Tester
		       • Format: nibble
		       • Value: Not relevant
		     viii. Field: Health
		       • Format: nibble
		       • Value: Not relevant
		     ix. Field: Exercise Duration
		       • This field is not included
		     x. Field: Exercise Intensity
		       • This field is not included
		     xi. Field: Medication ID
		       • This field is not included
		     xii. Medication – units of kilograms
		       • This field is not included
		     xiii. Medication – units of litres
		       • This field is not included
		     xiv. Field: HbA1c
		       • This field is not included
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test.
		 5. Check in manager transcoder output for the Context tester enumeration object – Metric-Spec-Small attribute.

Pass/Fail criteria		In step 5, the Context tester enumeration object – Metric-Spec-Small attribute is present and its value is {0xF048} (mss-avail-intermittent | mss-avail-stored-data | mss-upd-aperiodic | mss-msmt-aperiodic | mss-acc-agent-initiated | mss-cat-manual).

Notes		Possible values in typical points of observation after transcoder output are:
		 a) IEEE 11073 Objects and Attributes
		 Metric-Spec-Small attribute is present:
		   ❑ Object: Context tester enumeration object
		   ❑ Attribute-id: MDC_ATTR_METRIC_SPEC_SMALL (2630)
		   ❑ Attribute-type: BITS-16
		   ❑ Attribute-value: F0 48 (hex) or BITS mss-avail-intermittent(0), mss-avail-stored-data(1), mss-upd-aperiodic(2), mss-msmt-aperiodic(3), mss-acc-agent-initiated(9), mss-cat-manual(12) set to TRUE and remaining BITS set to FALSE
		 b) WAN PCD-01 message
		 PCD-01 message does not include segments with a Metric-Spec-Small attribute value.

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-067		
TP label		Whitepaper. Glucosemeter Context Tester Enumeration Object - Absolute-Time-Stamp Attribute		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	GL Enumeration 19; M	Date-Time Conv 2; M	Date-Time Conv 3; M
		Date-Time Conv 4; M	Date-Time Conv 5; M	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_015		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		2. The simulated agent implements several BLE characteristics. The characteristics of interest for this test case are:
		  a. Glucose measurement (0x2A18)
		  b. Glucose measurement context (0x2A34)
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test. The measurement of interest for this test case are:
		  a. Glucose measurement (0x2A18)
		    i. Field: Flags
		      • Format: 8 bit
		      • Value: 00010011 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location, Time Offset fields are included. Sensor Status Annunciation field is not included. Context information follows
		    ii. Field: Sequence number
		      • Format: uint16
		      • Value: Not relevant
		    iii. Field: Base Time
		      • Format: Date and Time
		      • Value: August 2nd, 2012, 10:59:27
		    iv. Field: Time Offset
		      • Format: sint16
		      • Value: 120 minutes
		    v. Field: Glucose Concentration - units of kg/L
		      • Format: SFLOAT
		      • Value: Not relevant
		    vi. Field: Glucose Concentration - units of mol/L
		      • This field is not included
		    vii. Field: Type
		      • Format: nibble
		      • Value: Not relevant
		    viii. Field: Sample Location
		      • Format: nibble
		      • Value: Not relevant
		    ix. Field: Sensor Status Annunciation
		      • This field is not included
		  b. Glucose measurement context (0x2A34)
		    i. Field: Flags
		      • Format: 8 bit
		      • Value: 0000 0100 (MSB → LSB). Tester-Health is included and Meal, Carbohydrate ID, Carbohydrate, Exercise Duration, Exercise Intensity, Medication ID, Medication Value and HbA1c fields are not included
		    ii. Field: Sequence number

	• Format: uint16
	• Value: Not relevant
	iii. Field: Extended Flags
	• This field is not included
	iv. Field: Carbohydrate ID
	• This field is not included
	v. Field: Carbohydrate - units of kilograms
	• This field is not included
	vi. Field: Meal
	• This field is not included
	vii. Field: Tester
	• Format: nibble
	• Value: Not relevant
	viii. Field: Health
	• Format: nibble
	• Value: Not relevant
	ix. Field: Exercise Duration
	• This field is not included
	x. Field: Exercise Intensity
	• This field is not included
	xi. Field: Medication ID
	• This field is not included
	xii. Medication – units of kilograms
	• This field is not included
	xiii. Medication – units of litres
	• This field is not included
	xiv. Field: HbA1c
	• This field is not included
	5. Check in manager transcoder output for the Context tester enumeration object – Absolute-Time-Stamp attribute.
Pass/Fail criteria	In step 5, the Context tester enumeration object – Absolute-Time-Stamp attribute is present, its value matches with the Time Stamp field in conjunction with the Time Offset field of the Glucose measurement characteristic and the fraction of seconds is set to 0.
Notes	Possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Absolute-Time-Stamp attribute is present:
	❑ Object: Context tester enumeration object
	❑ Attribute-id: MDC_ATTR_TIME_STAMP_ABS (2448)
	❑ Attribute-type: SEQUENCE {century (INT-U8), year (INT-U8), month (INT-U8), day (INT-U8), hour (INT-U8), minute (INT-U8), second (INT-U8), sec-fractions (INT-U8)} (BCD encoding)
	❑ Attribute-value:
	• century: 20 (hex) or 32 (dec)
	• year: 12 (hex) or 18 (dec)
	• month: 08 (hex) or 8 (dec)
	• day: 02 (hex) or 2 (dec)
	• hour: 12 (hex) or 18 (dec)
	• minute: 59 (hex) or 89 (dec)
	• second: 27 (hex) or 39 (dec)
	• sec-fractions: 00 (hex) or 0 (dec)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with Absolute-Time-Stamp attribute value:
	OBX|?|CWE|8417884^MDC_CTXT_GLU_TESTER^MDC|1.0.0.7| 8417888^
	MDC_CTXT_GLU_TESTER_SELF^MDC |||||R|||20120802125927+0000

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-068
TP label		Whitepaper. Glucosemeter Context Tester Enumeration Object - Enum-Observed-Value-Simple-OID Attribute
Coverage	**Spec**	[Bluetooth PHDT v1.4]
	Testable items	GL Enumeration 20; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_015
Initial condition		The manager under test and the simulated agent are in the standby state.
Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		a. Glucose measurement context (0x2A34)
		i. Field: Flags
		• Format: 8 bit
		• Value: 0000 0100 (MSB → LSB). Tester-Health is included and Meal, Carbohydrate ID, Carbohydrate, Exercise Duration, Exercise Intensity, Medication ID, Medication Value and HbA1c fields are not included
		ii. Field: Sequence number
		• Format: uint16
		• Value: Not relevant
		iii. Field: Extended Flags
		• This field is not included
		iv. Field: Carbohydrate ID
		• This field is not included
		v. Field: Carbohydrate - units of kilograms
		• This field is not included
		vi. Field: Meal
		• This field is not included
		vii. Field: Tester
		• Format: nibble
		• Value: Several values are checked in this test case
		viii. Field: Health
		• Format: nibble
		• Value: Not relevant
		ix. Field: Exercise Duration
		• This field is not included
		x. Field: Exercise Intensity
		• This field is not included
		xi. Field: Medication ID
		• This field is not included
		xii. Medication – units of kilograms
		• This field is not included
		xiii. Medication – units of litres
		• This field is not included
		xiv. Field: HbA1c
		• This field is not included
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement

	followed by the Glucose measurement context [Tester field set to 0x01 = Self] to the manager under test.
	5. Check in manager transcoder output for the Context tester enumeration object - Enum-Observed-Value-Simple-OID attribute.
	6. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement context [Tester field set to 0x02 = Health Care Professional] to the manager under test.
	7. Check in manager transcoder output for the Context tester enumeration object - Enum-Observed-Value-Simple-OID attribute.
	8. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement context [Tester field set to 0x03 = Lab test] to the manager under test.
	9. Check in manager transcoder output for the Context tester enumeration object - Enum-Observed-Value-Simple-OID attribute.
Pass/Fail criteria	In step 5, the Context tester enumeration object - Enum-Observed-Value-Simple-OID attribute is present and its value matches with the Context Tester Value field of the Glucose measurement context characteristic: 0x1 (self).
	In step 7, the Context tester enumeration object - Enum-Observed-Value-Simple-OID attribute is present and its value matches with the Context Tester Value field of the Glucose measurement context characteristic: 0x2 (Health Care Professional).
	In step 9, the Context tester enumeration object - Enum-Observed-Value-Simple-OID attribute is present and its value matches with the Context Tester Value field of the Glucose measurement context characteristic: 0x3 (Lab test).
Notes	In step 5, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Enum-Observed-Value-Simple-OID attribute is present:
	❑ Object: Context tester enumeration object
	❑ Attribute-id: MDC_ATTR_ENUM_OBS_VAL_SIMP_OID (2633)
	❑ Attribute-type: OID-Type(INT-U16)
	❑ Attribute-value: MDC_CTXT_GLU_TESTER_SELF (29280) or 1 (dec)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with an Enum-Observed-Value-Simple-OID attribute value. Check OBX-2 = CWE AND OBX-5 = 8417888^MDC_CTXT_GLU_TESTER_SELF^MDC
	In step 7, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Enum-Observed-Value-Simple-OID attribute is present:
	❑ Object: Context tester enumeration object
	❑ Attribute-id: MDC_ATTR_ENUM_OBS_VAL_SIMP_OID (2633)
	❑ Attribute-type: OID-Type(INT-U16)
	❑ Attribute-value: MDC_CTXT_GLU_ TESTER _HCP (29284) or 2 (dec)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with an Enum-Observed-Value-Simple-OID attribute value. Check OBX-2 = CWE AND OBX-5 = 8417892^MDC_CTXT_GLU_TESTER _HCP^MDC
	In step 9, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Enum-Observed-Value-Simple-OID attribute is present:
	❑ Object: Context tester enumeration object
	❑ Attribute-id: MDC_ATTR_ENUM_OBS_VAL_SIMP_OID (2633)
	❑ Attribute-type: OID-Type(INT-U16)
	❑ Attribute-value: MDC_CTXT_GLU_TESTER_LAB (29288) or 3 (dec)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with an Enum-Observed-Value-Simple-OID attribute value. Check OBX-2 = CWE AND OBX-5 = 8417896^MDC_CTXT_GLU_TESTER _LAB^MDC

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-069		
TP label		Whitepaper. Glucosemeter Context Tester Enumeration Object value		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	GL Enumeration 19; M	GL Enumeration 20; M	Date-Time Conv 1; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_007 AND C_MAN_BLE_015		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		
		   a. Glucose measurement (0x2A18)
		
		   b. Glucose measurement context (0x2A34)
		
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		
		4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test. The measurement of interest for this test case are:
		
		   a. Glucose measurement (0x2A18)
		
		      i. Field: Flags
		
		        • Format: 8 bit
		
		        • Value: 00010010 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location fields are included, Time Offset fields and Sensor Status Annunciation field are not included and Context Information follows
		
		      ii. Field: Sequence number
		
		        • Format: uint16
		
		        • Value: Not relevant
		
		      iii. Field: Base Time
		
		        ii. Format: Date and Time
		
		        • Value: August 2nd, 2012, 11:08:25
		
		      iv. Field: Time Offset
		
		        • This field is not included
		
		      v. Field: Glucose Concentration - units of kg/L
		
		        • Format: SFLOAT
		
		        • Value: Not relevant
		
		      vi. Field: Glucose Concentration - units of mol/L
		
		        • This field is not included
		
		      vii. Field: Type
		
		        • Format: nibble
		
		        • Value: Not relevant
		
		      viii. Field: Sample Location
		
		        • Format: nibble
		
		        • Value: Not relevant			

   ix. Field: Sensor Status Annunciation

    • This field is not included

  b. Glucose measurement context (0x2A34)

   i. Field: Flags

    • Format: 8 bit

    • Value: 0000 0100 (MSB → LSB). Tester and Health fields are included and Carbohydrate ID, Carbohydrate, Meal, Exercise Duration and Exercise Intensity, Medication ID, Medication Value, Extended Flags and HbA1c fields are not included

   ii. Field: Sequence number

    • Format: uint16

    • Value: Not relevant

   iii. Field: Extended Flags

    • This field is not included

   iv. Field: Carbohydrate ID

    • This field is not included

   v. Field: Carbohydrate

    • This field is not included

   vi. Field: Meal

    • This field is not included

   vii. Field: Tester

    • Format: nibble

    • Value: self (0001 MSB → LSB)

   viii. Field: Health

    • Format: nibble

    • Value: Not relevant

   ix. Field: Exercise Duration

    • This field is not included

   x. Field: Exercise Intensity

    • This field is not included

   xi. Field: Medication ID

    • This field is not included

   xii. Field: Medication

    • This field is not included

   xiii. Field: HbA1c

    • This field is not included

5. Check that the manager accepts the measurement and decodes its value properly (Tester value and base time).

Pass/Fail criteria	In step 5, the manager under test shows the following Tester self (MDC_CTXT_GLU_TESTER_SELF or 29280) with the time stamp '2012-08-02 11:08:25'.
Notes	

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-070
TP label		Whitepaper. Glucosemeter Context Health Enumeration Object - Handle Attribute
Coverage	**Spec**	[Bluetooth PHDT v1.4]
	Testable items	GL Enumeration 21; O
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_016
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Glucosemeter profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		
		   a. Glucose measurement context (0x2A34)
		
		     i. Field: Flags
		       • Format: 8 bit
		       • Value: 0000 0100 (MSB → LSB). Tester-Health is included and Meal, Carbohydrate ID, Carbohydrate, Exercise Duration, Exercise Intensity, Medication ID, Medication Value and HbA1c fields are not included
		
		     ii. Field: Sequence number
		       • Format: uint16
		       • Value: Not relevant
		
		     iii. Field: Extended Flags
		       • This field is not included
		
		     iv. Field: Carbohydrate ID
		       • This field is not included
		
		     v. Field: Carbohydrate - units of kilograms
		       • This field is not included
		
		     vi. Field: Meal
		       • This field is not included
		
		     vii. Field: Tester
		       • Format: nibble
		       • Value: Not relevant
		
		     viii. Field: Health
		       • Format: nibble
		       • Value: Not relevant
		
		     ix. Field: Exercise Duration
		       • This field is not included
		
		     x. Field: Exercise Intensity
		       • This field is not included
		
		     xi. Field: Medication ID
		       • This field is not included
		
		     xii. Medication – units of kilograms
		       • This field is not included
		
		     xiii. Medication – units of litres
		       • This field is not included
		
		     xiv. Field: HbA1c
		       • This field is not included
		
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		
		4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test.
		
		5. Check in manager transcoder output for the Context health enumeration object – Handle attribute.

Pass/Fail criteria		In step 5, the Context tester enumeration object – Handle attribute is not present; however, if it is present then its value is different to 0.

Notes		Possible values in typical points of observation after transcoder output are:
		a) IEEE 11073 Objects and Attributes
		Handle attribute is not present, or if it is present then:
		  ❑ Object: Context health enumeration object
		  ❑ Attribute-id: MDC_ATTR_ID_HANDLE (2337)
		  ❑ Attribute-type: INT-U16
		  ❑ Attribute-value: Any value other than 0
		b) WAN PCD-01 message
		PCD-01 message does not include segments with a Handle attribute value.

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-071
TP label		Whitepaper. Glucosemeter Context Health Enumeration Object - Type Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Enumeration 22; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_016
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		2. The simulated agent implements several BLE characteristics. The characteristics of interest for this test case are:
		   a. Glucose measurement context (0x2A34)
		      i. Field: Flags
		         • Format: 8 bit
		         • Value: 0000 0100 (MSB → LSB). Tester-Health is included and Meal, Carbohydrate ID, Carbohydrate, Exercise Duration, Exercise Intensity, Medication ID, Medication Value and HbA1c fields are not included
		      ii. Field: Sequence number
		         • Format: uint16
		         • Value: Not relevant
		      iii. Field: Extended Flags
		         • This field is not included
		      iv. Field: Carbohydrate ID
		         • This field is not included
		      v. Field: Carbohydrate - units of kilograms
		         • This field is not included
		      vi. Field: Meal
		         • This field is not included
		      vii. Field: Tester
		         • Format: nibble
		         • Value: Not relevant
		      viii. Field: Health
		         • Format: nibble
		         • Value: Not relevant
		      ix. Field: Exercise Duration
		         • This field is not included
		      x. Field: Exercise Intensity
		         • This field is not included
		      xi. Field: Medication ID
		         • This field is not included
		      xii. Medication – units of kilograms
		         • This field is not included
		      xiii. Medication – units of litres
		         • This field is not included
		      xiv. Field: HbA1c
		         • This field is not included
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test.
		5. Check in manager transcoder output for the Context health enumeration object – Type attribute.

Pass/Fail criteria		In step 5, the Context tester enumeration object – Type attribute is present and its value is { MDC_PART_PHD_DM | MDC_CTXT_GLU_HEALTH }.

Notes		In step 5, possible values in typical points of observation after transcoder output are:
		a) IEEE 11073 Objects and Attributes
		Type attribute is present:
		  ❑ Object: Context Health object
		  ❑ Attribute-id: MDC_ATTR_ID_TYPE (2351)
		  ❑ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
		  ❑ Attribute-value:
		    • partition: MDC_PART_PHD_DM or 128 (dec) or 00 80 (hex)
		    • code: MDC_CTXT_GLU_HEALTH or 29212 (dec) or 72 1C (hex)
		b) WAN PCD-01 message
		PCD-01 message includes a segment like this with a Type attribute value (check OBX-3):
		OBX|?|CWE| 8417820 ^MDC_CTXT_GLU_HEALTH^MDC|1.0.0.7| 8417824 ^ MDC_CTXT_GLU_HEALTH_MINOR
		^MDC |||||R|||[current_date_time]

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-072
TP label		Whitepaper. Glucosemeter Context Health Enumeration Object - Metric-Spec-Small Attribute
Coverage	Spec	[Bluetooth PHDT v1.4]
	Testable items	GL Enumeration 23; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_016
Initial condition		The manager under test and the simulated agent are in the standby state.

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		   a. Glucose measurement context (0x2A34)
		      i. Field: Flags
		        • Format: 8 bit
		        • Value: 0000 0100 (MSB → LSB). Tester-Health is included and Meal, Carbohydrate ID, Carbohydrate, Exercise Duration, Exercise Intensity, Medication ID, Medication Value and HbA1c fields are not included
		      ii. Field: Sequence number
		        • Format: uint16
		        • Value: Not relevant
		      iii. Field: Extended Flags
		        • This field is not included
		      iv. Field: Carbohydrate ID
		        • This field is not included
		      v. Field: Carbohydrate - units of kilograms
		        • This field is not included
		      vi. Field: Meal
		        • This field is not included
		      vii. Field: Tester
		        • Format: nibble
		        • Value: Not relevant
		      viii. Field: Health
		        • Format: nibble
		        • Value: Not relevant
		      ix. Field: Exercise Duration
		        • This field is not included
		      x. Field: Exercise Intensity
		        • This field is not included
		      xi. Field: Medication ID
		        • This field is not included
		      xii. Medication – units of kilograms
		        • This field is not included
		      xiii. Medication – units of litres
		        • This field is not included
		      xiv. Field: HbA1c
		        • This field is not included
		3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test.
		5. Check in manager transcoder output for the Context health enumeration object – Metric-Spec-Small attribute.

Pass/Fail criteria		In step 5, the Context health enumeration object – Metric-Spec-Small attribute is present and its value is {0xF048} (mss-avail-intermittent | mss-avail-stored-data | mss-upd-aperiodic | mss-msmt-aperiodic | mss-acc-agent-initiated | mss-cat-manual).

Notes		Possible values in typical points of observation after transcoder output are:
		a) IEEE 11073 Objects and Attributes
		Metric-Spec-Small attribute is present:
		  ❑ Object: Context health enumeration object
		  ❑ Attribute-id: MDC_ATTR_METRIC_SPEC_SMALL (2630)
		  ❑ Attribute-type: BITS-16
		  ❑ Attribute-value: F0 48 (hex) or BITS mss-avail-intermittent(0), mss-avail-stored-data(1), mss-upd-aperiodic(2), mss-msmt-aperiodic(3), mss-acc-agent-initiated(9), mss-cat-manual(12) set to TRUE and remaining BITS set to FALSE
		b) WAN PCD-01 message
		PCD-01 message does not include segments with a Metric-Spec-Small attribute value.

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-073		
TP label		Whitepaper. Glucosemeter Context Health Enumeration Object - Absolute-Time-Stamp Attribute		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	GL Enumeration 24; M	Date-Time Conv 2; M	Date-Time Conv 3; M
		Date-Time Conv 4; M	Date-Time Conv 5; M	
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_016		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		 2. The simulated agent implements several BLE characteristics. The characteristics of interest for this test case are:
		    a. Glucose measurement (0x2A18)
		    b. Glucose measurement context (0x2A34)
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test. The measurement of interest for this test case are:
		    a. Glucose measurement (0x2A18)
		       i. Field: Flags
		         • Format: 8 bit
		         • Value: 00010011 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location, Time Offset fields are included. Sensor Status Annunciation field is not included. Context information follows
		       ii. Field: Sequence number
		         • Format: uint16
		         • Value: Not relevant
		       iii. Field: Base Time
		         • Format: Date and Time
		         • Value: August 2nd, 2012, 10:59:27
		       iv. Field: Time Offset
		         • Format: sint16
		         • Value: 120 minutes
		       v. Field: Glucose Concentration - units of kg/L
		         • Format: SFLOAT
		         • Value: Not relevant
		       vi. Field: Glucose Concentration - units of mol/L
		         • This field is not included
		       vii. Field: Type
		         • Format: nibble
		         • Value: Not relevant
		       viii. Field: Sample Location
		         • Format: nibble
		         • Value: Not relevant
		       ix. Field: Sensor Status Annunciation
		         • This field is not included
		    b. Glucose measurement context (0x2A34)
		       i. Field: Flags
		         • Format: 8 bit
		         • Value: 0000 0100 (MSB → LSB). Tester-Health is included and Meal, Carbohydrate ID, Carbohydrate, Exercise Duration, Exercise Intensity, Medication ID, Medication Value and HbA1c fields are not included
		       ii. Field: Sequence number
		         • Format: uint16
		         • Value: Not relevant

	iii. Field: Extended Flags
	• This field is not included
	iv. Field: Carbohydrate ID
	• This field is not included
	v. Field: Carbohydrate - units of kilograms
	• This field is not included
	vi. Field: Meal
	• This field is not included
	vii. Field: Tester
	• Format: nibble
	• Value: Not relevant
	viii. Field: Health
	• Format: nibble
	• Value: Not relevant
	ix. Field: Exercise Duration
	• This field is not included
	x. Field: Exercise Intensity
	• This field is not included
	xi. Field: Medication ID
	• This field is not included
	xii. Medication – units of kilograms
	• This field is not included
	xiii. Medication – units of litres
	• This field is not included
	xiv. Field: HbA1c
	• This field is not included
	5. Check in manager transcoder output for the Context health enumeration object – Absolute-Time-Stamp attribute.
Pass/Fail criteria	In step 5, the Context health enumeration object – Absolute-Time-Stamp attribute is present, its value matches with the Time Stamp field in conjunction with the Time Offset field of the Glucose measurement characteristic and the fraction of seconds is set to 0.

Notes	Possible values in typical points of observation after transcoder output are:
	 a) IEEE 11073 Objects and Attributes
	 Absolute-Time-Stamp attribute is present:
	     ❑ Object: Context tester enumeration object
	     ❑ Attribute-id: MDC_ATTR_TIME_STAMP_ABS (2448)
	     ❑ Attribute-type: SEQUENCE {century (INT-U8), year (INT-U8), month (INT-U8), day (INT-U8), hour (INT-U8), minute (INT-U8), second (INT-U8), sec-fractions (INT-U8)} (BCD encoding)
	     ❑ Attribute-value:
	      • century: 20 (hex) or 32 (dec)
	      • year: 12 (hex) or 18 (dec)
	      • month: 08 (hex) or 8 (dec)
	      • day: 02 (hex) or 2 (dec)
	      • hour: 12 (hex) or 18 (dec)
	      • minute: 59 (hex) or 89 (dec)
	      • second: 27 (hex) or 39 (dec)
	      • sec-fractions: 00 (hex) or 0 (dec)
	 b) WAN PCD-01 message
	 PCD-01 message includes a segment like this with Absolute-Time-Stamp attribute value:
	 OBX|?|CWE| 8417820^MDC_CTXT_GLU_HEALTH^MDC|1.0.0.7|
	 8417824^MDC_CTXT_GLU_HEALTH_MINOR^MDC|||||R|||20120802125927+0000

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-074		
TP label		Whitepaper. Glucosemeter Context Health Enumeration Object - Enum-Observed-Value-Simple-OID Attribute		
Coverage	**Spec**	[Bluetooth PHDT v1.4]		
	Testable items	GL Enumeration 25; M		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_016		
Initial condition		The manager under test and the simulated agent are in the standby state.		
Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable). 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement context (0x2A34) i. Field: Flags • Format: 8 bit • Value: 0000 0100 (MSB → LSB). Tester-Health is included and Meal, Carbohydrate ID, Carbohydrate, Exercise Duration, Exercise Intensity, Medication ID, Medication Value and HbA1c fields are not included ii. Field: Sequence number • Format: uint16 • Value: Not relevant iii. Field: Extended Flags • This field is not included iv. Field: Carbohydrate ID • This field is not included v. Field: Carbohydrate - units of kilograms • This field is not included vi. Field: Meal • This field is not included vii. Field: Tester • Format: nibble • Value: Not relevant viii. Field: Health • Format: nibble • Value: Several values are checked in this test case ix. Field: Exercise Duration • This field is not included x. Field: Exercise Intensity • This field is not included xi. Field: Medication ID • This field is not included xii. Medication – units of kilograms • This field is not included xiii. Medication – units of litres		

- This field is not included

xiv. Field: HbA1c

- This field is not included

3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).

4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context [Health field set to 0x01 = Minor health issues] to the manager under test.

5. Check in manager transcoder output for the Context HealthEnumeration object - Enum-Observed-Value-Simple-OID attribute.

6. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement context [Health field set to 0x02 = Major Health Issues] to the manager under test.

7. Check in manager transcoder output for the Context HealthEnumeration object - Enum-Observed-Value-Simple-OID attribute.

8. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement context [Health field set to 0x03 = Menses] to the manager under test.

9. Check in manager transcoder output for the Context HealthEnumeration object - Enum-Observed-Value-Simple-OID attribute

10. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement context [Health field set to 0x04 = Under stress] to the manager under test.

11. Check in manager transcoder output for the Context health enumeration object - Enum-Observed-Value-Simple-OID attribute.

12. The manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement context [Health field set to 0x05 = No health issues] to the manager under test.

13. Check in manager transcoder output for the Context health enumeration object - Enum-Observed-Value-Simple-OID attribute.

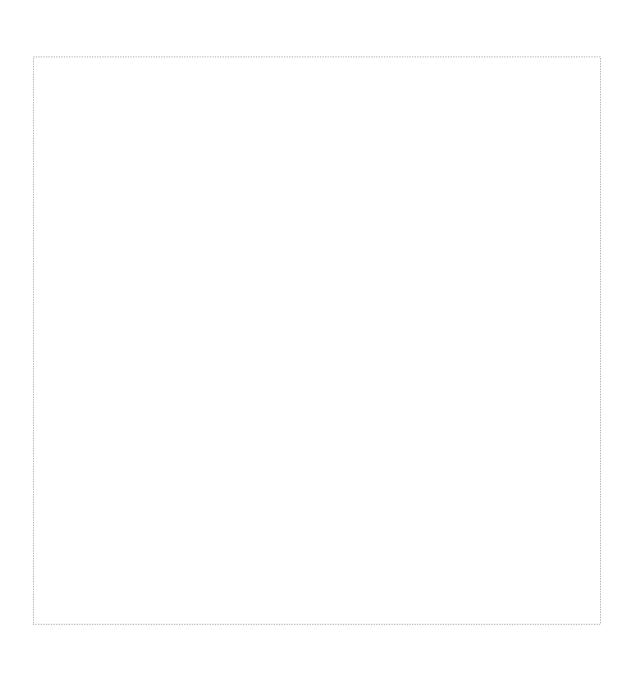|	
Pass/Fail criteria	In step 5, the Context health enumeration object - Enum-Observed-Value-Simple-OID attribute is present and its value matches with the Context Health Value field of the Glucose measurement context characteristic: 0x1 (Minor health issues). In step 7, the Context health enumeration object - Enum-Observed-Value-Simple-OID attribute is present and its value matches with the Context Health Value field of the Glucose measurement context characteristic: 0x2 (Major health issues). In step 9, the Context health enumeration object - Enum-Observed-Value-Simple-OID attribute is present and its value matches with the Context Health Value field of Glucose measurement context characteristic: 0x3 (Menses). In step 11, the Context health enumeration object - Enum-Observed-Value-Simple-OID attribute is present and its value matches with the Context Health Value field of Glucose measurement context characteristic: 0x4 (Under stress). In step 13, the Context health enumeration object - Enum-Observed-Value-Simple-OID attribute is present and its value matches with the Context Health Value field of Glucose measurement context characteristic: 0x5 (No health issues).

Notes	In step 5, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Enum-Observed-Value-Simple-OID attribute is present:
	❑ Object: Context health enumeration object
	❑ Attribute-id: MDC_ATTR_ENUM_OBS_VAL_SIMP_OID (2633)
	❑ Attribute-type: OID-Type(INT-U16)
	❑ Attribute-value: MDC_CTXT_GLU_HEALTH_MINOR (29216) or 1 (dec)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with an Enum-Observed-Value-Simple-OID attribute value. Check OBX-2 = CWE AND OBX-5 = 8417824^MDC_CTXT_GLU_HEALTH_MINOR^MDC
	In step 7, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Enum-Observed-Value-Simple-OID attribute is present:
	❑ Object: Context HealthEnumeration object
	❑ Attribute-id: MDC_ATTR_ENUM_OBS_VAL_SIMP_OID (2633)
	❑ Attribute-type: OID-Type(INT-U16)
	❑ Attribute-value: MDC_CTXT_GLU_HEALTH_MAJOR (29220)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with an Enum-Observed-Value-Simple-OID attribute value. Check OBX-2 = CWE AND OBX-5 = 8417828^MDC_CTXT_GLU_HEALTH_MAJOR^MDC
	In step 9, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Enum-Observed-Value-Simple-OID attribute is present:
	❑ Object: Context HealthEnumeration object
	❑ Attribute-id: MDC_ATTR_ENUM_OBS_VAL_SIMP_OID (2633)
	❑ Attribute-type: OID-Type(INT-U16)
	❑ Attribute-value: MDC_CTXT_GLU_HEALTH_MENSES(29224)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with an Enum-Observed-Value-Simple-OID attribute value. Check OBX-2 = CWE AND OBX-5 = 8417832^MDC_CTXT_GLU_HEALTH_MENSES^MDC
	In step 11, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Enum-Observed-Value-Simple-OID attribute is present:
	❑ Object: Context health enumeration object
	❑ Attribute-id: MDC_ATTR_ENUM_OBS_VAL_SIMP_OID (2633)
	❑ Attribute-type: OID-Type(INT-U16)
	❑ Attribute-value: MDC_CTXT_GLU_HEALTH_STRESS (29228)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with an Enum-Observed-Value-Simple-OID attribute value. Check OBX-2 = CWE AND OBX-5 = 8417836^MDC_CTXT_GLU_HEALTH_STRESS^MDC
	In step 13, possible values in typical points of observation after transcoder output are:
	a) IEEE 11073 Objects and Attributes
	Enum-Observed-Value-Simple-OID attribute is present:
	❑ Object: Context health enumeration object
	❑ Attribute-id: MDC_ATTR_ENUM_OBS_VAL_SIMP_OID (2633)
	❑ Attribute-type: OID-Type(INT-U16)
	❑ Attribute-value: MDC_CTXT_GLU_HEALTH_NONE (29232)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with an Enum-Observed-Value-Simple-OID attribute value. Check OBX-2 = CWE AND OBX-5 = 8417840^MDC_CTXT_GLU_HEALTH_NONE^MDC

TP Id		TP/LP-PAN/MAN/PHDTW/GL/BV-075		
TP label		Whitepaper. Glucosemeter Context Health Enumeration Object value		
Coverage	Spec	[Bluetooth PHDT v1.4]		
	Testable items	GL Enumeration 24; M	GL Enumeration 25; M	Date-Time Conv 1; M
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_007 AND C_MAN_BLE_016		
Initial condition		The manager under test and the simulated agent are in the standby state.		

Test procedure		1. The simulated agent is configured with a Glucose profile (device specialization); it has a measurement ready to be sent and it is in the advertising state (it is discoverable).
		
		 2. The simulated agent implements several BLE characteristics. The characteristic of interest for this test case is:
		
		   a. Glucose measurement (0x2A18)
		
		   b. Glucose measurement context (0x2A34)
		
		 3. The manager under test initiates a discovery process (scanning state). It discovers the simulated agent and it starts a pairing process with the simulated agent (initiating state).
		
		 4. When the pairing has been completed (connection state), the manager under test requests the simulated agent to report stored records writing an operation in Record Access Control Point (RACP) and the simulated agent sends a Glucose measurement followed by the Glucose measurement context to the manager under test. The measurement of interest for this test case are:
		
		   a. Glucose measurement (0x2A18)
		
		     i. Field: Flags
		       • Format: 8 bit
		       • Value: 00010010 (MSB → LSB). Glucose concentration in units of kg/L, Type and Sample Location fields are included, Time Offset fields and Sensor Status Annunciation field are not included and Context Information follows
		
		     ii. Field: Sequence number
		       • Format: uint16
		       • Value: Not relevant
		
		     iii. Field: Base Time
		       iii. Format: Date and Time
		       • Value: August 2nd, 2012, 11:08:25
		
		     iv. Field: Time Offset
		       • This field is not included
		
		     v. Field: Glucose Concentration - units of kg/L
		       • Format: SFLOAT
		       • Value: Not relevant
		
		     vi. Field: Glucose Concentration - units of mol/L
		       • This field is not included
		
		     vii. Field: Type
		       • Format: nibble
		       • Value: Not relevant
		
		     viii. Field: Sample Location
		       • Format: nibble
		       • Value: Not relevant			

ix.   Field: Sensor Status Annunciation

- This field is not included

b.   Glucose measurement context (0x2A34)

i.   Field: Flags

- Format: 8 bit

- Value: 0000 0100 (MSB → LSB). Tester and Health fields are included and Carbohydrate ID, Carbohydrate, Meal, Exercise Duration and Exercise Intensity, Medication ID, Medication Value, Extended Flags and HbA1c fields are not included

ii.   Field: Sequence number

- Format: uint16

- Value: Not relevant

iii.   Field: Extended Flags

- This field is not included

iv.   Field: Carbohydrate ID

- This field is not included

v.   Field: Carbohydrate

- This field is not included

vi.   Field: Meal

- This field is not included

vii.   Field: Tester

- Format: nibble

- Value: Not relevant

viii.   Field: Health

- Format: nibble

- Value: minor health issues (0001 MSB → LSB)

ix.   Field: Exercise Duration

- This field is not included

x.   Field: Exercise Intensity

- This field is not included

xi.   Field: Medication ID

- This field is not included

xii.   Field: Medication

- This field is not included

xiii.   Field: HbA1c

- This field is not included

5.   Check that the manager accepts the measurement and decodes its value properly (Health value and base time).

Pass/Fail criteria	In step 5, the manager under test shows the following Health minor health issues (MDC_CTXT_GLU_HEALTH_MINOR or 29216) with the time stamp '2012-08-02 11:08:25'.
Notes	

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