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SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

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Conformance of ITU-T H.810 personal health system: Personal Health Devices interface Part 10D: Transcoding for Bluetooth Low Energy: Personal Health Gateway – Glucose meter

Recommendation ITU-T H.850.4

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Recommendation ITU-T H.850.4

Conformance of ITU-T H.810 personal health system: Personal Health Devices interface Part 10D: Transcoding for Bluetooth Low Energy: Personal Health Gateway – Glucose meter

Summary

Recommendation ITU-T H.850.4 provides a test suite structure (TSS) and the test purposes (TP) for the transcoding of glucose meter data by personal health gateways in the Personal Health Devices (PHD) interface of application-level data between the Bluetooth Low Energy Bluetooth Generic Attribute Profile (GATT) format and the IEEE 11073-20601 data format, of which Recommendation ITU-T H.810 (2016) is the base Recommendation. The objective of this test specification is to provide a high probability of interoperability at this interface.

Recommendation ITU-T H.850.4 is a transposition of clause 3.6 of Continua Test Tool DG2016, Test Suite Structure & Test Purposes, Personal Health Devices Interface; Part 10: PHD Transcoding Whitepaper. Personal Health Gateway (Version 1.7, 2017-07-18), that was developed by the Personal Connected 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.850.4	2017-04-29	16	11.1002/1000/13357
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Keywords

Bluetooth Generic Attribute Profile, Bluetooth Low Energy (BLE), Conformance testing, Continua Design Guidelines, data format transcoding, e-health, glucose meter, IEEE 11073-20601, ITU-T H.810, personal area network, personal connected health devices, Personal Health Devices interface, Personal Health Gateway, touch area network.

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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/11.1002/1000/11830-en.

FOREWORD

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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/.

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Electronic attachment: 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.

Introduction

This Recommendation is a transposition of clause 3.6 of Continua Test Tool DG2016, Test Suite Structure & Test Purposes, Personal Health Devices Interface; Part 10: PHD Transcoding Whitepaper. Personal Health Gateway (Version 1.7, 2017-07-18), that was developed by the Personal Connected Health Alliance. The table below shows the revision history of this test specification; it may contain versions that existed before transposition.

Version	Date	Revision history
1.0	2012-10-05	Initial release for Test Tool DG2011 based on the requirements in [b-CDG 2011].
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 adds new features included in [b-CDG 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 adds new features included in [b-ITU-T H.810 (2013)]/[b-CDG 2013]: • Adds glucose meter BLE • Adds BLE SSP support • Adds NFC new transport • Adds INR device specialization
1.3	2014-04-24	TM Lite & Doc Enhancements (Test Tool v4.0 Maintenance Release 1). It uses "TSS&TP_DG2013_LP-PAN_PART_10_v1.2.doc" as a baseline and adds new features included in Documentation Enhancements: • "Other PICS" row has been added
1.4	2015-07-01	Initial release for Test Tool DG2015. It uses "TSS&TP_DG2013_LP-PAN_PART_10_v1.3.doc" as a baseline and adds new features included in [b-ITU-T H.810 (2015)]/[b-CDG 2015]: • Adds WS/BCA BLE device specialization • Adds SABTE IEEE device specialization
1.5	2016-01-26	First maintenance release for Test Tool DG2015. It uses "TSS&TP_DG2015_LP-PAN_PART_10_v1.4.doc" as a baseline and adds some updates according to the Maintenance 2015 activity.
1.6	2016-09-20	Initial release for Test Tool DG2016. It uses "TSS&TP_DG2016_LP-PAN_PART_10_v1.5.doc" as a baseline and adds new features included in [ITU-T H.810 (2016)]/[b-CDG 2016]: • Adds PLX BLE device specialization • Adds PLX CGM device specialization
1.7	2017-07-18	Second Maintenance Release for Test Tool DG2016. It uses "TSS&TP_DG2016_LP-PAN_PART_10_v1.6.doc" as a baseline and corrects minor typos.
1.8	2020-06-02	Updates related to the value of the Reg-Cert-Data-List according to [b-CDG 2017].

Recommendation ITU-T H.850.4

Conformance of ITU-T H.810 personal health system: Personal Health Devices interface Part 10D: Transcoding for Bluetooth Low Energy: Personal Health Gateway – Glucose meter

1 Scope

The scope of this Recommendation[1] is to provide a test suite structure (TSS) and the test purposes (TP) for the Personal Health Devices interface based on the requirements defined in the Continua Design Guidelines (CDG) [ITU-T H.810 (2016)]. The objective of this test specification is to provide a high probability of interoperability at this interface.

The TSS and TP for the Personal Health Devices interface have been divided into the parts specified below. This Recommendation covers Part 10D.

– Part 1: Optimized exchange protocol. Personal Health Device
– Part 2: Optimized exchange protocol. Personal Health Gateway
– Part 3: Continua design guidelines. Personal Health Device
– Part 4: Continua design guidelines. Personal Health Gateway
– Part 5: Device specializations. Personal Health Devices interface. This document is divided into the following 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
  - Part 5K: Peak expiratory flow monitor
  - Part 5L: Body composition analyser
  - Part 5M: Basic electrocardiograph
  - Part 5N: International normalized ratio monitor
  - Part 5O: Sleep apnoea breathing therapy equipment (SABTE)
  - Part 5P: Continuous glucose monitor (CGM)
– Part 6: Device specializations. Personal Health Gateway
– Part 7: Continua Design Guidelines. BLE Personal Health Device
– Part 8: Continua Design Guidelines. BLE Personal Health Gateway

[1] 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.

– Part 9: Personal Health Devices Transcoding Whitepaper. Personal Health Devices

– Part 10: Personal Health Devices Transcoding Whitepaper. Personal Health Gateway. In addition to the main part, the document is subdivided in the following subparts:

  - Part 10A: Whitepaper Thermometer requirements
  - Part 10B: Whitepaper Blood pressure requirements
  - Part 10C: Whitepaper Heart rate requirements
  - **Part 10D: Whitepaper Glucose meter requirements**
  - Part 10E: Whitepaper Weighing scales requirements
  - Part 10F: Whitepaper Pulse oximeter requirements
  - Part 10G: Whitepaper Continuous glucose monitoring requirements

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 (2016)] Recommendation ITU-T H.810 (2016), *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

[Bluetooth PHDT v1.5] Bluetooth SIG (2014), *Personal Health Devices Transcoding White Paper, v1.5*. https://www.bluetooth.org/DocMan/handlers/DownloadDoc.ashx?doc_id=272346

[Bluetooth PHDT v1.6] Bluetooth SIG (2015), *Personal Health Devices Transcoding White Paper, v1.6*. https://www.bluetooth.org/DocMan/handlers/DownloadDoc.ashx?doc_id=310657

[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 [ISO/IEEE 11073-20601-2015A], where xx can be any number from 01 to 99, inclusive.

[ISO/IEEE 11073-20601-2015A] ISO/IEEE 11073-20601:2010, *Health informatics – Personal health device communication – Part 20601: Application profile – Optimized exchange protocol,* including ISO/IEEE 11073-20601:2010 Amd 1:2015. https://www.iso.org/standard/54331.html with https://www.iso.org/standard/63972.html

[ISO/IEEE 11073-20601-2016C] ISO/IEEE 11073-20601:2016, *Health informatics – Personal health device communication – Part 20601: Application profile – Optimized exchange protocol,* including ISO/IEEE 11073-20601:2016/Cor.1:2016.

https://www.iso.org/standard/66717.html with
https://www.iso.org/standard/71886.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

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

3.1.1 agent [ISO/IEEE 11073-20601-2016C]: A node that collects and transmits personal health data to an associated manager.

3.1.2 manager [ISO/IEEE 11073-20601-2016C]: 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

CGM Continuous Glucose Monitor

DUT Device Under Test

GUI Graphical User Interface

INR International Normalized Ratio

IP Insulin Pump

IUT Implementation Under Test

LSB Least Significant Bit

MDS Medical Device System

MSB Most Significant Bit

NFC Near Field Communication

PAN Personal Area Network

PCD Patient Care Device

PCO Point of Control and Observation

PCT Protocol Conformance Testing

PHD Personal Health Device

PHDC Personal Healthcare Device Class

PHG Personal Health Gateway

PICS Protocol Implementation Conformance Statement

PIXIT Protocol Implementation extra Information for Testing

RACP Record Access Control Point

SABTE Sleep Apnoea Breathing Therapy Equipment

SCR Static Conformance Review

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 Recommendation 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.

In this document, hexadecimal numbers are denoted either with the prefix "0x" or by "(hex)" after the number; "(dec)" after a number indicates it is expressed in decimal format.

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 release	Transposed as	Version	Description	Designation
2016 plus errata	[ITU-T H.810 (2016)]	6.1	Release 2016 plus errata noting all ratified bugs [b-CDG 2016].	–
2016	–	6.0	Release 2016 of the CDG including maintenance updates of the CDG 2015 and additional guidelines that cover new functionalities.	Iris
2015 plus errata	[b-ITU-T H.810 (2015)]	5.1	Release 2015 plus errata noting all ratified bugs [b-CDG 2015]. The 2013 edition of ITU-T H.810 is split into eight parts in the ITU-T H.810-series.	–
2015	–	5.0	Release 2015 of the CDG including maintenance updates of the CDG 2013 and additional guidelines that cover new functionalities.	Genome
2013 plus errata	[b-ITU-T H.810 (2013)]	4.1	Release 2013 plus errata noting all ratified bugs [b-CDG 2013].	–
2013	–	4.0	Release 2013 of the CDG including maintenance updates of the CDG 2012 and additional guidelines that cover new functionalities.	Endorphin
2012 plus errata	–	3.1	Release 2012 plus errata noting all ratified bugs [b-CDG 2012].	–
2012	–	3.0	Release 2012 of the CDG including maintenance updates of the 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 the 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 the 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 Personal Health Devices interface have been divided into the groups and subgroups specified below. Annex A describes the TPs for subgroup 2.4.5 (shown in bold).

– Group 1: Personal Health Device (PHD)
  - 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: IEEE 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)
    - 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)
    - Subgroup 1.3.15: Sleep apnoea breathing therapy equipment (SABTE)
    - Subgroup 1.3.16: Continuous glucose monitor (CGM)
  - Group 1.4: Personal health device transcoding whitepaper (PHDTW)
    - Subgroup 1.4.1: Whitepaper general requirements (GEN)
    - Subgroup 1.4.2: Whitepaper thermometer requirements (TH)
    - Subgroup 1.4.3: Whitepaper blood pressure requirements (BPM)
    - Subgroup 1.4.4: Whitepaper heart rate requirements (HR)
    - Subgroup 1.4.5: Whitepaper glucose meter requirements (GL)
    - Subgroup 1.4.6: Whitepaper weight scale requirements (WS)

- Subgroup 1.4.7: Whitepaper pulse oximeter requirements (PLX)
- Subgroup 1.4.8: Whitepaper continuous glucose monitoring requirements (CGM)

– Group 2: Personal Health Gateway (PHG)

- 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: IEEE 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)
  - 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)
  - Subgroup 2.3.15: Sleep apnoea breathing therapy equipment (SABTE)
  - Subgroup 2.3.16: Continuous glucose monitor (CGM)
- Group 2.4: Personal health device transcoding whitepaper (PHDTW)
  - Subgroup 2.4.1: Whitepaper general requirements (GEN)
  - Subgroup 2.4.2: Whitepaper thermometer requirements (TH)
  - Subgroup 2.4.3: Whitepaper blood pressure measurement requirements (BPM)
  - Subgroup 2.4.4: Whitepaper heart rate requirements (HR)
  - **Subgroup 2.4.5**: **Whitepaper glucose meter requirements (GL)**
  - Subgroup 2.4.6: Whitepaper weight scale requirements (WS)

- Subgroup 2.4.7: Whitepaper pulse oximeter requirements (PLX)
- Subgroup 2.4.8: Whitepaper continuous glucose monitoring requirements (CGM)

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 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 (TPs) 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.
  - PHD: Personal Health Device
  - PHG: Personal Health Gateway
- <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 the 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.).

– **Other PICS**: This contains additional PICS items (apart from the PICS specified in the Applicability row) which are used within the test case implementation and can modify the final verdict. When this row is empty, it means that only the PICS specified in the Applicability row are used within the test case implementation.

– **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 2.4.5 – Whitepaper Glucose meter requirements (GL)

TP Id		TP/LP-PAN/PHG/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		
Test purpose		Check that: PHG does not include MDS object, System-Type attribute in transcoder output.		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 3. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends the measurement to the PHG under test. 4. Check in PHG 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/PHG/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		
Test purpose		Check that: PHG includes MDS object, Dev-Configuration-Id attribute in transcoder output. [AND] Dev-Configuration-Id value is set to any value in range of 0x4000 to 0x7FFF (Extended Configuration)		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		

Test procedure	1. The simulated PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 3. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends the measurement to the PHG under test. 4. Check in PHG 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 [b-ITU-T H.810 (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/PHG/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	
Test purpose		Check that: PHG includes MDS object, System-Type-Spec-List attribute in transcoder output. [AND] System-Type-Spec-List is set to (MDC_DEV_SPEC_PROFILE_GLUCOSE, Version 2)		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 3. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends the measurement to the PHG under test. 4. Check in PHG 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 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/PHG/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	
Test purpose		Check that: PHG transcodes IEEE 11073-20601 Regulatory Certification Data List characteristic into MDS object, Reg-Cert-Data-List attribute		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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 08 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: 08 (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 PHG under test initiates a discovery process (Scanning state). It discovers the		

	simulated PHD and it starts a pairing process with the simulated PHD. 4. When the pairing has been completed (Connection state), force the PHG under test to read the IEEE 11073-20601 Regulatory Certification Data List characteristic. 5. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and simulated PHD sends the measurement to the PHG under test. 6. Check in PHG 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 08 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: 08 (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|6.1|||||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/PHG/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		
Test purpose		Check that: PHG does not include Blood Glucose object, Handle Attribute in transcoder output [OR] If PHG includes Blood Glucose object, Handle attribute in transcoder output, then its value shall be different than 0		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state).		

	4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends the measurement to the PHG under test. 5. Check in PHG 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/PHG/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		
Test purpose		Check that: PHG includes Blood Glucose object, Type attribute in transcoder output. [AND] Type is set to different values depending on Type field value		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends the measurement to the PHG under test with the field Type set to Capillary Whole blood (0x01). 5. Check in PHG transcoder output for the Blood glucose object, Type. 6. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends the measurement to the PHG under test with field Type set to Capillary Plasma (0x02). 7. Check in PHG transcoder output for the Blood glucose object, Type. 8. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends the measurement to the PHG under test with field Type set to Venous Whole blood (0x03). 9. Check in PHG transcoder output for the Blood glucose object, Type. 10. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends the measurement to the PHG under test with field Type set to Venous Plasma (0x04). 11. Check in PHG transcoder output for the Blood glucose object, Type. 12. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends the measurement to the PHG under test with field Type set to Arterial Whole blood (0x05). 13. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the Check in PHG transcoder output for the Blood glucose object, Type. 14. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends the measurement to the PHG under test with field Type set to Arterial Plasma (0x06). 15. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the Check in PHG transcoder output for the Blood glucose object, Type. 16. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends the measurement to the PHG under test with field Type set to Undetermined

	Whole blood (0x07). 17. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the Check in PHG transcoder output for the Blood glucose object, Type. 18. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends the measurement to the PHG under test with field Type set to Undetermined Plasma (0x08). 19. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the Check in PHG transcoder output for the Blood glucose object, Type. 20. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends the measurement to the PHG under test with field Type set to Interstitial Fluid (ISF) (0x09). 21. Check in PHG transcoder output for the Blood glucose object, Type. 22. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends the measurement to the PHG under test with field Type set to Control Solution (0x0A). 23. Check in PHG 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/PHG/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		
Test purpose		Check that: PHG includes Blood Glucose Numeric object, Metric-Spec-Small attribute in transcoder output. [AND] Metric-Spec-Small is set to {0xF040} (mss-avail-intermittent |mss-avail-stored-data | mss-upd-aperiodic | mss-msmt-aperiodic | mss-acc-agent-initiated).		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007		
Other PICS				

Initial condition	The PHG under test and the simulated PHD are in the Standby state.
Test procedure	1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends the measurement to the PHG under test. 5. Check in PHG 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/PHG/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		
Test purpose		Check that: PHG includes Blood Glucose object, Unit-Code attribute in transcoder output. [AND] IF Glucose Concentration Value (kg/L) field of Glucose Measurement characteristic is present THEN Blood Glucose object, Unit-Code attribute is set to MDC_DIM_MILLI_G_PER_DL [AND] IF Glucose Concentration Value (mol/L or mmol/L) field of Glucose Measurement characteristic is present THEN Blood Glucose object, Unit-Code attribute is set to MDC_DIM_MILLI_MOLE_PER_L		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement (0x2A18) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends the measurement to the PHG 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 PHG transcoder output for the Blood glucose object, Unit-Code attribute. 6. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends the measurement to the PHG 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 PHG 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|9266866^MDC_DIM_MILLI_MOLE_PER_L^MDC||||R|||[current_date_time]

TP Id		TP/LP-PAN/PHG/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	
Test purpose		Check that: PHG transcodes Base Time field in conjunction with Time Offset field of Glucose Measurement characteristic into Blood Glucose Object - Absolute-Time-Stamp attribute [AND] PHG transcodes the Bluetooth Base Time field in conjunction with Time Offset field format to Absolute Time format [AND] The fraction of seconds in Absolute Time at transcoder output is 0		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007		

Other PICS	
Initial condition	The PHG under test and the simulated PHD are in the Standby state.
Test procedure	1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement (0x2A18) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends the measurement to the PHG 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 PHG 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/PHG/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	
Test purpose		Check that: PHG transcodes Glucose Concentration Value field of Glucose Measurement characteristic into Blood Glucose Object - Basic-Nu-Observed-Value attribute		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement (0x2A18) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends the measurement to the PHG 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 PHG transcoder output for the Blood glucose object– Basic-Nu-Observed-Value attribute. 6. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends the measurement to the PHG 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 PHG 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/PHG/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
Test purpose		Check that: PHG transcodes Glucose Concentration field of Glucose Measurement characteristic into Blood Glucose object, Basic-Nu-Observed-Value attribute [AND] PHG assigns the following special values: NaN (0x07FF), NRes (0x0800), +INFINITY (0x07FE) and -INFINITY (0x0802)		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement (0x2A18) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends the measurement to the PHG 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 PHG transcoder output for the Blood glucose object, Basic-Nu-Observed-Value attribute.
6. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends the measurement to the PHG 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 PHG transcoder output for the Blood glucose object, Basic-Nu-Observed-Value attribute.
8. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends the measurement to the PHG 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 PHG transcoder output for the Blood glucose object, Basic-Nu-Observed-Value attribute. 10. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends the measurement to the PHG 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 PHG transcoder output for the Blood glucose object, Basic-Nu-Observed-Value attribute. 12. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends the measurement to the PHG 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 PHG 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 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 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/PHG/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		
Test purpose		Check that: PHG processes correctly the Glucose Measurement Value (kg/L), Glucose Measurement Value (mol/L) and Base Time fields of Glucose Measurement characteristic		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_007		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement (0x2A18) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends the measurement to the PHG 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 PHG under test accepts the measurement and decodes its value properly (glucose measurement value, glucose units and base time).

6. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends the measurement to the PHG 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 PHG 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 PHG 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 PHG 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/PHG/PHDTW/GL/BV-012		
TP label		Whitepaper. Glucosemeter HbA1c Object - Handle Attribute		
Coverage	**Spec**	[Bluetooth PHDT v1.4]		
	Testable items	GL Numeric 7; O		
Test purpose		Check that: PHG does not include HbA1c object, Handle Attribute in transcoder output [OR] If PHG includes HbA1c object, Handle attribute in transcoder output, then its value shall be different than 0		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_008		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG under test. 5. Check in PHG 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/PHG/PHDTW/GL/BV-013		
TP label		Whitepaper. Glucosemeter HbA1c Object - Type Attribute		
Coverage	**Spec**	[Bluetooth PHDT v1.4]		
	Testable items	GL Numeric 8; M		
Test purpose		Check that: PHG includes HbA1c object, Type attribute in transcoder output. [AND]		

	Type is set to { MDC_PART_SCADA | MDC_CONC_HBA1C}
Applicability	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_008
Other PICS	
Initial condition	The PHG under test and the simulated PHD are in the Standby state.
Test procedure	1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose

	measurement followed by the Glucose measurement context to the PHG under test. 5. Check in PHG 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/PHG/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		
Test purpose		Check that: PHG includes HbA1c Numeric object, Metric-Spec-Small attribute in transcoder output. [AND] Metric-Spec-Small is set to {0xF048} (mss-avail-intermittent | mss-avail-stored-data | mss-upd-aperiodic | mss-msmt-aperiodic | mss-acc-agent-initiated | mss-cat-manual).		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_008		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 5. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG under test. 6. Check in PHG 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/PHG/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		
Test purpose		Check that: PHG includes HbA1c object, Unit-Code attribute in transcoder output. [AND] HbA1c object, Unit-Code attribute is set to MDC_DIM_PERCENT		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_008		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement context (0x2A34) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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 PHG 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/PHG/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	
Test purpose		Check that: PHG transcodes Base Time field in conjunction with Time Offset field of Glucose Measurement characteristic into HbA1c Object - Absolute-Time-Stamp attribute [AND] PHG transcodes the Bluetooth Base Time field in conjunction with Time Offset field format to Absolute Time format [AND] The fraction of seconds in Absolute Time at transcoder output is 0		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_008		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristics of		

	interest for this test case are: a. Glucose measurement (0x2A18) b. Glucose measurement context (0x2A34) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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: 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 PHG 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/PHG/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	
Test purpose		Check that: PHG transcodes HbA1c field of Glucose Measurement Context characteristic into HbA1c Object - Basic-Nu-Observed-Value attribute		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_008		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement context (0x2A34) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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 PHG 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/PHG/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
Test purpose		Check that: PHG transcodes HbA1c field of Glucose Measurement Context characteristic into HbA1c object, Basic-Nu-Observed-Value attribute [AND] PHG assigns the following special values: NaN (0x07FF), NRes (0x0800), +INFINITY (0x07FE) and -INFINITY (0x0802)		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_008		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristic of		

	interest for this test case is: a. Glucose measurement context (0x2A34) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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 PHG transcoder output for the HbA1c object, Basic-Nu-Observed-Value attribute. 6. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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 PHG transcoder output for the HbA1c object, Basic-Nu-Observed-Value attribute. 8. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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 PHG transcoder output for the HbA1c object, Basic-Nu-Observed-Value attribute. 10. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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 PHG transcoder output for the HbA1c object, Basic-Nu-Observed-Value attribute. 12. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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 PHG 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 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 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/PHG/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		
Test purpose		Check that: PHG processes correctly the HbA1c Value (%) and Base Time fields of Glucose Measurement Context characteristic		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_007 AND C_MAN_BLE_008		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement (0x2A18) b. Glucose measurement context (0x2A34) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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 PHG accepts the measurement and decodes its value properly (HbA1c value, HbA1c units and base time).
Pass/Fail criteria	In step 5, the PHG under test shows the following HbA1c 5.1 % with the time stamp '2012-08-02 11:08:25'.
Notes	

TP Id		TP/LP-PAN/PHG/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		
Test purpose		Check that: PHG does not include Context Exercise object, Handle Attribute in transcoder output [OR] If PHG includes Context Exercise object, Handle attribute in transcoder output, then its value shall be different than 0		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_009		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG under test. 5. Check in PHG 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/PHG/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		
Test purpose		Check that: PHG includes Context Exercise object, Type attribute in transcoder output. [AND] Type is set to { MDC_PART_PHD_DM | MDC_CTXT_GLU_EXERCISE}		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_009		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG under test. 5. Check in PHG 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/PHG/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		
Test purpose		Check that: PHG includes Context Exercise Numeric object, Metric-Spec-Small attribute in transcoder output. [AND] Metric-Spec-Small is set to {0xF048} (mss-avail-intermittent | mss-avail-stored-data | mss-		

	upd-aperiodic | mss-msmt-aperiodic | mss-acc-agent-initiated | mss-cat-manual).
Applicability	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_009
Other PICS	
Initial condition	The PHG under test and the simulated PHD are in the Standby state.
Test procedure	1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose

	measurement followed by the Glucose measurement context to the PHG under test. 5. Check in PHG 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/PHG/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		
Test purpose		Check that: PHG includes Context Exercise object, Unit-Code attribute in transcoder output. [AND] Context Exercise object, Unit-Code attribute is set to MDC_DIM_PERCENT		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_009		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement context (0x2A34) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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 PHG 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/PHG/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	
Test purpose		Check that: PHG transcodes Base Time field in conjunction with Time Offset field of Glucose Measurement characteristic into Context Exercise Object - Absolute-Time-Stamp attribute [AND] PHG transcodes the Bluetooth Base Time field in conjunction with Time Offset field format to Absolute Time format [AND] The fraction of seconds in Absolute Time at transcoder output is 0		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_009		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristics of interest for this test case are: a. Glucose measurement (0x2A18) b. Glucose measurement context (0x2A34) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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 PHG 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/PHG/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		
Test purpose		Check that: PHG transcodes Exercise Duration value field of Glucose Measurement Context characteristic into Context Exercise Object - Measure-Active-Period attribute		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_009		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement context (0x2A34) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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 PHG 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

TP Id		TP/LP-PAN/PHG/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	
Test purpose		Check that: PHG transcodes Exercise Intensity value field of Glucose Measurement Context characteristic into Context Exercise Object - Basic-Nu-Observed-Value attribute		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_009		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement context (0x2A34) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the simulated PHD sends the measurement to the PHG 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 PHG 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/PHG/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		
Test purpose		Check that: PHG processes correctly the Context Exercise Value (%) and Base Time fields of Glucose Measurement Context characteristic		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_007 AND C_MAN_BLE_009		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		

Test procedure	1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement (0x2A18) b. Glucose measurement context (0x2A34) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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 PHG accepts the measurement and decodes its value properly (Context exercise value, Context exercise units and base time).
Pass/Fail criteria	In step 5, the PHG under test shows the following Context exercise 33 % with the time stamp '2012-08-02 11:08:25'.
Notes	

TP Id		TP/LP-PAN/PHG/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		
Test purpose		Check that: PHG does not include Context Medication object, Handle Attribute in transcoder output [OR] If PHG includes Context Medication object, Handle attribute in transcoder output, then its value shall be different than 0		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_010		
Other PICS				

Initial condition	The PHG under test and the simulated PHD are in the Standby state.
Test procedure	1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose

	measurement followed by the Glucose measurement context to the PHG under test. 5. Check in PHG 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/PHG/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		
Test purpose		Check that: PHG includes Context Medication object, Type attribute in transcoder output. [AND] Type is set to {MDC_PART_PHD_DM | MDC_CTXT_MEDICATION}		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_010		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG under test. 5. Check in PHG 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/PHG/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		
Test purpose		Check that: PHG includes Context Medication Numeric object, Metric-Spec-Small attribute in transcoder output. [AND] Metric-Spec-Small is set to {0xF048} (mss-avail-intermittent | mss-avail-stored-data | mss-upd-aperiodic | mss-msmt-aperiodic | mss-acc-agent-initiated | mss-cat-manual).		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_010		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG under test. 5. Check in PHG 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/PHG/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		
Test purpose		Check that: PHG includes Context Medication object, Metric-Id attribute in transcoder output. [AND] Type is set to different values depending on Medication ID field value		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_010		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context (Medication ID field set to 0x01 = Rapid acting insulin) to the PHG under test. 5. Check in PHG transcoder output for the Context Medication numeric object, Metric-Id attribute. 6. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context (Medication ID field set to 0x02 = Short acting insulin) to the PHG under test. 7. Check in PHG transcoder output for the Context Medication numeric object, Metric-Id

	attribute. 8. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context (Medication ID field set to 0x03 = Intermediate acting insulin) to the PHG under test. 9. Check in PHG transcoder output for the Context Medication numeric object, Metric-Id attribute. 10. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context (Medication ID field set to 0x04 = Long acting insulin) to the PHG under test. 11. Check in PHG transcoder output for the Context Medication numeric object, Metric-Id attribute. 12. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context (Medication ID field set to 0x05 = Pre-mixed insulin) to the PHG under test. 13. Check in PHG 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 ❑ 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]

TP Id		TP/LP-PAN/PHG/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		

Test purpose	Check that: PHG includes Context Medication object, Unit-Code attribute in transcoder output. [AND] IF Medication Value (kg) field of Glucose Measurement Context characteristic is present THEN Context Medication object, Unit-Code attribute is set to MDC_DIM_MILLI_G [AND] IF Medication Value (l) field of Glucose Measurement Context characteristic is present THEN Context Medication object, Unit-Code attribute is set to MDC_DIM_MILLI_L
Applicability	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_010
Other PICS	
Initial condition	The PHG under test and the simulated PHD are in the Standby state.
Test procedure	1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement context (0x2A34) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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 PHG transcoder output for the Context medication object, Unit-Code attribute. 6. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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, 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: Not relevant xiv. Field: HbA1c • This field is not included 7. Check in PHG 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/PHG/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	
Test purpose		Check that: PHG transcodes Base Time field in conjunction with Time Offset field of Glucose Measurement characteristic into Context Medication Object - Absolute-Time-Stamp attribute [AND]		

	PHG transcodes the Bluetooth Base Time field in conjunction with Time Offset field format to Absolute Time format [AND] The fraction of seconds in Absolute Time at transcoder output is 0
Applicability	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_010
Other PICS	
Initial condition	The PHG under test and the simulated PHD are in the Standby state.
Test procedure	1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristics of interest for this test case are: a. Glucose measurement (0x2A18) b. Glucose measurement context (0x2A34) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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 PHG 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/PHG/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	
Test purpose		Check that: PHG transcodes Medication value field of Glucose Measurement Context characteristic into Context Medication Object - Basic-Nu-Observed-Value attribute		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_010		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement context (0x2A34) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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 PHG transcoder output for the Context medication object– Basic-Nu-Observed-Value attribute. 6. The simulated PHD sends the measurement to the PHG 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 PHG 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/PHG/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
Test purpose		Check that: PHG transcodes Medication field of Glucose Measurement Context characteristic into Context Medication object, Basic-Nu-Observed-Value attribute [AND] PHG assigns the following special values: NaN (0x07FF), NRes (0x0800), +INFINITY (0x07FE) and -INFINITY (0x0802)		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_010		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement context (0x2A34) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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 PHG transcoder output for the Context medication object, Basic-Nu-Observed-Value attribute. 6. The simulated PHD sends the measurement to the PHG 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 PHG transcoder output for the Context medication object, Basic-Nu-Observed-Value attribute.
8. The simulated PHD sends the measurement to the PHG 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 PHG transcoder output for the Context medication object, Basic-Nu-Observed-Value attribute. 10. The simulated PHD sends the measurement to the PHG 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 PHG transcoder output for the Context medication object, Basic-Nu-Observed-Value attribute. 12. The simulated PHD sends the measurement to the PHG 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 PHG 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 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 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/PHG/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		
Test purpose		Check that: PHG processes correctly the Context Medication Value (kg), Context Medication Value (l) and Base Time fields of Glucose Measurement Context characteristic		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_007 AND C_MAN_BLE_010		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement (0x2A18) b. Glucose measurement context (0x2A34) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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 PHG accepts the measurement and decodes its value properly (Context Medication value, Context Medication units and base time). 6. The simulated PHD sends the Glucose measurement followed by the Glucose measurement context to the PHG 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 PHG accepts the measurement and decodes its value properly (Context Medication value, Context Medication units and base time).
Pass/Fail criteria	In step 5, the PHG under test shows the following Context Medication 0.17 mg with the time stamp '2012-08-02 11:08:25'. In step 7, the PHG 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/PHG/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		
Test purpose		Check that: PHG does not include Context Carbohydrates object, Handle Attribute in transcoder output [OR] If PHG includes Context Carbohydrates object, Handle attribute in transcoder output, then its value shall be different than 0		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_011		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG under test. 5. Check in PHG 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/PHG/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		
Test purpose		Check that: PHG includes Context Carbohydrates object, Type attribute in transcoder output. [AND] Type is set to { MDC_PART_PHD_DM | MDC_CTXT_GLU_CARB}		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_011		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG under test. 5. Check in PHG 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/PHG/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		
Test purpose		Check that: PHG includes Context Carbohydrates Numeric object, Metric-Spec-Small attribute in transcoder output. [AND] Metric-Spec-Small is set to {0xF048} (mss-avail-intermittent | mss-avail-stored-data | mss-upd-aperiodic | mss-msmt-aperiodic | mss-acc-agent-initiated | mss-cat-manual).		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_011		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG under test. 5. Check in PHG 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/PHG/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		
Test purpose		Check that: PHG includes Context Carbohydrate object, Metric-Id attribute in transcoder output. [AND] Type is set to different values depending on Carbohydrate ID field value		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_011		
Other PICS				

Initial condition	The PHG under test and the simulated PHD are in the Standby state.
Test procedure	1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose

	measurement followed by the Glucose measurement context (Carbohydrate ID field set to 0x01 = Breakfast) to the PHG under test. 5. Check in PHG transcoder output for the Context carbohydrate numeric object, Metric-Id attribute. 6. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context (Carbohydrate ID field set to 0x02 = Lunch) to the PHG under test 7. Check in PHG transcoder output for the Context carbohydrate numeric object, Metric-Id attribute. 8. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context (Carbohydrate ID field set to 0x03 = Dinner) to the PHG under test 9. Check in PHG transcoder output for the Context carbohydrate numeric object, Metric-Id attribute. 10. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context (Carbohydrate ID field set to 0x04 = Snack) to the PHG under test 11. Check in PHG transcoder output for the Context carbohydrate numeric object, Metric-Id attribute. 12. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context (Carbohydrate ID field set to 0x05 = Drink) to the PHG under test. 13. Check in PHG transcoder output for the Context carbohydrate numeric object, Metric-Id attribute. 14. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context (Carbohydrate ID field set to 0x06 = Supper) to the PHG under test. 15. Check in PHG transcoder output for the Context carbohydrate numeric object, Metric-Id attribute. 16. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context (Carbohydrate ID field set to 0x07 = Brunch) to the PHG under test. 17. Check in PHG 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/PHG/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		
Test purpose		Check that:		

	PHG includes Context Carbohydrates object, Unit-Code attribute in transcoder output. [AND] IF Carbohydrate Value (kg) field of Glucose Measurement Context characteristic is present THEN Context Carbohydrate object, Unit-Code attribute is set to MDC_DIM_X_G
Applicability	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_011
Other PICS	
Initial condition	The PHG under test and the simulated PHD are in the Standby state.
Test procedure	1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG under test. 5. Check in PHG 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/PHG/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	
Test purpose		Check that: PHG transcodes Base Time field in conjunction with Time Offset field of Glucose Measurement characteristic into Context Carbohydrate Object - Absolute-Time-Stamp attribute [AND] PHG transcodes the Bluetooth Base Time field in conjunction with Time Offset field format to Absolute Time format [AND] The fraction of seconds in Absolute Time at transcoder output is 0		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_011		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristics of interest for this test case are: a. Glucose measurement (0x2A18) b. Glucose measurement context (0x2A34) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state).		

4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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 PHG 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/PHG/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	
Test purpose		Check that: PHG transcodes Carbohydrate value field of Glucose Measurement Context characteristic into Context Carbohydrate Object - Basic-Nu-Observed-Value attribute		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_011 AND C_MAN_BLE_025		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement context (0x2A34) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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 PHG 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/PHG/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
Test purpose		Check that: PHG transcodes Carbohydrate field of Glucose Measurement Context characteristic into Context Carbohydrate object, Basic-Nu-Observed-Value attribute [AND] PHG assigns the following special values: NaN (0x07FF), NRes (0x0800), +INFINITY (0x07FE) and -INFINITY (0x0802)		

Applicability	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_011
Other PICS	
Initial condition	The PHG under test and the simulated PHD are in the Standby state.
Test procedure	1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement context (0x2A34) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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 PHG transcoder output for the Context carbohydrate object, Basic-Nu-Observed-Value attribute. 6. The simulated PHD sends the measurement to the PHG 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 PHG transcoder output for the Context carbohydrate object, Basic-Nu-

	Observed-Value attribute. 8. The simulated PHD sends the measurement to the PHG 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 PHG transcoder output for the Context carbohydrate object, Basic-Nu-Observed-Value attribute. 10. The simulated PHD sends the measurement to the PHG 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 PHG transcoder output for the Context carbohydrate object, Basic-Nu-Observed-Value attribute. 12. The simulated PHD sends the measurement to the PHG 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 PHG 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 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 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/PHG/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		
Test purpose		Check that: PHG processes correctly the Context Carbohydrate Value (kg) and Base Time fields of Glucose Measurement Context characteristic		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_007 AND C_MAN_BLE_011		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement (0x2A18) b. Glucose measurement context (0x2A34) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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 PHG accepts the measurement and decodes its value properly (Context

	carbohydrates value, Context carbohydrates units and base time).
Pass/Fail criteria	In step 5, the PHG 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/PHG/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		
Test purpose		Check that: PHG does not include Device & Sensor Annunciation Enumeration object, Handle Attribute in transcoder output [OR] If PHG includes Device & Sensor Annunciation Enumeration object, Handle attribute in transcoder output, then its value shall be different than 0		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_012		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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: 16 bit • Value: Not relevant 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement to the PHG under test. 5. Check in PHG 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/PHG/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		
Test purpose		Check that: PHG includes Device & Sensor Annunciation Enumeration object, Type attribute in transcoder output. [AND] Type is set to { MDC_PART_PHD_DM | MDC_GLU_METER_DEV_STATUS }		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_012		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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: 16 bit • Value: Not relevant 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement to the PHG under test. 5. Check in PHG 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/PHG/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		
Test purpose		Check that: PHG includes Device & Sensor Annunciation Enumeration object, Metric-Spec-Small attribute in transcoder output. [AND] Metric-Spec-Small is set to {0xF040} (mss-avail-intermittent | mss-avail-stored-data | mss-upd-aperiodic | mss-msmt-aperiodic | mss-acc-agent-initiated).		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_012 AND C_MAN_BLE_025		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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: 16 bit • Value: Not relevant 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement to the PHG under test. 5. Check in PHG 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/PHG/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	
Test purpose		Check that: PHG transcodes Base Time field in conjunction with Time Offset field of Glucose Measurement characteristic into Device & Sensor Annunciation Enumeration Object - Absolute-Time-Stamp attribute [AND] PHG transcodes the Bluetooth Base Time field in conjunction with Time Offset field format to Absolute Time format [AND] The fraction of seconds in Absolute Time at transcoder output is 0		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_012		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristics of interest for this test case are: a. Glucose measurement (0x2A18) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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: 16 bit • Value: Not relevant 5. Check in PHG 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/PHG/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		
Test purpose		Check that: PHG transcodes Sensor Status Annunciation value field of Glucose Measurement characteristic into Device & Sensor Annunciation Enumeration Object - Enum-Observed-Value-Basic-Bit-Str attribute		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_012		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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: 16 bit • Value: Several values are checked in this test case 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement [Sensor Status Annunciation ID field set to 0000000000000001 0x0001 (MSB → LSB) = device battery low] to the PHG under test. 5. Check in PHG transcoder output for the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute. 6. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement [Sensor Status Annunciation ID field set to 0000000000000010 0x0002 (MSB → LSB) = sensor malfunction] to the PHG under test. 7. Check in PHG transcoder output for the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute. 8. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD 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 PHG under test. 9. Check in PHG transcoder output for the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute. 10. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement [Sensor Status Annunciation ID field set to 0000000000001000 0x0008 (MSB → LSB) = stripo insertion error] to the PHG under test. 11. Check in PHG transcoder output for the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute. 12. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement [Sensor Status Annunciation ID field set to 0000000000010000 0x0010 (MSB → LSB) = strip type is incorrect] to the PHG under test.

	13. Check in PHG transcoder output for the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute. 14. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement [Sensor Status Annunciation ID field set to 0000000000100000 0x0020 (MSB → LSB) = sensor result higher than device can process] to the PHG under test. 15. Check in PHG transcoder output for the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute. 16. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement [Sensor Status Annunciation ID field set to 0000000001000000 0x0040 (MSB → LSB) = sensor result lower than device can process] to the PHG under test. 17. Check in PHG transcoder output for the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute. 18. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD 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 PHG under test. 19. Check in PHG transcoder output for the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute. 20. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD 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 PHG under test. 21. Check in PHG transcoder output for the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute. 22. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD 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 PHG under test. 23. Check in PHG transcoder output for the Device & Sensor annunciation enumeration object - Enum-Observed-Value-Basic-Bit-Str attribute. 24. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement [Sensor Status Annunciation ID field set to 0000010000000000 0x0400 (MSB → LSB) = general device fault] to the PHG under test. 25. Check in PHG 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/PHG/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
Test purpose		Check that: PHG processes correctly the Device & Sensor Annunciation Value and Base Time fields of Glucose Measurement characteristic		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_007 AND C_MAN_BLE_012		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement (0x2A18) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends the measurement to the PHG 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: 16 bit • Value: device battery low (0000000000000001 MSB → LSB) 5. Check that the PHG accepts the measurement and decodes its value properly (sensor status annunciation and base time).
Pass/Fail criteria	In step 5, the PHG 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/PHG/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		
Test purpose		Check that: PHG does not include Context Meal Enumeration object, Handle Attribute in transcoder output [OR] If PHG includes Context Meal Enumeration object, Handle attribute in transcoder output, then its value shall be different than 0		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_013		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG under test. 5. Check in PHG 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/PHG/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		
Test purpose		Check that: PHG includes Context Meal Enumeration object, Type attribute in transcoder output. [AND] Type is set to { MDC_PART_PHD_DM | MDC_CTXT_GLU_MEAL }		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_013		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG under test. 5. Check in PHG 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/PHG/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		
Test purpose		Check that: PHG includes Context Meal Enumeration object, Metric-Spec-Small attribute in transcoder output. [AND] Metric-Spec-Small is set to {0xF048 (mss-avail-intermittent | mss-avail-stored-data | mss-upd-aperiodic | mss-msmt-aperiodic | mss-acc-agent-initiated | mss-cat-manual).		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_013		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG under test. 5. Check in PHG 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/PHG/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	
Test purpose		Check that: PHG transcodes Base Time field in conjunction with Time Offset field of Glucose Measurement characteristic into Context Meal Enumeration Object - Absolute-Time-Stamp attribute [AND] PHG transcodes the Bluetooth Base Time field in conjunction with Time Offset field format to Absolute Time format [AND] The fraction of seconds in Absolute Time at transcoder output is 0		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_013		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristics of interest for this test case are: a. Glucose measurement (0x2A18) b. Glucose measurement context (0x2A34) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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 PHG 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/PHG/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		
Test purpose		Check that: PHG transcodes Context Meal value field of Glucose Measurement Context characteristic into Context Meal Enumeration Object - Enum-Observed-Value-Simple-OID attribute		

Applicability	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_013
Other PICS	
Initial condition	The PHG under test and the simulated PHD are in the Standby state.
Test procedure	1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose

	measurement followed by the Glucose measurement context [Meal field set to 0x01 = Preprandial (before meal)] to the PHG under test. 5. Check in PHG transcoder output for the Context meal enumeration object - Enum-Observed-Value-Simple-OID attribute. 6. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement context [Meal field set to 0x02 = Postprandial (after meal)] to the PHG under test. 7. Check in PHG transcoder output for the Context meal enumeration object - Enum-Observed-Value-Simple-OID attribute. 8. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement context [Meal field set to 0x03 = Fasting] to the PHG under test. 9. Check in PHG transcoder output for the Context meal enumeration object - Enum-Observed-Value-Simple-OID attribute. 10. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement context [Meal field set to 0x04 = Casual] to the PHG under test. 11. Check in PHG transcoder output for the Context meal enumeration object - Enum-Observed-Value-Simple-OID attribute. 12. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement context [Meal field set to 0x05 = Bedtime] to the PHG under test. 13. Check in PHG 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/PHG/PHDTW/GL/BV-057
TP label	Whitepaper. Glucosemeter Context Meal Enumeration Object value

<table>
<tr><td rowspan="2">Coverage</td><td>Spec</td><td colspan="3">[Bluetooth PHDT v1.4]</td></tr>
<tr><td>Testable items</td><td>GL Enumeration 9; M</td><td>GL Enumeration 10; M</td><td>Date-Time Conv 1; M</td></tr>
<tr><td colspan="2">Test purpose</td><td colspan="3">Check that:
PHG processes correctly the Context Meal Value and Base Time fields of Glucose Measurement and Glucose Measurement Context characteristics</td></tr>
<tr><td colspan="2">Applicability</td><td colspan="3">C_MAN_BLE_000 AND C_MAN_BLE_007 AND C_MAN_BLE_013</td></tr>
<tr><td colspan="2">Other PICS</td><td colspan="3"></td></tr>
<tr><td colspan="2">Initial condition</td><td colspan="3">The PHG under test and the simulated PHD are in the Standby state.</td></tr>
<tr><td colspan="2">Test procedure</td><td colspan="3">1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristic of interest for this test case is:
a. Glucose measurement (0x2A18)
b. Glucose measurement context (0x2A34)
3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state).
4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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</td></tr>
</table>

	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 PHG accepts the measurement and decodes its value properly (Meal value and base time).
Pass/Fail criteria	In step 5, the PHG 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/PHG/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		
Test purpose		Check that: PHG does not include Context Sample Location Enumeration object, Handle Attribute in transcoder output [OR] If PHG includes Context Sample Location Enumeration object, Handle attribute in transcoder output, then its value shall be different than 0		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_014		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the		

	Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement to the PHG under test. 5. Check in PHG 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/PHG/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		
Test purpose		Check that: PHG includes Context Sample Location Enumeration object, Type attribute in transcoder output. [AND] Type is set to { MDC_PART_PHD_DM | MDC_CTXT_GLU_SAMPLELOCATION }		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_014		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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 → 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement to the PHG under test. 5. Check in PHG 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/PHG/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		
Test purpose		Check that: PHG includes Context Sample Location Enumeration object, Metric-Spec-Small attribute in transcoder output.		

	[AND] Metric-Spec-Small is set to {0xF048 (mss-avail-intermittent | mss-avail-stored-data | mss-upd-aperiodic | mss-msmt-aperiodic | mss-acc-agent-initiated | mss-cat-manual).
Applicability	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_014
Other PICS	
Initial condition	The PHG under test and the simulated PHD are in the Standby state.
Test procedure	1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement to the PHG under test. 5. Check in PHG 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/PHG/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	
Test purpose		Check that: PHG transcodes Base Time field in conjunction with Time Offset field of Glucose Measurement characteristic into Context Sample Location Enumeration Object - Absolute-Time-Stamp attribute [AND] PHG transcodes the Bluetooth Base Time field in conjunction with Time Offset field format to Absolute Time format [AND] The fraction of seconds in Absolute Time at transcoder output is 0		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_014		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristics of interest for this test case are: a. Glucose measurement (0x2A18) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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 PHG 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/PHG/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		
Test purpose		Check that: PHG transcodes Context Sample Location value field of Glucose Measurement Context characteristic into Context Sample Location Enumeration Object - Enum-Observed-Value-Simple-OID attribute		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_014		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement [Sample Location ID field set to 0x01 = Finger] to the PHG under test. 5. Check in PHG transcoder output for the Context Sample Location Enumeration object - Enum-Observed-Value-Simple-OID attribute. 6. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement [Sample Location ID field set to 0x02 = Alternate Site Test (AST)] to the PHG under test. 7. Check in PHG transcoder output for the Context Sample Location Enumeration object - Enum-Observed-Value-Simple-OID attribute. 8. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement [Sample Location ID field set to 0x03 = Earlobe] to the PHG under test. 9. Check in PHG transcoder output for the Context Sample Location Enumeration object - Enum-Observed-Value-Simple-OID attribute. 10. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement [Sample Location ID field set to 0x04 = Control Solution] to the PHG under test. 11. Check in PHG 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/PHG/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
Test purpose		Check that: PHG processes correctly the Context Sample Location Value and Base Time fields of Glucose Measurement characteristic		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_007 AND C_MAN_BLE_014		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristic of		

	interest for this test case is: a. Glucose measurement (0x2A18) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement [Sample Location field set to 0x0001 = Finger] followed by the Glucose measurement context to the PHG 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 PHG accepts the measurement and decodes its value properly (sample location and base time).
Pass/Fail criteria	In step 5, the PHG 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/PHG/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		
Test purpose		Check that: PHG does not include Context Tester Enumeration object, Handle Attribute in transcoder output [OR] If PHG includes Context Tester Enumeration object, Handle attribute in transcoder output, then its value shall be different than 0		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_015		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG under test. 5. Check in PHG 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/PHG/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		
Test purpose		Check that: PHG includes Context Tester Enumeration object, Type attribute in transcoder output. [AND] Type is set to { MDC_PART_PHD_DM | MDC_CTXT_GLU_TESTER }		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_015		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG under test. 5. Check in PHG 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/PHG/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		
Test purpose		Check that: PHG includes Context Tester Enumeration object, Metric-Spec-Small attribute in transcoder output. [AND] Metric-Spec-Small is set to {0xF048 (mss-avail-intermittent | mss-avail-stored-data | mss-upd-aperiodic | mss-msmt-aperiodic | mss-acc-agent-initiated | mss-cat-manual).		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_015		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG under test. 5. Check in PHG 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/PHG/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	
Test purpose		Check that: PHG transcodes Base Time field in conjunction with Time Offset field of Glucose Measurement characteristic into Context Tester Enumeration Object - Absolute-Time-Stamp attribute		

	[AND] PHG transcodes the Bluetooth Base Time field in conjunction with Time Offset field format to Absolute Time format [AND] The fraction of seconds in Absolute Time at transcoder output is 0
Applicability	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_015
Other PICS	
Initial condition	The PHG under test and the simulated PHD are in the Standby state.
Test procedure	1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristics of interest for this test case are: a. Glucose measurement (0x2A18) b. Glucose measurement context (0x2A34) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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 PHG 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/PHG/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		
Test purpose		Check that: PHG transcodes Context Tester value field of Glucose Measurement Context characteristic into Context Tester Enumeration Object - Enum-Observed-Value-Simple-OID attribute		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_015		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context [Tester field set to 0x01 = Self] to the PHG under test. 5. Check in PHG transcoder output for the Context tester enumeration object - Enum-Observed-Value-Simple-OID attribute. 6. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement context [Tester field set to 0x02 = Health Care Professional] to the PHG under test. 7. Check in PHG transcoder output for the Context tester enumeration object - Enum-Observed-Value-Simple-OID attribute. 8. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement context [Tester field set to 0x03 = Lab test] to the PHG under test. 9. Check in PHG 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/PHG/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
Test purpose		Check that: PHG processes correctly the Context Tester Value and Base Time fields of Glucose Measurement and Glucose Measurement Context characteristics		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_007 AND C_MAN_BLE_015		

Other PICS	
Initial condition	The PHG under test and the simulated PHD are in the Standby state.
Test procedure	1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement (0x2A18) b. Glucose measurement context (0x2A34) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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 PHG accepts the measurement and decodes its value properly (Tester value and base time).
Pass/Fail criteria	In step 5, the PHG 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/PHG/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		
Test purpose		Check that: PHG does not include Context Health Enumeration object, Handle Attribute in transcoder output [OR]		

	If PHG includes Context Health Enumeration object, Handle attribute in transcoder output, then its value shall be different than 0
Applicability	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_016
Other PICS	
Initial condition	The PHG under test and the simulated PHD are in the Standby state.
Test procedure	1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the

	simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG under test. 5. Check in PHG 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/PHG/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		
Test purpose		Check that: PHG includes Context Tester Enumeration object, Type attribute in transcoder output. [AND] Type is set to { MDC_PART_PHD_DM | MDC_CTXT_GLU_HEALTH }		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_016		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG under test. 5. Check in PHG 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/PHG/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		
Test purpose		Check that: PHG includes Context Health Enumeration object, Metric-Spec-Small attribute in transcoder output. [AND] Metric-Spec-Small is set to {0xF048 (mss-avail-intermittent | mss-avail-stored-data | mss-upd-aperiodic | mss-msmt-aperiodic | mss-acc-agent-initiated | mss-cat-manual).		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_016		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG under test. 5. Check in PHG 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/PHG/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	
Test purpose		Check that: PHG transcodes Base Time field in conjunction with Time Offset field of Glucose Measurement characteristic into Context Health Enumeration Object - Absolute-Time-Stamp attribute [AND] PHG transcodes the Bluetooth Base Time field in conjunction with Time Offset field format to Absolute Time format [AND] The fraction of seconds in Absolute Time at transcoder output is 0		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_016		
Other PICS				

Initial condition	The PHG under test and the simulated PHD are in the Standby state.
Test procedure	1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristics of interest for this test case are: a. Glucose measurement (0x2A18) b. Glucose measurement context (0x2A34) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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 PHG 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/PHG/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		
Test purpose		Check that: PHG transcodes Context Health value field of Glucose Measurement Context characteristic into Context Health Enumeration Object - Enum-Observed-Value-Simple-OID attribute		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_007 AND C_MAN_BLE_016		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD 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 PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context [Health field set to 0x01 = Minor health issues] to the PHG under test. 5. Check in PHG transcoder output for the Context HealthEnumeration object - Enum-Observed-Value-Simple-OID attribute. 6. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement context [Health field set to 0x02 = Major Health Issues] to the PHG under test. 7. Check in PHG transcoder output for the Context HealthEnumeration object - Enum-Observed-Value-Simple-OID attribute. 8. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement context [Health field set to 0x03 = Menses] to the PHG under test. 9. Check in PHG transcoder output for the Context HealthEnumeration object - Enum-Observed-Value-Simple-OID attribute 10. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement context [Health field set to 0x04 = Under stress] to the PHG under test. 11. Check in PHG transcoder output for the Context health enumeration object - Enum-Observed-Value-Simple-OID attribute. 12. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement context [Health field set to 0x05 = No health issues] to the PHG under test. 13. Check in PHG 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/PHG/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
Test purpose		Check that: PHG processes correctly the Context Health Value and Base Time fields of Glucose Measurement and Glucose Measurement Context characteristics		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_007 AND C_MAN_BLE_016		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		1. The simulated PHD 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 PHD implements several BLE characteristics. The characteristic of interest for this test case is: a. Glucose measurement (0x2A18) b. Glucose measurement context (0x2A34) 3. The PHG under test initiates a discovery process (Scanning state). It discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed (Connection state), the PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP) and the simulated PHD sends a Glucose measurement followed by the Glucose measurement context to the PHG 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 PHG accepts the measurement and decodes its value properly (Health value and base time).
Pass/Fail criteria	In step 5, the PHG 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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