ITU-T

H.850.7

TELECOMMUNICATION STANDARDIZATION SECTOR OF ITU (11/2019)

SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

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

Conformance of ITU-T H.810 personal health system: Personal Health Devices interface Part 10G: Transcoding for Bluetooth Low Energy: Personal Health Gateway – Continuous glucose monitoring

Recommendation ITU-T H.850.7



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### **Recommendation ITU-T H.850.7**

# Conformance of ITU-T H.810 personal health system: Personal Health Devices interface Part 10G: Transcoding for Bluetooth Low Energy: Personal Health Gateway – Continuous glucose monitoring

#### **Summary**

Recommendation ITU-T H.850.7 provides a test suite structure (TSS) and the test purposes (TP) for the transcoding of continuous glucose monitoring data by personal health gateways (PHGs) 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.850.7 is a transposition of clause 3.9 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.

This Recommendation is part of ITU-T H.850 that was originally approved in 04/2017 as a single part, but which was split at publication time into eight sub-parts for easier use, maintenance and expandability:

- ITU-T H.850 with the general requirements;
- ITU-T H.850.1 with thermometer PHD requirements;
- ITU-T H.850.2 with blood pressure PHD requirements;
- ITU-T H.850.3 with heart rate PHD requirements;
- ITU-T H.850.4 with glucose meter PHD requirements;
- ITU-T H.850.5 with weighing scale PHD requirements;
- ITU-T H.850.6 with pulse oximeter PHD requirements;
- ITU-T H.850.7 with continuous glucose monitoring PHD requirements.

### **History**

Edition	Recommendation	Approval	Study Group	Unique ID*
1.0	ITU-T H.850.7	2017-04-29	16	11.1002/1000/13360
2.0	ITU-T H.850.7	2019-11-29	16	11.1002/1000/14122

#### **Keywords**

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

<sup>\*</sup> 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, <a href="http://handle.itu.int/11.1002/1000/11830-en">http://handle.itu.int/11.1002/1000/11830-en</a>.

#### **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 <a href="http://www.itu.int/ITU-T/ipr/">http://www.itu.int/ITU-T/ipr/</a>.

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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 3.9 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-CDG2015]:  • 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	2018-10-17	It uses version 1.7 as a baseline and adds corrections due to the inclusion of CGM BLE profile test cases.	

# Recommendation ITU-T H.850.7

# Conformance of ITU-T H.810 personal health system: Personal Health Devices interface Part 10G: Transcoding for Bluetooth Low Energy: Personal Health Gateway – Continuous glucose monitoring

## 1 Scope

The scope of this Recommendation<sup>1</sup> 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 10G.

- 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

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), <i>Interoperability design</i> guidelines for personal health systems.
[Bluetooth PHDT v1.4]	Bluetooth SIG (2013), <i>Personal Health Devices Transcoding White Paper</i> , v1.4. <a href="https://www.bluetooth.org/DocMan/handlers/DownloadDoc.ashx?doc_id=294539">https://www.bluetooth.org/DocMan/handlers/DownloadDoc.ashx?doc_id=294539</a>
[Bluetooth PHDT v1.5]	Bluetooth SIG (2014), <i>Personal Health Devices Transcoding White Paper</i> , v1.5. <a href="https://www.bluetooth.org/DocMan/handlers/DownloadDoc.ashx?doc_id=272346">https://www.bluetooth.org/DocMan/handlers/DownloadDoc.ashx?doc_id=272346</a>
[Bluetooth PHDT v1.6]	Bluetooth SIG (2015), <i>Personal Health Devices Transcoding White Paper</i> , v1.6. <a href="https://www.bluetooth.org/DocMan/handlers/DownloadDoc.ashx?doc_id=310657">https://www.bluetooth.org/DocMan/handlers/DownloadDoc.ashx?doc_id=310657</a>
[ISO/IEEE 11073-104xx]	ISO/IEEE 11073-104xx (in force), <i>Health informatics</i> – <i>Personal health device communication</i> – <i>Device specialization</i> . 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, <i>Health informatics – Personal health device communication – Part 20601: Application profile – Optimized exchange protocol</i> , including ISO/IEEE 11073-20601:2010 Amd 1:2015. <a href="https://www.iso.org/standard/54331.html">https://www.iso.org/standard/54331.html</a> with <a href="https://www.iso.org/standard/63972.html">https://www.iso.org/standard/63972.html</a>
[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	Т	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 2.4.8 (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)
    - O 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)
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    - Subgroup 2.3.15: Sleep apnoea breathing therapy equipment (SABTE)
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    - 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 <a href="http://handle.itu.int/11.1002/2000/12067">http://handle.itu.int/11.1002/2000/12067</a>.

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
    - o 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.
    - o BV: Valid behaviour test
    - o 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 2.4.8 – Whitepaper Continuous glucose monitoring requirements (CGM)

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-000			
TP label		Whitepaper. Continuous Glucose Monitoring MDS Object - System-Type Attribute			
Coverage	Spec	[Bluetooth PHDT v1.6]			
	Testable items	CGM Specific MDS 1; M			
Test purpos	se	Check that:			
		PHG does not include MDS Object – System-Type attribute in transcoder output.			
Applicability	y	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043			
Other PICS					
Initial condi	tion	The PHG under test and the simulated Personal Health Device (PHD) are in the Standby state.			
Test procedure		<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a measurement ready to be sent and it is in the Advertising state (it is discoverable).</li> <li>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).</li> <li>When the pairing has been completed (Connection state) the simulated PHD sends the Measurement to the PHG under test.</li> </ol>			
		Check in PHG transcoder output the MDS Object – System-Type attribute			
Pass/Fail cr	iteria	In Step 4, the MDS Object – System-Type attribute is not present.			
Notes (To assist manual testing)		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 System-Type attribute value</not>			

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-001		
TP label	TP label Whitepaper. Continuous Glucose Monitoring MDS Object - Dev-Configuration-Id Attribute			-Configuration-Id Attribute
Coverage Spec [Bluetooth PHDT v1.6]				
	Testable items	Common MDS 17; 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_043			
Other PICS	ics			
Initial condition	The PHG under test and the simulated PHD are in the Standby state.			
Test procedure	<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a measurement ready to be sent and it is in the Advertising state (it is discoverable).</li> </ol>			
	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).			
	<ol><li>When the pairing has been completed (Connection state) the simulated PHD sends the Measurement to the PHG under test.</li></ol>			
	4. Check in PHG transcoder output the MDS Object – Dev-Configuration-Id attribute			
Pass/Fail criteria	In Step 4, the MDS Object – Dev-Configuration-Id attribute is present, its value is inside the range 0x4000 - 0x7FFF			
Notes	Possible values in typical points of observation after transcoder output are:			
(To assist manual testing)	a) IEEE 11073 Objects and Attributes			
g,	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 Continua DG, the Dev-Configuration-Id shall not be transmitted in PCD-01 message, therefore it is not possible to check this attribute.			

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-002			
TP label	TP label Whitepaper. Continuous Glucose Monitoring MDS Object - System-Type-Spec-List Attr			tem-Type-Spec-List Attribute	
		[Bluetooth PHDT v1.6]	[Bluetooth PHDT v1.6]		
		Common MDS 15; M	CGM Specific MDS 2; 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_CGM, Version 1)			
Applicabilit	у	_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043			
Other PICS					
Initial condition The PHG under test and the simulated PHD are in the Standby state.		state.			
Test procedure		The simulated PHD is configured with a Continuous Glucose Monitoring (device specialization), it has a measurement ready to be sent and it is in the Advertising state (i is discoverable).			

	<ul> <li>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).</li> <li>When the pairing has been completed (Connection state) the simulated PHD sends the Measurement to the PHG under test.</li> <li>Check in PHG transcoder output the MDS Object – System-Type-Spec-List attribute</li> </ul>			
Pass/Fail criteria	In Step 4, the MDS Object – System-Type-Spec-List attribute is present, its value is (MDC_DEV_SPEC_PROFILE_CGM, Version 1)			
Notes (To assist manual testing)	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_CGM, 4106 (dec) or 10 0A (hex) • version: 1 (dec) or 00 01 (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  528410^MDC_DEV_SPEC_PROFILE_CGM^MDC IIIIIR			
	528410^MDC_DEV_SPEC_PROFILE_CGM^MDC      R			

TP ld		TP/LP-PAN	TP/LP-PAN/PHG/PHDTW/CGM/BV-003		
TP label Whitepaper. Continuous Glucose Monitoring MDS Object		Glucose Monitoring MDS Object - Reg	g-Cert-Data-List Attribute		
Coverage	Spec	[Bluetooth	PHDT v1.6]		-
	Testable items	Common M	1DS 14; M	Regulatory Conv 1; M	
Test purpose  Check that:  PHG transcodes IEEE 11073-20601 Regulatory Certification Data List characteristic Object – Reg-Cert-Data-List attribute		ata List characteristic into MDS			
Applicabil	ity	C_MAN_BI	_E_000 AND C	C_MAN_BLE_002 AND C_MAN_BLE	_043
Other PICS	6				
Initial con	dition	The PHG under test and the simulated PHD are in the Standby state.			state.
Test procedure		<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a measurement ready to be sent and it is in the Advertising state (it is discoverable).</li> </ol>			
		<ol><li>The simulated PHD implements several BTLE characteristics. The characteristic of interest for this Test Case is:</li></ol>			
		a. IEEE 11073-20601 Regulatory Certification Data List (0x2A2A)			
		•	Format: reg-cert-data-list (opaque structure)		
		<ul> <li>Value: 00 02 00 12 02 01 00 08 06 01 00 01 00 02 80 1A 02 02 00 02 80 00 (hex)</li> </ul>			
		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: 07 (hex) minor-IG-version: 00 (hex) certified-devices: 80 1A (hex) BLE Continuous Glucose Monitor 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 The PHG under test initiates a discovery process (Scanning state), it discovers the simulated PHD and it starts a pairing process with simulated PHD. When the pairing has been completed (Connection state), force the PHG under test to read IEEE 11073-20601 Regulatory Certification Data List characteristic. 5. Check in the PHG transcoder output the MDS Object - Reg-Cert-Data-List attribute Pass/Fail criteria In Step 5, the MDS Object - Reg-Cert-Data-List attribute is present and its value matches with IEEE 11073-20601 Regulatory Certification Data List characteristic value **Notes** Possible values in typical points of observation after transcoder output are: (To assist manual IEEE 11073 Objects and Attributes testing) 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 06 01 00 01 00 02 80 1A 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] 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: 06 (hex) minor-IG-version: 01 (hex) certified-devices: 80 1A (hex). BLE Continuous Glucose Monitor 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 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):

 $OBX|?|CWE|68218^{MDC}\_REG\_CERT\_DATA\_AUTH\_BODY^{MDC}|1.0.0.a| \textbf{2^auth-body-continua}|||||R$ 

OBX|?|ST|532352^MDC\_REG\_CERT\_DATA\_CONTINUA\_VERSION^MDC| 1.0.0.a.x| 7.0|||||R

OBX|?|NA|532353^MDC\_REG\_CERT\_DATA\_CONTINUA\_CERT\_DEV\_LIST^MDC| 1.0.0.a.y|**32794**||||||R

 $OBX|?|CWE|68218^{M}DC\_REG\_CERT\_DATA\_AUTH\_BODY^{M}DC|1.0.0.b| \textbf{2^auth-body-continua}|||||R$ 

OBX|?|CWE|532354^MDC\_REG\_CERT\_DATA\_CONTINUA\_REG\_STATUS^MDC| 1.0.0.b.z|1^unregulated-device(0)||||||R

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-004					
TP label		Whitepaper. Glucose Numeric Object - Handle Attribute					
Coverage	Spec	[Bluetooth F	[Bluetooth PHDT v1.6]				
	Testable items	Glucose Nu	meric 1; O				
Test purpos	se	Check that:	Check that:				
		PHG does not include Glucose Numeric Object – Handle Attribute in transcoder output.  [OR]  If PHG includes Glucose Numeric Object – Handle attribute in transcoder output, then its value shall be different than 0					
Applicability	у	C_MAN_BL	E_000 AND C_MA	N_BLE_002 AND C_MAN_BLE	_043		
Other PICS							
Initial condi	tion	The PHG under test and the simulated PHD are in the Standby state.					
Test proced	lure	1. The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.					
		2. The simulated PHD implements several BTLE characteristics. The characteristic of interest for this Test Case is:					
		a. CGM Measurement (0x2AA7)					
		i. Field: Size					
			Format: uint8	3			
		ii.	Field: Flags				
			Format: 8 bit				
			Quality nor p present, Sen	0000 (MSB → LSB). CGM Tren resent, Sensor Status Annuncia sor Status Annunciation Field (0 s Annunciation Field (Status-Oc	Cal/Temp-Octet) not present,		
		iii.	Field: CGM Gluco	ose Concentration (mg/dL)			
			Format: SFL	OAT			
			Value: not re	levant			

	iv. Field: Time Offset
	Format: uint16
	Value: not relevant
	v. Field: Sensor Status Annunciation
	This field is not included
	vi. Field: CGM Trend Information
	This field is not included
	vii. Field: CGM Quality
	This field is not included
	viii. Field: E2E-CRC
	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).
	<ol> <li>When the pairing has been completed, force the PHG to read CGM Feature and CGM Session Start Time characteristics. Then, the simulated PHD sends the CGM measurement to the PHG under test.</li> </ol>
	5. Check in the PHG transcoder output the Glucose Numeric Object – Handle 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 temporarily stored CGM measurement to the PHG under test.
	7. Check in the PHG transcoder output the Glucose Numeric Object – Handle attribute
Pass/Fail criteria	In Step 5 and 7, the Glucose Numeric Object – Handle attribute is not present or, if it is present then its value is different than 0.
Notes	Possible values in typical points of observation after transcoder output are:
(To assist manual testing)	a) IEEE 11073 Objects and Attributes
testing)	Handle attribute is not present, or if it is present then:
	☐ Object: Glucose Numeric Object
	Attribute-id: MDC_ATTR_ID_HANDLE (2337)
	☐ Attribute-type: INT-U16
	☐ Attribute-value: Any value different than 0
	b) WAN PCD-01 message
	PCD-01 message does not include segments with Handle attribute value

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-005			
TP label		Whitepaper. Glucose Numeric Object - Type Attribute			
Coverage	Spec	[Bluetooth PHDT v1.6]			
	Testable items	Glucose Numeric 2; M			
Test purpose		Check that:  PHG includes Glucose Numeric Object – Type attribute in transcoder output.  [AND]  Type is set to the correct value according to CGM Type field value			
Applicability		C_MAN_BLE_000 AND C_MAN	N_BLE_002 AND C_MAN_BLE_	_043	

Other PICS	
Initial condition	The PHG under test and the simulated PHD are in the Standby state.
Test procedure	<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.</li> </ol>
	2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:
	a. CGM Feature (0x2AA8)
	i. Field: CGM Feature
	Format: 24 bit
	<ul> <li>Value: 0000 0000 0000 0000 0000 (MSB → LSB). No extra features supported.</li> </ul>
	ii. Field: CGM Type
	Format: 4 bit
	Value: 0x1 (capillary wholeblood)
	iii. Field: CGM Sample Location
	Format: 4 bit
	Value: not relevant
	iv. Field: E2E-CRC
	Format: uint16
	Value: not relevant
	b. CGM Measurement (0x2AA7)
	i. Field: Size
	• Format: uint8
	ii. Field: Flags
	• Format: 8 bit
	<ul> <li>Value: 0000 0000 (MSB → LSB). CGM Trend information not present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) not present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.</li> </ul>
	iii. Field: CGM Glucose Concentration (mg/dL)
	Format: SFLOAT
	Value: not relevant
	iv. Field: Time Offset
	Format: uint16
	Value: not relevant
	v. Field: Sensor Status Annunciation
	This field is not included
	vi. Field: CGM Trend Information
	This field is not included
	vii. Field: CGM Quality
	This field is not included  Fig. 600
	viii. Field: E2E-CRC
	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), force the PHG under test to read the CGM Feature characteristic and CGM Session Start Time characteristic.
- 5. The simulated PHD sends the Measurement to the PHG under test.
- 6. Check in the PHG transcoder output the Glucose Numeric Object Type attribute
- 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 temporarily stored CGM measurement to the PHG under test.
- 8. Check in the PHG transcoder output the Glucose Numeric Object Type attribute
- 9. End current CGM session and start a new one. The simulated PHD will now have CGM Type field of the CGM Feature characteristic set to 0x2 (capillary plasma). Repeat steps 3-8 and check in PHG transcoder output the Glucose Numeric Object-Type attribute as in step 6 and 8.
- 10. End current CGM session and start a new one. The simulated PHD will now have CGM Type field of the CGM Feature characteristic set to 0x3 (venous wholeblood). Repeat steps 3-8 and check in PHG transcoder output the Glucose Numeric Object-Type attribute as in step 6 and 8.
- 11. End current CGM session and start a new one. The simulated PHD will now have CGM Type field of the CGM Feature characteristic set to 0x4 (venous plasma). Repeat steps 3-8 and check in PHG transcoder output the Glucose Numeric Object-Type attribute as in step 6 and 8.
- 12. End current CGM session and start a new one. The simulated PHD will now have CGM Type field of the CGM Feature characteristic set to 0x5 (arterial wholeblood). Repeat steps 3-8 and check in PHG transcoder output the Glucose Numeric Object-Type attribute as in step 6 and 8.
- 13. End current CGM session and start a new one. The simulated PHD will now have CGM Type field of the CGM Feature characteristic set to 0x6 (arterial plasma). Repeat steps 3-8 and check in PHG transcoder output the Glucose Numeric Object-Type attribute as in step 6 and 8.
- 14. End current CGM session and start a new one. The simulated PHD will now have CGM Type field of the CGM Feature characteristic set to 0x7 (undetermined wholeblood). Repeat steps 3-8 and check in PHG transcoder output the Glucose Numeric Object-Type attribute as in step 6 and 8.
- 15. End current CGM session and start a new one. The simulated PHD will now have CGM Type field of the CGM Feature characteristic set to 0x8 (undetermined plasma). Repeat steps 3-8 and check in PHG transcoder output the Glucose Numeric Object-Type attribute as in step 6 and 8.
- 16. End current CGM session and start a new one. The simulated PHD will now have CGM Type field of the CGM Feature characteristic set to 0x9 (interstitial fluid ISF). Repeat steps 3-8 and check in PHG transcoder output the Glucose Numeric Object-Type attribute as in step 6 and 8.
- 17. End current CGM session and start a new one. The simulated PHD will now have CGM Type field of the CGM Feature characteristic set to 0xA (control solution). Repeat steps 3-8 and check in PHG transcoder output the Glucose Numeric Object-Type attribute as in step 6 and 8.

#### Pass/Fail criteria

- In Step 6 and 8, the Glucose Numeric Object Type attribute is set to {MDC\_PART\_SCADA | MDC\_CONC\_GLU\_CAPILLARY\_WHOLEBLOOD}
- In Step 9, the Glucose Numeric Object Type attribute is set to {MDC\_PART\_SCADA | MDC\_CONC\_GLU\_CAPILLARY\_PLASMA} in both cases.
- In Step 10, the Glucose Numeric Object Type attribute is set to {MDC\_PART\_SCADA | MDC\_CONC\_GLU\_VENOUS\_WHOLEBLOOD} in both cases.
- In Step 11, the Glucose Numeric Object Type attribute is set to {MDC\_PART\_SCADA | MDC\_CONC\_GLU\_VENOUS\_PLASMA} in both cases.
- In Step 12, the Glucose Numeric Object Type attribute is set to {MDC\_PART\_SCADA | MDC\_CONC\_GLU\_ARTERIAL\_WHOLEBLOOD} in both cases.

- In Step 13, the Glucose Numeric Object Type attribute is set to {MDC\_PART\_SCADA | MDC\_CONC\_GLU\_ARTERIAL\_PLASMA} in both cases.
- In Step 14, the Glucose Numeric Object Type attribute is set to {MDC\_PART\_SCADA | MDC\_CONC\_GLU\_UNDETERMINED\_WHOLEBLOOD} in both cases.
- In Step 15, the Glucose Numeric Object Type attribute is set to {MDC\_PART\_SCADA | MDC\_CONC\_GLU\_UNDETERMINED\_PLASMA} in both cases.
- In Step 16, the Glucose Numeric Object Type attribute is set to {MDC\_PART\_SCADA | MDC\_CONC\_GLU\_ISF} in both cases.
- In Step 17, the Glucose Numeric Object Type attribute is set to {MDC\_PART\_SCADA | MDC\_CONC\_GLU\_CONTROL} in both cases.

#### Notes (To assist manual testing)

Possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Type attribute is present:

- □ Object: Glucose Numeric Object
- ☐ Attribute-id: MDC\_ATTR\_ID\_TYPE (2351)
- ☐ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
- ☐ Attribute-value (Steps 6 & 8):
  - partition: MDC\_PART\_SCADA or 2 (dec) or 00 02 (hex)
  - code: MDC\_CONC\_GLU\_CAPILLARY\_WHOLEBLOOD or 29112 (dec) or 71 B8 (hex)
- ☐ Attribute-value (Step 9):
  - partition: MDC\_PART\_SCADA or 2 (dec) or 00 02 (hex)
  - code: MDC\_CONC\_GLU\_CAPILLARY\_PLASMA or 29116 (dec) or 71 BC (hex)
- ☐ Attribute-value (Step 10):
  - partition: MDC\_PART\_SCADA or 2 (dec) or 00 02 (hex)
  - code: MDC\_CONC\_GLU\_VENOUS\_WHOLEBLOOD or 29120 (dec) or 71 C0 (hex)
- ☐ Attribute-value (Step 11):
  - partition: MDC\_PART\_SCADA or 2 (dec) or 00 02 (hex)
  - code: MDC\_CONC\_GLU\_VENOUS\_PLASMA or 29124 (dec) or 71 C4 (hex)
- ☐ Attribute-value (Step 12):
  - partition: MDC\_PART\_SCADA or 2 (dec) or 00 02 (hex)
  - code: MDC\_CONC\_GLU\_ARTERIAL\_WHOLEBLOOD or 29128 (dec) or 71 C8 (hex)
- ☐ Attribute-value (Step 13):
  - partition: MDC\_PART\_SCADA or 2 (dec) or 00 02 (hex)
  - code: MDC\_CONC\_GLU\_ARTERIAL\_PLASMA or 29132 (dec) or 71 CC (hex)
- ☐ Attribute-value (Step 14):
  - partition: MDC\_PART\_SCADA or 2 (dec) or 00 02 (hex)
  - code: MDC\_CONC\_GLU\_UNDETERMINED\_WHOLEBLOOD or 29292 (dec) or 72 6C (hex)
- Attribute-value (Step 15):
  - partition: MDC\_PART\_SCADA or 2 (dec) or 00 02 (hex)
  - code: MDC\_CONC\_GLU\_UNDETERMINED\_PLASMA or 29296 (dec) or 72 70 (hex)
- ☐ Attribute-value (Step 16):

- partition: MDC\_PART\_SCADA or 2 (dec) or 00 02 (hex)
- code: MDC\_CONC\_GLU\_ISF or 29140 (dec) or 71 D4 (hex)
- Attribute-value (Step 17):
  - 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 Type attribute (check OBX-3):

Steps 6 & 8

OBX|n|NM|160184^MDC\_CONC\_GLU\_CAPILLARY\_WHOLEBLOOD^MDC| m.0.0.x|[value]|264274^MDC\_DIM\_MILLI\_G\_PER\_DL^MDC||||R|||[date\_time]

Step 9

OBX|n|NM|160188^MDC\_CONC\_GLU\_CAPILLARY\_PLASMA^MDC|m.0.0.x|[value]| 264274^MDC\_DIM\_MILLI\_G\_PER\_DL^MDC|||||R|||[date\_time]

Step 10

OBX|n|NM|160192^MDC\_CONC\_GLU\_VENOUS\_WHOLEBLOOD^MDC| m.0.0.x|[value]|264274^MDC\_DIM\_MILLI\_G\_PER\_DL^MDC||||R|||[date\_time]

Step 11

OBX|n|NM|160196^MDC\_CONC\_GLU\_VENOUS\_PLASMA^MDC|m.0.0.x|[value]| 264274^MDC\_DIM\_MILLI\_G\_PER\_DL^MDC|||||R|||[date\_time]

Step 12

 $\label{eq:obx_n_n_model} OBX|n|NM|160200^{MDC}\_CONC\_GLU\_ARTERIAL\_WHOLEBLOOD^{MDC}|\\ m.0.0.x[[value]]264274^{MDC}\_DIM\_MILLI\_G\_PER\_DL^{MDC}|||||R|||[date\_time]$ 

Step 13

OBX|n|NM|160204^MDC\_CONC\_GLU\_ARTERIAL\_PLASMA^MDC|m.0.0.x|[value]| 264274^MDC\_DIM\_MILLI\_G\_PER\_DL^MDC||||R|||[date\_time]

Step 14

OBX|n|NM|160364^MDC\_CONC\_GLU\_UNDETERMINED\_WHOLEBLOOD^MDC| m.0.0.x|[value]|264274^MDC\_DIM\_MILLI\_G\_PER\_DL^MDC||||R|||[date\_time]

Step 15

 $\label{eq:obx_nlm} OBX|n|NM|160368^MDC\_CONC\_GLU\_UNDETERMINED\_PLASMA^MDC|\\ m.0.0.x[[value]]264274^MDC\_DIM\_MILLI\_G\_PER\_DL^MDC|||||R|||[date\_time]\\$ 

Step 16

OBX|n|NM|160212^MDC\_CONC\_GLU\_ISF^MDC|m.0.0.x|[value]| 264274^MDC\_DIM\_MILLI\_G\_PER\_DL^MDC||||R|||[date\_time]

Step 17

OBX|n|NM|160208^MDC\_CONC\_GLU\_CONTROL^MDC|m.0.0.x|[value]| 264274^MDC\_DIM\_MILLI\_G\_PER\_DL^MDC|||||R|||[date\_time]

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-006		
TP label		Whitepaper. Glucose Numeric Object – Supplemental-Types Attribute		
Coverage	erage Spec [Bluetooth PHDT v1.6]			
	Testable items	Glucose Numeric 3; O		
Test purpose		Check that:		
		PHG may include Glucose Numeric Object output.	ct – Supplemental-Types attribute in transcoder	

	[AND]		
	If present, Supplemental-Types is set to the correct value according to CGM Sample Location field value		
Applicability	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043		
Other PICS			
Initial condition	The PHG under test and the simulated PHD are in the Standby state.		
Test procedure	<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.</li> </ol>		
	<ol><li>The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:</li></ol>		
	a. CGM Feature (0x2AA8)		
	i. Field: CGM Feature		
	Format: 24 bit		
	<ul> <li>Value: 0000 0000 0000 0000 0000 (MSB → LSB). No extra features supported.</li> </ul>		
	ii. Field: CGM Type		
	Format: 4 bit		
	Value: not relevant		
	iii. Field: CGM Sample Location		
	Format: 4 bit		
	Value: 0x1 (finger)		
	iv. Field: E2E-CRC		
	Format: uint16		
	Value: not relevant		
	b. CGM Measurement (0x2AA7)		
	i. Field: Size		
	Format: uint8		
	ii. Field: Flags		
	Format: 8 bit		
	<ul> <li>Value: 0000 0000 (MSB → LSB). CGM Trend information not present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) not present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.</li> </ul>		
	iii. Field: CGM Glucose Concentration (mg/dL)		
	Format: SFLOAT		
	Value: not relevant		
	iv. Field: Time Offset		
	Format: uint16		
	Value: not relevant		
	v. Field: Sensor Status Annunciation		
	This field is not included		
	vi. Field: CGM Trend Information		
	This field is not included		

vii. Field: CGM Quality

• This field is not included

viii. Field: E2E-CRC

- This field is not included
- 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).
- When the pairing has been completed (Connection state), force the PHG under test to read the CGM Feature and CGM Session Start Time characteristics.
- 5. The simulated PHD sends the Measurement to PHG under test.
- Check in the PHG transcoder output the Glucose Numeric Object–Supplemental-Types attribute
- 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 temporarily stored CGM measurement to the PHG under test.
- Check in the PHG transcoder output the Glucose Numeric Object Supplemental-Types attribute
- End current CGM session and start a new one. The simulated PHD will now have CGM Sample Location field of the CGM Feature characteristic set to 0x2 (alternative site test). Repeat steps 3-8 and check in PHG transcoder output the Glucose Numeric Object-Supplemental-Types attribute as in step 6 and 8.
- 10. End current CGM session and start a new one. The simulated PHD will now have CGM Sample Location field of the CGM Feature characteristic set to 0x3 (earlobe). Repeat steps 3-8 and check in PHG transcoder output the Glucose Numeric Object-Supplemental-Types attribute as in step 6 and 8.
- 11. End current CGM session and start a new one. The simulated PHD will now have CGM Sample Location field of the CGM Feature characteristic set to 0x4 (control solution). Repeat steps 3-8 and check in PHG transcoder output the Glucose Numeric Object-Supplemental-Types attribute as in step 6 and 8.
- 12. End current CGM session and start a new one. The simulated PHD will now have CGM Sample Location field of the CGM Feature characteristic set to 0x5 (subcutaneous tissue). Repeat steps 3-8 and check in PHG transcoder output the Glucose Numeric Object-Supplemental-Types attribute as in step 6 and 8.
- 13. End current CGM session and start a new one. The simulated PHD will now have CGM Sample Location field of the CGM Feature characteristic set to 0xF (sample location value not available). Repeat steps 3-8 and check in PHG transcoder output the Glucose Numeric Object-Supplemental-Types attribute as in step 6 and 8.

#### Pass/Fail criteria

- In Step 6 and 8, if present, the Glucose Numeric Object Supplemental-Types attribute is set to {MDC\_PART\_PHD\_DM | MDC\_CTXT\_GLU\_SAMPLELOCATION\_FINGER}
- In Step 9, if present, the Glucose Numeric Object Supplemental-Types attribute is set to {MDC\_PART\_PHD\_DM | MDC\_CTXT\_GLU\_SAMPLELOCATION\_AST} in both cases.
- In Step 10, if present, the Glucose Numeric Object Supplemental-Types attribute is set to {MDC\_PART\_PHD\_DM | MDC\_CTXT\_GLU\_SAMPLELOCATION\_EARLOBE} in both cases
- In Step 11, if present, the Glucose Numeric Object Supplemental-Types attribute is set to {MDC\_PART\_PHD\_DM | MDC\_CTXT\_GLU\_SAMPLELOCATION\_CTRLSOLUTION} in both cases.
- In Step 12, if present, the Glucose Numeric Object Supplemental-Types attribute is set to {MDC\_PART\_PHD\_DM | MDC\_CTXT\_GLU\_SAMPLELOCATION\_SUBCUTANEOUS} in both cases.
- In Step 13, if present, the Glucose Numeric Object Supplemental-Types attribute is set to {MDC\_PART\_PHD\_DM | MDC\_CTXT\_GLU\_SAMPLELOCATION\_UNDERTERMINED} in both cases.

#### Notes (To assist manual testing)

Possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

If Supplemental-Types attribute is present: Object: Glucose Numeric Object Attribute-id: MDC\_ATTR\_SUPPLEMENTAL\_TYPES (2657) Attribute-type: SEQUENCE of SEQUENCE (partition (INT-U16), code (INT-U16)) Attribute-value (Steps 6 & 8): partition: MDC\_PART\_PHD\_DM or 128 (dec) or 00 80 (hex) code: MDC\_CTXT\_GLU\_SAMPLELOCATION\_FINGER or 29240 (dec) or 72 38 (hex) ☐ Attribute-value (Step 9): partition: MDC PART PHD DM or 128 (dec) or 00 80 (hex) code: MDC\_CTXT\_GLU\_SAMPLELOCATION\_AST or 29244 (dec) or 72 3C (hex) Attribute-value (Step 10): partition: MDC PART PHD DM or 128 (dec) or 00 80 (hex) code: MDC CTXT GLU SAMPLELOCATION EARLOBE or 29248 (dec) or 72 40 (hex) Attribute-value (Step 11): partition: MDC\_PART\_PHD\_DM or 128 (dec) or 00 80 (hex) code: MDC\_CTXT\_GLU\_SAMPLELOCATION\_CTRLSOLUTION or 29252 (dec) or 72 44 (hex) ☐ Attribute-value (Step 12): partition: MDC\_PART\_PHD\_DM or 128 (dec) or 00 80 (hex) code: MDC\_CTXT\_GLU\_SAMPLELOCATION\_SUBCUTANEOUS or 29241 (dec) or 72 39 (hex) Attribute-value (Step 13): partition: MDC PART PHD DM or 128 (dec) or 00 80 (hex) code: MDC\_CTXT\_GLU\_SAMPLELOCATION\_UNDERTERMINED or 29237 (dec) or 72 35 (hex) WAN PCD-01 message If Supplemental-Types is present, PCD-01 message includes a facet OBX segment of the CGM measurement OBX segment with Supplemental-Types attribute (check OBX-3 and OBX-5): OBX|n|NM|[GlucoseType]|m.0.0.x|[value]|264274^MDC\_DIM\_MILLI\_G\_PER\_DL ^MDC||||R|||[date\_time] Steps 6 & 8 OBXInICWEI68193^MDC ATTR SUPPLEMENTAL TYPES^MDCIm.0.0.x.vl 8417848^MDC\_CTXT\_GLU\_SAMPLELOCATION\_FINGER^MDC||||||R Step 9 OBX|n|CWE|68193^MDC ATTR SUPPLEMENTAL TYPES^MDC|m.0.0.x.v| 8417852^MDC\_CTXT\_GLU\_SAMPLELOCATION\_AST^MDC||||||R Step 10 OBX|n|CWE|68193^MDC\_ATTR\_SUPPLEMENTAL\_TYPES^MDC|m.0.0.x.y| 8417856^MDC CTXT GLU SAMPLELOCATION EARLOBE^MDC||||||R Step 11 OBX|n|CWE|68193^MDC\_ATTR\_SUPPLEMENTAL\_TYPES^MDC|m.0.0.x.y| 8417860^MDC\_CTXT\_GLU\_SAMPLELOCATION\_CTRLSOLUTION^MDC||||||R

Step 12

OBX|n|CWE|68193^MDC\_ATTR\_SUPPLEMENTAL\_TYPES^MDC|m.0.0.x.y|
8417849^MDC\_CTXT\_GLU\_SAMPLELOCATION\_SUBCUTANEOUS^MDC||||||R

• Step 13

OBX|n|CWE|68193^MDC\_ATTR\_SUPPLEMENTAL\_TYPES^MDC|m.0.0.x.y|
8417845^MDC\_CTXT\_GLU\_SAMPLELOCATION\_UNDERTERMINED^MDC|||||R

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-007						
TP label		Whitepaper. Glucose Numeric Object - Metric-Spec-Small Attribute						
Coverage	Spec	[Bluetooth	Bluetooth PHDT v1.6]					
	Testable items	Glucose N	Numer	ic 4; M				
Test purpose		Check that:  PHG includes Glucose Numeric Object – Metric-Spec-Small attribute in transcoder output.  [AND]  Metric-Spec-Small is set to {0xC042}.						
Applicabilit	y	C_MAN_E	BLE_0	00 AND C_N	MAN_BLE_0	002 AND C_MA	N_BLE_	_043
Other PICS								
Initial condi	tion	The PHG	under	test and the	simulated F	PHD are in the	Standby	state.
Test proced	Test procedure		The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.					
		<ol><li>The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:</li></ol>					ics. The characteristics of	
		a. CGM Measurement (0x2AA7)						
		i. Field: Size						
			•	Format: uiı	nt8			
		i	i. Fie	eld: Flags				
			•	Format: 8				
			•	Quality not present, S	r present, S ensor Statu	ensor Status A s Annunciation	nnunciat Field (C	d information not present, CGM tion Field (Warning-Octet) not cal/Temp-Octet) not present, tet) not present.
		i	ii. Fie	eld: CGM Glu	ucose Conc	entration (mg/d	dL)	
			•	Format: SF	FLOAT			
			•	Value: not	relevant			
		i	v. Fie	eld: Time Off	fset			
			•	Format: uii	nt16			
			•	Value: not	relevant			
		\	/. Fie	eld: Sensor S	Status Annu	nciation		
			•	This field is	s not include	ed		
		\	∕i. Fi∈	eld: CGM Tre	end Informat	tion		
			•	This field is	s not include	ed		
		\	∕ii. Fie	eld: CGM Qu	ıality			

	This field is not included				
	viii. Field: E2E-CRC				
	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), force the PHG to read the CGM Feature and CGM Session Start Time characteristics. Then, the simulated PHD sends the Measurement to PHG under test.				
	Check in PHG transcoder output the Glucose Numeric Object     Metric-Spec-Small 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 temporarily stored CGM measurement to the PHG under test.				
	7. Check in the PHG transcoder output the Glucose Numeric Object – Metric-Spec-Small attribute				
Pass/Fail criteria	In Step 5 and 7, the Glucose Numeric Object – Metric-Spec-Small attribute is present and its value is {0xC042} (mss-avail-intermittent   mss-avail-stored-data   mss-acc-agent-initiated   mss-cat-calculation)				
Notes	Possible values in typical points of observation after transcoder output are:				
(To assist manual	a) IEEE 11073 Objects and Attributes				
testing)	Metric-Spec-Small attribute is present:				
	□ Object: Glucose Numeric Object				
	Attribute-id: MDC_ATTR_METRIC_SPEC_SMALL (2630)				
	☐ Attribute-type: BITS-16				
	Attribute-value: 0xC042 (hex) or BITS mss-avail-intermittent (0), mss-avail-stored-data (1), mss-acc-agent-initiated(9), mss-cat-calculation(14) set to TRUE and remaining BITS set to FALSE				
	b) WAN PCD-01 message				
	PCD-01 message does not include segments with Metric-Spec-Small attribute value				

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-008			
TP label		Whitepaper. Glucose Numeric Object – Measurement-Status Attribute			
Coverage	rage Spec [Bluetooth PHDT v1.6]				
	Testable items	Glucose Numeric 5; O			
Test purpose		Check that:  PHG may include Glucose Numeric Object – Measurement-Status attribute in transcoder output.  [AND]			
		If present and related to the Sensor Status Annunciation field, Measurement-Status is set to the correct value			
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043			
Other PICS					
Initial condition		The PHG under test and the simulated PHD are in the Standby state.			

#### Test procedure

- The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.
- The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:
  - a. CGM Feature (0x2AA8)
    - i. Field: CGM Feature
      - Format: 24 bit
      - Value: 0000 0000 0000 1111 1111 1111 (MSB → LSB). Calibration supported, patient high/low alerts supported, hypo alerts supported, yper alerts supported, rate of increase/decrease alerts supported, device specific alert supported, sensor malfunction detection supported, sensor temperature high-low detection supported, sensor result high-low detection supported, low battery detection supported, sensor type error detection supported, general device fault supported.
    - ii. Field: CGM Type
      - Format: 4 bit
      - Value: not relevant
    - iii. Field: CGM Sample Location
      - Format: 4 bit
      - · Value: not relevant
    - iv. Field: E2E-CRC
      - Format: uint16
      - · Value: not relevant
  - b. CGM Measurement (0x2AA7)
    - i. Field: Size
      - Format: uint8
    - ii. Field: Flags
      - Format: 8 bit
      - Value: 0100 0000 (MSB → LSB). CGM Trend information not present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) not present, Sensor Status Annunciation Field (Cal/Temp-Octet) present, Sensor Status Annunciation Field (Status-Octet) not present.
    - iii. Field: CGM Glucose Concentration (mg/dL)
      - Format: SFLOAT
      - Value: not relevant
    - iv. Field: Time Offset
      - Format: uint16
      - · Value: not relevant
    - v. Field: Sensor Status Annunciation
      - Format: 8 bit
      - Value: 0000 1000 (MSB → LSB) (calibration required).
    - vi. Field: CGM Trend Information
      - · This field is not included
    - vii. Field: CGM Quality
      - This field is not included
    - viii. Field: E2E-CRC

- This field is not included
- 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), force the simulated PHG to read the CGM Feature and CGM Session Start Time characteristics. Then, the simulated PHD sends the Measurement to the PHG under test.
- Check in the PHG transcoder output the Glucose Numeric Object

  Measurement-Status attribute.
- 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 temporarily stored CGM measurement to the PHG under test.
- 7. Check in the PHG transcoder output the Glucose Numeric Object Measurement-Status attribute
- 8. The simulated PHD sends a Measurement to PHG under test with Sensor Status Annunciation field set to 0001 0000 (MSB → LSB), sensor temperature too high for valid test/result at time of measurement (bit 12). All remaining fields remain equal to those in step 2. The simulated PHD also deletes all stored records in RACP and stores an identical measurement. Repeat steps 5-7.
- 9. The simulated PHD sends a Measurement to PHG under test with Sensor Status Annunciation field set to 0010 0000 (MSB → LSB), sensor temperature too low for valid test/result at time of measurement (bit 13). All remaining fields remain equal to those in step 2. The simulated PHD also deletes all stored records in RACP and stores an identical measurement. Repeat steps 5-7.
- 10. The simulated PHD sends a Measurement to PHG under test with Sensor Status Annunciation field set to 0000 0001 (MSB → LSB) and Flags field set to 1000 0000 (MSB → LSB), Sensor result lower than the Patient Low level (bit 16). All remaining fields remain equal to those in step 2. The simulated PHD also deletes all stored records in RACP and stores an identical measurement. Repeat steps 5-7.
- 11. The simulated PHD sends a Measurement to PHG under test with Sensor Status Annunciation field set to 0000 0010 (MSB → LSB) and Flags field set to 1000 0000 (MSB → LSB), Sensor result higher than the Patient Low level (bit 17). All remaining fields remain equal to those in step 2. The simulated PHD also deletes all stored records in RACP and stores an identical measurement. Repeat steps 5-7.
- 12. The simulated PHD sends a Measurement to PHG under test with Sensor Status Annunciation field set to 0000 0100 (MSB → LSB) and Flags field set to 1000 0000 (MSB → LSB), Sensor result lower than the Hypo level (bit 18). All remaining fields remain equal to those in step 2. The simulated PHD also deletes all stored records in RACP and stores an identical measurement. Repeat steps 5-7.
- 13. The simulated PHD sends a Measurement to PHG under test with Sensor Status Annunciation field set to 0000 1000 (MSB → LSB) and Flags field set to 1000 0000 (MSB → LSB), Sensor result higher than the Hyper level (bit 19). All remaining fields remain equal to those in step 2. The simulated PHD also deletes all stored records in RACP and stores an identical measurement. Repeat steps 5-7.
- 14. The simulated PHD sends a Measurement to PHG under test with Sensor Status Annunciation field set to 0100 0000 (MSB → LSB) and Flags field set to 1000 0000 (MSB → LSB), sensor result lower than the device can process (bit 22). All remaining fields remain equal to those in step 2. The simulated PHD also deletes all stored records in RACP and stores an identical measurement. Repeat steps 5-7.
- 15. The simulated PHD sends a Measurement to PHG under test with Sensor Status Annunciation field set to 1000 0000 (MSB → LSB) and Flags field set to 1000 0000 (MSB → LSB), sensor result higher than the device can process (bit 23). All remaining fields remain equal to those in step 2. The simulated PHD also deletes all stored records in RACP and stores an identical measurement. Repeat steps 5-7.

#### Pass/Fail criteria

- In Step 5 and 7 the Glucose Numeric Object Measurement-Status attribute, if present, is set to "questionable" (bit 1).
- In Step 8 the Glucose Numeric Object Measurement-Status attribute, if present, is set to "invalid" (bit 0).
- In Step 9 the Glucose Numeric Object Measurement-Status, if present, is set to "invalid" (bit 0).

- In Step 10 the Glucose Numeric Object Measurement-Status attribute, if present, is set to "measurement outside threshold boundaries" (bit 14)
- In Step 11 the Glucose Numeric Object Measurement-Status attribute, if present, is set to "measurement outside threshold boundaries" (bit 14)
- In Step 12 the Glucose Numeric Object Measurement-Status attribute, if present, is set to "measurement outside threshold boundaries" (bit 14)
- In Step 13 the Glucose Numeric Object Measurement-Status attribute, if present, is set to "measurement outside threshold boundaries" (bit 14)
- In Step 14 the Glucose Numeric Object Measurement-Status attribute, if present, is set to "invalid" (bit 0).
- In Step 15 the Glucose Numeric Object Measurement-Status attribute, if present, is set to "invalid" (bit 0).

#### Notes (To assist manual testing)

Possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

If Measurement-Status attribute is present:

- □ Object: Glucose Numeric Object
- ☐ Attribute-id: MDC\_ATTR\_MSMT\_STAT (2375)
- ☐ Attribute-type: BITS16
- ☐ Attribute-value (Steps 5 & 7): "questionable" (0x4000)
- ☐ Attribute-value (Step 8): "invalid" (0x8000)
- ☐ Attribute-value (Step 9): "invalid" (0x8000)
- ☐ Attribute-value (Step 10): "measurement outside threshold boundaries" (0x0002)
- ☐ Attribute-value (Step 11): "measurement outside threshold boundaries" (0x0002)
- Attribute-value (Step 12): "measurement outside threshold boundaries" (0x0002)
- ☐ Attribute-value (Step 13): "measurement outside threshold boundaries" (0x0002)
- ☐ Attribute-value (Step 14): "invalid" (0x8000)
- ☐ Attribute-value (Step 15): "invalid" (0x8000)
- b) WAN PCD-01 message

If Measurement-Status is present, PCD-01 message includes a segment like this with Measurement-Status attribute value (check OBX-8 and OBX-11):

Steps 5 & 7

 $OBX[n]NM[[GlucoseType]]m.0.0.x[[value]]264274^MDC\_DIM\_MILLI\_G\_PER\_DL^MDC[]QUES[][R][[[date\_time]]$ 

Step 8

Step 9

 $OBX[n]NM[[GlucoseType]]m.0.0.x[[value]]264274^MDC\_DIM\_MILLI\_G\_PER\_DL^MDC][INV][[X]][[date\_time]$ 

• Step 10

 $OBX|n|NM|[GlucoseType]|m.0.0.x|[value]|264274^{MDC}\_DIM\_MILLI\_G\_PER\_DL^{MDC}|ALACT|||R|||[date\_time]$ 

Step 11

 $OBX[n]NM[[GlucoseType]]m.0.0.x[[value]]264274^MDC\_DIM\_MILLI\_G\_PER\_DL ^MDC[|ALACT||R]||[date\_time]$ 

• Step 12

 $OBX[n]NM[[GlucoseType]]m.0.0.x|[value]|264274^{MDC}\_DIM\_MILLI\_G\_PER\_DL ^{MDC}|ALACT|||R|||[date\_time]$ 

<ul> <li>Step 13         OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL ^MDC  ALACT   R   [date_time]</li> </ul>
• Step 14
OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL
• Step 15
OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-009					
TP label		Whitepaper. Glucose Numeric Object – Unit-Code Attribute					
Coverage	Spec	[Bluetooth PHDT v1.6]					
	Testable items	Glucose Numeric 6; M					
Test purpose		Check that:  PHG includes Glucose Numeric Object – Unit-Code attribute in transcoder output.  [AND]					
		Unit-Code attribute value is set to MDC_DIM_MILLI_G_PER_DL					
Applicabilit	у	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043					
Other PICS							
Initial cond	tion	The PHG under test and the simulated PHD are in the Standby state.					
Test proced	lure	<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.</li> <li>The simulated PHD implements several BTLE characteristics. The characteristic of interest for this Test Case is:         <ol> <li>CGM Measurement (0x2AA7)</li> <li>Field: Size</li> <li>Format: uint8</li> <li>Field: Flags</li> <li>Format: 8 bit</li> <li>Value: 0000 0000 (MSB → LSB). CGM Trend information not present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.</li> </ol> </li> </ol>					
		<ul> <li>iii. Field: CGM Glucose Concentration (mg/dL)</li> <li>Format: SFLOAT</li> <li>Value: not relevant</li> <li>iv. Field: Time Offset</li> <li>Format: uint16</li> <li>Value: not relevant</li> <li>v. Field: Sensor Status Annunciation</li> </ul>					

	This field is not included
	vi. Field: CGM Trend Information
	This field is not included
	vii. Field: CGM Quality
	This field is not included
	viii. Field: E2E-CRC
	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), force the PHG to read the CGM Feature and CGM Session Start Time characteristic. Then, the simulated PHD sends the Measurement to the PHG under test.
	5. Check in the PHG transcoder output the Glucose Numeric 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 temporarily stored CGM measurement to the PHG under test.
	7. Check in the PHG transcoder output the Glucose Numeric Object – Unit-Code attribute
Pass/Fail criteria	In Step 5 and 7 the Glucose Numeric Object – Unit-Code attribute is present and its value is set to MDC_DIM_MILLI_G_PER_DL
Notes	Possible values in typical points of observation after transcoder output are:
(To assist manual	a) IEEE 11073 Objects and Attributes
testing)	Unit-Code attribute is present:
	□ Object: Glucose Numeric Object
	Attribute-id: MDC_ATTR_UNIT_CODE (2454)
	☐ Attribute-type: OID-Type
	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 n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL

TP ld TP label		TP/LP-PAN/PHG/PHDTW/CGM/BV-010  Whitepaper. Glucose Numeric Object – Base-Offset-Time-Stamp Attribute					
					Coverage	Spec	[Bluetooth PHDT v1.6]
	Testable items	Glucose Numeric 7; M	BaseOffset 3; M				
Test purpose		Check that:  PHG includes Glucose Numeric Object Base-Offset-Time-Stamp attribute in transcoder output.  [AND]					
					Base-Offset-Time-Stamp attribute is set to the correct value according to Base-Offset time stamp derivation		
					Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043

Other PICS	
Initial condition	The PHG under test and the simulated PHD are in the Standby state.
Test procedure	<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.</li> </ol>
	2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:
	a. CGM Session Start Time (0x2AAA)
	i. Field: Session Start Time
	Format: {uint16, uint8, uint8, uint8, uint8}
	<ul> <li>Value: {2016, 5, 12, 16, 39, 27} (May 12, 2016, 16:39:27)</li> </ul>
	ii. Field: Time Zone
	Format: sint8
	• Value: 4 (UTC+1:00)
	iii. Field: DST-Offset
	Format: uint8
	Value: 4 (Daylight Time (+1h))
	iv. Field: E2E-CRC
	This field is not included
	b. CGM Measurement (0x2AA7)
	i. Field: Size
	Format: uint8
	ii. Field: Flags
	Format: 8 bit
	<ul> <li>Value: 0000 0000 (MSB → LSB). CGM Trend information not present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) not present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.</li> </ul>
	iii. Field: CGM Glucose Concentration (mg/dL)
	Format: SFLOAT
	Value: not relevant
	iv. Field: Time Offset
	Format: uint16
	• Value: 20
	v. Field: Sensor Status Annunciation
	This field is not included
	vi. Field: CGM Trend Information
	This field is not included
	vii. Field: CGM Quality
	This field is not included
	viii. Field: E2E-CRC
	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).

	7				
	4. When the pairing has been completed (Connection state), force the PHG under test to read the CGM Features and CGM Session Start Time characteristics.				
	5. The simulated PHD sends the Measurement to the PHG under test.				
	6. Check in the PHG transcoder output the Glucose Numeric Object–Base-Offset-Time- Stamp attribute				
	7. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP). The simulated PHD sends the temporarily stored CGM measurement to the PHG under test.				
	8. Check in PHG transcoder output the Glucose Numeric Object – Base-Offset-Time-Stamp attribute				
Pass/Fail criteria	In Step 6 and 8, the Glucose Numeric Object – Base-Offset-Time-Stamp is set to the addition of CGM Session Start Time characteristic's Session Start Time (May 12, 2016, 16:39:27) field plus CGM Measurement characteristic's Time Offset field (20 min).				
Notes	Possible values in typical points of observation after transcoder output are:				
(To assist manual testing)	a) IEEE 11073 Objects and Attributes				
testing)	Base-Offset-Time-Stamp attribute is present:				
	□ Object: Glucose Numeric Object				
	☐ Attribute-id: MDC_ATTR_TIME_STAMP_BO (2690)				
	<ul> <li>Attribute-type: SEQUENCE (bo-seconds (INT-U32), bo-fraction (INT-U16), bo-time-offset (INT-I16))</li> </ul>				
	☐ Attribute-value: addition of				
	<ul> <li>CGM Session Start Time characteristic Session Start Time field (May 12, 2016, 16:39:27)</li> </ul>				
	CGM Measurement characteristic Time Offset field (20m)				
	Note that the same Base-Offset-Time-Stamp can have different representations depending on bo-time-offset value. If it is set to 20 min (CGM Measurement characteristic Time Offset field), then Base-Offset-Time-Stamp value shall be {3672059967, 0, 20}				
	b) WAN PCD-01 message				
	PCD-01 message includes a segment like this with Base-Offset-Time-Stamp attribute value (check OBX-14):				
	OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL ^MDC    R   [value described in a) coded in DTM format]				

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-011_A			
TP label Whitepaper. Glucose Numeric Object – Basic-Nu-Observed-Value Attribute			lue Attribute		
Coverage	Spec	[Bluetooth PHDT v1.6]			
	Testable items	Glucose Numeric 8; M			
Test purpose		Check that:			
		PHG includes Glucose Numeric Coutput.	Object Basic-Nu-Observed-Val	ue attribute in transcoder	
		[AND]			
		Basic-Nu-Observed-Value attribu	ite is set to the correct value.		
Applicability C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043		_043			
Other PICS					

Initial condition	The PHG under test and the simulated PHD are in the Standby state.
Test procedure	<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.</li> </ol>
	2. The simulated PHD implements several BTLE characteristics. The characteristic of interest for this Test Case is:
	a. CGM Measurement (0x2AA7)
	i. Field: Size
	Format: uint8
	ii. Field: Flags
	Format: 8 bit
	<ul> <li>Value: 0000 0000 (MSB → LSB). CGM Trend information not present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) not present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.</li> </ul>
	iii. Field: CGM Glucose Concentration (mg/dL)
	Format: SFLOAT
	• Value: 160.0
	iv. Field: Time Offset
	Format: uint16
	Value: not relevant
	v. Field: Sensor Status Annunciation
	This field is not included
	vi. Field: CGM Trend Information
	This field is not included
	vii. Field: CGM Quality
	This field is not included
	viii. Field: E2E-CRC
	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).
	<ol> <li>When the pairing has been completed (Connection state), force the PHG to read the CGM Feature and CGM Session Start Time characteristics. Then, the simulated PHD sends the Measurement to the PHG under test.</li> </ol>
	<ol> <li>Check in the PHG transcoder output the Glucose Numeric Object–Basic-Nu-Observed- Value attribute</li> </ol>
	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). The simulated PHD sends the temporarily stored CGM measurement to the PHG under test.
	7. Check in the PHG transcoder output the Glucose Numeric Object – Basic-Nu-Observed-Value attribute
Pass/Fail criteria	In Step 5 and 7, the Glucose Numeric Object – Basic-Nu-Observed-Value is set to 160 mg/dL
Notes	Possible values in typical points of observation after transcoder output are:
(To assist manual testing)	a) IEEE 11073 Objects and Attributes
3,	Basic-Nu-Observed-Value attribute is present:
	□ Object: Glucose Numeric Object

☐ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636)	
☐ Attribute-type: SFLOAT	
☐ Attribute-value: 160 (dec) or 00A0 (hex) or 0110 (hex) or F640 (hex)	
WAN PCD-01 message	
PCD-01 message includes a segment like this with Basic-Nu-Observed-Vavalue (check OBX-5):	lue attribute
OBX n NM [GlucoseType] m.0.0.x 160 264274^MDC_DIM_MILLI_G_F	'ER_DL^MDC

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-011_B					
TP label		Whitepaper. Glucose Numeric Object – Basic-Nu-Observed-Value Attribute Special Values					
Coverage	Spec	[Bluetooth PHDT v1.6]					
	Testable items	Glucose Numeric 9; M	Glucose Numeric 10; M	Float Type 1; C			
		Float Type 2; M					
Test purpose		Check that:  PHG transcodes CGM Glucose Concentration field of CGM Measurement characteristic into Glucose Numeric Object – Basic-Nu-Observed-Value attribute  [AND]  PHG assigns the following special values: NaN (0x07FF), NRes (0x0800), +INFINITY (0x07FE) and -INFINITY (0x0802)					
Applicabilit	ty	C_MAN_BLE_000 AND C_M	AN_BLE_002 AND C_MAN_BI	LE_043			
Other PICS							
Initial cond	ition	The PHG under test and the s	simulated PHD are in the Stand	dby state.			
Test procedure		<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.</li> <li>The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:         <ol> <li>CGM Feature (0x2AA8)</li> <li>Field: CGM Feature</li> </ol> </li> </ol>					
		Format: 24	bit				
		supported, palerts supported, latert supported supported, latert supported	orted, rate of increase/decrease ted, sensor malfunction detect	ed, hypo alerts supported, yper e alerts supported, device specific ion supported, sensor , sensor result high-low detecntion d, sensor type error detection			
		ii. Field: CGM Type	Э				
		Format: 4 b	it				
		Value: not r					
		iii. Field: CGM Sam	•				
		Format: 4 b					
		Value: not r	elevant				

iv. Field: E2E-CRC

Format: uint16

Value: not relevant

- b. CGM Measurement (0x2AA7)
  - i. Field: Size
    - Format: uint8
  - i. Field: Flags
    - Format: 8 bit
    - Value: 0010 0000 (MSB → LSB). CGM Trend information not present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.
  - iii. Field: CGM Glucose Concentration (mg/dL)
    - Format: SFLOAT
    - Value: 07 FF (hex). Special value: NaN
  - iv. Field: Time Offset
    - Format: uint16
    - Value: not relevant
  - v. Field: Sensor Status Annunciation
    - Format: 8 bit
    - Value: 0000 1000 (MSB → LSB) (sensor malfunction).
  - vi. Field: CGM Trend Information
    - · This field is not included
  - vii. Field: CGM Quality
    - · This field is not included
  - viii. Field: E2E-CRC
    - This field is not included
- 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).
- When the pairing has been completed (Connection state), the simulated PHD sends the Measurement to the PHG under test.
- Check in the PHG transcoder output the Glucose Numeric Object–Basic-Nu-Observed-Value attribute
- The PHG under test requests the simulated PHD to report stored records by performing a
  writing operation in the Record Access Control Point (RACP). The simulated PHD sends
  the temporarily stored CGM measurement to the PHG under test.
- Check in the PHG transcoder output the Glucose Numeric Object Basic-Nu-Observed-Value attribute
- 8. The simulated PHD sends a CGM Measurement to PHG under test with the following values. The simulated PHD also deletes all previous stored records in RACP and stores an identical measurement in it.
  - a. CGM Measurement (0x2AA7)
    - i. Field: Size
      - Format: uint8
    - i. Field: Flags
      - Format: 8 bit

- Value: 0010 0000 (MSB → LSB). CGM Trend information not present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.
- iii. Field: CGM Glucose Concentration (mg/dL)
  - Format: SFLOAT
  - Value: 08 00(hex). Special value: NRes
- iv. Field: Time Offset
  - Format: uint16
  - Value: not relevant
- v. Field: Sensor Status Annunciation
  - Format: 8 bit
  - Value: 0000 1000 (MSB → LSB) (sensor malfunction).
- vi. Field: CGM Trend Information
  - This field is not included
- vii. Field: CGM Quality
  - This field is not included
- viii. Field: E2E-CRC
  - This field is not included
- Repeat steps 5-7 to check in transcoder output the Glucose Numeric Object Basic-Nu-Observed-Value attribute.
- The simulated PHD sends a CGM Measurement to PHG under test with the following values. The simulated PHD also deletes all stored records in RACP and stores an identical measurement in it.
  - CGM Measurement (0x2AA7)
    - Field: Size
      - Format: uint8
    - ii. Field: Flags
      - Format: 8 bit
      - Value: 1000 0000 (MSB → LSB). CGM Trend information not present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) not present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) present.
    - iii. Field: CGM Glucose Concentration (mg/dL)
      - Format: SFLOAT
      - Value: 08 02(hex). Special value: -INFINITY
    - iv. Field: Time Offset
      - Format: uint16
      - Value: not relevant
    - v. Field: Sensor Status Annunciation
      - Format: 8 bit
      - Value: 0100 0000 (MSB → LSB) (sensor result lower than the device can process).
    - vi. Field: CGM Trend Information
      - · This field is not included
    - vii. Field: CGM Quality

	This field is not included
	viii. Field: E2E-CRC
	This field is not included
	11. Repeat steps 5-7 to check in transcoder output the Glucose Numeric Object – Basic-Nu- Observed-Value attribute
	12. The simulated PHD sends a CGM Measurement to PHG under test with the following values. The simulated PHD also deletes all stored records in RACP and stores an identical measurement in it.
	a. CGM Measurement (0x2AA7)
	i. Field: Size
	Format: uint8
	ii. Field: Flags
	Format: 8 bit
	<ul> <li>Value: 1000 0000 (MSB → LSB). CGM Trend information not present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) not present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) present.</li> </ul>
	iii. Field: CGM Glucose Concentration (mg/dL)
	Format: SFLOAT
	Value: 07 FE(hex). Special value: +INFINITY
	iv. Field: Time Offset
	Format: uint16
	Value: not relevant
	v. Field: Sensor Status Annunciation
	Format: 8 bit
	<ul> <li>Value: 1000 0000 (MSB → LSB) (sensor result higher than the device can process).</li> </ul>
	vi. Field: CGM Trend Information
	This field is not included
	vii. Field: CGM Quality
	This field is not included
	viii. Field: E2E-CRC
	This field is not included
	13. Repeat steps 5-7 to check in transcoder output the Glucose Numeric Object – Basic-Nu- Observed-Value attribute
Pass/Fail criteria	In Step 5 and 7, the Glucose Numeric Object – Basic-Nu-Observed-Value is set to 0x07FF
	In Step 9, the Glucose Numeric Object – Basic-Nu-Observed-Value is set to 0x0800 for both cases.
	In Step 11, the Glucose Numeric Object – Basic-Nu-Observed-Value is set to 0x0802 for both cases.
	In Step 13, the Glucose Numeric Object – Basic-Nu-Observed-Value is set to 0x07FE for both cases.
Notes	Possible values in typical points of observation after transcoder output are:
(To assist manual	a) IEEE 11073 Objects and Attributes
testing)	Basic-Nu-Observed-Value attribute is present:
	□ Object: Glucose Numeric Object

		Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636)
	_	Attribute-type: SFLOAT
		Attribute-value (Steps 5 & 7): 0x07FF (hex)
		Attribute-value (Step 9): 0x0800 (hex)
		Attribute-value (Step 11): 0x0802 (hex)
		Attribute-value (Step 13): 0x07FE (hex)
b)	WA	N PCD-01 message
	•	Steps 5 & 7
		OBX n NM [GlucoseType] m.0.0.x  264274^MDC_DIM_MILLI_G_PER_DL^MDC   NAN   X   [date_time]
	•	Step 9
		OBX n NM [GlucoseType] m.0.0.x  264274^MDC_DIM_MILLI_G_PER_DL^MDC   OTH   X   [date_time]
	•	Step 11
		OBX n NM [GlucoseType] m.0.0.x  264274^MDC_DIM_MILLI_G_PER_DL^MDC   NINF   X   [date_time]
	•	Step 13
		OBX n NM [GlucoseType] m.0.0.x  264274^MDC_DIM_MILLI_G_PER_DL^MDC   PINF   X   [date_time]

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-012				
TP label		Whitepaper. Glucose Numeric Object – Threshold-Notification-Text-String				
Coverage	Spec	[Bluetooth PHDT v1.6]				
	Testable items	Glucose Numeric 11; O				
Test purpose		Check that:  PHG may transcode bits 16 through 19 of the CGM Sensor Status Annunciation field of CGM Measurement characteristic into Glucose Numeric Object – Threshold-Notification-Text-String attribute				
Applicability	1	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043				
Other PICS						
Initial condition The PHG under test and the simulated PHD are in the Standby state.		The PHG under test and the simulated PHD are in the Standby state.				
Test procedure		The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.				
		<ol><li>The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:</li></ol>				
		a. CGM Feature (0x2AA8)				
		i. Field: CGM Feature				
		Format: 24 bit				
		<ul> <li>Value: 0000 0000 0000 1111 1111 1111 (MSB → LSB). Calibration supported, patient high/low alerts supported, hypo alerts supported, yper alerts supported, rate of increase/decrease alerts supported, device specific alert supported, sensor malfunction detection supported, sensor temperature high-low detection supported, sensor result high-low detecntion</li> </ul>				

supported, low battery detection supported, sensor type error detection supported, general device fault supported.

ii. Field: CGM Type

• Format: 4 bit

· Value: not relevant

iii. Field: CGM Sample Location

Format: 4 bit

Value: not relevant

iv. Field: E2E-CRC

Format: uint16

Value: not relevant

b. CGM Measurement (0x2AA7)

i. Field: Size

Format: uint8

ii. Field: Flags

• Format: 8 bit

- Value: 1000 0000 (MSB → LSB). CGM Trend information not present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) not present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) present.
- iii. Field: CGM Glucose Concentration (mg/dL)

Format: SFLOAT

Value: not relevant

iv. Field: Time Offset

Format: uint16

Value: not relevant

- v. Field: Sensor Status Annunciation
  - Format: 8 bit
  - Value: 0000 0001 (MSB → LSB) (sensor result lower than the patient low level).
- vi. Field: CGM Trend Information
  - This field is not included
- vii. Field: CGM Quality
  - This field is not included

viii. Field: E2E-CRC

- This field is not included
- 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).
- When the pairing has been completed (Connection state), the simulated PHD sends the Measurement to the PHG under test.
- Check in the PHG transcoder output the Glucose Numeric Object

   Threshold-Notification-Text-String attribute
- The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP). The simulated PHD sends the temporarily stored CGM measurement to the PHG under test.
- Check in the PHG transcoder output the Glucose Numeric Object Threshold-Notification-Text-String attribute

- The simulated PHD sends a CGM Measurement to the PHG under test with the following values. The simulated PHD also deletes all previous stored records in RACP and stores an identical measurement in it.
  - a. CGM Measurement (0x2AA7)

i. Field: Size

Format: uint8

i. Field: Flags

Format: 8 bit

- Value: 1000 0000 (MSB → LSB). CGM Trend information not present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) not present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) present..
- iii. Field: CGM Glucose Concentration (mg/dL)

Format: SFLOATValue: not relevant

iv. Field: Time Offset

Format: uint16

Value: not relevant

- v. Field: Sensor Status Annunciation
  - Format: 8 bit
  - Value: 0000 0010 (MSB → LSB) (sensor result higher than the patient high level).
- vi. Field: CGM Trend Information
  - · This field is not included
- vii. Field: CGM Quality
  - · This field is not included

viii. Field: E2E-CRC

- This field is not included
- Repeat steps 5-7 to check in transcoder output the Glucose Numeric Object Threshold-Notification-Text-String attribute.
- The simulated PHD sends a CGM Measurement to PHG under test with the following values. The simulated PHD also deletes all stored records in RACP and stores an identical measurement in it.
  - a. CGM Measurement (0x2AA7)

i. Field: Size

Format: uint8

ii. Field: Flags

Format: 8 bit

- Value: 1000 0000 (MSB → LSB). CGM Trend information not present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) not present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) present.
- iii. Field: CGM Glucose Concentration (mg/dL)

Format: SFLOAT

Value: not relevant

iv. Field: Time Offset

Format: uint16

Value: not relevant

v. Field: Sensor Status Annunciation

Format: 8 bit

Value: 0000 0100 (MSB → LSB) (sensor result lower than the Hypo level).

vi. Field: CGM Trend Information

This field is not included

vii. Field: CGM Quality

This field is not included

viii. Field: E2E-CRC

This field is not included

- Repeat steps 5-7 to check in transcoder output the Glucose Numeric Object Threshold-Notification-Text-String attribute
- 12. The simulated PHD sends a CGM Measurement to PHG under test with the following values. The simulated PHD also deletes all stored records in RACP and stores an identical measurement in it.
  - a. CGM Measurement (0x2AA7)

i. Field: Size

Format: uint8

ii. Field: Flags

• Format: 8 bit

- Value: 1000 0000 (MSB → LSB). CGM Trend information not present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) not present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) present.
- iii. Field: CGM Glucose Concentration (mg/dL)

• Format: SFLOAT

Value: not relevant

iv. Field: Time Offset

Format: uint16

Value: not relevant

- v. Field: Sensor Status Annunciation
  - Format: 8 bit
  - Value: 0000 1000 (MSB → LSB) (sensor result higher than the Hyper Level).
- vi. Field: CGM Trend Information
  - This field is not included

vii. Field: CGM Quality

· This field is not included

viii. Field: E2E-CRC

• This field is not included

 Repeat steps 5-7 to check in transcoder output the Glucose Numeric Object – Threshold-Notification-Text-String attribute

## Pass/Fail criteria

In Step 5 and 7, if present, the Glucose Numeric Object – Threshold-Notification-Text-String is set to an OCTET STRING with a readable description of the threshold notification "sensor result lower than the patient low level"

	-	
	•	In Step 9, if present, the Glucose Numeric Object – Threshold-Notification-Text-String is set to an OCTET STRING with a readable description of the threshold notification "sensor result higher than the patient high level" for both cases.
	•	In Step 11, if present, the Glucose Numeric Object – Threshold-Notification-Text-String is set to an OCTET STRING with a readable description of the threshold notification "sensor result lower than the Hypo level" for both cases.
	•	In Step 13, if present,, the Glucose Numeric Object – Threshold-Notification-Text-String is set to an OCTET STRING with a readable description of the threshold notification "sensor result higher than the Hyper level" for both cases.
Notes	Pos	ssible values in typical points of observation after transcoder output are:
(To assist manual testing)	a)	IEEE 11073 Objects and Attributes
<b>0</b> ,		If Threshold-Notification-Text-String attribute is present:
		□ Object: Glucose Numeric Object
		☐ Attribute-id: MDC_ATTR_THRES_NOTIF_TEXT_STRING (2696)
		☐ Attribute-type: OCTET STRING
		Attribute-value (Steps 5 & 7): readable description of the threshold notification "sensor result lower than the patient low level"
		Attribute-value (Step 9): readable description of the threshold notification "sensor result higher than the patient high level"
		☐ Attribute-value (Step 11): readable description of the threshold notification "sensor result lower than the Hypo level"
		□ Attribute-value (Step 13): readable description of the threshold notification "sensor result higher than the Hyper level"
	b)	WAN PCD-01 message
		Threshold-Notification-Text-String attribute is not included in PCD-01 message

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-013				
TP label		Whitepaper. Sensor Calibration Numeric Object - Handle Attribute				
Coverage	Spec	[Bluetooth PHDT v1.6]				
	Testable items	SensCal Numeric 1; O				
Test purpos	e	Check that:				
		PHG does not include Sensor Calibration Numeric Object – Handle Attribute in transcoder output.				
		[OR]				
		If PHG includes Sensor Calibration Numeric 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_043				
Other PICS						
Initial condition The PHG under test and the simulated PHD are in the Standby state.		The PHG under test and the simulated PHD are in the Standby state.				
Test procedure		The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). The simulated PHD has a Calibration Data Record stored.				
		2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:				
		a. CGM Feature (0x2AA8)				

		i.	Field: CGM Feature
			Format: 24 bit
			<ul> <li>Value: 0000 0000 0000 0000 0001 (MSB → LSB). Calibration supported.</li> </ul>
		ii.	Field: CGM Type
			Format: 4 bit
			Value: not relevant
		iii.	Field: CGM Sample Location
			Format: 4 bit
			Value: not relevant
		iv.	Field: E2E-CRC
			Format: uint16
			Value: not relevant
	b.	CGI	M Specific Ops Control Point (0x2AAC)
		i.	Field: Op Code
			□ Format: uint8
			□ Value: 0x06 (Glucose Calibration Value Response)
		ii.	Field: Calibration Value – Glucose concentration of Calibration (mg/dL)
			□ Format: SFLOAT
			□ Value: not relevant
		iii.	Field: Calibration Value – Calibration Time
			☐ Format: uint16
			□ Value: not relevant
		iv.	Field: Calibration Value – Calibration Type
			☐ Format: 4 bit
			□ Value: not relevant
		٧.	Field: Calibration Value – Calibration Sample Location
			☐ Format: 4 bit
			□ Value: not relevant
		vi.	Field: Calibration Value - Next Calibration Time
			☐ Format: uint16
			□ Value: not relevant
		vii.	Field: Calibration Value – Calibration Data Record Number
			☐ Format: uint16
			□ Value: not relevant
		viii.	Field: Calibration Value – Calibration Status
			☐ Format: 8 bit
			□ Value: not relevant
		ix.	Field: E2E-CRC
			This field is not present
3.	sim	ulate	G under test initiates a discovery process (Scanning state), it discovers the d PHD and it starts a pairing process with the simulated PHD (Initiating state).
4.	Ses	sion	e pairing has been completed, force the PHG to read CGM Feature and CGM Start Time characteristics, and then to perform a Glucose Calibration procedure cocode "Get Glucose Calibration value" (0x05) with Operand "0xFFFF" (by

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	performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code and Calibration Data Record Number fields respectively).
	5. The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration information.
	Check in PHG transcoder output the Sensor Calibration Numeric Object – Handle attribute
Pass/Fail criteria	In Step 6, the Sensor Calibration Numeric Object – Handle attribute is not present or, if it is present then its value is different than 0
Notes (To assist manual testing)	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: Sensor Calibration Numeric Object
	<ul> <li>□ Attribute-id: MDC_ATTR_ID_HANDLE (2337)</li> <li>□ Attribute-type: INT-U16</li> <li>□ Attribute-value: Any value different than 0</li> <li>b) WAN PCD-01 message</li> </ul>
	PCD-01 message does not include segments with Handle attribute value

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-014					
TP label		Whitepaper. Sensor Calibration Numeric Object - Type Attribute					
Coverage	Spec	[Bluetooth PHDT v1.6]					
	Testable items	SensCal Nu	meric 2; M				
Test purpose		Check that:  PHG includes Sensor Calibration Numeric Object – Type attribute in transcoder output.  [AND]  Type is set to MDC_PART_PHD_DM   MDC_CGM_SENSOR_CALIBRATION					
Applicability	y	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043					
Other PICS							
Initial condition		The PHG under test and the simulated PHD are in the Standby state.					
Test procedure		speciali	zation). The sim	ulated PHD has a Calibration I			
		<ol><li>The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:</li></ol>					
		a. CG	GM Feature (0x2	AA8)			
		i.	Field: CGM Fe	eature			
			☐ Format: 2	4 bit			
			☐ Value: 00 supported	00 0000 0000 0000 0000 000 <b>1</b> I.	(MSB → LSB). Calibration		
		ii.	Field: CGM Ty	pe			
			☐ Format: 4	bit			
			☐ Value: no	t relevant			

			iii.	Field: CGM Sample Location
				□ Format: 4 bit
				□ Value: not relevant
			iv.	Field: E2E-CRC
				□ Format: uint16
				□ Value: not relevant
		b.	CGI	M Specific Ops Control Point (0x2AAC)
		٠.	i.	Field: Op Code
				□ Format: uint8
				□ Value: 0x06 (Glucose Calibration Value Response)
			ii.	Field: Calibration Value – Glucose concentration of Calibration (mg/dL)
				□ Format: SFLOAT
				□ Value: not relevant
			iii.	Field: Calibration Value – Calibration Time
				□ Format: uint16
				□ Value: not relevant
			iv.	Field: Calibration Value – Calibration Type
				□ Format: 4 bit
				□ Value: not relevant
			v.	Field: Calibration Value – Calibration Sample Location
				☐ Format: 4 bit
				□ Value: not relevant
			vi.	Field: Calibration Value - Next Calibration Time
				☐ Format: uint16
				□ Value: not relevant
			vii.	Field: Calibration Value – Calibration Data Record Number
				□ Format: uint16
				□ Value: not relevant
			viii.	Field: Calibration Value – Calibration Status
				□ Format: 8 bit
				□ Value: not relevant
			ix.	Field: E2E-CRC
				☐ This field is not present
	3.			G under test initiates a discovery process (Scanning state), it discovers the d PHD and it starts a pairing process with the simulated PHD (Initiating state).
	4.	Sessusin perf	sion ig Op ormi	e pairing has been completed, force the PHG to read CGM Feature and CGM Start Time characteristics, and then to perform a Glucose Calibration procedure o Code "Get Glucose Calibration value" (0x05) with Operand "0xFFFF" (by ng a write operation to the CGM Specific Ops Control Point characteristic's Op d Calibration Data Record Number fields respectively).
	5.	The Res	simi pons	ulated PHD will respond with an indication including a "Calibration Value se" Op Code (0x06) and a Calibration Data Record containing the requested on information.
	6.	Che	ck ir	PHG transcoder output the Sensor Calibration Numeric Object – Type attribute
Pass/Fail criteria				Sensor Calibration Numeric Object – Type attribute is present and set to PHD_DM   MDC_CGM_SENSOR_CALIBRATION

Notes (To assist manual testing)	Possible values in typical points of observation after transcoder output are:  a) IEEE 11073 Objects and Attributes		
	Type attribute is present:		
	□ Object: Sensor Calibration Numeric Object		
	☐ Attribute-id: MDC_ATTR_ID_TYPE (2351)		
	☐ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}		
	☐ Attribute-value:		
	<ul> <li>partition: MDC_PART_PHD_DM or 128 (dec) or 00 80 (hex)</li> </ul>		
	<ul> <li>code: MDC_CGM_SENSOR_CALIBRATION or 29428 (dec) or 72 F4 (hex)</li> </ul>		
	b) WAN PCD-01 message		
	PCD-01 message includes a segment like this with Type attribute (check OBX-3):		
	OBX n NM 8418036^MDC_CGM_SENSOR_CALIBRATION^MDC  m.0.0.x [value] [unit]    R   [date_time]		

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-015					
TP label		Whitepaper. Sensor Calibration Numeric Object – Supplemental-Types Attribute					
Coverage	Spec	Bluetooth PHDT v1.6]					
	Testable items	SensCal Numeric 3; O					
Test purpos	ie .	Check that:					
		PHG may include Sensor Calibration Numeric Object – Supplemental-Types attribute in transcoder output.					
		[AND]					
		If present, Supplemental-Types is set to the correct value according to Sample Location Nibble in Calibration Data Record					
Applicability	y	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043					
Other PICS							
Initial condi	tion	The PHG under test and the simulated PHD are in the Standby state.					
Test procedure		The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). The simulated PHD has six different Calibration Data Records stored.					
		2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:					
		a. CGM Feature (0x2AA8)					
		i. Field: CGM Feature					
		☐ Format: 24 bit					
		□ Value: 0000 0000 0000 0000 0001 (MSB → LSB). Calibration supported.					
		ii. Field: CGM Type					
		☐ Format: 4 bit					
		□ Value: not relevant					
		iii. Field: CGM Sample Location					
		☐ Format: 4 bit					
		☐ Value: not relevant					

		iv.	Field: E2E-CRC
			□ Format: uint16
			□ Value: not relevant
	b.	CG	M Specific Ops Control Point (0x2AAC)
		i.	Field: Op Code
			□ Format: uint8
Ì			□ Value: 0x06 (Glucose Calibration Value Response)
		ii.	Field: Calibration Value – Glucose concentration of Calibration (mg/dL)
			□ Format: SFLOAT
			□ Value: not relevant
		iii.	Field: Calibration Value – Calibration Time
			□ Format: uint16
			□ Value: not relevant
		iv.	Field: Calibration Value – Calibration Type
			☐ Format: 4 bit
			□ Value: not relevant
		٧.	Field: Calibration Value – Calibration Sample Location
			☐ Format: 4 bit
			□ Value (CDR number 1): 0x1 (finger)
			□ Value (CDR number 2): 0x2 (alternative site test)
			☐ Value (CDR number 3): 0x3 (earlobe)
			☐ Value (CDR number 4): 0x4 (control solution)
			☐ Value (CDR number 5): 0x5 (subcutaneous tissue)
			☐ Value (CDR number 6): 0xF (sample location value not available)
		vi.	Field: Calibration Value - Next Calibration Time
			□ Format: uint16
			□ Value: not relevant
		vii.	Field: Calibration Value - Calibration Data Record Number
			□ Format: uint16
			□ Value: 1 to 6 (six Calibration Data Records (CDR) stored)
		viii.	Field: Calibration Value – Calibration Status
			□ Format: 8 bit
			□ Value: not relevant
		ix.	Field: E2E-CRC
			☐ This field is not present
3.			G under test initiates a discovery process (Scanning state), it discovers the ed PHD and it starts a pairing process with the simulated PHD (Initiating state).
4.	Ses usir per	ssion ng O form	se pairing has been completed, force the PHG to read CGM Feature and CGM Start Time characteristics, and then to perform a Glucose Calibration procedure p Code "Get Glucose Calibration value" (0x05) with Operand "0x0001" (by ing a write operation to the CGM Specific Ops Control Point characteristic's Op and Calibration Data Record Number fields respectively).
5.	Res	spon	ulated PHD will respond with an indication including a "Calibration Value se" Op Code (0x06) and a Calibration Data Record containing the requested on information.
6.	Che	eck in	PHG transcoder output the Sensor Calibration Numeric Object – Supplemental-

Types attribute

- 7. Force the PHG to perform a Glucose Calibration procedure using Op Code "Get Glucose Calibration value" (0x05) with Operand "0x0002". The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration information. Check in PHG transcoder output the Sensor Calibration Numeric Object Supplemental-Types attribute
- 8. Force the PHG to perform a Glucose Calibration procedure using Op Code "Get Glucose Calibration value" (0x05) with Operand "0x0003". The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration information. Check in PHG transcoder output the Sensor Calibration Numeric Object Supplemental-Types attribute
- 9. Force the PHG to perform a Glucose Calibration procedure using Op Code "Get Glucose Calibration value" (0x05) with Operand "0x0004". The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration information. Check in PHG transcoder output the Sensor Calibration Numeric Object Supplemental-Types attribute
- 10. Force the PHG to perform a Glucose Calibration procedure using Op Code "Get Glucose Calibration value" (0x05) with Operand "0x0005". The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration information. Check in PHG transcoder output the Sensor Calibration Numeric Object Supplemental-Types attribute
- 11. Force the PHG to perform a Glucose Calibration procedure using Op Code "Get Glucose Calibration value" (0x05) with Operand "0x0006". The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration information. Check in PHG transcoder output the Sensor Calibration Numeric Object Supplemental-Types attribute

## Pass/Fail criteria

- In Step 6, if present, the Sensor Calibration Numeric Object Supplemental-Types attribute is set to {MDC\_PART\_PHD\_DM | MDC\_CTXT\_GLU\_SAMPLELOCATION\_FINGER}
- In Step 7, if present, the Sensor Calibration Numeric Object Supplemental-Types attribute is to {MDC\_PART\_PHD\_DM | MDC\_CTXT\_GLU\_SAMPLELOCATION\_AST}
- In Step 8, if present, the Sensor Calibration Numeric Object Supplemental-Types attribute is set to {MDC\_PART\_PHD\_DM | MDC\_CTXT\_GLU\_SAMPLELOCATION\_EARLOBE}
- In Step 9, if pesent, the Sensor Calibration Numeric Object Supplemental-Types attribute is set to {MDC\_PART\_PHD\_DM | MDC\_CTXT\_GLU\_SAMPLELOCATION\_CTRLSOLUTION}
- In Step 10, if present the Sensor Calibration Numeric Object Supplemental-Types attribute is set to {MDC\_PART\_PHD\_DM | MDC\_CTXT\_GLU\_SAMPLELOCATION\_SUBCUTANEOUS}
- In Step 11, if present, the Sensor Calibration Numeric Object Supplemental-Types attribute is set to {MDC\_PART\_PHD\_DM | MDC\_CTXT\_GLU\_SAMPLELOCATION\_UNDERTERMINED}

## Notes (To assist manual testing)

Possible values in typical points of observation after transcoder output are:

- a) IEEE 11073 Objects and Attributes
  - If Supplemental-Types attribute is present:
  - □ Object: Sensor Calibration Numeric Object
  - ☐ Attribute-id: MDC\_ATTR\_SUPPLEMENTAL\_TYPES (2657)
  - ☐ Attribute-type: SEQUENCE of SEQUENCE {partition (INT-U16), code (INT-U16)}
  - ☐ Attribute-value (Step 6):
    - partition: MDC\_PART\_PHD\_DM or 128 (dec) or 00 80 (hex)
    - code: MDC\_CTXT\_GLU\_SAMPLELOCATION\_FINGER or 29240 (dec) or 72 38 (hex)
  - Attribute-value (Step 7):
    - partition: MDC\_PART\_PHD\_DM or 128 (dec) or 00 80 (hex)

- code: MDC\_CTXT\_GLU\_SAMPLELOCATION\_AST or 29244 (dec) or 72 3C (hex)
- ☐ Attribute-value (Step 8):
  - partition: MDC\_PART\_PHD\_DM or 128 (dec) or 00 80 (hex)
  - code: MDC\_CTXT\_GLU\_SAMPLELOCATION\_EARLOBE or 29248 (dec) or 72 40 (hex)
- ☐ Attribute-value (Step 9):
  - partition: MDC\_PART\_PHD\_DM or 128 (dec) or 00 80 (hex)
  - code: MDC\_CTXT\_GLU\_SAMPLELOCATION\_CTRLSOLUTION or 29252 (dec) or 72 44 (hex)
- ☐ Attribute-value (Step 10):
  - partition: MDC\_PART\_PHD\_DM or 128 (dec) or 00 80 (hex)
  - code: MDC\_CTXT\_GLU\_SAMPLELOCATION\_SUBCUTANEOUS or 29241 (dec) or 72 39 (hex)
- ☐ Attribute-value (Step 11):
  - partition: MDC\_PART\_PHD\_DM or 128 (dec) or 00 80 (hex)
  - code: MDC\_CTXT\_GLU\_SAMPLELOCATION\_UNDERTERMINED or 29237 (dec) or 72 35 (hex)
- b) WAN PCD-01 message

If Supplemental-Types is present, PCD-01 message includes a facet OBX segment of the Sensor Calibration OBX segment with Supplemental-Types attribute (check OBX-3 and OBX-5):

 $\label{eq:obx_nlm} OBX|n|NM|8418036^MDC\_CGM\_SENSOR\_CALIBRATION^MDC|\\ m.0.0.x|[value]|[unit]|||||R|||[date\_time]$ 

Step 6

OBX|n|CWE|68193^MDC\_ATTR\_SUPPLEMENTAL\_TYPES^MDC|m.0.0.x.y| 8417848^MDC\_CTXT\_GLU\_SAMPLELOCATION\_FINGER^MDC||||||R

Step 7

OBX|n|CWE|68193^MDC\_ATTR\_SUPPLEMENTAL\_TYPES^MDC|m.0.0.x.y| 8417852^MDC\_CTXT\_GLU\_SAMPLELOCATION\_AST^MDC||||||R

Step 8

OBX|n|CWE|68193^MDC\_ATTR\_SUPPLEMENTAL\_TYPES^MDC|m.0.0.x.y| 8417856^MDC\_CTXT\_GLU\_SAMPLELOCATION\_EARLOBE^MDC||||||R

Step 9

OBX|n|CWE|68193^MDC\_ATTR\_SUPPLEMENTAL\_TYPES^MDC|m.0.0.x.y| 8417860^MDC\_CTXT\_GLU\_SAMPLELOCATION\_CTRLSOLUTION^MDC|||||R

Step 10

OBX|n|CWE|68193^MDC\_ATTR\_SUPPLEMENTAL\_TYPES^MDC|m.0.0.x.y| 8417849^MDC\_CTXT\_GLU\_SAMPLELOCATION\_SUBCUTANEOUS^MDC|||||R

Step 11

OBX|n|CWE|68193^MDC\_ATTR\_SUPPLEMENTAL\_TYPES^MDC|m.0.0.x.y| 8417845^MDC\_CTXT\_GLU\_SAMPLELOCATION\_UNDERTERMINED^MDC||||||R

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-016_A			
TP label	bel Whitepaper. Sensor Calibration Numeric Object - Metric-Spec-Small Attribute 1			Small Attribute 1	
Coverage	Spec	[Bluetooth PHDT v1.6]			
	Testable	SensCal Numeric 4; M	SensCal Numeric 6; M		

items	
Test purpose	Check that:  PHG includes Sensor Calibration Numeric Object – Metric-Spec-Small attribute in transcoder output.  [AND]  Metric-Spec-Small is set to {0x604C} when the calibration is updated manually by the user.
Applicability	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043
Other PICS	
Initial condition	The PHG under test and the simulated PHD are in the Standby state.
Test procedure	The PHG under test and the simulated PHD are in the Standby state.  1. The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). The simulated PHD has a Calibration Data Record stored.  2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:  a. CGM Feature (0x2AA8)  i. Field: CGM Feature    Format: 24 bit   Value: 0000 0000 0000 0000 0000 0001 (MSB → LSB). Calibration supported.  ii. Field: CGM Type    Format: 4 bit   Value: not relevant  iii. Field: CGM Sample Location   Format: 4 bit   Value: not relevant  iv. Field: E2E-CRC   Format: uint16   Value: not relevant  b. CGM Specific Ops Control Point (0x2AAC)  i. Field: Op Code   Format: uint8   Value: 0x06 (Glucose Calibration Value Response)  ii. Field: Calibration Value – Glucose concentration of Calibration (mg/dL)   Format: SFLOAT   Value: not relevant  iii. Field: Calibration Value – Calibration Time   Format: uint16
	□ Value: not relevant  iv. Field: Calibration Value – Calibration Type □ Format: 4 bit □ Value: not relevant  v. Field: Calibration Value – Calibration Sample Location □ Format: 4 bit □ Value: not relevant  vi. Field: Calibration Value - Next Calibration Time

			☐ Format: uint16
			□ Value: not relevant
		vii.	Field: Calibration Value – Calibration Data Record Number
			☐ Format: uint16
			□ Value: not relevant
		viii	Field: Calibration Value – Calibration Status
			☐ Format: 8 bit
			□ Value: not relevant
		ix.	Field: E2E-CRC
			☐ This field is not present
	3.		G under test initiates a discovery process (Scanning state), it discovers the ed PHD and it starts a pairing process with the simulated PHD (Initiating state).
	4.	Session stored p Calibrat CGM S	ne pairing has been completed, force the PHG to read CGM Feature and CGM in Start Time characteristics, and then to request the las Calibration Data Record performing a Glucose Calibration procedure using Op Code "Get Glucose cion value" (0x05) with Operand "0xFFFF" (by performing a write operation to the pecific Ops Control Point characteristic's Op Code and Calibration Data Record in fields respectively).
	5.	Respon	nulated PHD will respond with an indication including a "Calibration Value ise" Op Code (0x06) and a Calibration Data Record containing the requested ion information, which was manually updated by the user.
	6.	Check i Small a	n PHG transcoder output the Sensor Calibration Numeric Object – Metric-Spectribute
Pass/Fail criteria	its \	value is {	e Sensor Calibration Numeric Object – Metric-Spec-Small attribute is present and 0x604C} (mss-avail-stored-data   mss-upd-aperiodic   mss-acc-agent-initiated   nual   mss-cat-setting)
Notes	Pos	ssible val	ues in typical points of observation after transcoder output are:
(To assist manual	a)		1073 Objects and Attributes
testing)	u)		Spec-Small attribute is present:
			ject: Sensor Calibration Numeric Object
			ribute-id: MDC_ATTR_METRIC_SPEC_SMALL (2630)
			ribute-type: BITS-16
		☐ Att	ribute-value: 0x604C (hex) or BITS mss-avail-stored-data (1), mss-upd-eriodic(2), mss-acc-agent-initiated(9), mss-cat-manual(12), mss-cat-setting(13) set FRUE and remaining BITS set to FALSE
	b)	WAN P	CD-01 message
		PCD-01	message does not include segments with Metric-Spec-Small attribute value

TP ld		TP/LP-PAN/PHG/PHDTW/CGI	M/BV-016_B			
TP label		Whitepaper. Sensor Calibration Numeric Object - Metric-Spec-Small Attribute 2				
Coverage	Spec	[Bluetooth PHDT v1.6]				
	Testable items	SensCal Numeric 4; M SensCal Numeric 5; M				
Test purpose		Check that:				
		PHG includes Sensor Calibration Numeric Object – Metric-Spec-Small attribute in transcoder output.				

	[AND]		
	Metric-Spec-Small is set to {0x6044} when the Glucose Calibration procedure has been executed.		
Applicability	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043		
Other PICS			
Initial condition	The PHG under test and the simulated PHD are in the Standby state.		
Test procedure	The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization).		
	2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:		
	a. CGM Feature (0x2AA8)		
	i. Field: CGM Feature		
	☐ Format: 24 bit		
	□ Value: 0000 0000 0000 0000 0001 (MSB → LSB). Calibration supported.		
	ii. Field: CGM Type		
	☐ Format: 4 bit		
	□ Value: not relevant		
	iii. Field: CGM Sample Location		
	☐ Format: 4 bit		
	□ Value: not relevant		
	iv. Field: E2E-CRC		
	☐ Format: uint16		
	□ Value: not relevant		
	b. CGM Specific Ops Control Point (0x2AAC)		
	i. Field: Op Code		
	☐ Format: uint8		
	□ Value: 0x06 (Glucose Calibration Value Response)		
	ii. Field: Calibration Value – Glucose concentration of Calibration (mg/dL)		
	☐ Format: SFLOAT		
	☐ Value: not relevant		
	iii. Field: Calibration Value – Calibration Time		
	☐ Format: uint16		
	□ Value: not relevant		
	iv. Field: Calibration Value – Calibration Type		
	☐ Format: 4 bit		
	☐ Value: not relevant		
	v. Field: Calibration Value – Calibration Sample Location		
	☐ Format: 4 bit		
	□ Value: not relevant		
	vi. Field: Calibration Value - Next Calibration Time		
	☐ Format: uint16		
	□ Value: not relevant		
	vii. Field: Calibration Value – Calibration Data Record Number		

	☐ Format: uint16
	☐ Value: not relevant
	viii. Field: Calibration Value – Calibration Status
	☐ Format: 8 bit
	☐ Value: not relevant
	ix. Field: E2E-CRC
	☐ This field is not present
	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).
	<ol> <li>When the pairing has been completed, force the PHG to read CGM Feature and CGM Session Start Time characteristics.</li> </ol>
	5. Force the PHG to calibrate the CGM Sensor, writing a "Set Glucose Calibration Value" Op Code (0x04) and a Calibration Data Record operand with valid values. The simulated PHD will respond with an indication including a Response Op Code value of "Success".
	6. Then request the last Calibration Data Record stored performing a Glucose Calibration procedure using Op Code "Get Glucose Calibration value" (0x05) with Operand "0xFFFF" (by performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code and Calibration Data Record Number fields respectively).
	7. The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the previously set calibration information.
	8. Check in the PHG transcoder output the Sensor Calibration Numeric Object – Metric- Spec-Small
Pass/Fail criteria	In Step 6, the Sensor Calibration Numeric Object – Metric-Spec-Small attribute is present and its value is {0x6044} (mss-avail-stored-data   mss-upd-aperiodic   mss-acc-agent-initiated   mss-cat-setting)
Notes	Possible values in typical points of observation after transcoder output are:
(To assist manual	a) IEEE 11073 Objects and Attributes
testing)	Metric-Spec-Small attribute is present:
	□ Object: Sensor Calibration Numeric Object
	☐ Attribute-id: MDC_ATTR_METRIC_SPEC_SMALL (2630)
	☐ Attribute-type: BITS-16
	Attribute-value: 0x6044 (hex) or BITS mss-avail-stored-data (1), mss-upd-aperiodic(2), mss-acc-agent-initiated(9), mss-cat-setting(13) set to TRUE and remaining BITS set to FALSE
	b) WAN PCD-01 message
	PCD-01 message does not include segments with Metric-Spec-Small attribute value

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-017				
TP label		Whitepaper. Sensor Calibration Numeric Object – Measurement-Status Attribute				
Coverage	Spec	[Bluetooth PHDT v1.6]				
	Testable items	SensCal Numeric 7; O	SensCal Numeric 8; M	SensCal Numeric 9; M		
Test purpose		Check that:  PHG may include Sensor Calibration Numeric Object – Measurement-Status attribute in transcoder output.  [AND]				

	If present and related to the Sensor Status Annunciation field, Measurement-Status is set to the correct value				
Applicability	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043				
Other PICS					
Initial condition	The PHG under test and the simulated PHD are in the Standby state.				
Test procedure	The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device)				
	specialization). The simulated PHD has four different Calibration Data Records stored.				
	<ol><li>The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:</li></ol>				
	a. CGM Feature (0x2AA8)				
	i. Field: CGM Feature				
	☐ Format: 24 bit				
	□ Value: 0000 0000 0000 0000 0001 (MSB → LSB). Calibration supported.				
	ii. Field: CGM Type				
	☐ Format: 4 bit				
	☐ Value: not relevant				
	iii. Field: CGM Sample Location				
	☐ Format: 4 bit				
	☐ Value: not relevant				
	iv. Field: E2E-CRC				
	☐ Format: uint16				
	☐ Value: not relevant				
	b. CGM Specific Ops Control Point (0x2AAC)				
	i. Field: Op Code				
	☐ Format: uint8				
	□ Value: 0x06 (Glucose Calibration Value Response)				
	ii. Field: Calibration Value – Glucose concentration of Calibration (mg/dL)				
	☐ Format: SFLOAT				
	☐ Value: not relevant				
	iii. Field: Calibration Value – Calibration Time				
	☐ Format: uint16				
	□ Value: not relevant				
	iv. Field: Calibration Value – Calibration Type				
	☐ Format: 4 bit				
	☐ Value: not relevant				
	v. Field: Calibration Value – Calibration Sample Location				
	☐ Format: 4 bit				
	☐ Value: not relevant				
	vi. Field: Calibration Value - Next Calibration Time				
	☐ Format: uint16				
	□ Value: not relevant				
	vii. Field: Calibration Value – Calibration Data Record Number				
	☐ Format: uint16				

<ul> <li>present, is set to "invalid" (bit 0).</li> <li>In Step 7 the Sensor Calibration Numeric Object – Measurement-Status attribute, if present, is set to "invalid" (bit 0).</li> <li>In Step 8 the Sensor Calibration Numeric Object – Measurement-Status, if present, is set to "calibration-ongoing" (bit 3).</li> <li>In Step 9 the Sensor Calibration Numeric Object – Measurement-Status attribute, if present, is set to "validated-data" (bit 8)</li> <li>Notes</li> </ul>				
Format: 8 bit   Value (CDR number 1): 0000 0001 (calibration data rejected)   Value (CDR number 2): 0000 0100 (calibration data out-of-range)   Value (CDR number 4): 0000 0100 (calibration process pending)   Value (CDR number 4): 0000 0100 (calibration process pending)   Value (CDR number 4): 0000 0100 (calibration process pending)   Value (CDR number 4): 0000 0000				☐ Value: 1 to 4 (four Calibration Data Records (CDR) stored)
Value (CDR number 1): 0000 0001 (calibration data rejected)   Value (CDR number 2): 0000 00010 (calibration data out-of-range)   Value (CDR number 3): 0000 0100 (calibration data out-of-range)   Value (CDR number 3): 0000 0100 (calibration process pending)   Value (CDR number 4): 0000 0000   ix. Field: E2E-CRC   This field is not present   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, force the PHG to read CGM Feature and CGM Session Start Time characteristics, and then to perform a Glucose Calibration of CGM Session Start Time characteristics, and then to perform a Glucose Calibration Potential Session Start Time operation to the CGM Specific Ope Control Point characteristic's Op Code and Calibration Data Record Number fields respectively),   5. The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration information.   6. Check in PHG transcoder output the Sensor Calibration Numeric Object — Measurement-Status attribute   7. Force the PHG to perform a Glucose Calibration procedure using Op Code "Get Glucose Calibration value" (0x05) with Operand "0x0002". The simulated PHD will respond with an indication including a "Calibration Numeric Object — Measurement-Status attribute   8. Force the PHG to perform a Glucose Calibration formation. Check in PHG transcoder output the Sensor Calibration Numeric Object — Measurement-Status attribute   9. Force the PHG to perform a Glucose Calibration incomation. Check in PHG transcoder output the Sensor Calibration Numeric Object — Measurement-Status attribute in present, is set to "validated data" (bit 0).   In Step 6 the Sensor Calibration Numeric Object — Measurement-Status, if present, is set to "validated data" (bit 0).   In Step 8 the Sensor Calibration Numeric Object — Measurement-Statu			viii.	Field: Calibration Value – Calibration Status
Value (CDR number 2): 0000 0010 (calibration data out-of-range)   Value (CDR number 3): 0000 0100 (calibration process pending)   Value (CDR number 3): 0000 0100 (calibration process pending)   Value (CDR number 4): 0000 0000   ix. Field: E2E-CRC   This field is not present   3. The PHG under test initiates a discovery process (Scanning state), it discovers the simulated PHD under test initiates a discovery process with the simulated PHD (Initiating state).   4. When the pairing has been completed, force the PHG to read CGM Feature and CGM Session Start Time characteristics, and then to perform a Glucose Calibration procedure using Op Code "Cet Glucose Calibration Patrick" (0x05) with Operand "0x0001" (by performing a write operation to the COM Specific Ops Control Point characteristic's Op Code and Calibration Data Record Number fields respectively.   5. The simulated PHD will respond with an indication including a "Calibration Value Response" (Op Code (0x06) and a Calibration Data Record containing the requested calibration number of Code (0x06) and a Calibration Numeric Object — Measurement-Status attribute   7. Force the PHG to perform a Glucose Calibration procedure using Op Code "Get Glucose Calibration value" (0x05) with Operand "0x0002". The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record Containing the requested calibration information. Check in PHG transcoder output the Sensor Calibration Nature Response" Op Code (0x06) and a Calibration Data Record Containing the requested calibration information. Check in PHG transcoder output the Sensor Calibration Numeric Object — Measurement-Status attribute output the Sensor Calibration Numeric Object — Measurement-Status attribute output the Sensor Calibration Numeric Object — Measurement-Status attribute, if present, is set to "invalid" (bit 0).  In Step 8 the Sensor Calibration Numeric Object — Measurement-Status attribute, if present, is set to "invalid" (bit 0).  In Step				☐ Format: 8 bit
Value (CDR number 3): 0000 0100 (calibration process pending)   Value (CDR number 4): 0000 0000   Value (				☐ Value (CDR number 1): 0000 0001 (calibration data rejected)
Value (CDR number 4): 0000 0000   ix. Field: E2E-CRC				☐ Value (CDR number 2): 0000 0010 (calibration data out-of-range)
ix. Field: E2E-CRC    This field is not present				☐ Value (CDR number 3): 0000 0100 (calibration process pending)
This field is not present				☐ Value (CDR number 4): 0000 0000
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, force the PHG to read CGM Feature and CGM Session Start Time characteristics, and then to perform a Glucose Calibration procedure using Op Code "Get Glucose Calibration value" (0x03) with Operand "0x0001" (by performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code and Calibration Data Record Number fields respectively).  5. The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration information.  6. Check in PHG transcoder output the Sensor Calibration Numeric Object – Measurement-Status attribute  7. Force the PHG to perform a Glucose Calibration procedure using Op Code "Get Glucose Calibration value" (0x05) with Operand "0x0002". The simulated PHD will respond with an indication including a "Calibration Numeric Object – Measurement-Status attribute  8. Force the PHG to perform a Glucose Calibration procedure using Op Code "Get Glucose Calibration value" (0x05) with Operand "0x0002". The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration information. Check in PHG transcoder output the Sensor Calibration Numeric Object – Measurement-Status attribute  8. Force the PHG to perform a Glucose Calibration procedure using Op Code "Get Glucose Calibration including" ("Ox50) with Operand "0x0004". The simulated PHD will respond with an indication including a "Calibration Numeric Object – Measurement-Status attribute. If present, is set to "invalid" (bit 0).  • In Step 5 the Sensor Calibration Numeric Object – Measurement-Status attribute, if present, is set to "invalid" (bit 0).  • In Step 9 the Sensor Calibration Numeric Object – Measurement-St			ix.	Field: E2E-CRC
simulated PHD and it starts a pairing process with the simulated PHD (Initiating state).  4. When the pairing has been completed, force the PHG to read CGM Feature and CGM Session Start Time characteristics, and then to perform a Glucose Calibration procedure using Op Code "Get Glucose Calibration value" (0x05) with Operand "0x0001" (by performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code and Calibration Data Record Number fields respectively).  5. The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration information.  6. Check in PHG transcoder output the Sensor Calibration Numeric Object – Measurement-Status attribute  7. Force the PHG to perform a Glucose Calibration procedure using Op Code "Get Glucose Calibration value" (0x05) with Operand "0x0002". The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration information. Check in PHG transcoder output the Sensor Calibration Numeric Object – Measurement-Status attribute  8. Force the PHG to perform a Glucose Calibration procedure using Op Code "Get Glucose Calibration value" (0x05) with Operand "0x0003". The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration procedure using Op Code "Get Glucose Calibration value" (0x05) with Operand "0x0003". The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration procedure using Op Code "Get Glucose Calibration Paula" (0x05) with Operand "0x0004". The simulation Check in PHG transcoder output the Sensor Calibration Numeric Object – Measurement-Status attribute, if present, is set to "invalid" (bit 0).  In Step 8 the Sensor Calibra				☐ This field is not present
Session Start Time characteristics, and then to perform a Glucose Calibration procedure using Op Code "Get Glucose Calibration value" (0x05) with Operand "0x0001" (by performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code and Calibration Data Record Number fields respectively).  5. The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration information.  6. Check in PHG transcoder output the Sensor Calibration Numeric Object – Measurement-Status attribute  7. Force the PHG to perform a Glucose Calibration procedure using Op Code "Get Glucose Calibration value" (0x05) with Operand "0x0002". The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration information. Check in PHG transcoder output the Sensor Calibration Numeric Object – Measurement-Status attribute  8. Force the PHG to perform a Glucose Calibration procedure using Op Code "Get Glucose Calibration value" (0x05) with Operand "0x0003". The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration including a "Calibration Data Record containing the requested calibration including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration procedure using Op Code "Get Glucose Calibration value" (0x05) with Operand "0x0004". The simulated PHD will respond with an indication including a "Calibration Numeric Object – Measurement-Status attribute in present, is set to "invalid" (bit 0).  9. Force the PHG to perform a Glucose Calibration Procedure using Op Code "Get Glucose Calibration Numeric Object – Measurement-Status attribute, if present, is set to "invalid" (bit 0).  • In Step 8 the Sensor Calibration Numeric Object – Measurement-Statu		3.		
Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration information.  6. Check in PHG transcoder output the Sensor Calibration Numeric Object – Measurement-Status attribute  7. Force the PHG to perform a Glucose Calibration procedure using Op Code "Get Glucose Calibration value" (0x05) with Operand "0x0002". The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration information. Check in PHG transcoder output the Sensor Calibration Numeric Object – Measurement-Status attribute  8. Force the PHG to perform a Glucose Calibration procedure using Op Code "Get Glucose Calibration value" (0x05) with Operand "0x0003". The simulated PHD will respond with an indication including a "Calibration Numeric Object – Measurement-Status attribute  9. Force the PHG to perform a Glucose Calibration information. Check in PHG transcoder output the Sensor Calibration Numeric Object – Measurement-Status attribute  9. Force the PHG to perform a Glucose Calibration procedure using Op Code "Get Glucose Calibration value" (0x05) with Operand "0x0004". The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration information. Check in PHG transcoder output the Sensor Calibration Numeric Object – Measurement-Status attribute  Pass/Fail criteria  • In Step 6 the Sensor Calibration Numeric Object – Measurement-Status attribute, if present, is set to "invalid" (bit 0).  • In Step 7 the Sensor Calibration Numeric Object – Measurement-Status attribute, if present, is set to "invalid" (bit 0).  • In Step 8 the Sensor Calibration Numeric Object – Measurement-Status attribute, if present, is set to "alidated-data" (bit 8)  Possible values in typical points of observation after transcoder output are:  a) IEEE 11073 Objects and Attributes  If Measurement-Status attribute is present:  Object: S		4.	Session Susing Opperforming	Start Time characteristics, and then to perform a Glucose Calibration procedure Code "Get Glucose Calibration value" (0x05) with Operand "0x0001" (by g a write operation to the CGM Specific Ops Control Point characteristic's Op
Status attribute  7. Force the PHG to perform a Glucose Calibration procedure using Op Code "Get Glucose Calibration value" (0x05) with Operand "0x0002". The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration information. Check in PHG transcoder output the Sensor Calibration numeric Object — Measurement-Status attribute  8. Force the PHG to perform a Glucose Calibration procedure using Op Code "Get Glucose Calibration value" (0x05) with Operand "0x0003". The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration information. Check in PHG transcoder output the Sensor Calibration Numeric Object — Measurement-Status attribute  9. Force the PHG to perform a Glucose Calibration procedure using Op Code "Get Glucose Calibration value" (0x05) with Operand "0x0004". The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration information. Check in PHG transcoder output the Sensor Calibration Numeric Object — Measurement-Status attribute  Pass/Fail criteria  • In Step 6 the Sensor Calibration Numeric Object — Measurement-Status attribute, if present, is set to "invalid" (bit 0).  • In Step 7 the Sensor Calibration Numeric Object — Measurement-Status attribute, if present, is set to "invalid" (bit 0).  • In Step 8 the Sensor Calibration Numeric Object — Measurement-Status attribute, if present, is set to "validated-data" (bit 8)  Notes  (To assist manual testing)  1. In Step 9 the Sensor Calibration Numeric Object — Measurement-Status attribute, if present, is set to "validated-data" (bit 8)  1. In Step 9 the Sensor Calibration Numeric Object — Measurement-Status attribute, if present, is set to "validated-data" (bit 8)  1. Attribute-id: MDC_ATTR_MSMT_STAT (2375)  1. Attribute-id: MDC		5.	Response	e" Op Code (0x06) and a Calibration Data Record containing the requested
Calibration value" (0x05) with Operand "0x002". The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration information. Check in PHG transcoder output the Sensor Calibration Numeric Object — Measurement-Status attribute  8. Force the PHG to perform a Glucose Calibration procedure using Op Code "Get Glucose Calibration value" (0x05) with Operand "0x0003". The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration information. Check in PHG transcoder output the Sensor Calibration Pumeric Object — Measurement-Status attribute  9. Force the PHG to perform a Glucose Calibration procedure using Op Code "Get Glucose Calibration value" (0x05) with Operand "0x0004". The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration information. Check in PHG transcoder output the Sensor Calibration Numeric Object — Measurement-Status attribute  Pass/Fail criteria  • In Step 6 the Sensor Calibration Numeric Object — Measurement-Status attribute, if present, is set to "invalid" (bit 0).  • In Step 7 the Sensor Calibration Numeric Object — Measurement-Status attribute, if present, is set to "invalid" (bit 0).  • In Step 9 the Sensor Calibration Numeric Object — Measurement-Status attribute, if present, is set to "validated-data" (bit 3).  • In Step 9 the Sensor Calibration Numeric Object — Measurement-Status attribute, if present, is set to "validated-data" (bit 8)  Possible values in typical points of observation after transcoder output are:    Object: Sensor Calibration Numeric Object — Measurement-Status attribute, if present is set to "validated-data" (bit 8)    Attribute-vipe: BITS16		6.		
Calibration value" (0x05) with Operand "0x0003". The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration information. Check in PHG transcoder output the Sensor Calibration Numeric Object – Measurement-Status attribute  9. Force the PHG to perform a Glucose Calibration procedure using Op Code "Get Glucose Calibration value" (0x05) with Operand "0x0004". The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration information. Check in PHG transcoder output the Sensor Calibration Numeric Object – Measurement-Status attribute  Pass/Fail criteria  In Step 6 the Sensor Calibration Numeric Object – Measurement-Status attribute, if present, is set to "invalid" (bit 0).  In Step 7 the Sensor Calibration Numeric Object – Measurement-Status attribute, if present, is set to "invalid" (bit 0).  In Step 8 the Sensor Calibration Numeric Object – Measurement-Status attribute, if present, is set to "validated-data" (bit 8).  Notes (To assist manual testing)  Notes (To assist manual testing)  Possible values in typical points of observation after transcoder output are:    Object: Sensor Calibration Numeric Object     Attribute-id: MDC_ATTR_MSMT_STAT (2375)     Attribute-id: MDC_ATTR_MSMT_STAT (2375)     Attribute-value (Step 6): "invalid" (0x8000)		7.	Calibration indication Data Rec	n value" (0x05) with Operand "0x0002". The simulated PHD will respond with an including a "Calibration Value Response" Op Code (0x06) and a Calibration ord containing the requested calibration information. Check in PHG transcoder
Calibration value" (0x05) with Operand "0x0004". The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration information. Check in PHG transcoder output the Sensor Calibration Numeric Object – Measurement-Status attribute  Pass/Fail criteria  In Step 6 the Sensor Calibration Numeric Object – Measurement-Status attribute, if present, is set to "invalid" (bit 0).  In Step 7 the Sensor Calibration Numeric Object – Measurement-Status attribute, if present, is set to "invalid" (bit 0).  In Step 8 the Sensor Calibration Numeric Object – Measurement-Status, if present, is set to "calibration-ongoing" (bit 3).  In Step 9 the Sensor Calibration Numeric Object – Measurement-Status attribute, if present, is set to "validated-data" (bit 8)  Notes (To assist manual testing)  Possible values in typical points of observation after transcoder output are:    Object: Sensor Calibration Numeric Object     Attribute-id: MDC_ATTR_MSMT_STAT (2375)     Attribute-type: BITS16     Attribute-value (Step 6): "invalid" (0x8000)		8.	Calibration indication Data Rec	n value" (0x05) with Operand "0x0003". The simulated PHD will respond with an including a "Calibration Value Response" Op Code (0x06) and a Calibration ord containing the requested calibration information. Check in PHG transcoder
present, is set to "invalid" (bit 0).  In Step 7 the Sensor Calibration Numeric Object – Measurement-Status attribute, if present, is set to "invalid" (bit 0).  In Step 8 the Sensor Calibration Numeric Object – Measurement-Status, if present, is set to "calibration-ongoing" (bit 3).  In Step 9 the Sensor Calibration Numeric Object – Measurement-Status attribute, if present, is set to "validated-data" (bit 8)  Notes (To assist manual testing)  Possible values in typical points of observation after transcoder output are:  a) IEEE 11073 Objects and Attributes If Measurement-Status attribute is present:  Object: Sensor Calibration Numeric Object  Attribute-id: MDC_ATTR_MSMT_STAT (2375)  Attribute-type: BITS16  Attribute-value (Step 6): "invalid" (0x8000)		9.	Calibration indication Data Rec	n value" (0x05) with Operand "0x0004". The simulated PHD will respond with an including a "Calibration Value Response" Op Code (0x06) and a Calibration ord containing the requested calibration information. Check in PHG transcoder
<ul> <li>In Step 7 the Sensor Calibration Numeric Object – Measurement-Status attribute, if present, is set to "invalid" (bit 0).</li> <li>In Step 8 the Sensor Calibration Numeric Object – Measurement-Status, if present, is set to "calibration-ongoing" (bit 3).</li> <li>In Step 9 the Sensor Calibration Numeric Object – Measurement-Status attribute, if present, is set to "validated-data" (bit 8)</li> <li>Notes         (To assist manual testing)</li> <li>Possible values in typical points of observation after transcoder output are:         <ul> <li>a) IEEE 11073 Objects and Attributes</li> <li>If Measurement-Status attribute is present:</li> <li>Dobject: Sensor Calibration Numeric Object</li> <li>Attribute-id: MDC_ATTR_MSMT_STAT (2375)</li> <li>Attribute-type: BITS16</li> <li>Attribute-value (Step 6): "invalid" (0x8000)</li> </ul> </li> </ul>	Pass/Fail criteria	•		
to "calibration-ongoing" (bit 3).  In Step 9 the Sensor Calibration Numeric Object – Measurement-Status attribute, if present, is set to "validated-data" (bit 8)  Possible values in typical points of observation after transcoder output are:  a) IEEE 11073 Objects and Attributes  If Measurement-Status attribute is present:  Object: Sensor Calibration Numeric Object  Attribute-id: MDC_ATTR_MSMT_STAT (2375)  Attribute-type: BITS16  Attribute-value (Step 6): "invalid" (0x8000)		•		
Notes (To assist manual testing)  Possible values in typical points of observation after transcoder output are:  a) IEEE 11073 Objects and Attributes If Measurement-Status attribute is present:  Object: Sensor Calibration Numeric Object  Attribute-id: MDC_ATTR_MSMT_STAT (2375)  Attribute-type: BITS16  Attribute-value (Step 6): "invalid" (0x8000)		•		
a) IEEE 11073 Objects and Attributes  If Measurement-Status attribute is present:  Object: Sensor Calibration Numeric Object  Attribute-id: MDC_ATTR_MSMT_STAT (2375)  Attribute-type: BITS16  Attribute-value (Step 6): "invalid" (0x8000)		•		
a) IEEE 11073 Objects and Attributes  If Measurement-Status attribute is present:  Object: Sensor Calibration Numeric Object  Attribute-id: MDC_ATTR_MSMT_STAT (2375)  Attribute-type: BITS16  Attribute-value (Step 6): "invalid" (0x8000)	Notes	Pos	sible value	es in typical points of observation after transcoder output are:
If Measurement-Status attribute is present:  Object: Sensor Calibration Numeric Object  Attribute-id: MDC_ATTR_MSMT_STAT (2375)  Attribute-type: BITS16  Attribute-value (Step 6): "invalid" (0x8000)	(To assist manual	a)	IEEE 110	73 Objects and Attributes
<ul> <li>□ Attribute-id: MDC_ATTR_MSMT_STAT (2375)</li> <li>□ Attribute-type: BITS16</li> <li>□ Attribute-value (Step 6): "invalid" (0x8000)</li> </ul>	testing)		If Measur	ement-Status attribute is present:
<ul> <li>□ Attribute-id: MDC_ATTR_MSMT_STAT (2375)</li> <li>□ Attribute-type: BITS16</li> <li>□ Attribute-value (Step 6): "invalid" (0x8000)</li> </ul>				·
□ Attribute-type: BITS16 □ Attribute-value (Step 6): "invalid" (0x8000)				
☐ Attribute-value (Step 6): "invalid" (0x8000)				
				•

	Attribute-value (Step 8): "calibration-ongoing" (0x1000)
	Attribute-value (Step 9): "validated-data" (0x0080)
b) V	VAN PCD-01 message
	Measurement-Status is present, PCD-01 message includes a segment like this with leasurement-Status attribute value (check OBX-8 and OBX-11):
•	Step 6
	OBX n NM 8418036^MDC_CGM_SENSOR_CALIBRATION^MDC  m.0.0.x [value] [unit]  INV   X   [date_time]
•	Step 7
	OBX n NM 8418036^MDC_CGM_SENSOR_CALIBRATION^MDC  m.0.0.x [value] [unit]  INV   X   [date_time]
•	Step 8
	OBX n NM 8418036^MDC_CGM_SENSOR_CALIBRATION^MDC  m.0.0.x [value] [unit]  CAL   R   [date_time]
•	Step 9
	OBX n NM 8418036^MDC_CGM_SENSOR_CALIBRATION^MDC  m.0.0.x [value] [unit]    R   [date_time]

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-018					
TP label		Whitepaper. Sensor Calibration Numeric Object – Unit-Code Attribute					
Coverage	Spec	[Bluetooth PHDT v1.6]					
	Testable items	SensCal Numeric 10; M					
Test purpos	е	Check that:					
		PHG includes Sensor Calibration Numeric Object – Unit-Code attribute in transcoder output.  [AND]  Unit-Code attribute value is set to MDC_DIM_MILLI_G_PER_DL					
Applicability	1	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043					
Other PICS							
Initial condi	tion	The PHG under test and the simulated PHD are in the Standby state.					
Test proced	ure	The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). The simulated PHD has a Calibration Data Record stored.					
		2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:					
		a. CGM Feature (0x2AA8)					
		i. Field: CGM Feature					
		☐ Format: 24 bit					
		□ Value: 0000 0000 0000 0000 0001 (MSB → LSB). Calibration supported.					
		ii. Field: CGM Type					
		☐ Format: 4 bit					
		☐ Value: not relevant					
		iii. Field: CGM Sample Location					

	☐ Format: 4 bit	
	□ Value: not relevant	
	iv. Field: E2E-CRC	
	☐ Format: uint16	
	□ Value: not relevant	
	b. CGM Specific Ops Control Point (0x2AAC)	
	i. Field: Op Code	
	☐ Format: uint8	
	□ Value: 0x06 (Glucose Calibration Value Response)	
	ii. Field: Calibration Value – Glucose concentration of Calibration (mg/dL)	
	☐ Format: SFLOAT	
	☐ Value: not relevant	
	iii. Field: Calibration Value – Calibration Time	
	☐ Format: uint16	
	☐ Value: not relevant	
	iv. Field: Calibration Value – Calibration Type	
	☐ Format: 4 bit	
	□ Value: not relevant	
	v. Field: Calibration Value - Calibration Sample Location	
	☐ Format: 4 bit	
	☐ Value: not relevant	
	vi. Field: Calibration Value - Next Calibration Time	
	☐ Format: uint16	
	☐ Value: not relevant	
	vii. Field: Calibration Value - Calibration Data Record Number	
	☐ Format: uint16	
	☐ Value: not relevant	
	viii. Field: Calibration Value - Calibration Status	
	☐ Format: 8 bit	
	☐ Value: not relevant	
	ix. Field: E2E-CRC	
	☐ This field is not present	
	<ol><li>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).</li></ol>	
	4. When the pairing has been completed, force the PHG to read CGM Feature and CGM Session Start Time characteristics, and then to perform a Glucose Calibration procedure using Op Code "Get Glucose Calibration value" (0x05) with Operand "0xFFFF" (by performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code and Calibration Data Record Number fields respectively).	
	<ol> <li>The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration information.</li> </ol>	
	Check in PHG transcoder output the Sensor Calibration Numeric Object – Unit-Code attribute	
Pass/Fail criteria	In Step 6, the Sensor Calibration Numeric Object – Unit-Code attribute is present and set to MDC_DIM_MILLI_G_PER_DL	_

Notes (To assist manual testing)	Possible values in typical points of observation after transcoder output are:  a) IEEE 11073 Objects and Attributes		
,g,	Unit-Code attribute is present:		
	□ Object: Sensor Calibration Numeric Object		
	☐ Attribute-id: MDC_ATTR_UNIT_CODE (2454)		
	☐ Attribute-type: OID-Type		
	☐ 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 n NM 8418036^MDC_CGM_SENSOR_CALIBRATION^MDC m.0.0.x [value]  264274^MDC_DIM_MILLI_G_PER_DL^MDC    R   [date_time]		

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-019					
TP label		Whitepaper. Sensor Calibration Numeric Object – Base-Offset-Time-Stamp Attribute					
Coverage	Spec	[Bluetooth PHDT v1.6]					
	Testable items	SensCal Nu	meric 11; M	BaseOffset 3; M			
Test purpos	se	Check that:					
		PHG includes Glucose Numeric Object Base-Offset-Time-Stamp attribute in transcoder output.					
		[AND]					
		Base-Offset stamp deriva	-Time-Stamp attrib ation	ute is set to the correct value acc	cording to Base-Offset time		
Applicabilit	y	C_MAN_BL	E_000 AND C_MA	N_BLE_002 AND C_MAN_BLE	_043		
Other PICS							
Initial condi	tion	The PHG under test and the simulated PHD are in the Standby state.					
Test proced	lure	The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). The simulated PHD has a Calibration Data Record stored.					
			nulated PHD impler for this Test Case	ments several BTLE characterist are:	ics. The characteristics of		
		a. CG	M Session Start Ti	me (0x2AAA)			
		i.	Field: Session St	art Time			
			☐ Format: {uint	16, uint8, uint8, uint8, uint8, uint	8}		
			☐ Value: {2016	, 5, 12, 16, 39, 27} (May 12, 201	6, 16:39:27)		
		ii.	Field: Time Zone				
			☐ Format: sint8	3			
			□ Value: 4 (UT	C+1:00)			
		iii.	Field: DST-Offset	t			
			☐ Format: uint8	3			
			□ Value: 4 (Da	ylight Time (+1h))			
		iv.	Field: E2E-CRC				
			☐ This field is r	not included			

	b. CO	GM Feature (0x2AA8)
	i.	Field: CGM Feature
		☐ Format: 24 bit
		□ Value: 0000 0000 0000 0000 0001 (MSB → LSB). Calibration supported.
	ii.	Field: CGM Type
		☐ Format: 4 bit
		□ Value: not relevant
	iii.	Field: CGM Sample Location
		☐ Format: 4 bit
		□ Value: not relevant
	iv.	Field: E2E-CRC
		☐ Format: uint16
		□ Value: not relevant
	c. CG	GM Specific Ops Control Point (0x2AAC)
	i.	Field: Op Code
		☐ Format: uint8
		□ Value: 0x06 (Glucose Calibration Value Response)
	ii.	Field: Calibration Value – Glucose concentration of Calibration (mg/dL)
		☐ Format: SFLOAT
		□ Value: not relevant
	iii.	Field: Calibration Value – Calibration Time
		☐ Format: uint16 (min)
		□ Value: 20
	iv.	Field: Calibration Value – Calibration Type
		☐ Format: 4 bit
		□ Value: not relevant
	٧.	Field: Calibration Value – Calibration Sample Location
		☐ Format: 4 bit
		□ Value: not relevant
	vi.	Field: Calibration Value - Next Calibration Time
		☐ Format: uint16
		☐ Value: not relevant
	vii.	Field: Calibration Value – Calibration Data Record Number
		☐ Format: uint16
		□ Value: not relevant
	viii	. Field: Calibration Value – Calibration Status
		☐ Format: 8 bit
		☐ Value: not relevant
	ix.	Field: E2E-CRC
		☐ This field is not present
3.		IG under test initiates a discovery process (Scanning state), it discovers the ed PHD and it starts a pairing process with the simulated PHD (Initiating state).
4.		he pairing has been completed, force the PHG to read CGM Feature and CGM n Start Time characteristics, and then to perform a Glucose Calibration procedure

Trimo dialactoriologi, and their to perform a Glacese Gambiation procedure

	using Op Code "Get Glucose Calibration value" (0x05) with Operand "0xFFFF" (by performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code and Calibration Data Record Number fields respectively).
	5. The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration information.
	6. Check in PHG transcoder output the Sensor Calibration Numeric Object – Base-Offset- Time-Stamp attribute
Pass/Fail criteria	In Step 6 and 8, the Sensor Calibration Numeric Object – Base-Offset-Time-Stamp is set to the addition of CGM Session Start Time characteristic's Session Start Time (May 12, 2016, 16:39:27) field plus the Calibration Time field of the obtained Calibration Data Record (20 min).
Notes	Possible values in typical points of observation after transcoder output are:
(To assist manual testing)	a) IEEE 11073 Objects and Attributes
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Base-Offset-Time-Stamp attribute is present:
	□ Object: Sensor Calibration Numeric Object
	☐ Attribute-id: MDC_ATTR_TIME_STAMP_BO (2690)
	Attribute-type: SEQUENCE {bo-seconds (INT-U32), bo-fraction (INT-U16), bo-time-offset (INT-I16)}
	☐ Attribute-value: addition of
	<ul> <li>CGM Session Start Time characteristic Session Start Time field (May 12, 2016, 16:39:27)</li> </ul>
	CGM Special Ops Control Point characteristic Calibration Time field (20m)
	Note that the same Base-Offset-Time-Stamp can have different representations depending on bo-time-offset value. If it is set to 20 min (CGM Measurement characteristic's Time Offset field), then Base-Offset-Time-Stamp value shall be {3672059967, 0, 20}
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with Base-Offset-Time-Stamp attribute value (check OBX-14):
	OBX n NM 8418036^MDC_CGM_SENSOR_CALIBRATION^MDC m.0.0.x [value]  264274^MDC_DIM_MILLI_G_PER_DL^MDC    R   [value described in a) coded in DTM format]

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-020				
TP label		Whitepaper. Sensor Calibration Numeric Object – Basic-Nu-Observed-Value Attribute				
Coverage	Spec	[Bluetooth PHDT v1.6]				
	Testable items	SensCal Numeric 12; M				
Test purpose		Check that:  PHG includes Sensor Calibration Numeric Object Basic-Nu-Observed-Value attribute in transcoder output.  [AND]  Basic-Nu-Observed-Value attribute is set to the correct value.				
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043				
Other PICS						
Initial condition		The PHG under test and the simulated PHD are in the Standby state.				

Test procedure	1.			ulated PHD is configured with a Continuous Glucose Monitoring Profile (device ration). The simulated PHD has a Calibration Data Record stored.
	2.			ulated PHD implements several BTLE characteristics. The characteristics of for this Test Case are:
		a.	CGI	M Feature (0x2AA8)
			i.	Field: CGM Feature
				☐ Format: 24 bit
				□ Value: 0000 0000 0000 0000 0001 (MSB → LSB). Calibration supported.
			ii.	Field: CGM Type
				☐ Format: 4 bit
				□ Value: not relevant
			iii.	Field: CGM Sample Location
				□ Format: 4 bit
				□ Value: not relevant
			iv.	Field: E2E-CRC
				□ Format: uint16
				□ Value: not relevant
		b.	CGI	M Specific Ops Control Point (0x2AAC)
			i.	Field: Op Code
				☐ Format: uint8
				□ Value: 0x06 (Glucose Calibration Value Response)
			ii.	Field: Calibration Value – Glucose concentration of Calibration (mg/dL)
				□ Format: SFLOAT (mg/dL)
				□ Value: 115.3
			iii.	Field: Calibration Value – Calibration Time
				□ Format: uint16
				□ Value: not relevant
			iv.	Field: Calibration Value – Calibration Type
				□ Format: 4 bit
				□ Value: not relevant
			v.	Field: Calibration Value – Calibration Sample Location
			••	□ Format: 4 bit
				□ Value: not relevant
			vi.	Field: Calibration Value - Next Calibration Time
			V	Format: uint16
				□ Value: not relevant
			vii	Field: Calibration Value – Calibration Data Record Number
			VIII.	Format: uint16
				□ Value: not relevant
			viii	Field: Calibration Value – Calibration Status
			viii.	Format: 8 bit
				□ Value: not relevant
			iv	Field: E2E-CRC
			ıA.	
	1			☐ This field is not present

	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, force the PHG to read CGM Feature and CGM Session Start Time characteristics, and then to perform a Glucose Calibration procedure using Op Code "Get Glucose Calibration value" (0x05) with Operand "0xFFFF" (by performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code and Calibration Data Record Number fields respectively).
	5. The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration information.
	6. Check in PHG transcoder output the Sensor Calibration Numeric Object – Basic-Nu- Observed-Value attribute
Pass/Fail criteria	In Step 6, the Sensor Calibration Numeric Object – Unit-Code attribute is present and set to MDC_DIM_MILLI_G_PER_DL
Notes	Possible values in typical points of observation after transcoder output are:
(To assist manual testing)	a) IEEE 11073 Objects and Attributes
testing)	Basic-Nu-Observed-Value attribute is present:
	□ Object: Sensor Calibration Numeric Object
	☐ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636)
	☐ Attribute-type: SFLOAT
	☐ Attribute-value: 115.3 (dec) or F481 (hex)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with Basic-Nu-Observed-Value attribute value (check OBX-5):
	OBX n NM 8418036^MDC_CGM_SENSOR_CALIBRATION^MDC m.0.0.x 15.3  264274^MDC_DIM_MILLI_G_PER_DL^MDC    R   [date_time]

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-021	
TP label		Whitepaper. Sensor Run-time Numeric Object - Handle Attribute	
Coverage	Spec	[Bluetooth PHDT v1.6]	
	Testable items	SRT Numeric 1; O	
Test purpose		Check that:	
		PHG does not include Sensor Run-time Numeric Object – Handle Attribute in transcoder output.	
		[OR]	
		If PHG includes Sensor Run-time Numeric Object – Handle attribute in transcoder output, then its value shall be different than 0	
Applicabilit	у	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043	
Other PICS			
Initial cond	ition	The PHG under test and the simulated PHD are in the Standby state.	
Test proced	dure	The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization).	
		2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:	

	a. CGM Session Start Time (0x2AAA)
	i. Field: Session Start Time
	<ul><li>Format: {uint16, uint8, uint8, uint8, uint8}</li></ul>
	Value: not relevant
	ii. Field: Time Zone
	Format: sint8
	Value: not relevant
	iii. Field: DST-Offset
	Format: uint8
	Value: not relevant
	iv. Field: E2E-CRC
	This field is not included
	b. CGM Session Run Time (0x2AAB)
	i. Field: Session Run Time
	Format: uint16
	Value: not relevant
	ii. Field: E2E-CRC
	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).
	<ol> <li>When the pairing has been completed, force the PHG to read CGM Feature, CGM Session Start Time and CGM Session Run Time characteristics.</li> </ol>
	Check in the PHG transcoder output the Sensor Run-time Numeric Object – Handle attribute
Pass/Fail criteria	In Step 5, the Sensor Run-time Numeric Object – Handle attribute is not present or, if it is present then its value is different than 0
Notes	Possible values in typical points of observation after transcoder output are:
(To assist manual testing)	a) IEEE 11073 Objects and Attributes
testing)	Handle attribute is not present, or if it is present then:
	□ Object: Sensor Run-time Numeric Object
	☐ Attribute-id: MDC_ATTR_ID_HANDLE (2337)
	☐ Attribute-type: INT-U16
	☐ Attribute-value: Any value different than 0
	b) WAN PCD-01 message
	PCD-01 message does not include segments with Handle attribute value
<u>-</u>	

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-022	
TP label Whitepaper. Sensor Run-time Numeric Object - Type Attribute		Whitepaper. Sensor Run-time Numeric Object - Type Attribute	
Coverage	Spec	[Bluetooth PHDT v1.6]	
	Testable items	SRT Numeric 2; M	
Test purpose		Check that:	

	PHG includes Sensor Run-time Numeric Object – Type attribute in transcoder output.
	[AND]
	Type is set to MDC_PART_PHD_DM   MDC_CGM_SENSOR_RUN_TIME
Applicability	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043
Other PICS	
Initial condition	The PHG under test and the simulated PHD are in the Standby state.
Toot procedure	·
Test procedure	<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization).</li> </ol>
	2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:
	a. CGM Session Start Time (0x2AAA)
	i. Field: Session Start Time
	<ul> <li>Format: {uint16, uint8, uint8, uint8, uint8, uint8}</li> </ul>
	Value: not relevant
	ii. Field: Time Zone
	Format: sint8
	Value: not relevant
	iii. Field: DST-Offset
	Format: uint8
	Value: not relevant
	iv. Field: E2E-CRC
	This field is not included
	b. CGM Session Run Time (0x2AAB)
	i. Field: Session Run Time
	Format: uint16
	Value: not relevant
	ii. Field: E2E-CRC
	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).
	<ol> <li>When the pairing has been completed, force the PHG to read CGM Feature, CGM Session Start Time and CGM Session Run Time characteristics.</li> </ol>
	Check in the PHG transcoder output the Sensor Run-time Numeric Object – Type attribute
Pass/Fail criteria	In Step 5, the Sensor Run-time Numeric Object – Type attribute is present and its value is MDC_PART_PHD_DM   MDC_CGM_SENSOR_RUN_TIME
Notes	Possible values in typical points of observation after transcoder output are:
(To assist manual testing)	a) IEEE 11073 Objects and Attributes
	Type attribute is not present, or if it is present then:
	□ Object: Sensor Run-time Numeric Object
	☐ Attribute-id: MDC_ATTR_ID_TYPE (2351)
	☐ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
	☐ Attribute-value:

<ul> <li>partition: MDC_PART_PHD_DM or 128 (dec) or 00 80 (hex)</li> <li>code: MDC_CGM_SENSOR_RUN_TIME or 29432 (dec) or 72 F8 (hex)</li> </ul>
b) WAN PCD-01 message PCD-01 message includes a segment like this with Type attribute (check OBX-3):
OBX n NM 8418040^MDC_CGM_SENSOR_RUN_TIME^MDC m.0.0.x [value]  264384^MDC_DIM_HR^MDC    R   [date_time]

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-023
TP label		Whitepaper. Sensor Run-time Numeric Object - Metric-Spec-Small Attribute
Coverage	Spec	[Bluetooth PHDT v1.6]
	Testable items	SRT Numeric 3; M
Test purpos	se	Check that:  PHG includes Sensor Run-time Numeric Object – Metric-Spec-Small attribute in transcoder output.  [AND]  Metric-Spec-Small is set to {0x7046}.
Applicability	у	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043
Other PICS		
Initial condi	tion	The PHG under test and the simulated PHD are in the Standby state.
Test proced	lure	1. The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization).  2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:  a. CGM Session Start Time (0x2AAA)  i. Field: Session Start Time  • Format: {uint16, uint8, uint8, uint8, uint8}  • Value: not relevant  ii. Field: Time Zone  • Format: sint8  • Value: not relevant  iii. Field: DST-Offset  • Format: uint8  • Value: not relevant  iv. Field: E2E-CRC  • This field is not included  b. CGM Session Run Time (0x2AAB)  i. Field: Session Run Time  • Format: uint16  • Value: not relevant  ii. Field: E2E-CRC  • 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, force the PHG to read CGM Feature, CGM Session Start Time and CGM Session Run Time characteristics.
	Check in PHG transcoder output the Sensor Run-time Numeric Object – Metric-Spec- Small attribute
Pass/Fail criteria	In Step 5 the Sensor Run-time Numeric Object – Metric-Spec-Small attribute is present and its value is {0x7046} (mss-upd-aperiodic   mss-msmt-aperiodic   mss-acc-agent-initiated   mss-cat-calculation   mss-avail-stored-data   mss-cat-setting)
Notes (To assist manual testing)	Possible values in typical points of observation after transcoder output are:  a) IEEE 11073 Objects and Attributes  Metric-Spec-Small attribute is present:  Object: Sensor Run-time Numeric Object  Attribute-id: MDC_ATTR_METRIC_SPEC_SMALL (2630)  Attribute-type: BITS-16  Attribute-value: 0x7046 (hex) or BITS mss-avail-stored-data (1), mss-upd-aperiodic (2), mss-msmt-aperiodic (3), mss-acc-agent-initiated(9), mss-cat-setting(13), mss-cat-calculation(14) set to TRUE and remaining BITS set to FALSE
	b) WAN PCD-01 message
	PCD-01 message does not include segments with Metric-Spec-Small attribute value

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-024	
TP label		Whitepaper. Sensor Run-time Numeric Object – Unit-Code Attribute	
Coverage	Spec	[Bluetooth PHDT v1.6]	
	Testable items	SRT Numeric 4; M	
Test purpos	se	Check that:  PHG includes Sensor Run-time Numeric Object – Unit-Code attribute in transcoder output.  [AND]  Unit-Code attribute value is set to MDC_DIM_HR	
Applicabilit	у	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043	
Other PICS Initial condi	tion	The PHG under test and the simulated PHD are in the Standby state.	
Test procedure		<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization).</li> <li>The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:         <ul> <li>CGM Session Start Time (0x2AAA)</li> </ul> </li> </ol>	
		<ul> <li>i. Field: Session Start Time</li> <li>Format: {uint16, uint8, uint8, uint8, uint8, uint8}</li> <li>Value: not relevant</li> </ul>	
		ii. Field: Time Zone  • Format: sint8	

	Value: not relevant	
	iii. Field: DST-Offset	
	Format: uint8	
	Value: not relevant	
	iv. Field: E2E-CRC	
	This field is not included	
	b. CGM Session Run Time (0x2AAB)	
	i. Field: Session Run Time	
	Format: uint16	
	Value: not relevant	
	ii. Field: E2E-CRC	
	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).	
	<ol> <li>When the pairing has been completed, force the PHG to read CGM Feature, CGM Session Start Time and CGM Session Run Time characteristics.</li> </ol>	
	Check in PHG transcoder output the Sensor Run-time Numeric Object – Unit-Code attribute	
Pass/Fail criteria	In Step 5 the Sensor Run-time Numeric Object – Unit-Code attribute is present and its value is set to MDC_DIM_HR	
Notes	Possible values in typical points of observation after transcoder output are:	
(To assist manual testing)	a) IEEE 11073 Objects and Attributes	
	Unit-Code attribute is present:	
	☐ Object: Sensor Run-time Numeric Object	
	☐ Attribute-id: MDC_ATTR_UNIT_CODE (2454)	
	☐ Attribute-type: OID-Type	
	☐ Attribute-value: MDC_DIM_HR or 2240 (dec) or 08 C0 (hex)	
	b) WAN PCD-01 message	
	PCD-01 message includes a segment like this with Unit-Code attribute value (check OBX-6):	
	OBX n NM 8418040^MDC_CGM_SENSOR_RUN_TIME^MDC m.0.0.x [value]  264384^MDC_DIM_HR^MDC    R   [date_time]	

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-025		
TP label Whitepaper. Sensor Run-time Numeric Object – Base-Offset-Time-S		ime-Stamp Attribute		
Coverage	Spec	[Bluetooth PHDT v1.6]		
	Testable items	SRT Numeric 5; M BaseOffset 2; M		
Test purpose		Check that:  PHG includes Sensor Run-time Numeric Object Base-Offset-Time-Stamp attribute in transcoder output.  [AND]  Base-Offset-Time-Stamp attribute is set to the correct value according to Base-Offset time stamp derivation		

Applicability	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043		
Other PICS			
Initial condition	The PHG under test and the simulated PHD are in the Standby state.		
Test procedure	The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization).		
	2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:		
	a. CGM Session Start Time (0x2AAA)		
	i. Field: Session Start Time		
	Format: {uint16, uint8, uint8, uint8, uint8}		
	• Value: {2016, 5, 12, 16, 39, 27} (May 12, 2016, 16:39:27)		
	ii. Field: Time Zone		
	Format: sint8		
	• Value: 4 (UTC+1:00)		
	iii. Field: DST-Offset		
	Format: uint8		
	Value: 4 (Daylight Time (+1h))		
	iv. Field: E2E-CRC		
	This field is not included		
	b. CGM Session Run Time (0x2AAB)		
	i. Field: Session Run Time		
	Format: uint16		
	Value: not relevant		
	ii. Field: E2E-CRC		
	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).		
	<ol> <li>When the pairing has been completed, force the PHG to read CGM Feature, CGM Session Start Time and CGM Session Run Time characteristics.</li> </ol>		
	Check in PHG transcoder output the Sensor Run-time Numeric Object – Base-Offset- Time-Stamp attribute		
Pass/Fail criteria	In Step 5, the Sensor Run-time Numeric Object – Base-Offset-Time-Stamp is set to the CGM Session Start Time characteristic's Session Start Time (May 12, 2016, 16:39:27) field.		
Notes	Possible values in typical points of observation after transcoder output are:		
(To assist manual	a) IEEE 11073 Objects and Attributes		
testing)	Base-Offset-Time-Stamp attribute is present:		
	□ Object: Sensor Run-time Numeric Object		
	☐ Attribute-id: MDC_ATTR_TIME_STAMP_BO (2690)		
	Attribute-type: SEQUENCE {bo-seconds (INT-U32), bo-fraction (INT-U16), bo-time-offset (INT-I16)}		
	☐ Attribute-value:		
	CGM Session Start Time characteristic Session Start Time field (May 12, 2016, 16:39:27)		

Note that the same Base-Offset-Time-Stamp can have different representations depending on bo-time-offset value. If it is set to 0 min then Base-Offset-Time-Stamp value shall be {3672059967, 0, 0}
b) WAN PCD-01 message
PCD-01 message includes a segment like this with Base-Offset-Time-Stamp attribute value (check OBX-14):
OBX n NM 8418040^MDC_CGM_SENSOR_RUN_TIME^MDC m.0.0.x [value]  264384^MDC_DIM_HR^MDC    R   [value described in a) coded in DTM format]

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-026		
TP label Whitepaper. Sensor Run-time Numeric Object – Simple-Nu-Observed-Value Attribu		Whitepaper. Sensor Run-time Numeric Object – Simple-Nu-Observed-Value Attribute		
Coverage	Spec	[Bluetooth PHDT v1.6]		
	Testable items	SRT Numeric 6; M		
Test purpos	se	Check that:		
		PHG includes Sensor Run-time Numeric Object Simple-Nu-Observed-Value attribute in transcoder output.		
		[AND]		
		Simple-Nu-Observed-Value attribute is set to the correct value.		
Applicability	у	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043		
Other PICS				
Initial condi	tion	The PHG under test and the simulated PHD are in the Standby state.		
Test proced	lure	The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization).		
		2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:		
		a. CGM Session Start Time (0x2AAA)		
		i. Field: Session Start Time		
		Format: {uint16, uint8, uint8, uint8, uint8, uint8}		
		Value: not relevant		
		ii. Field: Time Zone		
		Format: sint8		
		Value: not relevant		
		iii. Field: DST-Offset		
		Format: uint8		
		Value: not relevant		
		iv. Field: E2E-CRC		
		This field is not included		
		b. CGM Session Run Time (0x2AAB)		
		i. Field: Session Run Time		
		Format: uint16 (h)		
		• Value: 168		
		ii. Field: E2E-CRC		

	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).		
	<ol> <li>When the pairing has been completed, force the PHG to read CGM Feature, CGM Session Start Time and CGM Session Run Time characteristics.</li> </ol>		
	5. Check in PHG transcoder output the Sensor Run-time Numeric Object – Simple-Nu- Observed-Value attribute		
Pass/Fail criteria	In Step 5 the Sensor Run-time Numeric Object – Simple-Nu-Observed-Value is set to 0x000000A8 (uint16 value converted to FLOAT-Type with an exponent of 0).		
Notes	Possible values in typical points of observation after transcoder output are:		
(To assist manual testing)	a) IEEE 11073 Objects and Attributes		
testing)	Simple-Nu-Observed-Value attribute is present:		
	☐ Object: Sensor Run-time Numeric Object		
	☐ Attribute-id: MDC_ATTR_NU_VAL_OBS_SIMP (2646)		
	☐ Attribute-type: FLOAT		
	☐ Attribute-value: 168 (dec) or 000000A8 (hex)		
	b) WAN PCD-01 message		
	PCD-01 message includes a segment like this with Simple-Nu-Observed-Value attribute value (check OBX-5):		
	OBX n NM 8418040^MDC_CGM_SENSOR_RUN_TIME^MDC m.0.0.x 168  264384^MDC_DIM_HR^MDC     R   [date_time]		

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-027		
TP label		Whitepaper. Glucose Sampling Interval Numeric Object - Handle Attribute		
Coverage	Spec	[Bluetooth PHDT v1.6]		
	Testable items	GSI Numeric 1; O		
Test purpos	se	Check that:		
		PHG does not include .Glucose Sampling Interval Numeric Object – Handle Attribute in transcoder output.		
		[OR]		
		If PHG includes .Glucose Sampling Interval Numeric 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_043		
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). PHD has a manually entered communication interval value stored.		
		2. The simulated PHD implements several BTLE characteristics. The characteristic of interest for this Test Case is:		
		a. CGM Specific Ops Control Point (0x2AAC)		
		i. Field: Op Code		
		Format: uint8		

Value: 0x03		
ii. Field: Operand		
Format: uint8 (min)		
Value: not relevant		
iii. Field: E2E-CRC		
This field is not present		
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, force the PHG to perform a CGM Communication Interval procedure using Op Code "Get CGM Communication Interval" (0x02) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code field).		
5. The simulated PHD will respond with an indication including a "Communication Interval Response" Op Code (0x03) and an UINT8 containing the communication interval in minutes.		
6. Check in PHG transcoder output the Glucose Sampling Interval Numeric Object – Handle attribute		
In Step 6, the Glucose Sampling Interval Numeric Object – Handle attribute is not present or, if it is present then its value is different than 0		
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: Glucose Sampling Interval Numeric Object		
☐ Attribute-id: MDC_ATTR_ID_HANDLE (2337)		
☐ Attribute-type: INT-U16		
☐ Attribute-value: Any value different than 0		
b) WAN PCD-01 message		
PCD-01 message does not include segments with Handle attribute value		

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-028		
TP label		Whitepaper. Glucose Sampling Interval Numeric Object – Type Attribute		
Coverage	Coverage Spec [Bluetooth PHDT v1.6]			
	Testable items	GSI Numeric 2; M		
Test purpose		Check that:		
		PHG includes Glucose Sampling Interval Numeric Object – Type Attribute in transcoder output.		
		[OR]		
		Type is set to MDC_PART_PHD_DM   MDC_CGM_SENSOR_SAMPLE_INTERVAL		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MA	N_BLE_043	
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 Continuou specialization). PHD has a manually entered comm		

	The simulated PHD implements several BTLE characteristics. The characteristic of interest for this Test Case is:	
	a. CGM Specific Ops Control Point (0x2AAC)	
	i. Field: Op Code	
	Format: uint8	
	Value: 0x03	
	ii. Field: Operand	
	Format: uint8 (min)	
	Value: not relevant	
	iii. Field: E2E-CRC	
	This field is not present	
	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, force the PHG to perform a CGM Communication Interval procedure using Op Code "Get CGM Communication Interval" (0x02) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code field).	
	5. The simulated PHD will respond with an indication including a "Communication Interval Response" Op Code (0x03) and an UINT8 containing the communication interval in minutes.	
	Check in PHG transcoder output the Glucose Sampling Interval Numeric Object – Type attribute	
Pass/Fail criteria	In Step 6, the Glucose Sampling Interval Numeric Object – Type attribute is present and set to MDC_PART_PHD_DM   MDC_CGM_SENSOR_SAMPLE_INTERVAL	
Notes	Possible values in typical points of observation after transcoder output are:	
(To assist manual testing)	a) IEEE 11073 Objects and Attributes	
lesting)	Type attribute is not present, or if it is present then:	
	□ Object: Glucose Sampling Interval Numeric Object	
	☐ Attribute-id: MDC_ATTR_ID_TYPE (2351)	
	☐ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}	
	☐ Attribute-value:	
	<ul> <li>partition: MDC_PART_PHD_DM or 128 (dec) or 00 80 (hex)</li> </ul>	
	<ul> <li>code: MDC_CGM_SENSOR_SAMPLE_INTERVAL or 29436 (dec) or 72 FC (hex)</li> </ul>	
	b) WAN PCD-01 message	
	PCD-01 message includes a segment like this with Type attribute (check OBX-3):	
	OBX n NM 8418044^MDC_CGM_SENSOR_SAMPLE_INTERVAL^MDC  m.0.0.x [value] 264352^MDC_DIM_MIN^MDC     R   [date_time]	

TP Id TP/LP-PAN/PHG/P		TP/LP-PAN/PHG/PHDTW/CGI	M/BV-029_A	
TP label Whitepaper. Glucose Sampling Interval Numeric Object - Metric-Spec-Small A		c-Spec-Small Attribute 1		
Coverage	Spec	[Bluetooth PHDT v1.6]		
	Testable items	GSI Numeric 3; M	GSI Numeric 5; M	
Test purpose		Check that:		

	PHG includes Glucose Sampling Interval Numeric Object – Metric-Spec-Small attribute in			
	transcoder output.			
	[AND]			
	Metric-Spec-Small is set to {0x604C} when the communication interval was updated manually by the user			
Applicability	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043			
Other PICS				
Initial condition	The PHG under test and the simulated PHD are in the Standby state.			
Test procedure	The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). The PHD has a manually entered communication interval value stored.			
	2. The simulated PHD implements several BTLE characteristics. The characteristic of interest for this Test Case is:			
	a. CGM Specific Ops Control Point (0x2AAC)			
	i. Field: Op Code			
	Format: uint8			
	Value: 0x03			
	ii. Field: Operand			
	Format: uint8 (min)			
	Value: not relevant			
	iii. Field: E2E-CRC			
	This field is not present			
	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, force the PHG to perform a CGM Communication Interval procedure using Op Code "Get CGM Communication Interval" (0x02) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code field).			
	5. The simulated PHD will respond with an indication including a "Communication Interval Response" Op Code (0x03) and an UINT8 containing the communication interval in minutes.			
	Check in PHG transcoder output the Glucose Sampling Interval Numeric Object – Metric- Spec-Small attribute			
Pass/Fail criteria	In Step 6, the Glucose Sampling Interval Numeric Object – Metric-Spec-Small attribute is present and its value is {0x604C} (mss-avail-stored-data   mss-upd-aperiodic   mss-acc-agent-initiated   mss-cat-manual   mss-cat-setting)			
Notes	Possible values in typical points of observation after transcoder output are:			
(To assist manual testing)	a) IEEE 11073 Objects and Attributes			
testing)	Metric-Spec-Small attribute is present:			
	☐ Object: Glucose Sampling Interval Numeric Object			
	☐ Attribute-id: MDC_ATTR_METRIC_SPEC_SMALL (2630)			
	☐ Attribute-type: BITS-16			
	Attribute-value: 60 4C (hex) or BITS mss-avail-stored-data (1), mss-upd-aperiodic(2), mss-acc-agent-initiated(9), mss-cat-manual(12), mss-cat-setting(13) set to TRUE and remaining BITS set to FALSE			
	b) WAN PCD-01 message			
	PCD-01 message does not include segments with Metric-Spec-Small attribute value			

Testable   Whitepaper, Glucose Sampling Interval Numeric Object - Metric-Spec-Small Attribute 2	TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-029_B				
Test purpose  Check that: PHG includes Glucose Sampling Interval Numeric Object – Metric-Spec-Small attribute in transcoder output.  [AND] Metric-Spec-Small is set to (0x6044) when the CGM Communication Interval procedure has been executed  Applicability  C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND C_MAN_BLE_044  Other PICS  Initial condition  The PHG under test and the simulated PHD are in the Standby state.  1. The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization).  2. The simulated PHD implements several BTLE characteristics. The characteristic of interest for this Test Case is: a. CGM Specific Ops Control Point (0x2AAC) i. Field: Op Code							
Test purpose  Check that:  PHG includes Glucose Sampling Interval Numeric Object – Metric-Spec-Small attribute in transcoder output.  [AND]  Metric-Spec-Small is set to (0x6044) when the CGM Communication Interval procedure has been executed  Applicability  C MAN BLE 000 AND C MAN BLE 002 AND C MAN BLE 043 AND C MAN BLE 044  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 Continuous Glucose Monitoring Profile (device specialization).  2. The simulated PHD implements several BTLE characteristics. The characteristic of interest for this Test Case is:  a. CGM Specific Ops Control Point (0x2AAC)  i. Field: Op Code  • Format: uint8  • Value: 0x03  ii. Field: Operand  • Format: uint8 (min)  • Value: not relevant  iii. Field: E2E-CRC  • This field is not present  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, force the PHG to set the communication interval by performing a CGM Communication Interval procedure using Op Code "Set CGM Communication Interval Procedure using Op Code "Set CGM Communication Interval Procedure using Op Code and Operand fields: respectively) followed by a valid Unit? Value in minutes (performing write operation to the CGM Specific Ops Control Point characteristic's Op Code and Operand fields: respectively) followed by a valid Unit? Value in minutes (performing write operation to the CGM Specific Ops Control Point characteristic's Op Code and Operand fields: respectively) followed by a valid Unit? Value in minutes (performing write operation to the CGM Specific Ops Control Point characteristic's Op Code and Operand fields: respectively) followed by a valid Unit? Value in minutes (performing in write operation to the CGM Specific Ops Control Point characteristic's Op Code field).  6. The simulated PHD will respond with an							
Test purpose  Check that:  PHG includes Glucose Sampling Interval Numeric Object – Metric-Spec-Small attribute in transcoder output.  [AND]  Metric-Spec-Small is set to {0x6044} when the CGM Communication Interval procedure has been executed  Applicability  C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND C_MAN_BLE_044  Other PICS  Initial condition  The PHG under test and the simulated PHD are in the Standby state.  1. The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization).  2. The simulated PHD implements several BTLE characteristics. The characteristic of interest for this Test Case is:  a. CGM Specific Ops Control Point (0x2AAC)  i. Field: Op Code  • Format: uint8  • Value: 0x03  ii. Field: Op Cade  • Format: uint8 (min)  • Value: not relevant  iii. Field: E2E-CRC  • This field is not present  3. The PHG under test initiates a discovery process (Scanning state), it discovers the simulated PHD in iteration interval by performing a CGM Communication interval procedure using Op Code "Set CGM Communication interval procedure using Op Code "Set CGM Communication interval procedure using Op Code "Set CGM Communication interval procedure using Op Code and Operand fields, respectively). Flost simulated PHD will respond with an indication includin a Response Op Code value of "Success."  5. Then force the PHG to perform a CGM Communication Interval procedure using Op Code and Operand fields, respectively). The simulated PHD will respond with an indication including a "Communication interval" (NO22) (performing a write operation to the CGM Specific Ops Control Point characteristics Op Code field).  6. The simulated PHD will respond with an indication including a "Communication Interval" (NO22) (performing a write operation to the CGM Specific Ops Control Point characteristics Op Code field).  7. Check in the PHG transcoder output the Glucose Sampling Interval Numeric Object – Metric-Spec-Small attribute is present as its value is (0x6044) (mss-avail-stored-data   mss-	Coverage	Spec	Bluetooth PHDT V1.6]				
PHG includes Glucose Sampling Interval Numeric Object – Metric-Spec-Small attribute in transcoder output.  [AND]  Metric-Spec-Small is set to (0x6044) when the CGM Communication Interval procedure has been executed  Applicability  C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND C_MAN_BLE_044  Other PICS  Initial condition  The PHG under test and the simulated PHD are in the Standby state.  1. The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization).  2. The simulated PHD implements several BTLE characteristics. The characteristic of interest for this Test Case is:  a. CGM Specific Ops Control Point (0x2AAC)  i. Field: Op Code  • Format: uint8  • Value: 0x03  ii. Field: Cperand  • Format: uint8 (min)  • Value: not relevant  iii. Field: E2E-CRC  • This field is not present  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, force the PHG to set the communication interval by performing a cGM Communication interval procedure using Op Code and Operand fields, respectively). The simulated PHD will respond with an indication includin a Response Op Code Value of "Success".  5. Then force the PHG to perform a CGM Communication Interval procedure using Op Code "Get CGM Communication PHG Value" (9x02) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code and Operand fields, respectively). The simulated PHD will respond with an indication including a Response Op Code Value of "Success".  5. Then force the PHG to perform a CGM Communication Interval Response" Op Code (9x03) and an UINT8 containing the entered communication Interval Response" Op Code (9x03) and an UINT8 containing the entered communication interval minutes.  7. Check in the PHG transcoder output the Glucose Sampling Interval Numeric Object – Metric-Spec-Small attribute is present and ts value is (0x6044) (ms			GSI Numeric 3; M GSI Numeric 4; M				
transcoder output. [AND] Metric-Spec-Small is set to {0x6044} when the CGM Communication Interval procedure has been executed  Applicability  C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND C_MAN_BLE_044  Other PICS  Initial condition  The PHG under test and the simulated PHD are in the Standby state.  1. The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization).  2. The simulated PHD implements several BTLE characteristics. The characteristic of interest for this Test Case is:  a. CGM Specific Ops Control Point (0x2AAC)  i. Field: Op Code  • Format: uint8  • Value: 0x03  ii. Field: Operand  • Format: uint8  • Value: not relevant  iii. Field: E2E-CRC  • This field is not present  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, force the PHG to set the communication interval by performing a CGM Communication Interval procedure using Op Code "Set CGM Communication interval" (0x01) followed by a valid UINT8 value in minutes (performing write operation to the CGM Specific Ops Control Point characteristics Op Code and Operand fields, respectively). The simulated PHD will respond with an indication includin a Response Op Code value of "Success".  5. Then force the PHG to perform a CGM Communication Interval procedure using Op Code "Get CGM Communication Interval" (0x02) (performing a write operation to the CGM Specific Ops Code faeld)  Get CGM Communication Interval" (0x02) (performing a write operation to the CGM Specific Ops Code rall of Specific Ops Code faeld)  Get CGM Communication Interval" (0x02) (performing a write operation to the CGM Specific Ops Code feeld)  In Step 7, the Sensor Calibration Numeric Object – Metric-Spec-Small attribute is present and to value is (0x6044) (mss-avail-stored-data   mss-upd-aperiodic   mss-acc-agent-initiated	Test purpos	se	Check that:				
Metric-Spec-Small is set to {0x6044} when the CGM Communication Interval procedure has been executed  Applicability  C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND C_MAN_BLE_044  Other PICS  Initial condition  The PHG under test and the simulated PHD are in the Standby state.  1. The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization).  2. The simulated PHD implements several BTLE characteristics. The characteristic of interest for this Test Case is:  a. CGM Specific Ops Control Point (0x2AAC)  i. Field: Op Code  • Format: uint8  • Value: 0x03  ii. Field: Operand  • Format: uint8 (min)  • Value: not relevant  iii. Field: E2E-CRC  • This field is not present  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, force the PHG to set the communication interval by performing a CGM Communication Interval procedure using Op Code "Set CGM Communication Interval" (0x01) followed by a valid UINT8 value in minutes (performing write operation to the CGM Specific Ops Control Point characteristics S Op Code and Operand fields, respectively). The simulated PHD will respond with an indication includin a Response Op Code value of "Success".  5. Then force the PHG to perform a CGM Communication Interval procedure using Op Code "Get CGM Communication Interval" (0x02) (performing a write operation to the CGM Specific Ops Control Point characteristics op Code field).  6. The simulated PHD will respond with an indication including a "Communication Interval Response" Op Code (0x03) and an UINT8 containing the entered communication interval in minutes.  7. Check in the PHG transcoder output the Glucose Sampling Interval Numeric Object — Metric-Spec-Small attribute is present an its value is (0x6044) (mss-avail-stored-data) mss-upd-aperiodic   mss-acc-agent-initiated							
Applicability  C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND C_MAN_BLE_044  Other PICS  Initial condition  The PHG under test and the simulated PHD are in the Standby state.  1. The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization).  2. The simulated PHD implements several BTLE characteristics. The characteristic of interest for this Test Case is:  a. CGM Specific Ops Control Point (0x2AAC)  i. Field: Op Code  • Format: uint8  • Value: 0x03  ii. Field: Operand  • Format: uint8 (min)  • Value: not relevant  iii. Field: E2E-CRC  • This field is not present  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, force the PHG to set the communication interval by performing a CGM Communication Interval procedure using Op Code "Set CGM Communication Interval" (0x01) followed by a valid UnitR3 value in minuse (performing write operation to the CGM Specific Ops Control Point characteristic's Op Code and Operand fields, respectively). The simulated PHD will respond with an indication including a Response Op Code value of "Success".  5. Then force the PHG to perform a CGM Communication Interval procedure using Op Code "Get CGM Communication Interval" (0x02) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code field).  6. The simulated PHD will respond with an indication including a "Communication interval" (0x03) and an UINT8 containing the entered communication interval in minutes.  7. Check in the PHG transcoder output the Glucose Sampling Interval Numeric Object – Metric-Spec-Small attribute is present an its value is (0x6044) (mss-avail-stored-data) mss-upd-aperiodic   mss-acc-agent-initiated			[AND]				
Test procedure  1. The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization).  2. The simulated PHD implements several BTLE characteristics. The characteristic of interest for this Test Case is:  a. CGM Specific Ops Control Point (0x2AAC)  i. Field: Op Code  • Format: uint8  • Value: 0x03  ii. Field: Operand  • Format: uint8  • Value: not relevant  iii. Field: E2E-CRC  • This field is not present  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, force the PHG to set the communication interval by performing a CGM Communication Interval procedure using 0p Code "Set CGM Communication Interval" (0x01) followed by a valid UINT8 value in minutes (performing write operation to the CGM Specific Ops Control Point characteristic's 0p Code and Operand fields, respectively). The simulated PHD will respond with an indication including a Response 0p Code value of "Success".  5. Then force the PHG to perform a CGM Communication Interval procedure using Op Code "Get CGM Communication Interval" (0x02) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code and Operand fields, respectively). The simulated PHD will respond with an indication including a Response Op Code value of "Success".  5. Then force the PHG to perform a CGM Communication Interval procedure using Op Code "Get CGM Communication Interval" (0x02) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code field).  6. The simulated PHD will respond with an indication including a "Communication Interval Response" Op Code (0x03) and an UINT8 containing the entered communication interval in minutes.  7. Check in the PHG transcoder output the Glucose Sampling Interval Numeric Object – Metric-Spec-Small attribute is present an its value is (0x6044) (mss-avail-stored-data   mss-upd-aperiodic			· · · · · · · · · · · · · · · · · · ·				
The PHG under test and the simulated PHD are in the Standby state.  1. The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization).  2. The simulated PHD implements several BTLE characteristics. The characteristic of interest for this Test Case is:  a. CGM Specific Ops Control Point (0x2AAC)  i. Field: Op Code  • Format: uint8  • Value: 0x03  ii. Field: Operand  • Format: uint8 (min)  • Value: not relevant  iii. Field: E2E-CRC  • This field is not present  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, force the PHG to set the communication interval by performing a CGM Communication Interval procedure using Op Code "Set CGM Communication Interval procedure using Op Code "Set CGM Communication Interval PHD will respond with an indication includin a Response Op Code value of "Success".  5. Then force the PHG to perform a CGM Communication Interval procedure using Op Code "Get CGM Communication Interval" (0x02) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code and Response" Op Code value of "Success".  5. Then force the PHG to perform a CGM Communication Interval procedure using Op Code "Get CGM Communication Interval" (0x02) (performing a "Communication Interval Response" Op Code (0x03) and an UINT8 containing the entered communication interval in minutes.  7. Check in the PHG transcoder output the Glucose Sampling Interval Numeric Object – Metric-Spec-Small attribute is present an its value is (0x6044) (mss-avail-stored-data   mss-upd-aperiodic   mss-acc-agent-initiated	Applicability	у	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND C_MAN_BLE_044				
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interest for this Test Case is:  a. CGM Specific Ops Control Point (0x2AAC)  i. Field: Op Code  • Format: uint8  • Value: 0x03  ii. Field: Operand  • Format: uint8 (min)  • Value: not relevant  iii. Field: E2E-CRC  • This field is not present  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, force the PHG to set the communication interval by performing a CGM Communication Interval procedure using Op Code "Set CGM Communication Interval" (0x01) followed by a valid UINT8 value in minutes (performing write operation to the CGM Specific Ops Control Point characteristic's Op Code and Operand fields, respectively). The simulated PHD will respond with an indication includin a Response Op Code value of "Success".  5. Then force the PHG to perform a CGM Communication Interval procedure using Op Code "Get CGM Communication Interval" (0x02) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code field).  6. The simulated PHD will respond with an indication including a "Communication Interval Response" Op Code (0x03) and an UINT8 containing the entered communication interval in minutes.  7. Check in the PHG transcoder output the Glucose Sampling Interval Numeric Object – Metric-Spec-Small attribute is present an its value is (0x6044) (mss-avail-stored-data   mss-upd-aperiodic   mss-acc-agent-initiated	Test proced	lure					
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<ol> <li>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).</li> <li>When the pairing has been completed, force the PHG to set the communication interval by performing a CGM Communication Interval procedure using Op Code "Set CGM Communication Interval" (0x01) followed by a valid UINT8 value in minutes (performing write operation to the CGM Specific Ops Control Point characteristic's Op Code and Operand fields, respectively). The simulated PHD will respond with an indication including a Response Op Code value of "Success".</li> <li>Then force the PHG to perform a CGM Communication Interval procedure using Op Code "Get CGM Communication Interval" (0x02) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code field).</li> <li>The simulated PHD will respond with an indication including a "Communication Interval Response" Op Code (0x03) and an UINT8 containing the entered communication interval in minutes.</li> <li>Check in the PHG transcoder output the Glucose Sampling Interval Numeric Object – Metric-Spec-Small attribute</li> </ol> Pass/Fail criteria In Step 7, the Sensor Calibration Numeric Object – Metric-Spec-Small attribute is present an its value is {0x6044} (mss-avail-stored-data   mss-upd-aperiodic   mss-acc-agent-initiated			iii. Field: E2E-CRC				
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Pass/Fail criteria In Step 7, the Sensor Calibration Numeric Object – Metric-Spec-Small attribute is present an its value is {0x6044} (mss-avail-stored-data   mss-upd-aperiodic   mss-acc-agent-initiated			Response" Op Code (0x03) and an UINT8 containing the entered communication interval				
its value is {0x6044} (mss-avail-stored-data   mss-upd-aperiodic   mss-acc-agent-initiated							
	Pass/Fail criteria						
Notes Possible values in typical points of observation after transcoder output are:	Notes		Possible values in typical points of observation after transcoder output are:				

(To assist manual testing)	a)	IEEE 11073 Objects and Attributes		
		Metric-Spec-Small attribute is present:		
		☐ Object: Glucose Sampling Interval Numeric Object		
		☐ Attribute-id: MDC_ATTR_METRIC_SPEC_SMALL (2630)		
		☐ Attribute-type: BITS-16		
		Attribute-value: 60 44 (hex) or BITS mss-avail-stored-data (1), mss-upd-aperiodic(2), mss-acc-agent-initiated(9), mss-cat-setting(13) set to TRUE and remaining BITS set to FALSE		
	b)	WAN PCD-01 message		
		PCD-01 message does not include segments with Metric-Spec-Small attribute value		

TP ld	TP/LP-PAN/PHG/PHDTW/CGM/BV-030			
TP label	Whitepaper. Glucose Sampling Interval Numeric Object – Unit-Code Attribute			
Coverage Spec	[Bluetooth PHDT v1.6]			
Testab items	e GSI Numeric 6; M			
Test purpose	Check that:  PHG includes Glucose Sampling Interval Numeric – Unit-Code attribute in transcoder output.  [AND]  Unit-Code attribute value is set to MDC_DIM_MIN			
Applicability	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043			
Other PICS				
Initial condition	The PHG under test and the simulated PHD are in the Standby state.			
Test procedure	<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). PHD has a manually entered communication interval value stored.</li> <li>The simulated PHD implements several BTLE characteristics. The characteristic of interest for this Test Case is:         <ol> <li>CGM Specific Ops Control Point (0x2AAC)</li> <li>Field: Op Code</li> <li>Format: uint8</li> <li>Value: 0x03</li> <li>Field: Operand</li> <li>Format: uint8 (min)</li> <li>Value: not relevant</li> <li>Field: E2E-CRC</li> <li>This field is not present</li> </ol> </li> <li>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).</li> <li>When the pairing has been completed, force the PHG to perform a CGM Communication Interval procedure using Op Code "Get CGM Communication Interval" (0x02) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code field).</li> <li>The simulated PHD will respond with an indication including a "Communication Interval Response" Op Code (0x03) and an UINT8 containing the communication interval in minutes.</li> </ol>			

	Check in the PHG transcoder output the Glucose Sampling Interval Numeric Object –     Unit-Code attribute		
Pass/Fail criteria	In Step 6 the Glucose Sampling Interval Numeric Object – Unit-Code attribute is present and its value is set to MDC_DIM_MIN		
Notes (To assist manual testing)	Possible values in typical points of observation after transcoder output are:  a) IEEE 11073 Objects and Attributes Unit-Code attribute is present:  Object: Glucose Sampling Interval Numeric Object Attribute-id: MDC_ATTR_UNIT_CODE (2454) Attribute-type: OID-Type Attribute-value: MDC_DIM_MIN or 2208 (dec) or 08 A0 (hex)  b) WAN PCD-01 message PCD-01 message includes a segment like this with Unit-Code attribute value (check OBX-6):  OBX n NM 8418044^MDC_CGM_SENSOR_SAMPLE_INTERVAL^MDC		
	m.0.0.x[[value]]264352^MDC_DIM_MIN^MDC[][[][R][[[date_time]		

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-031			
TP label		Whitepaper. Glucose Sampling Interval Numeric Object – Base-Offset-Time-Stamp Attribute			
Coverage	Spec	[Bluetooth PHDT v1.6]			
	Testable items	GSI Numeric 7	; M	BaseOffset 1; M	
Test purpos	e	Check that:			
		PHG includes of transcoder outp		ng Interval Numeric Object Base	-Offset-Time-Stamp attribute in
		[AND]			
		Base-Offset-Time-Stamp attribute is set to the correct value according to Base-Offset time stamp derivation (Base-Offset-Time-Stamp attribute will be derived from the collector's time at the time of collection)			
Applicability	y	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043			
Other PICS					
Initial condi	tion	The PHG under test and the simulated PHD are in the Standby state.			
Test proced	ure	The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). The PHD has a manually entered communication interval value stored.			
		2. The simulated PHD implements several BTLE characteristics. The characteristic of interest for this Test Case is:			
		a. CGM Specific Ops Control Point (0x2AAC)			
		i. Field: Op Code			
		Format: uint8			
		Value: 0x03			
		ii. Field: Operand			
		Format: uint8 (min)			
		Value: not relevant			

	iii. Field: E2E-CRC			
	This field is not present			
	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, force the PHG to perform a CGM Communication Interval procedure using Op Code "Get CGM Communication Interval" (0x02) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code field).			
	5. The simulated PHD will respond with an indication including a "Communication Interval Response" Op Code (0x03) and an UINT8 containing the communication interval in minutes.			
	Check in PHG transcoder output the Glucose Sampling Interval Numeric Object – Base- Offset-Time-Stamp attribute			
Pass/Fail criteria	In Step 6 the Glucose Sampling Interval Numeric Object – Base-Offset-Time-Stamp attribute is present and it is set to the collector's time at the time of collection.			
Notes	Possible values in typical points of observation after transcoder output are:			
(To assist manual testing)	a) IEEE 11073 Objects and Attributes			
tooting)	Base-Offset-Time-Stamp attribute is present:			
	□ Object: Glucose Sampling Interval Numeric Object			
	☐ Attribute-id: MDC_ATTR_TIME_STAMP_BO (2690)			
	Attribute-type: SEQUENCE (bo-seconds (INT-U32), bo-fraction (INT-U16), bo-time-offset (INT-I16))			
	☐ Attribute-value: collector's time at the time of collection.			
	b) WAN PCD-01 message			
	PCD-01 message includes a segment like this with Base-Offset-Time-Stamp attribute value (check OBX-14):			
	OBX n NM 8418044^MDC_CGM_SENSOR_SAMPLE_INTERVAL^MDC  m.0.0.x [value] 264352^MDC_DIM_MIN^MDC     R   [value described in a) coded in DTM format]			

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-032			
TP label		Whitepaper. Glucose Sampling Interval Numeric Object – Basic-Nu-Observed-Value Attribute			
Coverage	Spec	[Bluetooth PHDT v1.6]			
	Testable items	GSI Numeric 8; M			
Test purpos	se	Check that:			
		PHG includes Glucose Sampling Interval Numeric Object Basic-Nu-Observed-Value attribute in transcoder output.			
		[AND]			
		Basic-Nu-Observed-Value attribute is set to the correct value.			
Applicabilit	у	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043			
Other PICS					
Initial condition		The PHG under test and the simulated PHD are in the Standby state.			
Test procedure		The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). The PHD has a manually entered communication interval value stored.			

	The simulated PHD implements several BTLE characteristics. The characteristic of interest for this Test Case is:		
	a. CGM Specific Ops Control Point (0x2AAC)		
	i. Field: Op Code		
	Format: uint8		
	• Value: 0x03		
	ii. Field: Operand		
	Format: uint8 (min)		
	• Value: 15		
	iii. Field: E2E-CRC		
	This field is not present		
	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, force the PHG to perform a CGM Communication Interval procedure using Op Code "Get CGM Communication Interval" (0x02) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code field).		
	5. The simulated PHD will respond with an indication including a "Communication Interval Response" Op Code (0x03) and an UINT8 containing the communication interval in minutes.		
	6. Check in PHG transcoder output the Glucose Sampling Interval Numeric Object – Basic-Nu-Observed-Value attribute		
Pass/Fail criteria	In Step 6 the Glucose Sampling Interval Numeric Object – Basic-Nu-Observed-Value attribute is present and it is set to 0x000F (SFLOAT-Type conversion of uint8 with exponent of 0)		
Notes	Possible values in typical points of observation after transcoder output are:		
(To assist manual	a) IEEE 11073 Objects and Attributes		
testing)	Basic-Nu-Observed-Value attribute is present:		
	□ Object: Glucose Sampling Interval Numeric Object		
	☐ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636)		
	☐ Attribute-type: SFLOAT		
	☐ Attribute-value: 15 (dec) or 000F (hex)		
	b) WAN PCD-01 message		
	PCD-01 message includes a segment like this with Basic-Nu-Observed-Value attribute value (check OBX-5):		
	OBX n NM 8418044^MDC_CGM_SENSOR_SAMPLE_INTERVAL^MDC m.0.0.x 15  264352^MDC_DIM_MIN^MDC     R   [date_time]		

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-033		
TP label		Whitepaper. Glucose trend Numeric Object - Handle Attribute		
Coverage	Spec	[Bluetooth PHDT v1.6]		
Testable items		GT Numeric 1; O		
Test purpose		Check that:		
		PHG does not include Glucose trend Numeric Object – Handle Attribute in transcoder output.		
		[OR]		

	If PHG includes Glucose trend Numeric 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_043			
Other PICS				
Initial condition	The PHG under test and the simulated PHD are in the Standby state.			
Test procedure	The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.			
	<ol> <li>The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:</li> </ol>			
	a. CGM Feature (0x2AA8)			
	i. Field: CGM Feature			
	Format: 24 bit			
	<ul> <li>Value: 0000 0000 1000 0000 0000 (MSB → LSB). CGM trend information supported.</li> </ul>			
	ii. Field: CGM Type			
	Format: 4 bit			
	Value: not relevant			
	iii. Field: CGM Sample Location			
	Format: 4 bit			
	Value: not relevant			
	iv. Field: E2E-CRC			
	Format: uint16			
	Value: not relevant			
	b. CGM Measurement (0x2AA7)			
	i. Field: Size			
	Format: uint8			
	ii. Field: Flags			
	Format: 8 bit			
	<ul> <li>Value: 0000 0001 (MSB → LSB). CGM Trend information present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) not present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.</li> </ul>			
	iii. Field: CGM Glucose Concentration (mg/dL)			
	Format: SFLOAT			
	Value: not Relevant			
	iv. Field: Time Offset			
	Format: uint16			
	Value: not relevant			
	v. Field: Sensor Status Annunciation			
	This field is not included			
	vi. Field: CGM Trend Information (mg/dL)/min			
	Format: SFLOAT			
	Value: not relevant			

	vii. Field: CGM Quality
	This field is not included
	viii. Field: E2E-CRC
	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), force the PHG under test to read the CGM Feature and CGM Session Start Time characteristics.
	5. The simulated PHD sends the Measurement to the PHG under test.
	6. Check in the PHG transcoder output the Glucose trend Numeric Object- Handle attribute
	7. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP). The simulated PHD sends the temporarily stored CGM measurement to the PHG under test.
	8. Check in the PHG transcoder output the Glucose trend Numeric Object – Handle attribute
Pass/Fail criteria	In Step 6 and 8, the Glucose Numeric Object – Handle attribute is not present or, if it is present then its value is different than 0
Notes	Possible values in typical points of observation after transcoder output are:
(To assist manual testing)	a) IEEE 11073 Objects and Attributes
testing)	Handle attribute is not present, or if it is present then:
	□ Object: Glucose trend Numeric Object
	☐ Attribute-id: MDC_ATTR_ID_HANDLE (2337)
	☐ Attribute-type: INT-U16
	☐ Attribute-value: Any value different than 0
	b) WAN PCD-01 message
	PCD-01 message does not include segments with Handle attribute value

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-034			
TP label		Whitepaper. Glucose trend Numeric Object - Type Attribute			
Coverage	Spec	[Bluetooth PHDT v1.6]			
	Testable items	GT Numeric 2; M			
Test purpose		Check that:  PHG includes Glucose trend Numeric Object – Type attribute in transcoder output.  [AND]  Type is set to MDC_PART_PHD_DM   MDC_CONC_GLU_TREND			
Applicability	y	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043			
Other PICS					
Initial condition		The PHG under test and the simulated PHD are in the Standby state.			
Test procedure		<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.</li> </ol>			

- The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:
  - a. CGM Feature (0x2AA8)
    - i. Field: CGM Feature
      - Format: 24 bit
      - Value: 0000 0000 1000 0000 0000 0000 (MSB → LSB). CGM trend information supported.
    - ii. Field: CGM Type
      - Format: 4 bit
      - Value: not relevant
    - iii. Field: CGM Sample Location
      - Format: 4 bit
      - Value: not relevant
    - iv. Field: E2E-CRC
      - Format: uint16
      - Value: not relevant
  - b. CGM Measurement (0x2AA7)
    - Field: Size
      - Format: uint8
    - i. Field: Flags
      - Format: 8 bit
      - Value: 0000 0001 (MSB → LSB). CGM Trend information present, CGM
        Quality nor present, Sensor Status Annunciation Field (Warning-Octet) not
        present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present,
        Sensor Status Annunciation Field (Status-Octet) not present.
    - iii. Field: CGM Glucose Concentration (mg/dL)
      - Format: SFLOAT
      - Value: not Relevant
    - iv. Field: Time Offset
      - Format: uint16
      - Value: not relevant
    - v. Field: Sensor Status Annunciation
      - This field is not included
    - vi. Field: CGM Trend Information (mg/dL)/min
      - Format: SFLOAT
      - · Value: not relevant
    - vii. Field: CGM Quality
      - This field is not included
    - viii. Field: E2E-CRC
      - 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), force the PHG under test to read the CGM Feature and CGM Session Start Time characteristics.
- 5. The simulated PHD sends the Measurement to the PHG under test.

	<ol> <li>Check in the PHG transcoder output the Glucose trend Numeric Object         Type attribute         The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP). The simulated PHD sends the temporarily stored CGM measurement to the PHG under test.     </li> </ol>
	8. Check in PHG transcoder output the Glucose trend Numeric Object – Type attribute
Pass/Fail criteria	In Step 6 and 8, the Glucose Numeric Object – Type attribute is present and its value is MDC_PART_PHD_DM   MDC_CONC_GLU_TREND
Notes	Possible values in typical points of observation after transcoder output are:
(To assist manual testing)	a) IEEE 11073 Objects and Attributes
	Type attribute is not present, or if it is present then:
	□ Object: Glucose trend Numeric Object
	☐ Attribute-id: MDC_ATTR_ID_TYPE (2351)
	☐ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
	☐ Attribute-value:
	<ul> <li>partition: MDC_PART_PHD_DM or 128 (dec) or 00 80 (hex)</li> </ul>
	<ul> <li>code: MDC_CONC_GLU_TREND or 29400 (dec) or 72 D8 (hex)</li> </ul>
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with Type attribute (check OBX-3):
	OBX n NM 8418008^MDC_CONC_GLU_TREND^MDC m.0.0.x [value]  266868^MDC_DIM_MILLI_G_PER_DL_PER_MIN^MDC    R   [date_time]

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-035		
TP label Whitepaper. Glucose trend Numeric Object - Metric-Spec-Small Attribute		Whitepaper. Glucose trend Numeric Object - Metric-Spec-Small Attribute		
Coverage	Spec	[Bluetooth PHDT v1.6]		
	Testable items	GT Numeric 3; M		
Test purpose		Check that:		
		PHG includes Glucose trend Numeric Object – Metric-Spec-Small attribute in transcoder output.		
		[AND]		
		Metric-Spec-Small is set to {0xF042}.		
Applicability C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043		
Other PICS				
Initial condi	tion	The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.</li> </ol>		
		2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:		
		a. CGM Feature (0x2AA8)		
		i. Field: CGM Feature		
		Format: 24 bit		

- Value: 0000 0000 1000 0000 0000 0000 (MSB → LSB). CGM trend information supported.
- ii. Field: CGM Type
  - Format: 4 bit
  - Value: not relevant
- iii. Field: CGM Sample Location
  - Format: 4 bit
  - Value: not relevant
- iv. Field: E2E-CRC
  - Format: uint16
  - Value: not relevant
- b. CGM Measurement (0x2AA7)
  - i. Field: Size
    - Format: uint8
  - ii. Field: Flags
    - Format: 8 bit
    - Value: 0000 0001 (MSB → LSB). CGM Trend information present, CGM
      Quality nor present, Sensor Status Annunciation Field (Warning-Octet) not
      present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present,
      Sensor Status Annunciation Field (Status-Octet) not present.
  - iii. Field: CGM Glucose Concentration (mg/dL)
    - Format: SFLOAT
    - Value: not Relevant
  - iv. Field: Time Offset
    - Format: uint16
    - Value: not relevant
  - v. Field: Sensor Status Annunciation
    - This field is not included
  - vi. Field: CGM Trend Information (mg/dL)/min
    - Format: SFLOAT
    - Value: not relevant
  - vii. Field: CGM Quality
    - · This field is not included
  - viii. Field: E2E-CRC
    - This field is not included
- 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), force the PHG under test to read the CGM Feature and CGM Session Start Time characteristics.
- 5. The simulated PHD sends the Measurement to the PHG under test.
- Check in the PHG transcoder output the Glucose trend Numeric Object
   Metric-Spec-Small attribute
- The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP). The simulated PHD sends the temporarily stored CGM measurement to the PHG under test.
- Check in PHG transcoder output the Glucose trend Numeric Object Metric-Spec-Small attribute

Pass/Fail criteria	In Step 6 and 8, the Glucose trend Numeric Object – Metric-Spec-Small attribute is present and its value is {0xF042} (mss-avail-intermittent   mss-upd-aperiodic   mss-msmt-aperiodic   mss-acc-agent-initiated   mss-cat-calculation   mss-avail-stored-data)	
Notes (To assist manual testing)	Possible values in typical points of observation after transcoder output are:  a) IEEE 11073 Objects and Attributes Metric-Spec-Small attribute is present:  Object: Glucose trend Numeric Object Attribute-id: MDC_ATTR_METRIC_SPEC_SMALL (2630) Attribute-type: BITS-16 Attribute-value: 0xF042 (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-calculation(14) set to TRUE and remaining BITS set to FALSE  D) WAN PCD-01 message PCD-01 message does not include segments with Metric-Spec-Small attribute value	

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-036			
TP label		Whitepaper. Glucose trend Numeric Object – Measurement-Status Attribute			
Coverage	Spec	[Bluetooth PHDT v1.6]			
	Testable items	GT Numeric 4; O			
Test purpose Check that:		Check that:			
		PHG may include Glucose trend Numeric Object – Measurement-Status attribute in transcoder output.			
		[AND]			
		If present, and related to Sensor Status Annunciation field, Measurement-Status is set to the correct value.			
Applicabilit	у	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043			
Other PICS					
Initial cond	ition	The PHG under test and the simulated PHD are in the Standby state.			
Test procedure		1. The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.			
		2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:			
		a. CGM Feature (0x2AA8)			
		i. Field: CGM Feature			
		Format: 24 bit			
		<ul> <li>Value: 0000 0000 1000 0000 0001 0000 (MSB → LSB). CGM trend information supported, rate of increase/decrease alert supported.</li> </ul>			
		ii. Field: CGM Type			
		Format: 4 bit			
		Value: not relevant			
		iii. Field: CGM Sample Location			

Format: 4 bit

• Value: not relevant

iv. Field: E2E-CRC

Format: uint16

Value: not relevant

- b. CGM Measurement (0x2AA7)
  - i. Field: Size

Format: uint8

ii. Field: Flags

Format: 8 bit

- Value: 1000 0001 (MSB → LSB). CGM Trend information present, CGM
   Quality nor present, Sensor Status Annunciation Field (Warning-Octet) not
   present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present,
   Sensor Status Annunciation Field (Status-Octet) present.
- iii. Field: CGM Glucose Concentration (mg/dL)

Format: SFLOAT

Value: not Relevant

iv. Field: Time Offset

Format: uint16

Value: not relevant

- v. Field: Sensor Status Annunciation
  - Format: 8 bit
  - Value: 0001 0000 (MSB → LSB) (sensor rate of decrease exceeded).
- vi. Field: CGM Trend Information (mg/dL)/min

Format: SFLOAT

Value: not relevant

vii. Field: CGM Quality

This field is not included

viii. Field: E2E-CRC

- 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), force the PHG under test to read the CGM Feature and CGM Session Start Time characteristics.
- 5. The simulated PHD sends the Measurement to the PHG under test.
- Check in the PHG transcoder output the Glucose trend Numeric Object

  MeasurementStatus attribute
- The PHG under test requests the simulated PHD to report stored records by performing a
  writing operation in the Record Access Control Point (RACP). The simulated PHD sends
  the temporarily stored CGM measurement to the PHG under test.
- Check in the PHG transcoder output the Glucose trend Numeric Object Measurement-Status attribute
- 9. The simulated PHD sends a Measurement to PHG under test with Sensor Status Annunciation field set to 0010 0000 (MSB → LSB), sensor rate of increase exceeded (bit 21). All remaining fields remain equal to those in step 2. The simulated PHD also deletes all stored records in RACP and stores an identical measurement. Repeat steps 5-7.

Pass/Fail criteria	<ul> <li>In Step 6 and 8 the Glucose trend Numeric Object – Measurement-Status attribute, if present, is set to "measurement outside threshold boundaries" (bit 14).</li> <li>In Step 9 the Glucose trend Numeric Object – Measurement-Status attribute, if present is set to "measurement outside threshold boundaries" (bit 14) for both cases.</li> </ul>	
Notes (To assist manual testing)	Possible values in typical points of observation after transcoder output are:  a) IEEE 11073 Objects and Attributes  If Measurement-Status attribute is present:	
	□ Object: Glucose trend Numeric Object	
	☐ Attribute-id: MDC_ATTR_MSMT_STAT (2375)	
	☐ Attribute-type: BITS16	
	☐ Attribute-value (Steps 6 & 8): "measurement outside threshold boundaries" (0x0020)	
	☐ Attribute-value (Step 9): "measurement outside threshold boundaries" (0x0020)	
	WAN PCD-01 message	
	If Measurement-Status is present, PCD-01 message includes a segment like this with Measurement-Status attribute value (check OBX-8 and OBX-11):	
	• Steps 6 & 8	
	OBX n NM 8418008^MDC_CONC_GLU_TREND^MDC m.0.0.x [value] [ 266868^MDC_DIM_MILLI_G_PER_DL_PER_MIN^MDC  ALACT   R   [date_time]	
	• Step 9	
	OBX n NM 8418008^MDC_CONC_GLU_TREND^MDC m.0.0.x [value] [ 266868^MDC_DIM_MILLI_G_PER_DL_PER_MIN^MDC  ALACT   R   [date_time]	

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-037		
TP label Whitepaper. Glucose trend Numeric Object – Unit-Code Attribute		te		
Coverage	Spec	[Bluetooth PHDT v1.6]	[Bluetooth PHDT v1.6]	
	Testable items	GT Numeric 5; M		
Test purpose  Check that:  PHG includes Glucose trend Numeric Object – Unit-Code attribute in transco  [AND]		ute in transcoder output.		
Unit-Code attribute value is set		to MDC_DIM_MILLI_G_PER_D	L_PER_MIN	
Applicability C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043		_043		
Other PICS				
Initial condit	tion	The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.</li> </ol>		
		2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:		
		a. CGM Feature (0x2AA8	)	
		i. Field: CGM Featur	e	
		Format: 24 bit		

- Value: 0000 0000 1000 0000 0000 0000 (MSB → LSB). CGM trend information supported.
- ii. Field: CGM Type
  - Format: 4 bit
  - · Value: not relevant
- iii. Field: CGM Sample Location
  - Format: 4 bit
  - Value: not relevant
- iv. Field: E2E-CRC
  - Format: uint16
  - Value: not relevant
- b. CGM Measurement (0x2AA7)
  - i. Field: Size
    - Format: uint8
  - ii. Field: Flags
    - Format: 8 bit
    - Value: 0000 0001 (MSB → LSB). CGM Trend information present, CGM
      Quality nor present, Sensor Status Annunciation Field (Warning-Octet) not
      present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present,
      Sensor Status Annunciation Field (Status-Octet) not present.
  - iii. Field: CGM Glucose Concentration (mg/dL)
    - Format: SFLOAT
    - Value: not relevant
  - iv. Field: Time Offset
    - Format: uint16
    - Value: not relevant
  - v. Field: Sensor Status Annunciation
    - This field is not included
  - vi. Field: CGM Trend Information (mg/dL)/min
    - Format: SFLOAT
    - Value: not relevant
  - vii. Field: CGM Quality
    - · This field is not included
  - viii. Field: E2E-CRC
    - This field is not included
- 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), force the PHG under test to read the CGM Feature and CGM Session Start Time characteristics.
- 5. The simulated PHD sends the Measurement to the PHG under test.
- 6. Check in PHG transcoder output the Glucose trend Numeric Object- Unit-Code attribute
- 7. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP). The simulated PHD sends the temporarily stored CGM measurement to the PHG under test.
- 8. Check in PHG transcoder output the Glucose trend Numeric Object Unit-Code attribute

Notes (To assist manual testing)  Possible values in typical points of observation after transcoder output are:  a) IEEE 11073 Objects and Attributes Unit-Code attribute is present:  Object: Glucose trend Numeric Object	Pass/Fail criteria	In Step 6 and 8 the Glucose trend Numeric Object – Unit-Code attribute is present and its value is set to MDC_DIM_MILLI_G_PER_DL_PER_MIN	
Attribute-id: MDC_ATTR_UNIT_CODE (2454)  Attribute-type: OID-Type  Attribute-value: MDC_DIM_MILLI_G_PER_DL_PER_MIN or 4724 (dec) or 12 74 (hex)  b) WAN PCD-01 message  PCD-01 message includes a segment like this with Unit-Code attribute value (check OBX-6):  OBX n NM 8418008^MDC_CONC_GLU_TREND^MDC m.0.0.x [value]  266868^MDC_DIM_MILLI_G_PER_DL_PER_MIN^MDC     R   [date_time]	(To assist manual	Possible values in typical points of observation after transcoder output are:  a) IEEE 11073 Objects and Attributes    Unit-Code attribute is present:     Object: Glucose trend Numeric Object     Attribute-id: MDC_ATTR_UNIT_CODE (2454)     Attribute-type: OID-Type     Attribute-value: MDC_DIM_MILLI_G_PER_DL_PER_MIN or 4724 (dec) or 12 74 (hex)  b) WAN PCD-01 message    PCD-01 message includes a segment like this with Unit-Code attribute value (check OBX-6):     OBX n NM 8418008^MDC_CONC_GLU_TREND^MDC m.0.0.x [value]	

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-038			
TP label		Whitepaper. Glucose trend Numeric Object – Base-Offset-Time-Stamp Attribute			t-Time-Stamp Attribute
Coverage	Spec	[Bluetooth PHDT v1.6]			
	Testable items	GT Numeric	6; M	BaseOffset 3; M	
Test purpose		Check that:			
		PHG include output.	s Glucose trend	Numeric Object Base-Offset	t-Time-Stamp attribute in transcoder
		[AND]			
	Base-Offset-Time-Stamp attribute is set to the correct value according to Base-Off stamp derivation			ue according to Base-Offset time	
Applicability	y	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043			_BLE_043
Other PICS					
Initial condi	tion	The PHG under test and the simulated PHD are in the Standby state.		andby state.	
Test procedure		<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.</li> </ol>			
		2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:			
		a. CGM Feature (0x2AA8)			
		i. Field: CGM Feature			
		Format: 24 bit			
			<ul> <li>Value: 0000 information</li> </ul>		0 (MSB → LSB). CGM trend
		ii. Field: CGM Type			
		Format: 4 bit			
		Value: not relevant			

- iii. Field: CGM Sample Location
  - Format: 4 bit
  - · Value: not relevant
- iv. Field: E2E-CRC
  - Format: uint16
  - Value: not relevant
- b. CGM Measurement (0x2AA7)
  - i. Field: Size
    - Format: uint8
  - i. Field: Flags
    - Format: 8 bit
    - Value: 0000 0001 (MSB → LSB). CGM Trend information present, CGM
      Quality nor present, Sensor Status Annunciation Field (Warning-Octet) not
      present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present,
      Sensor Status Annunciation Field (Status-Octet) not present.
  - iii. Field: CGM Glucose Concentration (mg/dL)
    - Format: SFLOAT
    - Value: not relevant
  - iv. Field: Time Offset
    - Format: uint16
    - Value: 20 (min)
  - v. Field: Sensor Status Annunciation
    - This field is not included
  - vi. Field: CGM Trend Information (mg/dL)/min
    - Format: SFLOAT
    - Value: not relevant
  - vii. Field: CGM Quality
    - This field is not included
  - viii. Field: E2E-CRC
    - This field is not included
- c. CGM Session Start Time (0x2AAA)
  - i. Field: Session Start Time
    - Format: {uint16, uint8, uint8, uint8, uint8, uint8}
    - Value: {2016, 5, 12, 16, 39, 27} (May 12, 2016, 16:39:27)
  - ii. Field: Time Zone
    - Format: sint8
    - Value: 4 (UTC+1:00)
  - iii. Field: DST-Offset
    - Format: uint8
    - Value: 4 (Daylight Time (+1h))
  - iv. Field: E2E-CRC
    - This field is not included
- 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), force the PHG under test to read the CGM Feature and CGM Session Start Time characteristics.
	5. The simulated PHD sends the Measurement to the PHG under test.
	6. Check in the PHG transcoder output the Glucose trend Numeric Object– Base-Offset- Time-Stamp attribute
	7. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP). The simulated PHD sends the temporarily stored CGM measurement to the PHG under test.
	8. Check in PHG transcoder output the Glucose trend Numeric Object – Base-Offset-Time-Stamp attribute
Pass/Fail criteria	In Step 6 and 8, the Glucose Numeric Object – Base-Offset-Time-Stamp is set to the addition of CGM Session Start Time characteristic's Session Start Time (May 12, 2016, 16:39:27) field plus CGM Measurement characteristic's Time Offset field (20 min).
Notes	Possible values in typical points of observation after transcoder output are:
(To assist manual testing)	a) IEEE 11073 Objects and Attributes
testing)	Base-Offset-Time-Stamp attribute is present:
	□ Object: Glucose trend Numeric Object
	☐ Attribute-id: MDC_ATTR_TIME_STAMP_BO (2690)
	Attribute-type: SEQUENCE {bo-seconds (INT-U32), bo-fraction (INT-U16), bo-time-offset (INT-I16)}
	☐ Attribute-value: addition of
	<ul> <li>CGM Session Start Time characteristic Session Start Time field (May 12, 2016, 16:39:27)</li> </ul>
	CGM Measurement characteristic Time Offset field (20m)
	Note that the same Base-Offset-Time-Stamp can have different representations depending on bo-time-offset value. If it is set to 20 min (CGM Measurement characteristic's Time Offset field), then Base-Offset-Time-Stamp value shall be {3672059967, 0, 20}
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with Base-Offset-Time-Stamp attribute value (check OBX-14):
	OBX n NM 8418008^MDC_CONC_GLU_TREND^MDC m.0.0.x [value]  266868^MDC_DIM_MILLI_G_PER_DL_PER_MIN^MDC     R   [value described in a) coded in DTM format]

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-039		
TP label		Whitepaper. Glucose trend Numeric Object – Basic-Nu-Observed-Value Attribute		
Coverage	Spec	[Bluetooth PHDT v1.6]		
	Testable items	GT Numeric 7; M		
Test purpose		Check that:  PHG includes Glucose trend Numeric Object Basic-Nu-Observed-Value attribute in transcoder output.  [AND]		
Basic-Nu-Observed-Value attribute is set to the correct value.				
Applicability	y	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043		

Other PICS			
Initial condition	The PHG under test and the simulated PHD are in the Standby state.		
Test procedure	<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.</li> </ol>		
	2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:		
	a. CGM Feature (0x2AA8)		
	i. Field: CGM Feature		
	Format: 24 bit		
	<ul> <li>Value: 0000 0000 1000 0000 0000 (MSB → LSB). CGM trend information supported.</li> </ul>		
	ii. Field: CGM Type		
	Format: 4 bit		
	Value: not relevant		
	iii. Field: CGM Sample Location		
	Format: 4 bit		
	Value: not relevant		
	iv. Field: E2E-CRC		
	Format: uint16		
	Value: not relevant		
	b. CGM Measurement (0x2AA7)		
	i. Field: Size		
	Format: uint8		
	ii. Field: Flags		
	Format: 8 bit		
	<ul> <li>Value: 0000 0001 (MSB → LSB). CGM Trend information present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) not present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.</li> </ul>		
	iii. Field: CGM Glucose Concentration (mg/dL)		
	Format: SFLOAT		
	Value: not relevant		
	iv. Field: Time Offset		
	Format: uint16		
	Value: not relevant		
	v. Field: Sensor Status Annunciation		
	This field is not included		
	vi. Field: CGM Trend Information (mg/dL)/min		
	Format: SFLOAT		
	• Value: 3.6		
	vii. Field: CGM Quality		
	This field is not included		
	viii. Field: E2E-CRC		

	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), force the PHG under test to read the CGM Feature and CGM Session Start Time characteristics.
	5. The simulated PHD sends the Measurement to the PHG under test.
	Check in the PHG transcoder output the Glucose trend Numeric Object– Basic-Nu- Observed-Value attribute
	7. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP). The simulated PHD sends the temporarily stored CGM measurement to the PHG under test.
	Check in PHG transcoder output the Glucose trend Numeric Object – Basic-Nu- Observed-Value attribute
Pass/Fail criteria	In Step 6 and 8, the Glucose trend Numeric Object – Basic-Nu-Observed-Value is set to 3.6 (mg/dL)/min
Notes	Possible values in typical points of observation after transcoder output are:
(To assist manual testing)	a) IEEE 11073 Objects and Attributes
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Basic-Nu-Observed-Value attribute is present:
	□ Object: Glucose trend Numeric Object
	☐ Attribute-id: MDC_ATTR_NU_VAL_OBS_BASIC (2636)
	☐ Attribute-type: SFLOAT
	☐ Attribute-value: 3.6 (dec) or F0 24 (hex) or E1 68 (hex) or DE 10 (hex)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with Basic-Nu-Observed-Value attribute value (check OBX-5):
	OBX n NM 8418008^MDC_CONC_GLU_TREND^MDC m.0.0.x 3.6  266868^MDC_DIM_MILLI_G_PER_DL_PER_MIN^MDC     R   [date_time]

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-040				
TP label		Whitepaper. Glucose trend Numeric Object – Threshold-Notification-Text-String				
Coverage	Spec	[Bluetooth PHDT v1.6]				
	Testable items	GT Numeric 8; O				
Test purpose		Check that:  PHG may transcode bits 20 and 21 of the CGM Sensor Status Annunciation field of CGM Measurement characteristic into Glucose trend Numeric Object – Threshold-Notification-Text-String attribute				
Applicability	/	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043				
Other PICS						
Initial condition		The PHG under test and the simulated PHD are in the Standby state.				
Test procedure		<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.</li> </ol>				

- The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:
  - a. CGM Feature (0x2AA8)
    - i. Field: CGM Feature
      - Format: 24 bit
      - Value: 0000 0000 1000 0000 0001 0000 (MSB → LSB). CGM trend information supported, rate of increase/decrease alerts supported.
    - ii. Field: CGM Type
      - Format: 4 bit
      - Value: not relevant
    - iii. Field: CGM Sample Location
      - Format: 4 bit
      - Value: not relevant
    - iv. Field: E2E-CRC
      - Format: uint16
      - · Value: not relevant
  - b. CGM Measurement (0x2AA7)
    - i. Field: Size
      - Format: uint8
    - ii. Field: Flags
      - Format: 8 bit
      - Value: 1000 0001 (MSB → LSB). CGM Trend information present, CGM
        Quality nor present, Sensor Status Annunciation Field (Warning-Octet) not
        present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present,
        Sensor Status Annunciation Field (Status-Octet) present.
    - iii. Field: CGM Glucose Concentration (mg/dL)
      - Format: SFLOAT
      - Value: not relevant
    - iv. Field: Time Offset
      - Format: uint16
      - Value: not relevant
    - v. Field: Sensor Status Annunciation
      - Format: 8 bit
      - Value: 0001 0000 (MSB → LSB) (sensor rate of decrease exceeded).
    - vi. Field: CGM Trend Information (mg/dL)/min
      - Format: SFLOAT
      - · Value: not relevant
    - vii. Field: CGM Quality
      - This field is not included
    - viii. Field: E2E-CRC
      - 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), force the PHG under test to read the CGM Feature and CGM Session Start Time characteristics.

- 5. The simulated PHD sends the Measurement to the PHG under test.
- The PHG under test requests the simulated PHD to report stored records by performing a
  writing operation in the Record Access Control Point (RACP). The simulated PHD sends
  the temporarily stored CGM measurement to the PHG under test.
- Check in PHG transcoder output the Glucose trend Numeric Object Threshold-Notification-Text-String attribute
- The simulated PHD sends a CGM Measurement to PHG under test with the following values. The simulated PHD also deletes all previous stored records in RACP and stores an identical measurement in it.
  - a. CGM Measurement (0x2AA7)

i. Field: Size

Format: uint8

ii. Field: Flags

• Format: 8 bit

- Value: 1000 0001 (MSB → LSB). CGM Trend information present, CGM
  Quality nor present, Sensor Status Annunciation Field (Warning-Octet) not
  present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present,
  Sensor Status Annunciation Field (Status-Octet) present.
- iii. Field: CGM Glucose Concentration (mg/dL)

Format: SFLOAT

Value: not relevant

iv. Field: Time Offset

• Format: uint16

· Value: not relevant

- v. Field: Sensor Status Annunciation
  - Format: 8 bit
  - Value: 0010 0000 (MSB → LSB) (sensor rate of increase exceeded).
- vi. Field: CGM Trend Information (mg/dL)/min

Format: SFLOAT

Value: not relevant

vii. Field: CGM Quality

• This field is not included

viii. Field: E2E-CRC

This field is not included

 Repeat steps 6-8 to check in transcoder output the Glucose trend Numeric Object – Threshold-Notification-Text-String attribute.

## Pass/Fail criteria

- In Step 6 and 8, if present, the Glucose trend Numeric Object Threshold-Notification-Text-String is set to an OCTET STRING that may contain a readable description of the threshold notification "sensor rate of decrease exceeded"
- In Step 10, if present, the Glucose trend Numeric Object Threshold-Notification-Text-String is set to an OCTET STRING that may contain a readable description of the threshold notification "sensor rate of increase exceeded" for both cases.

## Notes (To assist manual testing)

Possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

If Threshold-Notification-Text-String attribute is present:

	Object: Glucose trend Numeric Object
	Attribute-id: MDC_ATTR_THRES_NOTIF_TEXT_STRING (2696)
	Attribute-type: OCTET STRING
	Attribute-value (Steps 6 & 8): readable description of the threshold notification "sensor rate of decrease exceeded"
	Attribute-value (Step 10): readable description of the threshold notification "sensor rate of increase exceeded"
b) W	AN PCD-01 message
Th	reshold-Notification-Text-String attribute is not included in PCD-01 message

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-041						
TP label		Whitepaper. Patient low/high thresholds Compound Numeric Object - Handle Attribute						
Coverage	Spec	[Bluetooth PHDT v1.6]						
	Testable items	PLH Numeri	c 1; O					
Test purpos	se	Check that:						
			ot include Patient ranscoder output.	low/high thresholds Compound N	Numeric Object – Handle			
				gh thresholds Compound Numer ue shall be different than 0	ic Object – Handle attribute in			
Applicabilit	у	C_MAN_BL AND C_MAI		N_BLE_002 AND C_MAN_BLE	_043 AND C_MAN_BLE_046			
Other PICS								
Initial cond	ition	The PHG under test and the simulated PHD are in the Standby state.						
Test procedure		The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). PHD has manually entered Patient Low Alert Level and Patient High Alert Level values stored.						
		2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:						
		a. CG	M Feature (0x2AA	.8)				
		i.	Field: CGM Feat	ure				
			• Format: 24 b	pit				
			<ul> <li>Value: 0000 Alerts suppo</li> </ul>	0000 0000 0000 0000 00 <b>1</b> 0 (MS rted.	SB → LSB). Patient High/Low			
		ii.	Field: CGM Type					
			Format: 4 bit	t				
			Value: not re	elevant				
		iii.	Field: CGM Sam	ple Location				
			Format: 4 bit	t				
			Value: not re	elevant				
		iv.	Field: E2E-CRC					
			Format: uint:	16				
			<ul> <li>Value: not re</li> </ul>	elevant				

	b. CGM Specific Ops Control Point (0x2AAC)				
	i. Field: Op Code				
	□ Format: uint8				
	☐ Value: 0x09 (Patient High Alert Level Response) / 0x0C (Patient Low Alert Level Response)				
	ii. Field: Operand				
	☐ Format: SFLOAT (mg/dL)				
	☐ Value: not relevant				
	iii. Field: E2E-CRC				
	☐ This field is not present				
	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, force the PHG to read CGM Feature and CGM Session Start Time characteristics, and then to perform a Patient High Alert procedure using Op Code "Get Patient High Alert Level" (0x08) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code).				
	5. The simulated PHD will respond with an indication including a "Patient High Alert Level Response" (0x09) Op Code and an SFLOAT containing the requested value in mg/dL.				
	Force the PHG to perform a Patient Low Alert procedure using Op Code "Get Patient Low Alert Level" (0x0B) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code).				
	The simulated PHD will respond with an indication including a "Patient Low Alert Level Response" (0x0C) Op Code and an SFLOAT containing the requested value in mg/dL.				
	Check in the PHG transcoder output the Patient low/high thresholds Compound Numeric Object – Handle attribute				
Pass/Fail criteria	In Step 8, the Patient low/high thresholds Compound Numeric Object – Handle attribute is not present or, if it is present then its value is different than 0				
Notes	Possible values in typical points of observation after transcoder output are:				
(To assist manual testing)	a) IEEE 11073 Objects and Attributes				
testing)	Handle attribute is not present, or if it is present then:				
	☐ Object: Patient low/high thresholds Compound Numeric Object				
	☐ Attribute-id: MDC_ATTR_ID_HANDLE (2337)				
	☐ Attribute-type: INT-U16				
	☐ Attribute-value: Any value different than 0				
	b) WAN PCD-01 message				
	PCD-01 message does not include segments with Handle attribute value				

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-042					
TP label		Whitepaper. Patient low/high thresholds Compound Numeric Object - Type Attribute					
Coverage	Spec	[Bluetooth PHDT v1.6]					
	Testable items	PLH Numeric 2; M					
Test purpose		Check that:  PHG includes Patient low/high thresholds Compound Numeric Object – Type attribute in transcoder output.					
		[AND]					

	Type is set to MDC_PART_PHD_DM   MDC_CONC_GLU_PATIENT_THRESHOLDS_LOW_HIGH						
Applicability	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND C_MAN_BLE_046 AND C_MAN_BLE_048						
Other PICS							
Initial condition	The PHG under test and the simulated PHD are in the Standby state.						
Test procedure	The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). PHD has manually entered Patient Low Alert Level and Patient High Alert Level values stored.						
	2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:						
	a. CGM Feature (0x2AA8)						
	i. Field: CGM Feature						
	☐ Format: 24 bit						
	□ Value: 0000 0000 0000 0000 0010 (MSB → LSB). Patient High/Low Alerts supported.						
	ii. Field: CGM Type						
	☐ Format: 4 bit						
	☐ Value: not relevant						
	iii. Field: CGM Sample Location						
	☐ Format: 4 bit						
	☐ Value: not relevant						
	iv. Field: E2E-CRC						
	☐ Format: uint16						
	☐ Value: not relevant						
	b. CGM Specific Ops Control Point (0x2AAC)						
	i. Field: Op Code						
	☐ Format: uint8						
	□ Value: 0x09 (Patient High Alert Level Response) / 0x0C (Patient Low Alert Level Response)						
	ii. Field: Operand						
	☐ Format: SFLOAT (mg/dL)						
	☐ Value: not relevant						
	iii. Field: E2E-CRC						
	☐ This field is not present						
	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, force the PHG to read CGM Feature and CGM Session Start Time characteristics, and then to perform a Patient High Alert procedure using Op Code "Get Patient High Alert Level" (0x08) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code).						
	5. The simulated PHD will respond with an indication including a "Patient High Alert Level Response" (0x09) Op Code and an SFLOAT containing the requested value in mg/dL.						
	6. Force the PHG to perform a Patient Low Alert procedure using Op Code "Get Patient Low Alert Level" (0x0B) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code).						
	7. The simulated PHD will respond with an indication including a "Patient Low Alert Level Response" (0x0C) Op Code and an SFLOAT containing the requested value in mg/dL.						

	Check in PHG transcoder output the Patient low/high thresholds Compound Numeric Object – Type attribute					
Pass/Fail criteria	In Step 8, the Patient low/high thresholds Compound Numeric Object – Type attribute is present and set to MDC_PART_PHD_DM   MDC_CONC_GLU_PATIENT_THRESHOLDS_LOW_HIGH					
Notes (To assist manual testing)	Possible values in typical points of observation after transcoder output are:  a) IEEE 11073 Objects and Attributes Type attribute is present:  Object: Patient low/high thresholds Compound Numeric 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)					
	<ul> <li>code: MDC_CONC_GLU_PATIENT_THRESHOLDS_LOW_HIGH or 29404 (dec) or 72 DC (hex)</li> <li>b) WAN PCD-01 message</li> </ul>					
	PCD-01 message includes a segment like this with Type attribute (check OBX-3):					
	OBX n  8418012^MDC_CONC_GLU_PATIENT_THRESHOLDS_LOW_HIGH^MDC  m.0.x.0       X   [date_time]					

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-043_A						
TP label		Whitepaper. Patient low/high thresholds Compound Numeric Object - Metric-Spec-Small Attribute 1						
Coverage	Spec	[Bluetooth PHDT v1.6]						
	Testable items	PLH Numeric 3; M	PLH Numeric 3; M PLH Numeric 5; M					
Test purpo	se	Check that:						
		PHG includes Patient lov attribute in transcoder ou	w/high thresholds Compound Numericutput.	: Object – Metric-Spec-Small				
		[AND]	[AND]					
		Metric-Spec-Small is set to {0x604C} when the patient low/high thresholds were updated manually by the user						
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND C_MAN_BLE_046 AND C_MAN_BLE_048						
Other PICS								
Initial cond	ition	The PHG under test and the simulated PHD are in the Standby state.						
Test procedure		<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). PHD has manually entered Patient Low Alert Level and Patient High Alert Level values stored.</li> </ol>						
		2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:						
		a. CGM Feature (0x2AA8)						
		i. Field: CGM	1 Feature					
		☐ Format: 24 bit						

					Value: 0000 0000 0000 0000 0000 0010 (MSB $\rightarrow$ LSB). Patient High/Low Alerts supported.
			ii.	Field	d: CGM Type
					Format: 4 bit
					Value: not relevant
			iii.	Field	d: CGM Sample Location
					Format: 4 bit
					Value: not relevant
			iv.	Field	d: E2E-CRC
					Format: uint16
					Value: not relevant
		b.	CG	M Sp	ecific Ops Control Point (0x2AAC)
			i.	Field	d: Op Code
					Format: uint8
					Value: 0x09 (Patient High Alert Level Response) / 0x0C (Patient Low Alert Level Response)
			ii.	Field	d: Operand
					Format: SFLOAT (mg/dL)
					Value: not relevant
			iii.	Field	d: E2E-CRC
					This field is not present
	3.				der test initiates a discovery process (Scanning state), it discovers the ID and it starts a pairing process with the simulated PHD (Initiating state).
	4.	Ses usir	sion ng O	Start Coc	ring has been completed, force the PHG to read CGM Feature and CGM: Time characteristics, and then to perform a Patient High Alert procedure de "Get Patient High Alert Level" (0x08) (performing a write operation to the cops Control Point characteristic's Op Code).
	5.	The simulated PHD will respond with an indication including a "Patient High Alert Leve Response" (0x09) Op Code and an SFLOAT containing the requested value in mg/dL.			
	6.	<ol> <li>Force the PHG to perform a Patient Low Alert procedure using Op Code "Get Patient L Alert Level" (0x0B) (performing a write operation to the CGM Specific Ops Control Poir characteristic's Op Code).</li> </ol>			
	7.				d PHD will respond with an indication including a "Patient Low Alert Level x0C) Op Code and an SFLOAT containing the requested value in mg/dL.
	8.	Obj	ect -	Туре	G transcoder output the Patient low/high thresholds Compound Numeric e attributeCheck in PHG transcoder output the Patient low/high thresholds umeric Object – Metric-Spec-Small attribute
Pass/Fail criteria	attr	ibute	is p	resen	ient low/high thresholds Compound Numeric Object – Metric-Spec-Small it and its value is {0x604C} (mss-avail-stored-data   mss-upd-aperiodic   tiated   mss-cat-manual   mss-cat-setting)
Notes	Pos	ssible	valı	ues in	typical points of observation after transcoder output are:
(To assist manual	a)				Objects and Attributes
testing)					Small attribute is present:
			Obj	ect: F	Patient low/high thresholds Compound Numeric Object
			_		-id: MDC_ATTR_METRIC_SPEC_SMALL (2630)
					-type: BITS-16
			Attr	ibute- s-acc-	-value: 60 4C (hex) or BITS mss-avail-stored-data (1), mss-upd-aperiodic(2), -agent-initiated(9), mss-cat-manual(12), mss-cat-setting(13) set to TRUE aining BITS set to FALSE

b) WAN PCD-01 message
PCD-01 message does not include segments with Metric-Spec-Small attribute value

TP Id		TP/LP-F	TP/LP-PAN/PHG/PHDTW/CGM/BV-043_B						
TP label		Whitepaper. Patient low/high thresholds Compound Numeric Object - Metric-Spec-Small Attribute 2							
Coverage	Spec	[Bluetooth PHDT v1.6]							
	Testable items	PLH Nu	meric 3;	М	PLH Numeric 4; M				
Test purpos	se	Check that:							
		PHG includes Patient low/high thresholds Compound Numeric Object – Metric-Spec-Small attribute in transcoder output.							
		[AND]	_						
		Metric-S been ex		all is set to {0x	6044} when the Patient High/Lo	w Alert Level procedure has			
Applicabilit	у				N_BLE_002 AND C_MAN_BLE C_MAN_BLE_047 AND C_MAN				
Other PICS									
Initial cond	ition	The PH	The PHG under test and the simulated PHD are in the Standby state.						
Test proced	dure		<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization).</li> </ol>						
				ted PHD impler this Test Case	nents several BTLE characterist are:	tics. The characteristics of			
		a.	CGM F	eature (0x2AA	8)				
			i. Fie	eld: CGM Featu	ıre				
				Format: 24 b	it				
				Value: 0000 Alerts suppo	0000 0000 0000 0000 00 <b>1</b> 0 (MS rted.	SB → LSB). Patient High/Low			
			ii. Fie	eld: CGM Type					
				Format: 4 bit					
				Value: not re	levant				
			iii. Fie	eld: CGM Samp	ole Location				
				Format: 4 bit					
				Value: not re	levant				
			iv. Fie	eld: E2E-CRC					
				Format: uint1	6				
				Value: not re					
		b.			ontrol Point (0x2AAC)				
			_	eld: Op Code					
			_	Format: uint8					
				Level Respon	(Patient High Alert Level Respornse)	nse) / 0x0C (Patient Low Alert			
			ii. Fie	eld: Operand					
				Format: SFL	OAT (mg/dL)				

				Value: not relevant				
		iii.	Fiel	d: E2E-CRC				
				This field is not present				
	3.			der test initiates a discovery process (Scanning state), it discovers the HD and it starts a pairing process with the simulated PHD (Initiating state).				
	4.	When the pairing has been completed, force the PHG to read CGM Feature and Session Start Time characteristics.						
	5.	Force the PHG to set the patient high threshold by performing a Patient High A procedure using Op Code "Set Patient High Alert Level" (0x07) followed by a visible SFLOAT value (performing a write operation to the CGM Specific Ops Control characteristic's Op Code and Operand fields respectively). The simulated PHD respond with an indication including a Response Op Code value of "Success".						
	6.	procedo SFLOA charact	ure us T val eristic	HG to set the patient low threshold by performing a Patient Low Alert sing Op Code "Set Patient Low Alert Level" (0x0A) followed by a valid ue (performing a write operation to the CGM Specific Ops Control Point c's Op Code and Operand fields respectively). The simulated PHD will an indication including a Response Op Code value of "Success".				
	7.	Patient	High	the PHG to perform a Patient High Alert procedure using Op Code "Get Alert Level" (0x08) (performing a write operation to the CGM Specific Ops t characteristic's Op Code).				
	8.			ed PHD will respond with an indication including a "Patient High Alert Level 0x09) Op Code and an SFLOAT containing the requested value in mg/dL.				
	9.	Alert Le	evel" (	HG to perform a Patient Low Alert procedure using Op Code "Get Patient Low (0x0B) (performing a write operation to the CGM Specific Ops Control Point c's Op Code).				
	10.			ed PHD will respond with an indication including a "Patient Low Alert Level 0x0C) Op Code and an SFLOAT containing the requested value in mg/dL.				
	11.	Object -	– Тур	G transcoder output the Patient low/high thresholds Compound Numeric be attributeCheck in PHG transcoder output the Patient low/high thresholds Numeric Object – Metric-Spec-Small attribute				
Pass/Fail criteria	attri	bute is p	rese	atient low/high thresholds Compound Numeric Object – Metric-Spec-Small nt and its value is {0x6044} (mss-avail-stored-data   mss-upd-aperiodic   mss-d   mss-cat-setting)				
Notes	Pos	sible va	lues i	n typical points of observation after transcoder output are:				
(To assist manual testing)				Objects and Attributes				
testing)				Small attribute is present:				
		☐ Ob	ject:	Patient low/high thresholds Compound Numeric Object				
		☐ Att	ribute	e-id: MDC_ATTR_METRIC_SPEC_SMALL (2630)				
		☐ Att	ribute	e-type: BITS-16				
		ap	eriodi	e-value: 0x6044 (hex) or BITS mss-avail-stored-data (1), mss-upd-c(2), mss-acc-agent-initiated(9), mss-cat-setting(13) set to TRUE and ng BITS set to FALSE				
	b)	WAN P	CD-0	1 message				
		PCD-0	1 mes	sage does not include segments with Metric-Spec-Small attribute value				

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-044		
TP label		Whitepaper. Patient low/high thresholds Compound Numeric Object – Metric-Structure-Small Attribute		
Coverage	Spec	[Bluetooth PHDT v1.6]		
	Testable	PLH Numeric 6; M		

items				
Test purpose	Check that:			
	PHG includes Patient low/high thresholds Compound Numeric Object – Metric-Structure-Small attribute in transcoder output.			
	[AND]			
	Metric-Structure-Small is set to {0x40, 0x02}			
Applicability	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND C_MAN_BLE_046 AND C_MAN_BLE_048			
Other PICS				
nitial condition	The PHG under test and the simulated PHD are in the Standby state.			
Test procedure	<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). PHD has manually entered Patient Low Alert Level and Patient High Aler Level values stored.</li> </ol>			
	2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:			
	a. CGM Feature (0x2AA8)			
	i. Field: CGM Feature			
	☐ Format: 24 bit			
	□ Value: 0000 0000 0000 0000 0010 (MSB → LSB). Patient High/Low Alerts supported.			
	ii. Field: CGM Type			
	☐ Format: 4 bit			
	□ Value: not relevant			
	iii. Field: CGM Sample Location			
	☐ Format: 4 bit			
	☐ Value: not relevant			
	iv. Field: E2E-CRC			
	☐ Format: uint16			
	☐ Value: not relevant			
	b. CGM Specific Ops Control Point (0x2AAC)			
	i. Field: Op Code			
	☐ Format: uint8			
	□ Value: 0x09 (Patient High Alert Level Response) / 0x0C (Patient Low Alert Level Response)			
	ii. Field: Operand			
	☐ Format: SFLOAT (mg/dL)			
	☐ Value: not relevant			
	iii. Field: E2E-CRC			
	☐ This field is not present			
	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, force the PHG to read CGM Feature and CGM Session Start Time characteristics, and then to perform a Patient High Alert procedure using Op Code "Get Patient High Alert Level" (0x08) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code).			
	5. The simulated PHD will respond with an indication including a "Patient High Alert Level Response" (0x09) Op Code and an SFLOAT containing the requested value in mg/dL.			

	6. Force the PHG to perform a Patient Low Alert procedure using Op Code "Get Patient Low Alert Level" (0x0B) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code).
	7. The simulated PHD will respond with an indication including a "Patient Low Alert Level Response" (0x0C) Op Code and an SFLOAT containing the requested value in mg/dL.
	Check in PHG transcoder output the Patient low/high thresholds Compound Numeric     Object – Metric-Structure-Small attribute
Pass/Fail criteria	In Step 8, the Patient low/high thresholds Compound Numeric Object – Metric-Structure-Small attribute is present and set to 0x40 (ms-struct-compound), 0x02 (number of components is 2)
Notes	Possible values in typical points of observation after transcoder output are:
(To assist manual testing)	a) IEEE 11073 Objects and Attributes
	Metric-Structure-Small attribute is present:
	□ Object: Patient low/high thresholds Compound Numeric Object
	☐ Attribute-id: MDC_ATTR_METRIC_STRUCT_SMALL (2675)
	☐ Attribute-type: SEQUENCE {ms-struct (INT-U8), ms-comp-no (INT-U8)}
	☐ Attribute-value:
	ms-struct: 0x40 (ms-struct-compound)
	ms-comp-no: 0x02 (number of components)
	b) WAN PCD-01 message
	PCD-01 message does not include segments with Metric-Structure-Small attribute value

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-045					
TP label		Whitepaper. Patient low/high thresholds Compound Numeric Object – Metric-Id-List Attribute					
Coverage	Spec	[Bluetooth PHDT v1.6]					
	Testable items	PLH Numeric 7; M					
Test purpos	se	Check that:					
		PHG includes Patient low/high thresholds Compound Numeric Object – Metric-Id-List attribute in transcoder output.					
		[AND]					
		Metric-Id-List is set to { 0x0002, 0x0004, MDC_CONC_GLU_PATIENT_THRESHOLD_LOW, MDC_CONC_GLU_PATIENT_THRESHOLD_HIGH }					
Applicabilit	у	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND C_MAN_BLE_046 AND C_MAN_BLE_048					
Other PICS							
Initial cond	ition	The PHG under test and the simulated PHD are in the Standby state.					
Test procedure		The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). PHD has manually entered Patient Low Alert Level and Patient High Alert Level values stored.					
		2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:					
		a. CGM Feature (0x2AA8)					
		i. Field: CGM Feature					
		☐ Format: 24 bit					

				□ Value: 0000 0000 0000 0000 0000 0010 (MSB → LSB). Patient High/Low Alerts supported.
			ii.	Field: CGM Type
				☐ Format: 4 bit
				□ Value: not relevant
			iii.	Field: CGM Sample Location
				☐ Format: 4 bit
				□ Value: not relevant
			iv.	Field: E2E-CRC
				☐ Format: uint16
				□ Value: not relevant
		b.	CG	M Specific Ops Control Point (0x2AAC)
			i.	Field: Op Code
				☐ Format: uint8
				□ Value: 0x09 (Patient High Alert Level Response) / 0x0C (Patient Low Alert Level Response)
			ii.	Field: Operand
				☐ Format: SFLOAT (mg/dL)
				□ Value: not relevant
			iii.	Field: E2E-CRC
				☐ This field is not present
	3.			G under test initiates a discovery process (Scanning state), it discovers the ed PHD and it starts a pairing process with the simulated PHD (Initiating state).
	4.	Ses usir	sion ng O	ne pairing has been completed, force the PHG to read CGM Feature and CGM a Start Time characteristics, and then to perform a Patient High Alert procedure p Code "Get Patient High Alert Level" (0x08) (performing a write operation to the pecific Ops Control Point characteristic's Op Code).
	5.	The	sim	nulated PHD will respond with an indication including a "Patient High Alert Level se" (0x09) Op Code and an SFLOAT containing the requested value in mg/dL.
	6.	Aler	rt Le	ne PHG to perform a Patient Low Alert procedure using Op Code "Get Patient Low vel" (0x0B) (performing a write operation to the CGM Specific Ops Control Point eristic's Op Code).
	7.			nulated PHD will respond with an indication including a "Patient Low Alert Level se" (0x0C) Op Code and an SFLOAT containing the requested value in mg/dL.
	8.			n PHG transcoder output the Patient low/high thresholds Compound Numeric - Metric-Id-List attribute
Pass/Fail criteria	is p MD	rese	nt ar	e Patient low/high thresholds Compound Numeric Object – Metric-Id-List attribute nd set to 0x0002 (count of metric ids is 2), 0x0004 (list length is 4 octets), C_GLU_PATIENT_THRESHOLD_LOW, C_GLU_PATIENT_THRESHOLD_HIGH
Notes	Pos	sible	e valı	ues in typical points of observation after transcoder output are:
(To assist manual testing)	a)	IEE	E 11	1073 Objects and Attributes
tosting)		Met	ric-lo	d-List attribute is present:
			Obj	ject: Patient low/high thresholds Compound Numeric Object
			Attr	ribute-id: MDC_ATTR_ID_PHYSIO_LIST (2678)
			Attr	ribute-type: SEQUENCE OF [{OID-Type(INT-U16)}]
				ribute-value: 0x0002 (number of elements), 0x0004 (length of the sequence),
			follo	owed by

First element: MDC_CONC_GLU_PATIENT_THRESHOLD_LOW (0x72DD)     Second element: MDC_CONC_GLU_PATIENT_THRESHOLD_HIGH (0x72DE)  b) WAN PCD-01 message
PCD-01 message includes two segments like these with Metric-Id-List attribute values (check OBX-3 in both segments):
OBX n NM 8418013^MDC_CONC_GLU_PATIENT_THRESHOLD_LOW^MDC  m.0.x.a [value] 264274^MDC_DIM_MILLI_G_PER_DL^MDC    R
OBX n NM 8418014^MDC_CONC_GLU_PATIENT_THRESHOLD_HIGH^MDC  m.0.x.b [value] 264274^MDC_DIM_MILLI_G_PER_DL^MDC    R

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-046				
TP label		Whitepaper. Patient low/high thresholds Compound Numeric Object – Unit-Code Attribute				
Coverage	Spec	[Bluetooth PHDT v1.6]				
	Testable items	PLH Numeric 8; M				
Test purpos	е	Check that:				
		PHG includes Patient low/high thresholds Compound Numeric Object – Unit-Code attribute in transcoder output.				
		[AND]				
		Unit-Code is set to MDC_DIM_MILLI_G_PER_DL				
Applicability	′	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND C_MAN_BLE_046 AND C_MAN_BLE_048				
Other PICS						
Initial condi	tion	The PHG under test and the simulated PHD are in the Standby state.				
Test procedure		<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). PHD has manually entered Patient Low Alert Level and Patient High Alert Level values stored.</li> <li>The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:         <ol> <li>CGM Feature (0x2AA8)</li> <li>Field: CGM Feature</li> <li>Format: 24 bit</li> <li>Value: 0000 0000 0000 0000 0010 (MSB → LSB). Patient High/Low Alerts supported.</li> <li>Field: CGM Type</li> <li>Format: 4 bit</li> <li>Value: not relevant</li> <li>Field: CGM Sample Location</li> </ol> </li> </ol>				
		Format: 4 bit  Value: not relevant  iv. Field: E2E-CRC  Format: uint16  Value: not relevant  b. CGM Specific Ops Control Point (0x2AAC)				

	i. Field: Op Code			
	☐ Format: uint8			
	□ Value: 0x09 (Patient High Alert Level Response) / 0x0C (Patient Low Alert Level Response)			
	ii. Field: Operand			
	☐ Format: SFLOAT (mg/dL)			
	☐ Value: not relevant			
	iii. Field: E2E-CRC			
	☐ This field is not present			
	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, force the PHG to read CGM Feature and CGM Session Start Time characteristics, and then to perform a Patient High Alert procedure using Op Code "Get Patient High Alert Level" (0x08) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code).			
	5. The simulated PHD will respond with an indication including a "Patient High Alert Level Response" (0x09) Op Code and an SFLOAT containing the requested value in mg/dL.			
	6. Force the PHG to perform a Patient Low Alert procedure using Op Code "Get Patient Low Alert Level" (0x0B) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code).			
	7. The simulated PHD will respond with an indication including a "Patient Low Alert Level Response" (0x0C) Op Code and an SFLOAT containing the requested value in mg/dL.			
	8. Check in the PHG transcoder output the Patient low/high thresholds Compound Numeric Object – Unit-Code attribute			
Pass/Fail criteria	In Step 8, the Patient low/high thresholds Compound Numeric Object – Unit-Code attribute is present and set to MDC_DIM_MILLI_G_PER_DL			
Notes	Possible values in typical points of observation after transcoder output are:			
(To assist manual testing)	a) IEEE 11073 Objects and Attributes			
testing)	Unit-Code attribute is present:			
	□ Object: Patient low/high thresholds Compound Numeric Object			
	☐ Attribute-id: MDC_ATTR_UNIT_CODE (2454)			
	☐ Attribute-type: OID-Type			
	☐ Attribute-value: MDC_DIM_MILLI_G_PER_DL or 2130 (dec) or 0x0852 (hex)			
	b) WAN PCD-01 message			
	PCD-01 message includes two segments like these with Unit-Code attribute value (check OBX-6 in both segments):			
	OBX n NM 8418013^MDC_CONC_GLU_PATIENT_THRESHOLD_LOW^MDC  m.0.x.a [value] 264274^MDC_DIM_MILLI_G_PER_DL^MDC    R			
	OBX n NM 8418014^MDC_CONC_GLU_PATIENT_THRESHOLD_HIGH^MDC  m.0.x.b [value] 264274^MDC_DIM_MILLI_G_PER_DL^MDC    R			

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-047					
TP label	Whitepaper. Patient low/high thresholds Compound Numeric Object – Base-Offset-Tim Stamp Attribute						
Coverage	Spec	[Bluetooth PHDT v1.6]					
	Testable items	PLH Numeric 9; M BaseOffset 1; M					

Tost purposo	Check that:					
Test purpose	Check that:  PHG includes Patient low/high thresholds Compound Numeric Object _ Rase-Offset-Time-					
	PHG includes Patient low/high thresholds Compound Numeric Object – Base-Offset-Time-Stamp Attribute					
	[AND]					
	Base-Offset-Time-Stamp attribute is set to the correct value according to Base-Offset time stamp derivation (Base-Offset-Time-Stamp attribute will be derived from the collector's time at the time of collection)					
	,					
Applicability	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND C_MAN_BLE_046 AND C_MAN_BLE_048					
Other PICS						
Initial condition	The PHG under test and the simulated PHD are in the Standby state.					
Test procedure	The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). The PHD has manually entered Patient Low Alert Level and Patient High Alert Level values stored.					
	<ol><li>The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:</li></ol>					
	a. CGM Feature (0x2AA8)					
	i. Field: CGM Feature					
	☐ Format: 24 bit					
	□ Value: 0000 0000 0000 0000 0010 (MSB → LSB). Patient High/Low Alerts supported.					
	ii. Field: CGM Type					
	☐ Format: 4 bit					
	☐ Value: not relevant					
	iii. Field: CGM Sample Location					
	☐ Format: 4 bit					
	☐ Value: not relevant					
	iv. Field: E2E-CRC					
	☐ Format: uint16					
	☐ Value: not relevant					
	b. CGM Specific Ops Control Point (0x2AAC)					
	i. Field: Op Code					
	☐ Format: uint8					
	□ Value: 0x09 (Patient High Alert Level Response) / 0x0C (Patient Low Alert Level Response)					
	ii. Field: Operand					
	☐ Format: SFLOAT (mg/dL)					
	□ Value: not relevant					
	iii. Field: E2E-CRC					
	☐ This field is not present					
	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, force the PHG to read CGM Feature and CGM Session Start Time characteristics, and then to perform a Patient High Alert procedure using Op Code "Get Patient High Alert Level" (0x08) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code).					

	5. The simulated PHD will respond with an indication including a "Patient High Alert Level Response" (0x09) Op Code and an SFLOAT containing the requested value in mg/dL.			
	6. Force the PHG to perform a Patient Low Alert procedure using Op Code "Get Patient Low Alert Level" (0x0B) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code).			
	7. The simulated PHD will respond with an indication including a "Patient Low Alert Level Response" (0x0C) Op Code and an SFLOAT containing the requested value in mg/dL.			
	Check in PHG transcoder output the Patient low/high thresholds Compound Numeric     Object – Base-Offset-Time-Stamp attribute			
Pass/Fail criteria	In Step 8, the Patient low/high thresholds Compound Numeric Object – Base-Offset-Time-Stamp attribute is present and it is set to the collector's time at the time of collection.			
Notes	Possible values in typical points of observation after transcoder output are:			
(To assist manual testing)	a) IEEE 11073 Objects and Attributes			
,	Base-Offset-Time-Stamp attribute is present:			
	□ Object: Patient low/high thresholds Compound Numeric Object			
	☐ Attribute-id: MDC_ATTR_TIME_STAMP_BO (2690)			
	Attribute-type: SEQUENCE {bo-seconds (INT-U32), bo-fraction (INT-U16), bo-time-offset (INT-I16)}			
	☐ Attribute-value: collector's time at the time of collection.			
	b) WAN PCD-01 message			
	PCD-01 message includes a segment like this with Base-Offset-Time-Stamp attribute (check OBX-14):			
	OBX n  8418012^MDC_CONC_GLU_PATIENT_THRESHOLDS_LOW_HIGH^MDC  m.0.x.0      X   [value described in a) coded in DTM format]			

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-048				
TP label		Whitepaper. Patient low/high thresholds Compound Numeric Object – Compound-Basic-Nu-Observed-Value Attribute				
Coverage	Spec	[Bluetooth PHDT v1.6]				
	Testable items	PLH Numeric 10; M				
Test purpos	e	Check that:  PHG includes Patient low/high thresholds Compound Numeric Object Compound-Basic-Nu-Observed-Value attribute in transcoder output.  [AND]  Compound-Basic-Nu-Observed-Value attribute is set to the correct value.				
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND C_MAN_BLE_046 AND C_MAN_BLE_048				
Other PICS						
Initial condition		The PHG under test and the simulated PHD are in the Standby state.				
Test procedure		The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). PHD has manually entered Patient Low Alert Level and Patient High Alert Level values stored.				
		2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:				

		a. CGM Feature (0x2AA8)			
			i. Field: CGM Feature		
					Format: 24 bit
					Value: 0000 0000 0000 0000 0000 0010 (MSB $\rightarrow$ LSB). Patient High/Low Alerts supported.
			ii.	Fie	ld: CGM Type
					Format: 4 bit
					Value: not relevant
			iii.	Fie	ld: CGM Sample Location
					Format: 4 bit
					Value: not relevant
			iv.	Fie	ld: E2E-CRC
					Format: uint16
					Value: not relevant
		b.	CG	M S	pecific Ops Control Point (0x2AAC)
			i.	Fie	ld: Op Code
					Format: uint8
					Value: 0x09 (Patient High Alert Level Response) / 0x0C (Patient Low Alert Level Response)
			ii.	Fie	ld: Operand
					Format: SFLOAT (mg/dL)
					Value: 72.0 (Patient Low threshold) / 144.0 (Patient High threshold)
			iii.	Fie	ld: E2E-CRC
					This field is not present
	3.				der test initiates a discovery process (Scanning state), it discovers the HD and it starts a pairing process with the simulated PHD (Initiating state).
	4.	Ses usir	ssion ng O	Stai p Co	airing has been completed, force the PHG to read CGM Feature and CGM rt Time characteristics, and then to perform a Patient High Alert procedure de "Get Patient High Alert Level" (0x08) (performing a write operation to the ic Ops Control Point characteristic's Op Code).
	5.				ed PHD will respond with an indication including a "Patient High Alert Level 0x09) Op Code and an SFLOAT containing the requested value in mg/dL.
	6.	Ale	rt Le	vel" (	HG to perform a Patient Low Alert procedure using Op Code "Get Patient Low (0x0B) (performing a write operation to the CGM Specific Ops Control Point c's Op Code).
	7.				ed PHD will respond with an indication including a "Patient Low Alert Level 0x0C) Op Code and an SFLOAT containing the requested value in mg/dL.
	8.				G transcoder output the Patient low/high thresholds Compound Numeric mpound-Basic-Nu-Observed-Value attribute
Pass/Fail criteria	Obs leng	erve gth is	ed-Va s 4 o	alue ctets	tient low/high thresholds Compound Numeric Object – Compound-Basic-Nu- attributeis set to 0x0002 (count of components is 2), 0x0004 (component list ), the Patient Low Alert Level Response Operand followed by the Patient Response Operand
Notes	Pos	sible	e val	ues i	n typical points of observation after transcoder output are:
(To assist manual testing)	assist manual				
iesung <i>j</i>					Basic-Nu-Observed-Value attribute is present:
			-		Patient low/high thresholds Compound Numeric Object
					e-id: MDC_ATTR_NU_CMPD_VAL_OBS_BASIC (2677)

	☐ Attribute-type: SEQUENCE OF [{SFLOAT}]
	☐ Attribute-value: 0x0002 (number of elements), 0x0004 (length of the sequence), followed by
	<ul> <li>First element (Patient Low Alert Level Response Operand): 00 48 (hex) or F2 D0 (hex) or 72.0 (dec)</li> </ul>
	<ul> <li>Second element (Patient High Level Response Operand): 00 90 (hex) or F5 A0 (hex) or 144.0 (dec)</li> </ul>
b	b) WAN PCD-01 message
	PCD-01 message includes two segments like these with Compound-Basic-Nu-Observed-Value attribute value (check OBX-5 in both segments):
	OBX n NM 8418013^MDC_CONC_GLU_PATIENT_THRESHOLD_LOW^MDC  m.0.x.a 72.0 264274^MDC_DIM_MILLI_G_PER_DL^MDC     R
	OBX n NM 8418014^MDC_CONC_GLU_PATIENT_THRESHOLD_HIGH^MDC m.0.x.b 144.0 264274^MDC_DIM_MILLI_G_PER_DL^MDC     R

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-049										
TP label		Whitepaper. Device hypo/hyper thresholds Compound Numeric Object - Handle Attribute										
Coverage	Spec	[Bluetooth P	[Bluetooth PHDT v1.6]									
	Testable items	DHH Numer	ic 1; O									
Test purpos	se	Check that:										
			PHG does not include Device hypo/hyper thresholds Compound Numeric Object – Handle Attribute in transcoder output.									
		[OR]										
				yper thresholds Compound Nu alue shall be different than 0	meric Object – Handle attribute							
Applicability	y		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND (C_MAN_BLE_050 OR C_MAN_BLE_052)									
Other PICS												
Initial condi	tion	The PHG under test and the simulated PHD are in the Standby state.										
Test proced	lure	The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). The PHD has manually entered Hypo and Hyper Alert Level values stored.										
		2. The simulated PHD implements several BTLE characteristics. The characterist interest for this Test Case are:										
		a. CG	M Feature (0x2AA	8)								
		i.	Field: CGM Featu	ıre								
			• Format: 24 b	it								
			Value: 0000 Hyper Alerts	0000 0000 0000 0000 <b>11</b> 00 (M supported.	ISB → LSB). Hypo Alerts and							
		ii.	Field: CGM Type									
			Format: 4 bit									
			Value: not re	levant								
		iii.	Field: CGM Samp	ole Location								
			Format: 4 bit									

	Value: not relevant
	iv. Field: E2E-CRC
	Format: uint16
	Value: not relevant
	b. CGM Specific Ops Control Point (0x2AAC)
	i. Field: Op Code
	☐ Format: uint8
	□ Value: 0x0F (Hypo Alert Level Response) / 0x12 (Hyper Alert Level Response)
	ii. Field: Operand
	☐ Format: SFLOAT (mg/dL)
	☐ Value: not relevant
	iii. Field: E2E-CRC
	☐ This field is not present
	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, force the PHG to read CGM Feature and CGM Session Start Time characteristics.
	5. IF C_MAN_BLE_050 = TRUE, force the PHG to perform a Hypo Alert procedure using Op Code "Get Hypo Alert Level" (0x0E) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code). simulated PHD will respond with an indication including a "Hypo Alert Level Response" (0x0F) Op Code and an SFLOAT containing the requested alert level in mg/dL.
	6. IF C_MAN_BLE_052 = TRUE, force the PHG to perform a Hyper Alert procedure using Op Code "Get Hyper Alert Level" (0x11) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code). The simulated PHD will respond with an indication including a "Hyper Alert Level Response" (0x12) Op Code and an SFLOAT containing the requested alert level in mg/dL.
	7. Check in PHG transcoder output the Device hypo/hyper thresholds Compound Numeric Object – Handle attribute
Pass/Fail criteria	In Step 7, the Device hypo/hyper thresholds Compound Numeric Object – Handle attribute is not present or, if it is present then its value is different than 0
Notes	Possible values in typical points of observation after transcoder output are:
(To assist manual testing)	a) IEEE 11073 Objects and Attributes
toomig,	Handle attribute is not present, or if it is present then:
	☐ Object: Device hypo/hyper thresholds Compound Numeric Object
	☐ Attribute-id: MDC_ATTR_ID_HANDLE (2337)
	☐ Attribute-type: INT-U16
	☐ Attribute-value: Any value different than 0
	b) WAN PCD-01 message
	PCD-01 message does not include segments with Handle attribute value

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-050							
TP label		Whitepaper. Device hypo/hyper thresholds Compound Numeric Object - Type Attribute							
Coverage	Spec	[Bluetooth PHDT v1.6]							
	Testable DHH Numeric 2; M								

items										
Test purpose	Check that:									
	PHG includes Device hypo/hyper thresholds Compound Numeric Object – Type attribute in transcoder output.									
	[AND]									
	Type is set to MDC_PART_PHD_DM   MDC_CONC_GLU_THRESHOLDS_HYPO_HYPER									
Applicability	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND (C_MAN_BLE_050 OR C_MAN_BLE_052)									
Other PICS										
Initial condition	The PHG under test and the simulated PHD are in the Standby state.									
Test procedure	The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). The PHD has manually entered Hypo and Hyper Alert Level values stored.									
	2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:									
	a. CGM Feature (0x2AA8)									
	i. Field: CGM Feature									
	☐ Format: 24 bit									
	□ Value: 0000 0000 0000 0000 0000 1100 (MSB → LSB). Hypo Alerts and Hyper Alerts supported.									
	ii. Field: CGM Type									
	☐ Format: 4 bit									
	☐ Value: not relevant									
	iii. Field: CGM Sample Location									
	☐ Format: 4 bit									
	☐ Value: not relevant									
	iv. Field: E2E-CRC									
	☐ Format: uint16									
	☐ Value: not relevant									
	b. CGM Specific Ops Control Point (0x2AAC)									
	i. Field: Op Code									
	☐ Format: uint8									
	□ Value: 0x0F (Hypo Alert Level Response) / 0x12 (Hyper Alert Level Response)									
	ii. Field: Operand									
	☐ Format: SFLOAT (mg/dL)									
	☐ Value: not relevant									
	iii. Field: E2E-CRC									
	☐ This field is not present									
	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, force the PHG to read CGM Feature and CGM Session Start Time characteristics.									
	5. IF C_MAN_BLE_050 = TRUE, force the PHG to perform a Hypo Alert procedure using Op Code "Get Hypo Alert Level" (0x0E) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code). The simulated PHD will respond with an									

	indication including a "Hypo Alert Level Response" (0x0F) Op Code and an SFLOAT containing the requested alert level in mg/dL.
	6. IF C_MAN_BLE_052 = TRUE, force the PHG to perform a Hyper Alert procedure using Op Code "Get Hyper Alert Level" (0x11) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code). The simulated PHD will respond with an indication including a "Hyper Alert Level Response" (0x12) Op Code and an SFLOAT containing the requested alert level in mg/dL.
	7. Check in the PHG transcoder output the Device hypo/hyper thresholds Compound Numeric Object – Type attribute
Pass/Fail criteria	In Step 7, the Device hypo/hyper thresholds CompoundNumeric Object – Type attribute is present and set to MDC_PART_PHD_DM   MDC_CONC_GLU_THRESHOLDS_HYPO_HYPER
Notes	Possible values in typical points of observation after transcoder output are:
(To assist manual testing)	a) IEEE 11073 Objects and Attributes
testing)	Type attribute is present:
	□ Object: Device hypo/hyper thresholds Compound Numeric Object
	☐ Attribute-id: MDC_ATTR_ID_TYPE (2351)
	☐ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}
	☐ Attribute-value:
	<ul> <li>partition: MDC_PART_PHD_DM or 128 (dec) or 00 80 (hex)</li> </ul>
	code: MDC_CONC_GLU_THRESHOLDS_HYPO_HYPER or 29408 (dec) or 72 E0 (hex)
	b) WAN PCD-01 message
	PCD-01 message includes a segment like this with Type attribute (check OBX-3):
	OBX n  8418016^MDC_CONC_GLU_THRESHOLDS_HYPO_HYPER^MDC  m.0.x.0      X   [date_time]

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-051_A						
TP label		Whitepaper. Device hypo/hyper thresholds Compound Numeric Object - Metric-Spec-Small Attribute 1						
Coverage	Spec	[Bluetooth PHDT v1.6]						
	Testable items	DHH Numeric 3; M	DHH Numeric 4; M					
Test purpo	se	Check that:						
		PHG includes Device hypo/hyper thresholds Compound Numeric Object – Metric-Spec-Small attribute in transcoder output.						
		[AND]						
		Metric-Spec-Small is set to {0x604C} when the hypo/hyper thresholds were updated manually by the user						
Applicabilit	у	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND (C_MAN_BLE_050 OR C_MAN_BLE_052)						
Other PICS								
Initial condition		The PHG under test and the simulated PHD are in the Standby state.						
Test procedure		The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). The PHD has manually entered Hypo and Hyper Alert Level values stored.						

	<ol><li>The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:</li></ol>
	a. CGM Feature (0x2AA8)
	i. Field: CGM Feature
	☐ Format: 24 bit
	□ Value: 0000 0000 0000 0000 0000 1100 (MSB → LSB). Hypo Alerts and Hyper Alerts supported.
	ii. Field: CGM Type
	☐ Format: 4 bit
	☐ Value: not relevant
	iii. Field: CGM Sample Location
	☐ Format: 4 bit
	☐ Value: not relevant
	iv. Field: E2E-CRC
	☐ Format: uint16
	☐ Value: not relevant
	b. CGM Specific Ops Control Point (0x2AAC)
	i. Field: Op Code
	☐ Format: uint8
	□ Value: 0x0F (Hypo Alert Level Response) / 0x12 (Hyper Alert Level Response)
	ii. Field: Operand
	☐ Format: SFLOAT (mg/dL)
	☐ Value: not relevant
	iii. Field: E2E-CRC
	☐ This field is not present
	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).
	<ol> <li>When the pairing has been completed, force the PHG to read CGM Feature and CGM Session Start Time characteristics.</li> </ol>
	5. IF C_MAN_BLE_050 = TRUE, force the PHG to perform a Hypo Alert procedure using Op Code "Get Hypo Alert Level" (0x0E) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code). The simulated PHD will respond with an indication including a "Hypo Alert Level Response" (0x0F) Op Code and an SFLOAT containing the requested alert level in mg/dL.
	6. IF C_MAN_BLE_052 = TRUE, force the PHG to perform a Hyper Alert procedure using Op Code "Get Hyper Alert Level" (0x11) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code). The simulated PHD will respond with an indication including a "Hyper Alert Level Response" (0x12) Op Code and an SFLOAT containing the requested alert level in mg/dL.
	7. Check in PHG transcoder output the Device hypo/hyper thresholds Compound Numeric Object – Metric-Spec-Small attribute
Pass/Fail criteria	In Step 7, the Device hypo/hyper thresholds Compound Numeric Object – Metric-Spec-Small attribute is present and its value is {0x604C} (mss-avail-stored-data   mss-upd-aperiodic   mss-acc-agent-initiated   mss-cat-manual   mss-cat-setting)
Notes	Possible values in typical points of observation after transcoder output are:
(To assist manual testing)	a) IEEE 11073 Objects and Attributes
tooting,	Metric-Spec-Small attribute is present:
	☐ Object: Device hypo/hyper thresholds Compound Numeric Object

		Attribute-id: MDC_ATTR_METRIC_SPEC_SMALL (2630) Attribute-type: BITS-16
		Attribute-value: 60 4C (hex) or BITS mss-avail-stored-data (1), mss-upd-aperiodic(2), mss-acc-agent-initiated(9), mss-cat-manual(12), mss-cat-setting(13) set to TRUE and remaining BITS set to FALSE
ŀ	b) WA	N PCD-01 message
	PC	D-01 message does not include segments with Metric-Spec-Small attribute value

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-051_B									
TP label		Whitepaper. Device hypo/hyper thresholds Compound Numeric Object - Metric-Spec-Small Attribute 2									
Coverage	Spec	[Bluetooth	[Bluetooth PHDT v1.6]								
	Testable items	DHH Num	neric 3;	М	DHH Numeric 4; M						
Test purpose		Check that:  PHG includes Device hypo/hyper thresholds Compound Numeric Object – Metric-Spec-Small attribute in transcoder output.  [AND]  Metric-Spec-Small is set to {0x6044} when either the Hypo Alert or Hyper Alert procedure has									
Applicability Other PICS	у	C_MAN_E	been executed  C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND (C_MAN_BLE_050  OR C_MAN_BLE_052) AND (C_MAN_BLE_049 OR C_MAN_BLE_051)								
Initial condi	tion	The PHG under test and the simulated PHD are in the Standby state.									
Test procedure		speci 2. The s	specialization).								
		a. CGM Feature (0x2AA8)									
		i									
				Format: 24 b Value: 0000	it 0000 0000 0000 0000 <b>11</b> 00 (MS	SB → LSB). Hypo Alerts and					
				Hyper Alerts		, ,,					
		i		ld: CGM Type							
				Format: 4 bit							
			□ ii. Fie	Value: not re eld: CGM Samp							
		'	Fie	Format: 4 bit							
				Value: not re							
		i	_	ld: E2E-CRC							
				Format: uint1	6						
				Value: not re	levant						
		b. (	CGM S	pecific Ops Co	ontrol Point (0x2AAC)						
		i	. Fie	eld: Op Code							

				_	Format: uint8
				<b>3</b>	Value: 0x0F (Hypo Alert Level Response) / 0x12 (Hyper Alert Level Response)
		i	i. F	Fiel	d: Operand
				_	Format: SFLOAT (mg/dL)
				ב	Value: not relevant
		i	ii. F	iel	d: E2E-CRC
				_	This field is not present
	3.				der test initiates a discovery process (Scanning state), it discovers the ID and it starts a pairing process with the simulated PHD (Initiating state).
	4.				iring has been completed, force the PHG to read CGM Feature and CGM t Time characteristics.
	5.	Hypo SFLC chara	Aler DAT v acteri	t pı valı İstic	SLE_049 = TRUE, force the PHG to set the Hypo Alert Level by performing a cocedure using Op Code "Set Hypo Alert Level" (0x0D) followed by a valid use (performing a write operation to the CGM Specific Ops Control Point s's Op Code and Operand fields respectively). The simulated PHD will an indication including a Response Op Code value of "Success".
	6.	Hype SFLC chara	er Ale DAT v acteri	rt p valu stic	SLE_051 = TRUE, force the PHG to set the Hyper Alert Level by performing a procedure using Op Code "Set Hyper Alert Level" (0x10) followed by a valid use (performing a write operation to the CGM Specific Ops Control Point c's Op Code and Operand fields respectively). The simulated PHD will an indication including a Response Op Code value of "Success".
	7.	Op C Ops ( indica	ode ' Conti ation	"Ge rol inc	SLE_050 = TRUE, force the PHG to perform a Hypo Alert procedure using st Hypo Alert Level" (0x0E) (performing a write operation to the CGM Specific Point characteristic's Op Code). The simulated PHD will respond with an Iluding a "Hypo Alert Level Response" (0x0F) Op Code and an SFLOAT e requested alert level in mg/dL.
	8.	Op C Spec with a	ode ' ific C an ind	"Ge )ps dica	SLE_052 = TRUE, force the PHG to perform a Hyper Alert procedure using et Hyper Alert Level" (0x11) (performing a write operation to the CGM Control Point characteristic's Op Code). The simulated PHD will respond ation including a "Hyper Alert Level Response" (0x12) Op Code and an taining the requested alert level in mg/dL.
	9.				G transcoder output the Device hypo/hyper thresholds Compound Numeric ric-Spec-Small attribute
Pass/Fail criteria	attr	ibute is	s pre	ser	vice hypo/hyper thresholds Compound Numeric Object – Metric-Spec-Small and its value is {0x6044} (mss-avail-stored-data   mss-upd-aperiodic   mss-d   mss-cat-setting)
Notes	Pos	ssible v	value	s ir	n typical points of observation after transcoder output are:
(To assist manual testing)	a)	IEEE	110	73	Objects and Attributes
		Metri	c-Sp	ec-	Small attribute is present:
			Objed	ct: I	Device hypo/hyper thresholds Compound Numeric Object
			Attrib	ute	-id: MDC_ATTR_METRIC_SPEC_SMALL (2630)
			Attrib	ute	-type: BITS-16
		á	aperio	odi	-value: 0x6044 (hex) or BITS mss-avail-stored-data (1), mss-upd-c(2), mss-acc-agent-initiated(9), mss-cat-setting(13) set to TRUE and g BITS set to FALSE
	b)	WAN	I PCE	D-0	1 message
		PCD-	-01 m	nes	sage does not include segments with Metric-Spec-Small attribute value
	_	_		_	

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-052									
TP label		Whitepaper. Device hypo/hyper thresholds Compound Numeric Object – Metric-Structure-Small Attribute									
Coverage	Spec	[Blu	uetod	oth P	PHDT v1.6]						
	Testable items	DH	DHH Numeric 6; M								
Test purpose		PH Sm [AN	Check that:  PHG includes Device hypo/hyper thresholds Compound Numeric Object – Metric-Structure-Small attribute in transcoder output.  [AND]  Metric-Structure-Small is set to {0x40, 0x02}								
Applicability	/					00 AND C_MA E_052)	N_BLE_002 AND C_I	MAN_BLE	_043 AND (C_MAN_BLE_050		
Other PICS											
Initial condi	tion	The	e PH	G ur	der 1	test and the s	mulated PHD are in th	ne Standby	state.		
Test proced	ure	1.	<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (devi specialization). The PHD has manually entered Hypo and Hyper Alert Level values stored.</li> </ol>								
		2.	2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:								
			a. CGM Feature (0x2AA8)								
			i. Field: CGM Feature								
			☐ Format: 24 bit								
		□ Value: 0000 0000 0000 0000 0000 1100 (MSB → Hyper Alerts supported.						SB → LSB). Hypo Alerts and			
				ii.	Fie	ld: CGM Type					
						Format: 4 bi	t				
						Value: not re	elevant				
				iii.	Fie	ld: CGM Sam					
						Format: 4 bi					
						Value: not re	elevant				
				iv.		ld: E2E-CRC					
						Format: uint					
			L	00	<u> </u>	Value: not re					
			b.		-	· · · · · · · · · · · · · · · · · · ·	ontrol Point (0x2AAC)				
				i.		ld: Op Code Format: uint	Ω.				
								sponse) / 0	x12 (Hyper Alert Level		
					_	Response)	. 7				
				ii.	Fie	ld: Operand					
							OAT (mg/dL)				
						Value: not re	elevant				
				iii.	Fie	ld: E2E-CRC					
						This field is	not present				

	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, force the PHG to read CGM Feature and CGM Session Start Time characteristics.
	5. IF C_MAN_BLE_050 = TRUE, force the PHG to perform a Hypo Alert procedure using Op Code "Get Hypo Alert Level" (0x0E) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code). The simulated PHD will respond with an indication including a "Hypo Alert Level Response" (0x0F) Op Code and an SFLOAT containing the requested alert level in mg/dL.
	6. IF C_MAN_BLE_052 = TRUE, force the PHG to perform a Hyper Alert procedure using Op Code "Get Hyper Alert Level" (0x11) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code). The simulated PHD will respond with an indication including a "Hyper Alert Level Response" (0x12) Op Code and an SFLOAT containing the requested alert level in mg/dL.
	7. Check in the PHG transcoder output the Device hypo/hyper thresholds Compound Numeric Object – Metric-Structure-Small attribute
Pass/Fail criteria	In Step 7, the Device hypo/hyper thresholds Compound Numeric Object – Metric-Structure-Small attribute is present and set to 0x40 (ms-struct-compound), 0x02 (number of components is 2)
Notes	Possible values in typical points of observation after transcoder output are:
(To assist manual testing)	a) IEEE 11073 Objects and Attributes
testing)	Metric-Structure-Small attribute is present:
	☐ Object: Device hypo/hyper thresholds Compound Numeric Object
	☐ Attribute-id: MDC_ATTR_METRIC_STRUCT_SMALL (2675)
	☐ Attribute-type: SEQUENCE {ms-struct (INT-U8), ms-comp-no (INT-U8)}
	☐ Attribute-value:
	ms-struct: 0x40 (ms-struct-compound)
	ms-comp-no: 0x02 (number of components)
	b) WAN PCD-01 message
	PCD-01 message does not include segments with Metric-Structure-Small attribute value
·	

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-053				
TP label		Whitepaper. Device hypo/hyper thresholds Compound Numeric Object – Metric-Id-List Attribute				
Coverage	Spec	[Bluetooth PHDT v1.6]				
	Testable items	DHH Numeric 7; M				
Test purpos	se	Check that:  PHG includes Device hypo/hyper thresholds Compound Numeric Object – Metric-Id-List attribute in transcoder output.  [AND]				
		Metric-Id-List is set to { 0x0002, 0x0004, MDC_CONC_GLU_THRESHOLD_HYPO, MDC_CONC_GLU_THRESHOLD_HYPER }				
Applicability		C_MAN_BLE_000 AND C_M OR C_MAN_BLE_052)	AN_BLE_002 AND C_MAN_BLE	_043 AND (C_MAN_BLE_050		
Other PICS						

Initial condition	The	e PHG under test and the simulated PHD are in the Standby state.				
Test procedure	<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring specialization). The PHD has manually entered Hypo and Hyper Alert Le stored.</li> </ol>					
	2.	The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:	·			
		a. CGM Feature (0x2AA8)				
		i. Field: CGM Feature				
		☐ Format: 24 bit				
		□ Value: 0000 0000 0000 0000 0000 1100 (MSB → LSB). Hypo Alerts and Hyper Alerts supported.				
		ii. Field: CGM Type				
		☐ Format: 4 bit				
		□ Value: not relevant				
		iii. Field: CGM Sample Location				
		☐ Format: 4 bit				
		☐ Value: not relevant				
		iv. Field: E2E-CRC				
		☐ Format: uint16				
		□ Value: not relevant				
		b. CGM Specific Ops Control Point (0x2AAC)				
		i. Field: Op Code				
		☐ Format: uint8				
		□ Value: 0x0F (Hypo Alert Level Response) / 0x12 (Hyper Alert Level Response)				
		ii. Field: Operand				
		☐ Format: SFLOAT (mg/dL)				
		□ Value: not relevant				
		iii. Field: E2E-CRC				
		☐ This field is not present				
	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, force the PHG to read CGM Feature and CGM Session Start Time characteristics.				
	5.	IF C_MAN_BLE_050 = TRUE, force the PHG to perform a Hypo Alert procedure using Op Code "Get Hypo Alert Level" (0x0E) (performing a write operation to the CGM Speci Ops Control Point characteristic's Op Code). The simulated PHD will respond with an indication including a "Hypo Alert Level Response" (0x0F) Op Code and an SFLOAT containing the requested alert level in mg/dL.	fic			
	6.	IF C_MAN_BLE_052 = TRUE, force the PHG to perform a Hyper Alert procedure using Op Code "Get Hyper Alert Level" (0x11) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code). The simulated PHD will respond with an indication including a "Hyper Alert Level Response" (0x12) Op Code and an SFLOAT containing the requested alert level in mg/dL.				
	7.	Check in the PHG transcoder output the Device hypo/hyper thresholds Compound Numeric Object – Metric-Id-List attribute				
Pass/Fail criteria	attı	Step 7, the Device hypo/hyper thresholds Compound Numeric Object – Metric-Id-List ribute is present and set to 0x0002 (count of metric ids is 2), 0x0004 (list length is 4 octets DC_CONC_GLU_THRESHOLD_HYPER	;),			

Notes	Possib	e values in typical points of observation after transcoder output are:	
(To assist manual testing)	a) IEI	EE 11073 Objects and Attributes	
	Me	etric-Id-List attribute is present:	
		Object: Device hypo/hyper thresholds Compound Numeric Object	
		Attribute-id: MDC_ATTR_ID_PHYSIO_LIST (2678)	
		Attribute-type: SEQUENCE OF [{OID-Type(INT-U16)}]	
		Attribute-value: 0x0002 (number of elements), 0x0004 (length of the sequence), followed by	
		<ul> <li>First element: MDC_CONC_GLU_THRESHOLD_HYPO (0x72E1)</li> </ul>	
		<ul> <li>Second element: MDC_CONC_GLU_THRESHOLD_HYPER (0x72E2)</li> </ul>	
	b) W	AN PCD-01 message	
	two	If both Hypo/Hyper Alert Level Responses are received, then PCD-01 message includes two segments like these with Metric-Id-List attribute values (check OBX-3 in both segments):	
		OBX n NM 8418017^MDC_CONC_GLU_THRESHOLD_HYPO^MDC m.0.x.a [value]  264274^MDC_DIM_MILLI_G_PER_DL^MDC    R	
		OBX n NM 8418018^MDC_CONC_GLU_THRESHOLD_HYPER^MDC  m.0.x.b [value] 264274^MDC_DIM_MILLI_G_PER_DL^MDC    R	
		te: If one of the responses is not available, its related segment will appear with en upty [value], the value "NAN" in OBX-8 and the value "X" in OBX-11	

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-054					
TP label	TP label		Whitepaper. Device hypo/hyper thresholds Compound Numeric Object – Unit-Code Attribute				
Coverage	Spec	[Bluetooth PHD	Γ v1.6]				
	Testable items	DHH Numeric 8	; M				
Test purpos	e	Check that:					
		PHG includes D in transcoder ou		er thresholds Compound Numer	ric Object – Unit-Code attribute		
		[AND]					
		Unit-Code is set to MDC_DIM_MILLI_G_PER_DL					
Applicability	/	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND (C_MAN_BLE_050 OR C_MAN_BLE_052)					
Other PICS							
Initial condi	tion	The PHG under test and the simulated PHD are in the Standby state.					
Test proced	ure	The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). The PHD has manually entered Hypo and Hyper Alert Level values stored.					
		2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:					
		a. CGM Feature (0x2AA8)					
		i. Fie	eld: CGM Featu	ire			
			Format: 24 b	it			
		٥	Value: 0000 ( Hyper Alerts	0000 0000 0000 0000 1100 (MS supported.	B → LSB). Hypo Alerts and		

	ii. Field: CGM Type		
	□ Format: 4 bit		
	□ Value: not relevant		
	iii. Field: CGM Sample Location		
	□ Format: 4 bit		
	☐ Value: not relevant		
	iv. Field: E2E-CRC		
	Format: uint16		
	□ Value: not relevant		
	b. CGM Specific Ops Control Point (0x2AAC)		
	i. Field: Op Code		
	Format: uint8		
	□ Value: 0x0F (Hypo Alert Level Response) / 0x12 (Hyper Alert Level Response)		
	ii. Field: Operand		
	☐ Format: SFLOAT (mg/dL)		
	☐ Value: not relevant		
	iii. Field: E2E-CRC		
	☐ This field is not present		
	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, force the PHG to read CGM Feature and CGM Session Start Time characteristics.		
	5. IF C_MAN_BLE_050 = TRUE, force the PHG to perform a Hypo Alert procedure using Op Code "Get Hypo Alert Level" (0x0E) (performing a write operation to the CGM Specifi Ops Control Point characteristic's Op Code). The simulated PHD will respond with an indication including a "Hypo Alert Level Response" (0x0F) Op Code and an SFLOAT containing the requested alert level in mg/dL.		
	6. IF C_MAN_BLE_052 = TRUE, force the PHG to perform a Hyper Alert procedure using Op Code "Get Hyper Alert Level" (0x11) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code). The simulated PHD will respond with an indication including a "Hyper Alert Level Response" (0x12) Op Code and an SFLOAT containing the requested alert level in mg/dL.		
	Check in the PHG transcoder output the Device hypo/hyper thresholds Compound     Numeric Object – Unit-Code attribute		
Pass/Fail criteria	In Step 7, the Device hypo/hyper thresholds Compound Numeric Object – Unit-Code attribute is present and set to MDC_DIM_MILLI_G_PER_DL		
Notes	Possible values in typical points of observation after transcoder output are:		
(To assist manual	a) IEEE 11073 Objects and Attributes		
testing)	Unit-Code attribute is present:		
	Object: Device hypo/hyper thresholds Compound Numeric Object		
	☐ Attribute-id: MDC_ATTR_UNIT_CODE (2454)		
	☐ Attribute-type: OID-Type		
	☐ Attribute-value: MDC_DIM_MILLI_G_PER_DL or 2130 (dec) or 0x0852 (hex)		
	b) WAN PCD-01 message  If both Hype/Hyper Alort Level Responses are received, then PCD 01 message includes		
	If both Hypo/Hyper Alert Level Responses are received, then PCD-01 message includes two segments like these with Unit-Code attribute value (check OBX-6 in both segments):		

OBX|n|NM|8418017^MDC\_CONC\_GLU\_THRESHOLD\_HYPO^MDC|m.0.x.a|[value]| 264274^MDC\_DIM\_MILLI\_G\_PER\_DL^MDC|||||R

OBX|n|NM|8418018^MDC\_CONC\_GLU\_THRESHOLD\_HYPER^MDC|

OBX|n|NM|8418018^MDC\_CONC\_GLU\_THRESHOLD\_HYPER^MDC|m.0.x.b|[value]|264274^MDC\_DIM\_MILLI\_G\_PER\_DL^MDC|||||R

Note: If one of the responses is not available, its related segment will appear with en empty [value], the value "NAN" in OBX-8 and the value "X" in OBX-11

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-055										
TP label		Whitepaper. Device hypo/hyper thresholds Compound Numeric Object – Base-Offset-Time-Stamp Attribute										
Coverage	Spec	[Bluet	[Bluetooth PHDT v1.6]									
	Testable items	DHH	Numer	ic 9; M		BaseOffset 1; M						
Test purpos	se	Chec	k that:									
			include p Attrib		ce hypo/hyp	er thresholds Compo	und Nume	ric Object – Base-Offset-Time-				
		[AND	]									
		stamp	deriva		ase-Offset-			cording to Base-Offset time ived from the collector's time at				
Applicabilit	y			E_000 / _BLE_0		N_BLE_002 AND C_I	MAN_BLE	_043 AND (C_MAN_BLE_050				
Other PICS												
Initial cond	ition	The PHG under test and the simulated PHD are in the Standby state.										
Test proced	dure	The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). The PHD has manually entered Hypo and Hyper Alert Level values stored.										
		The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:										
		a. CGM Feature (0x2AA8)										
		i. Field: CGM Feature										
				□ F	ormat: 24 bi	it						
					alue: 0000 ( lyper Alerts		1100 (MS	SB → LSB). Hypo Alerts and				
			ii.	Field:	CGM Type							
					ormat: 4 bit							
					alue: not re							
			iii.		CGM Samp							
					ormat: 4 bit							
					alue: not rel	levant						
			iV.		E2E-CRC	6						
					ormat: uint1 alue: not rel							
		h	, <u>ce</u>									
			i.	-	Op Code	THIS I SHIL (UNZAAC)		b. CGM Specific Ops Control Point (0x2AAC)				

				Format: uint8
				Value: 0x0F (Hypo Alert Level Response) / 0x12 (Hyper Alert Level Response)
		i	ii. Fie	eld: Operand
				Format: SFLOAT (mg/dL)
				Value: not relevant
		i	iii. Fie	eld: E2E-CRC
				This field is not present
	3.			nder test initiates a discovery process (Scanning state), it discovers the PHD and it starts a pairing process with the simulated PHD (Initiating state).
	4.			airing has been completed, force the PHG to read CGM Feature and CGM art Time characteristics.
	5.	Op C Ops indica	Code "C Contro ation ir	BLE_050 = TRUE, force the PHG to perform a Hypo Alert procedure using Set Hypo Alert Level" (0x0E) (performing a write operation to the CGM Specific I Point characteristic's Op Code). The simulated PHD will respond with an acluding a "Hypo Alert Level Response" (0x0F) Op Code and an SFLOAT he requested alert level in mg/dL.
	6.	Op C Spec with a	ode "C ific Op an indi	BLE_052 = TRUE, force the PHG to perform a Hyper Alert procedure using Get Hyper Alert Level" (0x11) (performing a write operation to the CGM is Control Point characteristic's Op Code). The simulated PHD will respond cation including a "Hyper Alert Level Response" (0x12) Op Code and an intaining the requested alert level in mg/dL.
	7.			HG transcoder output the Device hypo/hyper thresholds Compound Numeric ise-Offset-Time-Stamp attribute
Pass/Fail criteria				evice hypo/hyper thresholds Compound Numeric Object – Base-Offset-Time- is present and it is set to the collector's time at the time of collection.
Notes	Pos	ssible v	values	in typical points of observation after transcoder output are:
(To assist manual	a)			3 Objects and Attributes
testing)	۵,			t-Time-Stamp attribute is present:
				Device hypo/hyper thresholds Compound Numeric Object
			-	re-id: MDC_ATTR_TIME_STAMP_BO (2690)
			Attribu	re-type: SEQUENCE {bo-seconds (INT-U32), bo-fraction (INT-U16), bo-time-INT-I16)}
			Attribu	re-value: collector's time at the time of collection.
	b)	WAN	I PCD-	01 message
		PCD-	-01 me	essage includes a segment like this with Type attribute (check OBX-14):
				8418016^MDC_CONC_GLU_THRESHOLDS_HYPO_HYPER^MDC         X   [value described in a) coded in DTM format]

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-056_A			
TP label		Whitepaper. Device hypo/hyper thresholds Compound Numeric Object – Compound-Basic-Nu-Observed-Value Attribute			
Coverage	Spec	[Bluetooth PHDT v1.6]			
	Testable items	DHH Numeric 10; M			
Test purpos	se	Check that:			
		PHG includes Device hypo/hyper thresho Nu-Observed-Value attribute in transcode	lds Compound Numeric Object Compound-Basic- er output.		

	[AND]				
	Compound-Basic-Nu-Observed-Value attribute is set to the correct value.				
Applicability	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND (C_MAN_BLE_050 OR C_MAN_BLE_052)				
Other PICS					
Initial condition	The PHG under test and the simulated PHD are in the Standby state.				
Test procedure	The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). The PHD has manually entered Hypo and Hyper Alert Level values stored.				
	2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:				
	a. CGM Feature (0x2AA8)				
	i. Field: CGM Feature				
	☐ Format: 24 bit				
	□ Value: 0000 0000 0000 0000 1100 (MSB → LSB). Hypo Alerts and Hyper Alerts supported.				
	ii. Field: CGM Type				
	☐ Format: 4 bit				
	☐ Value: not relevant				
	iii. Field: CGM Sample Location				
	☐ Format: 4 bit				
	☐ Value: not relevant				
	iv. Field: E2E-CRC				
	☐ Format: uint16				
	☐ Value: not relevant				
	b. CGM Specific Ops Control Point (0x2AAC)				
	i. Field: Op Code				
	☐ Format: uint8				
	□ Value: 0x0F (Hypo Alert Level Response) / 0x12 (Hyper Alert Level Response)				
	ii. Field: Operand				
	· Format: SFLOAT (mg/dL)				
	□ Value: 36.0 (Hypo Alert Level Response) / 360.0 (Hyper Alert Level Response)				
	iii. Field: E2E-CRC				
	☐ This field is not present				
	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).				
	<ol> <li>When the pairing has been completed, force the PHG to read CGM Feature and CGM Session Start Time characteristics.</li> </ol>				
	5. IF C_MAN_BLE_050 = TRUE, force the PHG to perform a Hypo Alert procedure using Op Code "Get Hypo Alert Level" (0x0E) (performing a write operation to the CGM Specifi Ops Control Point characteristic's Op Code). The simulated PHD will respond with an indication including a "Hypo Alert Level Response" (0x0F) Op Code and an SFLOAT containing the requested alert level in mg/dL.				
	6. IF C_MAN_BLE_052 = TRUE, force the PHG to perform a Hyper Alert procedure using Op Code "Get Hyper Alert Level" (0x11) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code). The simulated PHD will respond				

	<del>_</del>				
	with an indication including a "Hyper Alert Level Response" (0x12) Op Code and an SFLOAT containing the requested alert level in mg/dL.				
	7. Check in PHG transcoder output the Device hypo/hyper thresholds Compound Numeric Object – Compound-Basic-Nu-Observed-Value attribute				
Pass/Fail criteria	In Step 7, the Device hypo/hyper thresholds Compound Numeric Object – Compound-Basic-Nu-Observed-Value attributeis set to 0x0002 (count of components is 2), 0x0004 (component list length is 4 octets), the Hypo Alert Level Response Operand followed by the Hyper Alert Level Response Operand				
Notes	Possible values in typical points of observation after transcoder output are:				
(To assist manual testing)	a) IEEE 11073 Objects and Attributes				
<i>-</i>	Compound-Basic-Nu-Observed-Value attribute is present:				
	□ Object: Device hypo/hyper thresholds Compound Numeric Object				
	☐ Attribute-id: MDC_ATTR_NU_CMPD_VAL_OBS_BASIC (2677)				
	☐ Attribute-type: SEQUENCE OF [{SFLOAT}]				
	□ Attribute-value: 0x0002 (number of elements), 0x0004 (length of the sequence), followed by				
	<ul> <li>IF C_MAN_BLE_050 = TRUE, first element (Hypo Alert Level Response Operand) will be set to: 00 24 (hex) or F1 68 (hex) or EE 10 (hex) or 36.0 (dec).</li> <li>IF C_MAN_BLE_050 = FALSE, first element will be set to NaN (0x07FF)</li> </ul>				
	<ul> <li>IF C_MAN_BLE_052 = TRUE, second element (Hyper Alert Level Response Operand) will be set to: 01 24 (hex) or FE 10 (hex) or 360.0 (dec). IF C_MAN_BLE_052 = FALSE, second element will be set to NaN (0x07FF)</li> </ul>				
	b) WAN PCD-01 message				
	If both Hypo/Hyper Alert Level Responses are received,PCD-01 message includes two segments like these with Compound-Basic-Nu-Observed-Value attribute value (check OBX-5 in both segments):				
	OBX n NM 8418017^MDC_CONC_GLU_THRESHOLD_HYPO^MDC m.0.x.a 36.0  264274^MDC_DIM_MILLI_G_PER_DL^MDC    R				
	OBX n NM 8418018^MDC_CONC_GLU_THRESHOLD_HYPER^MDC m.0.x.b 360.0 264274^MDC_DIM_MILLI_G_PER_DL^MDC     R				
	Note: If one of the responses is not available, its related segment will appear with en empty [value], the value "NAN" in OBX-8 and the value "X" in OBX-11				

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-056_B				
TP label		Whitepaper. Device hypo/hyper thresholds Compound Numeric Object – Compound-Basic-Nu-Observed-Value Attribute Special Values				
Coverage	Spec	[Bluetooth PHDT v1.6]				
	Testable items	DHH Numeric 10; M	DHH Numeric 11; M			
Test purpos	e	Check that:				
		PHG includes Device hypo/hyper thresholds Compound Numeric Object Compound-Basic-Nu-Observed-Value attribute in transcoder output.				
		[AND]				
		If only one of the Hypo Alert or the Hyper Alert support is indicated in the CGM Feature characteristic, NaN will be used for the component of the Compound-Basic-Nu-Observed-Value that corresponds with the unsupported alert.				
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND (C_MAN_BLE_050 OR C_MAN_BLE_052)				

Other PICS	
Initial condition	The PHG under test and the simulated PHD are in the Standby state.
Test procedure	The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). The PHD has manually entered Hypo and Hyper Alert Level values stored.
	2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:
	a. CGM Feature (0x2AA8)
	i. Field: CGM Feature
	☐ Format: 24 bit
	□ Value: 0000 0000 0000 0000 0100 (MSB → LSB). Hypo Alerts supported.
	ii. Field: CGM Type
	☐ Format: 4 bit
	□ Value: not relevant
	iii. Field: CGM Sample Location
	☐ Format: 4 bit
	☐ Value: not relevant
	iv. Field: E2E-CRC
	☐ Format: uint16
	☐ Value: not relevant
	b. CGM Specific Ops Control Point (0x2AAC)
	i. Field: Op Code
	☐ Format: uint8
	☐ Value: 0x0F (Hypo Alert Level Response)
	ii. Field: Operand
	☐ Format: SFLOAT (mg/dL)
	☐ Value: 36.0 (Hypo Alert Level Response)
	iii. Field: E2E-CRC
	☐ This field is not present
	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, force the PHG to read CGM Feature and CGM Session Start Time characteristics.
	5. IF C_MAN_BLE_050 = TRUE, force the PHG to perform a Hypo Alert procedure using Op Code "Get Hypo Alert Level" (0x0E) (performing a write operation to the CGM Specif Ops Control Point characteristic's Op Code). The simulated PHD will respond with an indication including a "Hypo Alert Level Response" (0x0F) Op Code and an SFLOAT containing the requested alert level in mg/dL.
	6. IF C_MAN_BLE_050 = TRUE, check in PHG transcoder output the Device hypo/hyper thresholds Compound Numeric Object – Compound-Basic-Nu-Observed-Value attribute
	7. End current CGM session and start a new one.
	8. The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization) and implements several BTLE characteristics. The characteristics of interest for this Test Case are:
	a. CGM Feature (0x2AA8)
	i. Field: CGM Feature
	☐ Format: 24 bit

	□ Value: 0000 0000 0000 0000 1000 (MSB → LSB). Hyper Alerts supported.		
	ii. Field: CGM Type		
	☐ Format: 4 bit		
	☐ Value: not relevant		
	iii. Field: CGM Sample Location		
	☐ Format: 4 bit		
	☐ Value: not relevant		
	iv. Field: E2E-CRC		
	☐ Format: uint16		
	☐ Value: not relevant		
	b. CGM Specific Ops Control Point (0x2AAC)		
	Field: Op Code		
	☐ Format: uint8		
	☐ Value: 0x12 (Hyper Alert Level Response)		
	i. Field: Operand		
	☐ Format: SFLOAT (mg/dL)		
	☐ Value: 360.0 (Hyper Alert Level Response)		
	ii. Field: E2E-CRC		
	☐ This field is not present		
	9. 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).		
	When the pairing has been completed, IF C_MAN_BLE_052 = TRUE, force the PHG to perform a Hyper Alert procedure using Op Code "Get Hyper Alert Level" (0x11) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code). The simulated PHD will respond with an indication including a "Hyper Alert Level Response" (0x12) Op Code and an SFLOAT containing the requested alert level in mg/dL.		
	11. IF C_MAN_BLE_052 = TRUE, Check in PHG transcoder output the Device hypo/hyper thresholds Compound Numeric Object – Compound-Basic-Nu-Observed-Value attribute		
Pass/Fail criteria	If Step 6 was checked, the Device hypo/hyper thresholds Compound Numeric Object – Compound-Basic-Nu-Observed-Value attributeis set to 0x0002 (count of components is 2), 0x0004 (component list length is 4 octets), the Hypo Alert Level Response Operand followed by the special value NaN (0x07FF)		
	If Step 11 was checked, the Device hypo/hyper thresholds Compound Numeric Object – Compound-Basic-Nu-Observed-Value attributeis set to 0x0002 (count of components is 2), 0x0004 (component list length is 4 octets), the special value NaN (0x07FF) followed by the Hyper Alert Level Response Operand		
Notes	Possible values in typical points of observation after transcoder output are:		
(To assist manual testing)	a) IEEE 11073 Objects and Attributes		
tootingy	Compound-Basic-Nu-Observed-Value attribute is present:		
	☐ Object: Device hypo/hyper thresholds Compound Numeric Object		
	☐ Attribute-id: MDC_ATTR_NU_CMPD_VAL_OBS_BASIC (2677)		
	☐ Attribute-type: SEQUENCE OF [{SFLOAT}]		
	☐ Attribute-value (If Step 6 was checked): 0x0002 (number of elements), 0x0004 (length of the sequence), followed by		
	<ul> <li>First element (Hypo Alert Level Response Operand): 00 24 (hex) or F1 68 (hex) or EE 10 (hex) or 36.0 (dec)</li> </ul>		
	Second element (Hyper Alert Level Response Operand): NaN (0x07FF)		

Attribute-value (if Step 11 was checked): 0x0002 (number of elements), 0x0004 (length of the sequence), followed by First element (Hypo Alert Level Response Operand): NaN (0x07FF) Second element (Hyper Alert Level Response Operand): 01 24 (hex) or FE 10 (hex) or 360.0 (dec) b) WAN PCD-01 message PCD-01 message includes two segments like this with Compound-Basic-Nu-Observed-Value attribute value (check OBX-5): If Step 6 was checked: OBX|n|NM|8418017^MDC\_CONC\_GLU\_THRESHOLD\_HYPO^MDC|m.0.x.a|36.0| 264274^MDC\_DIM\_MILLI\_G\_PER\_DL^MDC|||||R OBX|n|NM|8418017^MDC\_CONC\_GLU\_THRESHOLD\_HYPO^MDC|m.0.x.a|| 264274^MDC\_DIM\_MILLI\_G\_PER\_DL^MDC||NAN|||X IF Step 11 was checked: OBX|n|NM|8418017^MDC\_CONC\_GLU\_THRESHOLD\_HYPO^MDC|m.0.x.a|| 264274^MDC\_DIM\_MILLI\_G\_PER\_DL^MDC||NAN|||X OBX|n|NM|8418018^MDC\_CONC\_GLU\_THRESHOLD\_HYPER^MDC| m.0.x.b|360.0|264274^MDC\_DIM\_MILLI\_G\_PER\_DL^MDC|||||R

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-057					
TP label		Whitepaper.Glucose rate of charge thresholds Compound Numeric Object - Handle Attribute					
Coverage	Spec	[Bluetooth Ph	[Bluetooth PHDT v1.6]				
	Testable items	GRC Numerio	c 1; O				
Test purpos	se	Check that:  PHG does not include Glucose rate of charge thresholds Compound Numeric Object – Handle Attribute in transcoder output.  [OR]  If PHG includes Glucose rate of charge thresholds Compound Numeric Object – Handle attribute in transcoder output, then its value shall be different than 0					
Applicabilit	у	C_MAN_BLE		N_BLE_002 AND C_MAN_BLE	E_043 AND C_MAN_BLE_054		
Other PICS							
Initial condi	tion	The PHG under test and the simulated PHD are in the Standby state.					
Test procedure		specialize Level value.  2. The simue.	ation). The PHD I ues stored. ılated PHD implei	figured with a Continuous Glucenas manually entered Rate of D	ecrease and Increase Alert		
		interest for this Test Case are:  a. CGM Feature (0x2AA8)					
			Field: CGM Feat	·			
			☐ Format: 24 b	it			
				0000 0000 0000 000 <b>1</b> 0000 (M crease Alerts supported.	SB → LSB). Rate of		
		ii.	Field: CGM Type				
			☐ Format: 4 bit				

	☐ Value: not relevant
	iii. Field: CGM Sample Location
	☐ Format: 4 bit
	☐ Value: not relevant
	iv. Field: E2E-CRC
	☐ Format: uint16
	☐ Value: not relevant
	2. CGM Specific Ops Control Point (0x2AAC)
	i. Field: Op Code
	☐ Format: uint8
	ii. Field: Op Code – Response Codes
	☐ Format: 8 bit
	□ Value: 0x15 (Rate of Decrease Alert Level Response) / 0x18 (Rate of Increase Alert Level Response)
	iii. Field: Operand
	☐ Format: SFLOAT (mg/dL/min)
	☐ Value: not relevant
	iv. Field: E2E-CRC
	☐ This field is not present
	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, force the PHG to read CGM Feature and CGM Session Start Time characteristics, and then to perform a Rate of Decrease Alert Level procedure using Op Code "Get Rate of Decrease Alert Level" (0x14) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code).
	5. The simulated PHD will respond with an indication including a "Rate of Decrease Alert Level Response" (0x15) Op Code and an SFLOAT containing the requested alert level in mg/dL/min.
	6. Force the PHG to perform a Rate of Increase Alert Level procedure using Op Code "Get Rate of Increase Alert Level" (0x17) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code).
	7. The simulated PHD will respond with an indication including a "Rate of Increase Alert Level Response" (0x18) Op Code and an SFLOAT containing the requested alert level in mg/dL/min.
	Check in PHG transcoder output the Glucose rate of charge thresholds Compound     Numeric Object – Handle attribute
Pass/Fail criteria	In Step 8, the Glucose rate of charge thresholds Compound Numeric Object – Handle attribute is not present or, if it is present then its value is different than 0
Notes	Possible values in typical points of observation after transcoder output are:
(To assist manual testing)	a) IEEE 11073 Objects and Attributes
testing)	Handle attribute is not present, or if it is present then:
	☐ Object: Glucose rate of charge thresholds Compound Numeric Object
	☐ Attribute-id: MDC_ATTR_ID_HANDLE (2337)
	☐ Attribute-type: INT-U16
	☐ Attribute-value: Any value different than 0
	b) WAN PCD-01 message
	PCD-01 message does not include segments with Handle attribute value

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-058					
TP label		Whitepaper. Glucose rate of charge thresholds Compound Numeric Object - Type Attribute					
Coverage	Spec	[Bluetooth PHDT v1.6]					
	Testable items	GRC Numeric 2; M					
Test purpos	se	Check that:					
		PHG includes Glucose rate of charge thresholds Compound Numeric Object – Type attribute in transcoder output.  [AND]  Type is set to MDC_PART_PHD_DM   MDC_CONC_GLU_RATE_THRESHOLDS					
Applicability	у	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND C_MAN_BLE_054 AND C_MAN_BLE_056					
Other PICS							
Initial condi	tion	The PHG under test and the simulated PHD are in the Standby state.					
Test proced		The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). The PHD has manually entered Rate of Decrease and Increase Alert Level values stored.					
		2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:					
		a. CGM Feature (0x2AA8)					
		i. Field: CGM Feature					
		☐ Format: 24 bit					
		□ Value: 0000 0000 0000 0000 0001 0000 (MSB → LSB). Rate of Increase/Decrease Alerts supported.					
		ii. Field: CGM Type					
		☐ Format: 4 bit					
		□ Value: not relevant					
		iii. Field: CGM Sample Location					
		☐ Format: 4 bit					
		☐ Value: not relevant					
		iv. Field: E2E-CRC					
		☐ Format: uint16					
		☐ Value: not relevant					
		b. CGM Specific Ops Control Point (0x2AAC)					
		i. Field: Op Code					
		☐ Format: uint8					
		ii. Field: Op Code – Response Codes					
		☐ Format: 8 bit					
		□ Value: 0x15 (Rate of Decrease Alert Level Response) / 0x18 (Rate of Increase Alert Level Response)					
		iii. Field: Operand					
		☐ Format: SFLOAT (mg/dL/min)					
		☐ Value: not relevant					
		iv. Field: E2E-CRC					

	☐ This field is not present					
	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, force the PHG to read CGM Feature and CGM Session Start Time characteristics, and then to perform a Rate of Decrease Alert Level procedure using Op Code "Get Rate of Decrease Alert Level" (0x14) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code).					
	5. The simulated PHD will respond with an indication including a "Rate of Decrease Alert Level Response" (0x15) Op Code and an SFLOAT containing the requested alert level in mg/dL/min.					
	6. Force the PHG to perform a Rate of Increase Alert Level procedure using Op Code "Get Rate of Increase Alert Level" (0x17) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code).					
	7. The simulated PHD will respond with an indication including a "Rate of Increase Alert Level Response" (0x18) Op Code and an SFLOAT containing the requested alert level in mg/dL/min.					
	Check in the PHG transcoder output the Glucose rate of charge thresholds Compound     Numeric Object – Type attribute					
Pass/Fail criteria	In Step 8, the Glucose rate of charge thresholds Compound Numeric Object – Type attribute is present and set to MDC_PART_PHD_DM   MDC_CONC_GLU_RATE_THRESHOLDS					
Notes	Possible values in typical points of observation after transcoder output are:					
(To assist manual	a) IEEE 11073 Objects and Attributes					
testing)	Type attribute is present:					
	□ Object: Glucose rate of charge thresholds Compound Numeric Object					
	☐ Attribute-id: MDC_ATTR_ID_TYPE (2351)					
	☐ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}					
	☐ Attribute-value:					
	<ul> <li>partition: MDC_PART_PHD_DM or 128 (dec) or 00 80 (hex)</li> </ul>					
	code: MDC_CONC_GLU_RATE_THRESHOLDS or 29412 (dec) or 72 E4 (hex)					
	b) WAN PCD-01 message					
	PCD-01 message includesa segments like this with Type attribute (check OBX-3):					
	OBX n  8391520^MDC_CONC_GLU_RATE_THRESHOLDS^MDC  m.0.x.0      X   [date_time]					

TP ld		TP/LP-PAN/PHG/PHDTV	V/CGM/BV-059_A				
TP label		Whitepaper. Glucose rate Small Attribute 1	hitepaper. Glucose rate of charge thresholds Compound Numeric Object - Metric-Spec- nall Attribute 1				
Coverage	Spec	[Bluetooth PHDT v1.6]	[Bluetooth PHDT v1.6]				
	Testable items	GRC Numeric 3; M	RC Numeric 3; M GRCNumeric 5; M				
Test purpose		Check that:  PHG includes Glucose rate of charge thresholds Compound Numeric Object – Metric-Spec-Small attribute in transcoder output.  [AND]  Metric-Spec-Small is set to {0x604C} when the rate of change thresholds were updated					

Applicability	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND C_MAN_BLE_054 AND C_MAN_BLE_056
Other PICS	
Initial condition	The PHG under test and the simulated PHD are in the Standby state.
Test procedure	The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). The PHD has manually entered Rate of Decrease and Increase Alert Level values stored.
	2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:
	a. CGM Feature (0x2AA8)
	i. Field: CGM Feature
	☐ Format: 24 bit
	□ Value: 0000 0000 0000 0001 0000 (MSB → LSB). Rate of Increase/Decrease Alerts supported.
	ii. Field: CGM Type
	☐ Format: 4 bit
	☐ Value: not relevant
	iii. Field: CGM Sample Location
	☐ Format: 4 bit
	□ Value: not relevant
	iv. Field: E2E-CRC
	☐ Format: uint16
	☐ Value: not relevant
	b. CGM Specific Ops Control Point (0x2AAC)
	i. Field: Op Code
	☐ Format: uint8
	ii. Field: Op Code – Response Codes
	☐ Format: 8 bit
	□ Value: 0x15 (Rate of Decrease Alert Level Response) / 0x18 (Rate of Increase Alert Level Response)
	iii. Field: Operand
	☐ Format: SFLOAT (mg/dL/min)
	☐ Value: not relevant
	iv. Field: E2E-CRC
	☐ This field is not present
	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, force the PHG to read CGM Feature and CGM Session Start Time characteristics, and then to perform a Rate of Decrease Alert Level procedure using Op Code "Get Rate of Decrease Alert Level" (0x14) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code).
	5. The simulated PHD will respond with an indication including a "Rate of Decrease Alert Level Response" (0x15) Op Code and an SFLOAT containing the requested alert level in mg/dL/min.
	6. Force the PHG to perform a Rate of Increase Alert Level procedure using Op Code "Get Rate of Increase Alert Level" (0x17) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code).

	<ol> <li>The simulated PHD will respond with an indication including a "Rate of Increase Alert Level Response" (0x18) Op Code and an SFLOAT containing the requested alert level in mg/dL/min.</li> <li>Check in the PHG transcoder output the Glucose rate of charge thresholds Compound Numeric Object – Metric-Spec-Small attribute</li> </ol>
Pass/Fail criteria	In Step 8, the Patient low/high thresholds Compound Numeric Object – Metric-Spec-Small attribute is present and its value is {0x604C} (mss-avail-stored-data   mss-upd-aperiodic   mss-acc-agent-initiated   mss-cat-manual   mss-cat-setting)
Notes (To assist manual testing)	Possible values in typical points of observation after transcoder output are:  a) IEEE 11073 Objects and Attributes    Metric-Spec-Small attribute is present:     Object: Glucose rate of charge thresholds Compound Numeric Object     Attribute-id: MDC_ATTR_METRIC_SPEC_SMALL (2630)     Attribute-type: BITS-16     Attribute-value: 60 4C (hex) or BITS mss-avail-stored-data (1), mss-upd-aperiodic(2), mss-acc-agent-initiated(9), mss-cat-manual(12), mss-cat-setting(13) set to TRUE and remaining BITS set to FALSE  b) WAN PCD-01 message
	PCD-01 message does not include segments with Metric-Spec-Small attribute value

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-059_B					
TP label		Whitepaper. Glucose rate of charge thresholds Compound Numeric Object - Metric-Spec-Small Attribute 2					
Coverage	Spec	[Bluetooth PHDT v1.6]					
	Testable items	GRC Numeric 3;	М	GRCNumeric 4; M			
Test purpose		Check that:					
		PHG includes GI Small attribute in			Numeric Object – Metric-Spec-		
		[AND]					
		6044} when the Rate of Increa	se/Decrease Alert Level				
Applicabilit	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND C_MAN AND C_MAN_BLE_056 AND C_MAN_BLE_053 AND C_MAN_BLE_055						
Other PICS							
Initial cond	ition	The PHG under test and the simulated PHD are in the Standby state.					
Test procedure		The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization).					
		2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:					
		a. CGM Feature (0x2AA8)					
		i. Field: CGM Feature					
			Format: 24 b	it			
				0000 0000 0000 000 <b>1</b> 0000 (M crease Alerts supported.	ISB → LSB). Rate of		

		ii.	Field: CGM Type
			☐ Format: 4 bit
			☐ Value: not relevant
		iii.	Field: CGM Sample Location
			☐ Format: 4 bit
			□ Value: not relevant
		iv.	Field: E2E-CRC
			☐ Format: uint16
			□ Value: not relevant
	b.	CG	SM Specific Ops Control Point (0x2AAC)
		i.	Field: Op Code
			☐ Format: uint8
		ii.	Field: Op Code – Response Codes
			☐ Format: 8 bit
			□ Value: 0x15 (Rate of Decrease Alert Level Response) / 0x18 (Rate of Increase Alert Level Response)
		iii.	Field: Operand
			☐ Format: SFLOAT (mg/dL/min)
			□ Value: not relevant
		iv.	Field: E2E-CRC
			☐ This field is not present
3.			IG under test initiates a discovery process (Scanning state), it discovers the ed PHD and it starts a pairing process with the simulated PHD (Initiating state).
4.			he pairing has been completed, force the PHG to read CGM Feature and CGM of Start Time characteristics.
5.	Aler by a Poir	t Lev a vali nt ch	the PHG to set the Rate of Decrease Alert Level by performing a Rate of Decrease evel procedure using Op Code "Set Rate of Decrease Alert Level" (0x13) followed lid SFLOAT value (performing a write operation to the CGM Specific Ops Control naracteristic's Op Code and Operand fields respectively). The simulated PHD will d with an indication including a Response Op Code value of "Success".
6.	Aler by a Poir	t Lev a vali nt ch	the PHG to set the Rate of Increase Alert Level by performing a Rate of Increase evel procedure using Op Code "Set Rate of Increase Alert Level" (0x16) followed lid SFLOAT value (performing a write operation to the CGM Specific Ops Control naracteristic's Op Code and Operand fields respectively). The simulated PHD will d with an indication including a Response Op Code value of "Success".
7.	"Ge	t Ra	orce the PHG to perform a Rate of Decrease Alert Level procedure using Op Code ate of Decrease Alert Level" (0x14) (performing a write operation to the CGM c Ops Control Point characteristic's Op Code).
8.	Lev		nulated PHD will respond with an indication including a "Rate of Decrease Alert lesponse" (0x15) Op Code and an SFLOAT containing the requested alert level in min.
9.	Rate	e of	ne PHG to perform a Rate of Increase Alert Level procedure using Op Code "Get Increase Alert Level" (0x17) (performing a write operation to the CGM Specific ontrol Point characteristic's Op Code).
10.			nulated PHD will respond with an indication including a "Rate of Increase Alert lesponse" (0x18) Op Code and an SFLOAT containing the requested alert level in

11. Check in the PHG transcoder output the Glucose rate of charge thresholds Compound Numeric Object – Metric-Spec-Small attribute

Pass/Fail criteria	In Step 11, the Glucose rate of charge thresholds Compound Numeric Object – Metric-Spec-Small attribute is present and its value is {0x6044} (mss-avail-stored-data   mss-upd-aperiodic   mss-acc-agent-initiated   mss-cat-setting)				
Notes (To assist manual testing)	Possible values in typical points of observation after transcoder output are:  a) IEEE 11073 Objects and Attributes				
	Metric-Spec-Small attribute is present:				
	□ Object: Glucose rate of charge thresholds Compound Numeric Object				
	☐ Attribute-id: MDC_ATTR_METRIC_SPEC_SMALL (2630)				
	☐ Attribute-type: BITS-16				
	Attribute-value: 60 44 (hex) or BITS mss-avail-stored-data (1), mss-upd-aperiodic(2), mss-acc-agent-initiated(9), mss-cat-setting(13) set to TRUE and remaining BITS set to FALSE				
	b) WAN PCD-01 message				
	PCD-01 message does not include segments with Metric-Spec-Small attribute value				

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-060					
TP label		Whitepaper. Glucose rate of charge thresholds Compound Numeric Object – Metric-Structure-Small Attribute					
Coverage	Spec	[Bluetooth PHDT v1.6]					
	Testable items	GRC Numeric 6; M					
Test purpose		Check that:					
		PHG includes Glucose rate of charge thresholds Compound Numeric Object – Metric-Structure-Small attribute in transcoder output.					
		[AND]					
		Metric-Structure-Small is set to {0x40, 0x02}					
Applicabilit	у	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND C_MAN_BLE_054 AND C_MAN_BLE_056					
Other PICS							
Initial condi	tion	The PHG under test and the simulated PHD are in the Standby state.					
Test procedure		The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). The PHD has manually entered Rate of Decrease and Increase Alert Level values stored.					
		2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:					
		a. CGM Feature (0x2AA8)					
		i. Field: CGM Feature					
		☐ Format: 24 bit					
		□ Value: 0000 0000 0000 0000 0001 0000 (MSB → LSB). Rate of Increase/Decrease Alerts supported.					
		ii. Field: CGM Type					
		☐ Format: 4 bit					
		☐ Value: not relevant					
		iii. Field: CGM Sample Location					

					Format: 4 bit				
					Value: not relevant				
			iv.	Fiel	d: E2E-CRC				
					Format: uint16				
					Value: not relevant				
		b.	CG	M Sp	pecific Ops Control Point (0x2AAC)				
		i. Field: Op Code							
					Format: uint8				
					Value: 0x15 (Rate of Decrease Alert Level Response) / 0x18 (Rate of Increase Alert Level Response)				
			ii.	Fiel	d: Operand				
					Format: SFLOAT (mg/dL/min)				
					Value: not relevant				
			iii.	Fiel	d: E2E-CRC				
					This field is not present				
	3.	The sim	PH ulate	der test initiates a discovery process (Scanning state), it discovers the HD and it starts a pairing process with the simulated PHD (Initiating state).					
	4.	When the pairing has been completed, force the PHG to read CGM Feature and CGM Session Start Time characteristics, and then to perform a Rate of Decrease Alert Level procedure using Op Code "Get Rate of Decrease Alert Level" (0x14) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code).							
	5.	The simulated PHD will respond with an indication including a "Rate of Decrease Alert Level Response" (0x15) Op Code and an SFLOAT containing the requested alert level in mg/dL/min.							
	6.	Force the PHG to perform a Rate of Increase Alert Level procedure using Op Code "Get Rate of Increase Alert Level" (0x17) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code).							
	7.	The simulated PHD will respond with an indication including a "Rate of Increase Alert Level Response" (0x18) Op Code and an SFLOAT containing the requested alert level in mg/dL/min.							
	8.	Check in PHG transcoder output the Glucose rate of charge thresholds Compound Numeric Object – Metric-Structure-Small attribute							
Pass/Fail criteria	In Step 8, the Glucose rate of charge thresholds Compound Numeric Object – Metric-Structure-Small attribute is present and set to 0x40 (ms-struct-compound), 0x02 (number of components is 2)								
Notes (To assist manual testing)	Possible values in typical points of observation after transcoder output are:								
	a)				Objects and Attributes				
	,				ture-Small attribute is present:				
					ect: Glucose rate of charge thresholds Compound Numeric Object				
		_	_		e-id: MDC_ATTR_METRIC_STRUCT_SMALL (2675)				
		_			e-type: SEQUENCE {ms-struct (INT-U8), ms-comp-no (INT-U8)}				
		_			e-value:				
		_	•		estruct: 0x40 (ms-struct-compound)				
			•		-comp-no: 0x02 (number of components)				
	b)	WΔ	ΝP						
	~,	<ul> <li>WAN PCD-01 message</li> <li>PCD-01 message does not include segments with Metric-Structure-Small attribute value</li> </ul>							
	1 00 01 message aces not include segments with Metric-Structure-Small attribute vi								

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-061										
TP label		Whitepaper. Glucose rate of charge thresholds Compound Numeric Object – Metric-Id-List Attribute										
Coverage	Spec	[Bluetooth PHDT v1.6]										
	Testable items	GRC Numeric 7; M										
Test purpos		Check that:  PHG includes Glucose rate of charge thresholds Compound Numeric Object – Metric-Id-List attribute in transcoder output.  [AND]  Metric-Id-List is set to { 0x0002, 0x0004, MDC_CONC_GLU_RATE_THRESHOLD_INCREASE, MDC_CONC_GLU_RATE_THRESHOLD_DECREASE }										
Applicability C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND C_MAN_BLE_056												
Other PICS												
Initial condi	tion	The PHG under test and the simulated PHD are in the Standby state.										
Test proced		<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). The PHD has manually entered Rate of Decrease and Increase Alert Level values stored.</li> <li>The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:         <ol> <li>CGM Feature (0x2AA8)</li> <li>Field: CGM Feature</li> <li>Value: 0000 0000 0000 0000 0000 (MSB → LSB). Rate of Increase/Decrease Alerts supported.</li> <li>Field: CGM Type</li> <li>Format: 4 bit</li> <li>Value: not relevant</li> <li>Field: CGM Sample Location</li> <li>Format: 4 bit</li> <li>Value: not relevant</li> </ol> </li> </ol>										
		iv. Field: E2E-CRC    Format: uint16   Value: not relevant   Format: uint3     Value: 0x15 (Rate of Decrease Alert Level Response) / 0x18 (Rate of Increase Alert Level Response)   Format: SFLOAT (mg/dL/min)   Value: not relevant     Field: E2E-CRC										

	T					
	☐ This field is not present					
	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, force the PHG to read CGM Feature and CGM Session Start Time characteristics, and then to perform a Rate of Decrease Alert Level procedure using Op Code "Get Rate of Decrease Alert Level" (0x14) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code).					
	5. The simulated PHD will respond with an indication including a "Rate of Decrease Alert Level Response" (0x15) Op Code and an SFLOAT containing the requested alert level in mg/dL/min.					
	6. Force the PHG to perform a Rate of Increase Alert Level procedure using Op Code "Get Rate of Increase Alert Level" (0x17) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code).					
	7. The simulated PHD will respond with an indication including a "Rate of Increase Alert Level Response" (0x18) Op Code and an SFLOAT containing the requested alert level in mg/dL/min.					
	Check in PHG transcoder output the Glucose rate of charge thresholds Compound     Numeric Object – Metric-Id-List attribute					
Pass/Fail criteria	In Step 8, the Glucose rate of charge thresholds Compound Numeric Object – Metric-Id-List attribute is present and set to 0x0002 (count of metric ids is 2), 0x0004 (list length is 4 octets), MDC_CONC_GLU_RATE_THRESHOLD_INCREASE, MDC_CONC_GLU_RATE_THRESHOLD_DECREASE					
Notes (To assist manual	Possible values in typical points of observation after transcoder output are:					
	a) IEEE 11073 Objects and Attributes					
testing)	Metric-Id-List attribute is present:					
	□ Object: Glucose rate of charge thresholds Compound Numeric Object					
	☐ Attribute-id: MDC_ATTR_ID_PHYSIO_LIST (2678)					
	☐ Attribute-type: SEQUENCE OF [{OID-Type(INT-U16)}]					
	☐ Attribute-value: 0x0002 (number of elements), 0x0004 (length of the sequence), followed by					
	First element: MDC_CONC_GLU_RATE_THRESHOLD_INCREASE (0x72E5)					
	<ul> <li>Second element: MDC_CONC_GLU_RATE_THRESHOLD_DECREASE (0x72E6)</li> </ul>					
	b) WAN PCD-01 message					
	PCD-01 message includes two segments like these with Metric-Id-List attribute values (check OBX-3 in both segments):					
	OBX n NM 8391521^MDC_CONC_GLU_RATE_THRESHOLD_INCREASE^MDC  m.0.x.a [value] 266868^MDC_DIM_MILLI_G_PER_DL_PER_MIN^MDC     R					
	OBX n NM 8391522^MDC_CONC_GLU_RATE_THRESHOLD_DECREASE^MDC  m.0.x.b [value] 266868^MDC_DIM_MILLI_G_PER_DL_PER_MIN^MDC      R					

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-062					
TP label		Whitepaper. Glucose rate of charge thresholds Compound Numeric Object – Unit-Code Attribute					
Coverage	Spec	[Bluetooth PHDT v1.6]					
	Testable items	GRC Numeric 8; M					
Test purpose		Check that:					

	PHG includes Glucose rate of charge thresholds Compound Numeric Object – Unit-Code attribute in transcoder output.						
	[AND]						
	Unit-Code is set to MDC_DIM_MILLI_G_PER_DL_PER_MIN						
Applicability	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND C_MAN_BLE_054 AND C_MAN_BLE_056						
Other PICS							
Initial condition	The PHG under test and the simulated PHD are in the Standby state.						
Test procedure	<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). The PHD has manually entered Rate of Decrease and Increase Alert Level values stored.</li> </ol>						
	2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:						
	a. CGM Feature (0x2AA8)						
	i. Field: CGM Feature						
	☐ Format: 24 bit						
	□ Value: 0000 0000 0000 0001 0000 (MSB → LSB). Rate of Increase/Decrease Alerts supported.						
	ii. Field: CGM Type						
	☐ Format: 4 bit						
	☐ Value: not relevant						
	iii. Field: CGM Sample Location						
	☐ Format: 4 bit						
	☐ Value: not relevant						
	iv. Field: E2E-CRC						
	☐ Format: uint16						
	☐ Value: not relevant						
	b. CGM Specific Ops Control Point (0x2AAC)						
	i. Field: Op Code						
	□ Format: uint8						
	□ Value: 0x15 (Rate of Decrease Alert Level Response) / 0x18 (Rate of Increase Alert Level Response)						
	ii. Field: Operand						
	☐ Format: SFLOAT (mg/dL/min)						
	□ Value: not relevant						
	iii. Field: E2E-CRC						
	☐ This field is not present						
	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, force the PHG to read CGM Feature and CGM Session Start Time characteristics, and then to perform a Rate of Decrease Alert Level procedure using Op Code "Get Rate of Decrease Alert Level" (0x14) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code).						
	<ol> <li>The simulated PHD will respond with an indication including a "Rate of Decrease Alert Level Response" (0x15) Op Code and an SFLOAT containing the requested alert level in mg/dL/min.</li> </ol>						

	6. Force the PHG to perform a Rate of Increase Alert Level procedure using Op Code "Get Rate of Increase Alert Level" (0x17) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code).
	7. The simulated PHD will respond with an indication including a "Rate of Increase Alert Level Response" (0x18) Op Code and an SFLOAT containing the requested alert level in mg/dL/min.
	Check in PHG transcoder output the Glucose rate of charge thresholds Compound     Numeric Object – Unit-Code attribute
Pass/Fail criteria	In Step 8, the Glucose rate of charge thresholds Compound Numeric Object – Unit-Code attribute is present and set to MDC_DIM_ MILLI_G_PER_DL_PER_MIN
Notes (To assist manual testing)	Possible values in typical points of observation after transcoder output are:  a) IEEE 11073 Objects and Attributes
tootiii.g)	Unit-Code attribute is present:
	□ Object: Glucose rate of charge thresholds Compound Numeric Object
	☐ Attribute-id: MDC_ATTR_UNIT_CODE (2454)
	, , ,
	Attribute-value: MDC_DIM_ MILLI_G_PER_DL_PER_MIN or 4724 (dec) or 0x1274 (hex)
	b) WAN PCD-01 message
	PCD-01 message includes two segments like these with Unit-Code attribute value (check OBX-6 in both segments):
	OBX n NM 8391521^MDC_CONC_GLU_RATE_THRESHOLD_INCREASE^MDC  m.0.x.a [value] 266868^MDC_DIM_MILLI_G_PER_DL_PER_MIN^MDC     R
	OBX n NM 8391522^MDC_CONC_GLU_RATE_THRESHOLD_DECREASE^MDC  m.0.x.b [value] 266868^MDC_DIM_MILLI_G_PER_DL_PER_MIN^MDC      R

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-063				
TP label		Whitepaper. Glucose rate of charge thresholds Compound Numeric Object – Base-Offset-Time-Stamp Attribute				
Coverage	Spec	[Bluetooth PHDT v1.6]				
	Testable items	GRC Numeric 9; M	GRC Numeric 9; M BaseOffset 1; M			
Test purpose		Time-Stamp Attribute [AND] Base-Offset-Time-Stamp attr	of charge thresholds Compound No ibute is set to the correct value ac ot-Time-Stamp attribute will be der	cording to Base-Offset time		
Applicability		C_MAN_BLE_000 AND C_M AND C_MAN_BLE_056	IAN_BLE_002 AND C_MAN_BLE	_043 AND C_MAN_BLE_054		
Other PICS						
Initial condition		The PHG under test and the	simulated PHD are in the Standby	state.		
Test procedure			onfigured with a Continuous Gluco has manually entered Rate of De			

	2.			ulated PHD implements several BTLE characteristics. The characteristics of
				for this Test Case are:
		a.		M Feature (0x2AA8)
			i.	Field: CGM Feature
				Format: 24 bit
				Value: 0000 0000 0000 0000 0001 0000 (MSB → LSB). Rate of Increase/Decrease Alerts supported.
			ii.	Field: CGM Type
				☐ Format: 4 bit
				□ Value: not relevant
			iii.	Field: CGM Sample Location
				☐ Format: 4 bit
				□ Value: not relevant
			iv.	Field: E2E-CRC
				☐ Format: uint16
				□ Value: not relevant
		b.	CG	M Specific Ops Control Point (0x2AAC)
			i.	Field: Op Code
				☐ Format: uint8
				□ Value: 0x15 (Rate of Decrease Alert Level Response) / 0x18 (Rate of Increase Alert Level Response)
			ii.	Field: Operand
				☐ Format: SFLOAT (mg/dL/min)
				□ Value: not relevant
			iii.	Field: E2E-CRC
				☐ This field is not present
	3.			G under test initiates a discovery process (Scanning state), it discovers the dPHD and it starts a pairing process with the simulated PHD (Initiating state).
	4.	Ses	sion cedu	be pairing has been completed, force the PHG to read CGM Feature and CGM Start Time characteristics, and then to perform a Rate of Decrease Alert Level re using Op Code "Get Rate of Decrease Alert Level" (0x14) (performing a write n to the CGM Specific Ops Control Point characteristic's Op Code).
	5.	Lev		ulated PHD will respond with an indication including a "Rate of Decrease Alert esponse" (0x15) Op Code and an SFLOAT containing the requested alert level in nin.
	6.	Rat	e of	e PHG to perform a Rate of Increase Alert Level procedure using Op Code "Get Increase Alert Level" (0x17) (performing a write operation to the CGM Specific ntrol Point characteristic's Op Code).
	7.	Lev		ulated PHD will respond with an indication including a "Rate of Increase Alert esponse" (0x18) Op Code and an SFLOAT containing the requested alert level in nin.
	8.			n the PHG transcoder output the Glucose rate of charge thresholds Compound : Object – Base-Offset-Time-Stamp attribute
Pass/Fail criteria				e Glucose rate of charge thresholds Compound Numeric Object – Base-Offset- attribute is present and it is set to the collector's time at the time of collection.
Notes	Pos	sible	e val	ues in typical points of observation after transcoder output are:
(To assist manual	a)			073 Objects and Attributes
testing)				fset-Time-Stamp attribute is present:
	1			<u> </u>

		Object: Glucose rate of charge thresholds Compound Numeric Object
		Attribute-id: MDC_ATTR_TIME_STAMP_BO (2690)
		Attribute-type: SEQUENCE {bo-seconds (INT-U32), bo-fraction (INT-U16), bo-time-offset (INT-I16)}
		Attribute-value: collector's time at the time of collection.
b)	WA	AN PCD-01 message
		D-01 message includes asegments like this with Base-Offset-Time-Stamp attribute eck OBX-14):
		OBX n  8391520^MDC_CONC_GLU_RATE_THRESHOLDS^MDC m.0.x.0       X   [ value described in a) coded in DTM format]

TP ld		TP/LP-PAN/	PHG/PHDTW/CGI	M/BV-064			
TP label		Whitepaper. Glucose rate of charge thresholds Compound Numeric Object – Compound-Basic-Nu-Observed-Value Attribute					
Coverage	Spec	[Bluetooth P	[Bluetooth PHDT v1.6]				
	Testable items	GRC Numer	ic 10; M				
Test purpose		Basic-Nu-Ob	oserved-Value attri	charge thresholds Compound N bute in transcoder output. d-Value attribute is set to the co			
Applicabilit	у		=_000 AND C_MA	N_BLE_002 AND C_MAN_BLE			
Other PICS							
Initial condi	tion	The PHG un	der test and the si	mulated PHD are in the Standby	y state.		
Test procedure		speciali: Level va	zation). The PHD halues stored.	figured with a Continuous Glucc nas manually entered Rate of De	ecrease and Increase Alert		
			ulated PHD impler for this Test Case	nents several BTLE characteris are:	tics. The characteristics of		
		a. CG	M Feature (0x2AA	8)			
		i.	Field: CGM Feat	ure			
			☐ Format: 24 b	it			
				0000 0000 0000 000 <b>1</b> 0000 (MS crease Alerts supported.	SB → LSB). Rate of		
		ii.	Field: CGM Type				
			☐ Format: 4 bit				
			☐ Value: not re	levant			
		iii.	Field: CGM Samp	ole Location			
			☐ Format: 4 bit				
			□ Value: not re	levant			
		iv.	Field: E2E-CRC				
			☐ Format: uint	16			

				□ Value: not relevant
		b.	CG	M Specific Ops Control Point (0x2AAC)
			i.	Field: Op Code
				□ Format: uint8
				□ Value: 0x15 (Rate of Decrease Alert Level Response) / 0x18 (Rate of Increase Alert Level Response)
			ii.	Field: Operand
				☐ Format: SFLOAT (mg/dL/min)
				□ Value: 9.0 (Rate of Decrease Alert Level Response) / 9.0 (Rate of Increase Alert Level Response)
			iii.	Field: E2E-CRC
				☐ This field is not present
	3.			G under test initiates a discovery process (Scanning state), it discovers the ed PHD and it starts a pairing process with the simulated PHD (Initiating state).
	4.	Ses pro	ssion cedu	ne pairing has been completed, force the PHG to read CGM Feature and CGM Start Time characteristics, and then to perform a Rate of Decrease Alert Level ire using Op Code "Get Rate of Decrease Alert Level" (0x14) (performing a write on to the CGM Specific Ops Control Point characteristic's Op Code).
	5.	Lev		ulated PHD will respond with an indication including a "Rate of Decrease Alert esponse" (0x15) Op Code and an SFLOAT containing the requested alert level in nin.
	6.	Rat	e of	ne PHG to perform a Rate of Increase Alert Level procedure using Op Code "Get Increase Alert Level" (0x17) (performing a write operation to the CGM Specific ntrol Point characteristic's Op Code).
	7.	Lev		ulated PHD will respond with an indication including a "Rate of Increase Alert esponse" (0x18) Op Code and an SFLOAT containing the requested alert level in nin.
	8.			n PHG transcoder output the Glucose rate of charge thresholds Compound c Object – Compound-Basic-Nu-Observed-Value attribute
Pass/Fail criteria	Bas (co	sic-N mpo	u-Ob nent	e Glucose rate of charge thresholds Compound Numeric Object – Compound- oserved-Value attributeis set to 0x0002 (count of components is 2), 0x0004 list length is 4 octets), the Rate of Increase Alert Level Response Operand the Rate of Decrease Alert Level Response Operand
Notes	Pos	ssible	e valı	ues in typical points of observation after transcoder output are:
(To assist manual	a)			073 Objects and Attributes
testing)				und-Basic-Nu-Observed-Value attribute is present:
			-	ect: Glucose rate of charge thresholds Compound Numeric Object
			Attr	ibute-id: MDC_ATTR_NU_CMPD_VAL_OBS_BASIC (2677)
			Attr	ibute-type: SEQUENCE OF [{SFLOAT}]
				ribute-value: 0x0002 (number of elements), 0x0004 (length of the sequence), bowed by
			•	First element (Rate of Increase Alert Level Response Operand): 00 09 (hex) or F0 5A (hex) or E3 84 (hex) or 9.0 (dec)
			•	Second element (Rate of Decrease Alert Level Response Operand): 00 09 (hex) or F0 5A (hex) or E3 84 (hex) or 9.0 (dec)
	b)	WA	N P	CD-01 message
				message includes two segments like these with Compound-Basic-Nu-Observed-ttribute value (check OBX-5 in both segments):
				X n NM 8391521^MDC_CONC_GLU_RATE_THRESHOLD_INCREASE^MDC  0.x.a 9.0 266868^MDC_DIM_MILLI_G_PER_DL_PER_MIN^MDC     R

# $OBX|n|NM|8391522^{A}MDC\_CONC\_GLU\_RATE\_THRESHOLD\_DECREASE^{A}MDC|\\ m.0.x.b|9.0|266868^{A}MDC\_DIM\_MILLI\_G\_PER\_DL\_PER\_MIN^{A}MDC |||||R$

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-065						
TP label		Whitepaper. PHD DM Status Enumeration Object - Handle Attribute						
Coverage	Spec	[Bluetooth PHDT v1.6]						
	Testable items	PHDM Enumeration 1; O						
Test purpose		Check that:  PHG does not include PHD DM Status Enumeration Object – Handle Attribute in transcoder output.  [OR]  If PHG includes PHD DM Status Enumeration Object – Handle attribute in transcoder output, then its value shall be different than 0						
Applicabilit	y	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043						
Other PICS								
Initial cond	ition	The PHG under test and the simulated PHD are in the Standby state.						
Test proced	dure	<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.</li> <li>The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:         <ol> <li>CGM Feature (0x2AA8)</li> <li>Field: CGM Feature</li> <li>Value: 0000 0000 0000 1010 0000 0000 (MSB → LSB). Low Battery detection supported, General Device Fault supported.</li> <li>Field: CGM Type</li> <li>Format: 4 bit</li> <li>Value: not relevant</li> <li>Field: CGM Sample Location</li> </ol> </li> </ol>						
		<ul> <li>Format: 4 bit</li> <li>Value: not relevant</li> <li>iv. Field: E2E-CRC</li> <li>Format: uint16</li> <li>Value: not relevant</li> <li>b. CGM Status (0x2AA8)</li> <li>i. Field: Time Offset</li> <li>Format: uint16</li> <li>Value: not relevant.</li> <li>ii. Field: CGM Status</li> <li>Format: 24 bit</li> </ul>						

Value: not relevant iii. Field: E2E-CRC This field is not included CGM Measurement (0x2AA7) i Field: Size Format: uint8 Field: Flags Format: 8 bit Value: 0010 0000 (MSB → LSB), CGM Trend information not present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present. iii. Field: CGM Glucose Concentration (mg/dL) Format: SFLOAT Value: not Relevant iv. Field: Time Offset Format: uint16 Value: not relevant Field: Sensor Status Annunciation Format: 8 bit Value: not relevant vi. Field: CGM Trend Information (mg/dL) This field is not included vii. Field: CGM Quality This field is not included viii. Field: E2E-CRC This field is not included 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). When the pairing has been completed (Connection state), force the PHG under test to read the CGM Feature and CGM Session Start Time characteristics. The simulated PHD sends the Measurement to PHG under test 6. Check in the PHG transcoder output the PHD DM Status Enumeration Object- Handle attribute The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP). The simulated PHD sends the temporarily stored CGM measurement to the PHG under test Check in the PHG transcoder output the PHD DM Status Enumeration Object - Handle attribute 9. Force the PHG under test to read the CGM Status characteristic to actively request the status of the CGM sensor. 10. Check in the PHG transcoder output the PHD DM Status Enumeration Object - Handle attribute Pass/Fail criteria In Step 6, 8 and 10, the PHD DM Status Enumeration Object - Handle attribute is not present or, if it is present then its value is different than 0 **Notes** Possible values in typical points of observation after transcoder output are: (To assist manual a) IEEE 11073 Objects and Attributes testing)

Handle attribute is not present, or if it is present then:
□ Object: PHD DM Status Enumeration Object
☐ Attribute-id: MDC_ATTR_ID_HANDLE (2337)
☐ Attribute-type: INT-U16
☐ Attribute-value: Any value different than 0
b) WAN PCD-01 message
PCD-01 message does not include segments with Handle attribute value

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-066					
TP label		Whitepaper. PHD DM Status Enumeration Object - Type Attribute					
Coverage	Spec	[Bluetooth PHDT v1.6]					
	Testable items	PHDM Enumeration 2; M					
Test purpose		Check that:  PHG includes PHD DM Status Enumeration Object – Type attribute in transcoder output.  [AND]  Type is set to MDC_PART_PHD_DM   MDC_PHD_DM_DEV_STAT					
Applicability	y	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043					
Other PICS							
Initial condi	tion	The PHG under test and the simulated PHD are in the Standby state.					
Test proced	ure	<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.</li> <li>The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:         <ol> <li>CGM Feature (0x2AA8)</li> <li>Field: CGM Feature</li> <li>Format: 24 bit</li> <li>Value: 0000 0000 0000 1010 0000 0000 (MSB → LSB). Low Battery detection supported, General Device Fault supported.</li> <li>Field: CGM Type</li> <li>Format: 4 bit</li> <li>Value: not relevant</li> <li>Field: CGM Sample Location</li> <li>Format: 4 bit</li> <li>Value: not relevant</li> <li>Field: E2E-CRC</li> <li>Format: uint16</li> <li>Value: not relevant</li> </ol> </li> <li>b. CGM Status (0x2AA8)</li> </ol>					

Format: uint16

· Value: not relevant.

ii. Field: CGM Status

Format: 24 bit

· Value: not relevant

iii. Field: E2E-CRC

· This field is not included

c. CGM Measurement (0x2AA7)

i. Field: Size

Format: uint8

ii. Field: Flags

• Format: 8 bit

- Value: 0010 0000 (MSB → LSB). CGM Trend information not present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.
- iii. Field: CGM Glucose Concentration (mg/dL)

Format: SFLOAT

· Value: not Relevant

iv. Field: Time Offset

Format: uint16

Value: not relevant

v. Field: Sensor Status Annunciation

• Format: 8 bit

Value: not relevant

- vi. Field: CGM Trend Information (mg/dL)
  - This field is not included

vii. Field: CGM Quality

This field is not included

viii. Field: E2E-CRC

• 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), force the PHG under test to read the CGM Feature and CGM Session Start Time characteristics.
- 5. The simulated PHD sends the Measurement to the PHG under test.
- 6. Check in PHG transcoder output the PHD DM Status Enumeration Object- Type attribute
- The PHG under test requests the simulated PHD to report stored records by performing a
  writing operation in the Record Access Control Point (RACP). The simulated PHD sends
  the temporarily stored CGM measurement to the PHG under test
- Check in the PHG transcoder output the PHD DM Status Enumeration Object Type attribute
- Force the PHG under test to read the CGM Status characteristic to actively request the status of the CGM sensor.
- Check in the PHG transcoder output the PHD DM Status Enumeration Object Type attribute

Pass/Fail criteria	n Step 6, 8 and 10, the PHD DM Status Enumeration Object – Type attribute is present and ts value is MDC_PART_PHD_DM   MDC_PHD_DM_DEV_STAT		
Notes (To assist manual testing)	its value is MDC_PART_PHD_DM   MDC_PHD_DM_DEV_STAT  Possible values in typical points of observation after transcoder output are:  a) IEEE 11073 Objects and Attributes     Type attribute is present:      Object: PHD DM Status 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_PHD_DM_DEV_STAT or 20000 (dec) or 4E 20 (hex)  b) WAN PCD-01 message		
	OBX n CWE 8408608^MDC_PHD_DM_DEV_STAT^MDC		
	<ul> <li>□ Attribute-id: MDC_ATTR_ID_TYPE (2351)</li> <li>□ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}</li> <li>□ Attribute-value:         <ul> <li>partition: MDC_PART_PHD_DM or 128 (dec) or 00 80 (hex)</li> <li>code: MDC_PHD_DM_DEV_STAT or 20000 (dec) or 4E 20 (hex)</li> </ul> </li> <li>b) WAN PCD-01 message         <ul> <li>PCD-01 message includes a segments like this with Type attribute (check OBX-3):</li> </ul> </li> </ul>		

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-067				
TP label		Whitepaper. PHD DM Status Enumeration Object - Supplemental-Types Attribute				
Coverage	Spec	[Bluetooth PHDT v1.6]				
	Testable items	PHDM Enumeration 3; O				
Test purpose		Check that:				
		PHG may include PHD DM Status Enumeration Object – Supplemental-Types attribute in transcoder output.				
		[AND]				
		If present, Supplemental-Types is set to a correct value				
Applicability	у	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043				
Other PICS						
Initial condi	tion	The PHG under test and the simulated PHD are in the Standby state.				
Test procedure		<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.</li> </ol>				
		2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:				
		a. CGM Feature (0x2AA8)				
		i. Field: CGM Feature				
		Format: 24 bit				
		<ul> <li>Value: 0000 0000 0000 1010 0000 0000 (MSB → LSB). Low Battery detection supported, General Device Fault supported.</li> </ul>				
		ii. Field: CGM Type				
		Format: 4 bit				
		Value: not relevant				

iii. Field: CGM Sample Location

Format: 4 bit

Value: not relevant

iv. Field: E2E-CRC

Format: uint16

· Value: not relevant

b. CGM Status (0x2AA8)

i. Field: Time Offset

Format: uint16

Value: not relevant.

ii. Field: CGM Status

Format: 24 bit

Value: not relevant

iii. Field: E2E-CRC

This field is not included

c. CGM Measurement (0x2AA7)

i. Field: Size

Format: uint8

ii. Field: Flags

• Format: 8 bit

- Value: 0010 0000 (MSB → LSB). CGM Trend information not present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.
- iii. Field: CGM Glucose Concentration (mg/dL)

Format: SFLOAT

Value: not Relevant

iv. Field: Time Offset

Format: uint16

Value: not relevant

v. Field: Sensor Status Annunciation

• Format: 8 bit

Value: not relevant

vi. Field: CGM Trend Information (mg/dL)

· This field is not included

vii. Field: CGM Quality

· This field is not included

viii. Field: E2E-CRC

• 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), force the PHG under test to read the CGM Feature and CGM Session Start Time characteristics.
- 5. The simulated PHD sends the Measurement to the PHG under test.

	Check in the PHG transcoder output the PHD DM Status Enumeration Object—     Supplemental-Types attribute
	7. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP). The simulated PHD sends the temporarily stored CGM measurement to the PHG under test.
	Check in the PHG transcoder output the PHD DM Status Enumeration Object –     Supplemental-Types attribute
	9. Force the PHG under test to read the CGM Status characteristic to actively request the status of the CGM sensor.
	Check in the PHG transcoder output the PHD DM Status Enumeration Object –     Supplemental-Types attribute
Pass/Fail criteria	In Step 6, 8 and 10, the PHD DM Status Enumeration Object – Supplemental-Types attribute may be present. If present, it is set to one of the following values:  MDC_CGM_DEV_TYPE_SENSOR, MDC_CGM_DEV_TYPE_TRANSMITTER,  MDC_CGM_DEV_TYPE_RECEIVER, or MDC_CGM_DEV_TYPE_OTHER
Notes	Possible values in typical points of observation after transcoder output are:
(To assist manual testing)	a) IEEE 11073 Objects and Attributes
testing)	Supplemental-Types attribute may be present. If it is present:
	□ Object: PHD DM Status Enumeration Object
	☐ Attribute-id: MDC_ATTR_SUPPLEMENTAL_TYPES (2657)
	☐ Attribute-type: SEQUENCE of SEQUENCE {partition (INT-U16), code (INT-U16)}
	☐ Attribute-value:
	<ul> <li>partition: MDC_PART_PHD_DM or 128 (dec) or 00 80 (hex) followed by one of:</li> </ul>
	<ul> <li>code: MDC_CGM_DEV_TYPE_SENSOR or 29460 (dec) or 73 14 (hex)</li> </ul>
	code: MDC_CGM_DEV_TYPE_TRANSMITTER or 29461 (dec) or 73 15 (hex)
	<ul> <li>code: MDC_CGM_DEV_TYPE_RECEIVER or 29462 (dec) or 73 16 (hex)</li> </ul>
	<ul> <li>code: MDC_CGM_DEV_TYPE_OTHER or 29463 (dec) or 73 17 (hex)</li> </ul>
	b) WAN PCD-01 message
	If Supplemental-Types attribute is present, PCD-01 message includes a facet OBX segment of the PHD DM Status OBX segment with Supplemental-Types attribute (check OBX-3 and OBX-5):
	OBX n CWE 8408608^MDC_PHD_DM_DEV_STAT^MDC  m.0.0.a [value]     R   [date_time]
	The following facet OBX segments are allowed:
	OBX n CWE 68193^MDC_ATTR_SUPPLEMENTAL_TYPES^MDC m.0.0.a.y  8418068^MDC_CGM_DEV_TYPE_SENSOR^MDC      R
	OBX n CWE 68193^MDC_ATTR_SUPPLEMENTAL_TYPES^MDC m.0.0.a.y  8418069^MDC_CGM_DEV_TYPE_TRANSMITTER^MDC     R
	OBX n CWE 68193^MDC_ATTR_SUPPLEMENTAL_TYPES^MDC m.0.0.a.y  8418070^MDC_CGM_DEV_TYPE_RECEIVER^MDC      R
	OBX n CWE 68193^MDC_ATTR_SUPPLEMENTAL_TYPES^MDC m.0.0.a.y  8418071^MDC_CGM_DEV_TYPE_OTHER^MDC     R

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-068		
TP label		Whitepaper. PHD DM Status Enumeration Object – Metric-Spec-Small Attribute		
Coverage	Spec	[Bluetooth PHDT v1.6]		
	Testable	PHDM Enumeration 4; M		

items			
Test purpose	Check that:		
	PHG includes PHD DM Status Enumeration Object – Metric-Spec-Small attribute in transcoder output.		
	[AND]		
	Metric-Spec-Small is set to {0xF040}.		
Applicability	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043		
Other PICS			
Initial condition	The PHG under test and the simulated PHD are in the Standby state.		
Test procedure	<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.</li> <li>The simulated PHD implements several BTLE characteristics. The characteristics of</li> </ol>		
	interest for this Test Case are:		
	a. CGM Feature (0x2AA8)		
	i. Field: CGM Feature		
	Format: 24 bit		
	<ul> <li>Value: 0000 0000 0000 1010 0000 0000 (MSB → LSB). Low Battery detection supported, General Device Fault supported.</li> </ul>		
	ii. Field: CGM Type		
	Format: 4 bit		
	Value: not relevant		
	iii. Field: CGM Sample Location		
	Format: 4 bit		
	Value: not relevant		
	iv. Field: E2E-CRC		
	Format: uint16		
	Value: not relevant		
	b. CGM Status (0x2AA8)		
	i. Field: Time Offset		
	Format: uint16		
	Value: not relevant.		
	ii. Field: CGM Status		
	Format: 24 bit		
	Value: not relevant		
	iii. Field: E2E-CRC		
	This field is not included		
	c. CGM Measurement (0x2AA7)		
	i. Field: Size		
	Format: uint8		
	ii. Field: Flags		
	Format: 8 bit		

	<ul> <li>Value: 0010 0000 (MSB → LSB). CGM Trend information not present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.</li> </ul>
	iii. Field: CGM Glucose Concentration (mg/dL)
	Format: SFLOAT
	Value: not Relevant
	iv. Field: Time Offset
	Format: uint16
	Value: not relevant
	v. Field: Sensor Status Annunciation
	Format: 8 bit
	Value: not relevant
	vi. Field: CGM Trend Information (mg/dL)
	This field is not included
	vii. Field: CGM Quality
	This field is not included
	viii. Field: E2E-CRC
	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), force the PHG under test to read the CGM Feature and CGM Session Start Time characteristics.
	5. The simulated PHD sends the Measurement to the PHG under test.
	6. Check in the PHG transcoder output the PHD DM Status Enumeration Object– Metric- Spec-Small attribute
	7. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP). The simulated PHD sends the temporarily stored CGM measurement to the PHG under test.
	8. Check in the PHG transcoder output the PHD DM Status Enumeration Object – Metric-Spec-Small attribute
	9. Force the PHG under test to read the CGM Status characteristic to actively request the status of the CGM sensor.
	Check in PHG transcoder output the PHD DM Status Enumeration Object – Metric-Spec-Small attribute
Pass/Fail criteria	In Step 6, 8 and 10, the PHD DM Status Enumeration Object – Metric-Spec-Small attribute is present and its value is 0xF040 (mss-avail-intermittent   mss-upd-aperiodic   mss-msmt-aperiodic   mss-acc-agent-initiated   mss-avail-stored-data)
Notes	Possible values in typical points of observation after transcoder output are:
(To assist manual testing)	a) IEEE 11073 Objects and Attributes
testing)	Metric-Spec-Small attribute is present:
	□ Object: PHD DM Status 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 Metric-Spec-Small attribute value

TP ld	d TP/LP-PAN/PHG/PHDTW/CGM/BV-069				
TP label Whitepaper. PHD DM Status Enumeration Object – Base-Offset-Time-Stamp Att		et-Time-Stamp Attribute			
Coverage	Spec	[Bluetooth F	[Bluetooth PHDT v1.6]		
	Testable items	PHDM Enur	meration 5; M	BaseOffset 3; M	
Test purpos	se	Check that:			
		PHG includes PHD DM Status Enumeration Object Base-Offset-Time-Stamp attribute in transcoder output.			
		[AND]			
		Base-Offset-Time-Stamp attribute is set to the correct value according to Base-Offset time stamp derivation			
Applicability	y	C_MAN_BL	E_000 AND C_MA	N_BLE_002 AND C_MAN_BLE	_043
Other PICS					
Initial condi	tion	The PHG ur	nder test and the si	mulated PHD are in the Standby	state.
Test procedure		<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.</li> </ol>			
		2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:			
		a. CG	GM Feature (0x2AA	8)	
		i.	Field: CGM Featu	ıre	
			• Format: 24 b	it	
				0000 0000 <b>101</b> 0 0000 0000 (MS oported, General Device Fault su	
		ii.	Field: CGM Type		
			Format: 4 bit		
			<ul> <li>Value: not re</li> </ul>	levant	
		iii.	Field: CGM Samp	ole Location	
			Format: 4 bit		
			<ul> <li>Value: not re</li> </ul>	levant	
		iv.	Field: E2E-CRC		
			<ul> <li>Format: uint1</li> </ul>	6	

Value: not relevant

b. CGM Status (0x2AA8)

i. Field: Time Offset

• Format: uint16

• Value: 5 (min)

ii. Field: CGM Status

Format: 24 bit

Value: not relevant

ii. viii. Field: E2E-CRC

This field is not included

c. CGM Measurement (0x2AA7)

i. Field: Size

Format: uint8

ii. Field: Flags

Format: 8 bit

- Value: 0010 0000 (MSB → LSB). CGM Trend information not present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.
- iii. Field: CGM Glucose Concentration (mg/dL)

• Format: SFLOAT

Value: not Relevant

iv. Field: Time Offset

Format: uint16

Value: 20 (min)

v. Field: Sensor Status Annunciation

• Format: 8 bit

Value: not relevant

vi. Field: CGM Trend Information (mg/dL)

• This field is not included

vii. Field: CGM Quality

• This field is not included

viii. Field: E2E-CRC

This field is not included

d. CGM Session Start Time (0x2AAA)

i. Field: Session Start Time

Format: {uint16, uint8, uint8, uint8, uint8, uint8}

Value: {2016, 5, 12, 16, 39, 27} (May 12, 2016, 16:39:27)

ii. Field: Time Zone

Format: sint8

Value: 4 (UTC+1:00)

iii. Field: DST-Offset

Format: uint8

Value: 4 (Daylight Time (+1h))

# iv. Field: E2E-CRC

- This field is not included
- 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).
- When the pairing has been completed (Connection state), force the PHG under test to read the CGM Feature and CGM Session Start Time characteristics.
- 5. The simulated PHD sends the Measurement to the PHG under test.
- Check in the PHG transcoder output PHD DM Status Enumeration Object Base-Offset-Time-Stamp attribute.
- The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP). The simulated PHD sends the temporarily stored CGM measurement to the PHG under test.
- 8. Check in the PHG transcoder output the PHD DM Status Enumeration Object Base-Offset-Time-Stamp attribute.
- Force the PHG under test to read the CGM Status characteristic to actively request the status of the CGM sensor.
- Check in the PHG transcoder output the PHD DM Status Enumeration Object Base-Offset-Time-Stamp attribute.

#### Pass/Fail criteria

- In Step 6 and 8 the PHD DM Status Enumeration Object Base-Offset-Time-Stamp attribute is present and set is to the addition of CGM Session Start Time characteristic's Session Start Time field (May 12, 2016, 16:39:27) plus CGM Measurement characteristic's Time Offset field (20 min).
- In Step 10 the PHD DM Status Enumeration Object Base-Offset-Time-Stamp attribute is
  present and set is to the addition of CGM Session Start Time characteristic's Session
  Start Time field (May 12, 2016, 16:39:27) plus CGM Status characteristic's Time Offset
  field (5 min).

# Notes (To assist manual testing)

Possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

Base-Offset-Time-Stamp attribute is present:

- □ Object: PHD DM Status Enumeration Object
- ☐ Attribute-id: MDC ATTR TIME STAMP BO (2690)
- Attribute-type: SEQUENCE (bo-seconds (INT-U32), bo-fraction (INT-U16), bo-time-offset (INT-I16))
- ☐ Attribute-value: addition of
  - CGM Session Start Time characteristic Session Start Time field (May 12, 2016, 16:39:27)
  - Steps 6 & 8

CGM Measurement characteristic Time Offset field (20m)

• Steps 10

CGM Status characteristic Time Offset field (5m)

Note that the same Base-Offset-Time-Stamp can have different representations depending on bo-time-offset value. If it is set to 20 min (CGM Measurement or CGM Status characteristic Time Offset field), then Base-Offset-Time-Stamp value shall be {3672059967, 0, 20} or {3672059967, 0, 5}

b) WAN PCD-01 message

PCD-01 message includes a segment like this with Base-Offset-Time-Stamp attribute value (check OBX-14):

OBX|n|CWE|8408608^MDC\_PHD\_DM\_DEV\_STAT^MDC| m.0.0.a|[value]|||||R|||[value described in a) coded in DTM format]

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-070			
TP label		Whitepaper. PHD DM Status Enumeration Object – Enum-Observed-Value-Simple-Bit-Str			
Coverage	Spec	[Bluetooth PHDT v1.6]			
	Testable items	PHDM Enumeration 6; M			
Test purpos	e	Check that:			
		PHG includes PHD DM Status Enumeration Object – Enum-Observed-Value-Simple-Bit-Str attribute in transcoder output.			
		[AND]			
		Enum-Observed-Value-Simple-Bit-Str is set to the correct value.			
Applicability	/	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043			
Other PICS					
Initial condi	tion	The PHG under test and the simulated PHD are in the Standby state.			
		,			
Test proced	ure	<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.</li> </ol>			
		2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:			
		a. CGM Feature (0x2AA8)			
		i. Field: CGM Feature			
		Format: 24 bit			
		<ul> <li>Value: 0000 0000 0000 1010 0000 0000 (MSB → LSB). Low Battery detection supported, General Device Fault supported.</li> </ul>			
		ii. Field: CGM Type			
		Format: 4 bit			
		Value: not relevant			
		iii. Field: CGM Sample Location			
		Format: 4 bit			
		Value: not relevant			
		iv. Field: E2E-CRC			
		Format: uint16			
		Value: not relevant			
b. CGM Status (0x2AA8)		b. CGM Status (0x2AA8)			
		i. Field: Time Offset			
		Format: uint16			
		Value: not relevant.			
		ii. Field: CGM Status			
		Format: 24 bit			
		<ul> <li>Value: 0000 0000 0000 0000 0010 (MSB -&gt; LSB). Device Battery Low.</li> </ul>			
		iii. Field: E2E-CRC			
		Format: uint16			

Value: not relevant

- c. CGM Measurement (0x2AA7)
  - i. Field: Size

Format: uint8

ii. Field: Flags

Format: 8 bit

- Value: 0010 0000 (MSB → LSB). CGM Trend information not present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.
- iii. Field: CGM Glucose Concentration (mg/dL)

Format: SFLOATValue: not Relevant

iv. Field: Time Offset

Format: uint16

Value: not relevant

- v. Field: Sensor Status Annunciation
  - Format: 8 bit
  - Value: 0000 0010 (MSB -> LSB). Device Battery Low.
- vi. Field: CGM Trend Information (mg/dL)
  - This field is not included
- vii. Field: CGM Quality
  - This field is not included

viii. Field: E2E-CRC

- · 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), force the PHG under test to read the CGM Feature and CGM Session Start Time characteristics.
- 5. The simulated PHD sends the Measurement to the PHG under test.
- Check in PHG transcoder output the PHD DM Status Enumeration Object

   Enum-Observed-Value-Simple-Bit-Str attribute
- 7. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP). The simulated PHD sends the temporarily stored CGM measurement to the PHG under test.
- 8. Check in the PHG transcoder output the PHD DM Status Enumeration Object Enum-Observed-Value-Simple-Bit-Str attribute
- Force the PHG under test to read the CGM Status characteristic to actively request the status of the CGM sensor.
- 10. Check in the PHG transcoder output the PHD DM Status Enumeration Object Enum-Observed-Value-Simple-Bit-Str attribute
- 11. End current CGM session and start a new one. The simulated PHD will now have the following values in the specified fields:
  - a. CGM Status (0x2AA8)

Field: CGM Status

• Format: 24 bit

 Value: 0000 0000 0000 0000 0010 0000 (MSB -> LSB). General device fault has ocurred in the sensor.

# b. CGM Measurement (0x2AA7)

- i. Field: Flags
  - Format: 8 bit
  - Value: 0010 0000 (MSB → LSB). CGM Trend information not present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.
- ii. Field: Sensor Status Annunciation
  - Format: 8 bit
  - Value: 0010 0000 (MSB -> LSB). General device fault has ocurred in the sensor.

The rest of the fields will remain with the same value as in step 2. Repeat steps 3-10 to check in PHG transcoder output the PHD DM Status Enumeration Object – Enum-Observed-Value-Simple-Bit-Str attribute like in 6, 8 and 10.

- 12. End current CGM session and start a new one. The simulated PHD will now have the following values in the specified fields:
  - a. CGM Status (0x2AA8)
    - i. Field: CGM Status
      - Format: 24 bit
      - Value: 0000 0000 0000 0001 0000 0000 (MSB -> LSB). Time synchronization between sensor and collector required.
  - b. CGM Measurement (0x2AA7)
    - Field: Flags
      - Format: 8 bit
      - Value: 0100 0000 (MSB → LSB). CGM Trend information not present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) not present, Sensor Status Annunciation Field (Cal/Temp-Octet) present, Sensor Status Annunciation Field (Status-Octet) not present.
    - ii. Field: Sensor Status Annunciation
      - Format: 8 bit
      - Value: 0000 0001 (MSB -> LSB). Time synchronization between sensor and collector required.

The rest of the fields will remain with the same value as in step 2. Repeat steps 3-10 to check in PHG transcoder output the PHD DM Status Enumeration Object – Enum-Observed-Value-Simple-Bit-Str attribute like in 6, 8 and 10.

# Pass/Fail criteria

- In Step 6, 8 and 10, the PHD DM Status Enumeration Object Enum-Observed-Value-Simple-Bit-Str is present with bit 25 set to 1 (device-status-battery-low). Rest of bits set to 0.
- In Step 11, the PHD DM Status Enumeration Object Enum-Observed-Value-Simple-Bit-Str is present with bit 5 set to 1 (device-status-error). Rest of bits set to 0.
- In Step 12, the PHD DM Status Enumeration Object Enum-Observed-Value-Simple-Bit-Str is present with bit 16 set to 1 (device-status-service-time-sync-required). Rest of bits set to 0.

# Notes (To assist manual testing)

Possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

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

- □ Object: PHD DM Status Enumeration Object
- ☐ Attribute-id: MDC\_ATTR\_ENUM\_OBS\_VAL\_SIMP\_BIT\_STR (2661)
- ☐ Attribute-type: BITS-32

☐ Attribute-value (Steps 6,8,10): 02 00 00 00 (hex)
☐ Attribute-value (Step 11): 00 00 00 20 (hex)
☐ Attribute-value (Step 12): 00 00 01 00 (hex)
b) WAN PCD-01 message
PCD-01 message includes a segment like this with Enum-Observed-Value-Basic-Bit-Str attribute value (check OBX-5):
• Steps 6, 8 &10
OBX n CWE 8408608^MDC_PHD_DM_DEV_STAT^MDC m.0.0.a [1^device-status-battery-low(25)     R  [date_time]
• Step 11
OBX n CWE 8408608^MDC_PHD_DM_DEV_STAT^MDC m.0.0.a 1^device-status-error(5)     R   [date_time]
• Step 12
OBX n CWE 8408608^MDC_PHD_DM_DEV_STAT^MDC m.0.0.a 1^device-status-service-time-sync-required(16)     R   [date_time]

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-071			
TP label		Whitepaper. CGM Status Enumeration Object - Handle Attribute			
Coverage Spec [Bluetooth PHDT v1.6]		[Bluetooth PHDT v1.6]			
	Testable items	CGM Enumeration 1; O			
Test purpose		Check that:			
		PHG does not include CGM Status Enumeration Object – Handle Attribute in transcoder output.			
		[OR]			
		If PHG includes CGM Status Enumeration Object – Handle attribute in transcoder output, then its value shall be different than 0			
Applicabilit	ty	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043			
Other PICS					
Initial cond	ition	The PHG under test and the simulated PHD are in the Standby state.			
Test procedure		<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.</li> </ol>			
		2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:			
		a. CGM Feature (0x2AA8)			
		i. Field: CGM Feature			
		Format: 24 bit			
		<ul> <li>Value: 0000 0000 0000 0101 1011 1111 (MSB → LSB). Sensor Type Error Detection supported, Device Specific Alert supported, Calibration supported, Sensor Temperature High-Low Detection supported, Patient High/Low Alerts supported, Hypo Alerts supported, Hyper Alerts supported, Rate of Increase/Decrease Alerts supported, Sensor Result High-Low Detection supported.</li> </ul>			
		ii. Field: CGM Type			

Format: 4 bit

· Value: not relevant

iii. Field: CGM Sample Location

• Format: 4 bit

Value: not relevant

iv. Field: E2E-CRC

Format: uint16

Value: not relevant

b. CGM Status (0x2AA8)

Field: Time Offset

Format: uint16

• Value: not relevant.

ii. Field: CGM Status

Format: 24 bit

Value: not relevant

iii. Field: E2E-CRC

This field is not included

c. CGM Measurement (0x2AA7)

i. Field: Size

Format: uint8

ii. Field: Flags

Format: 8 bit

- Value: 0010 0000 (MSB → LSB). CGM Trend information not present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.
- iii. Field: CGM Glucose Concentration (mg/dL)

Format: SFLOAT

Value: not Relevant

iv. Field: Time Offset

• Format: uint16

Value: not relevant

v. Field: Sensor Status Annunciation

• Format: 8 bit

· Value: not relevant

vi. Field: CGM Trend Information (mg/dL)

This field is not included

vii. Field: CGM Quality

• This field is not included

viii. Field: E2E-CRC

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), force the PHG under test to read the CGM Feature and CGM Session Start Time characteristics.

	5. The simulated PHD sends the Measurement to the PHG under test.
	6. Check in PHG transcoder output CGM Status Enumeration Object - Handle attribute.
	7. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP). The simulated PHD sends the temporarily stored CGM measurement to the PHG under test.
	8. Check in the PHG transcoder output the CGM Status Enumeration Object - Handle attribute.
	9. Force the PHG under test to read the CGM Status characteristic to actively request the status of the CGM sensor.
	10. Check in the PHG transcoder output the CGM Status Enumeration Object - Handle attribute.
Pass/Fail criteria	In Step 6, 8 and 10, the CGM Status Enumeration Object - Handle attribute is not present or, if it is present then its value is different than 0
Notes	Possible values in typical points of observation after transcoder output are:
(To assist manual testing)	a) IEEE 11073 Objects and Attributes
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Handle attribute is not present, or if it is present then:
	□ Object: CGM Status Enumeration Object
	☐ Attribute-id: MDC_ATTR_ID_HANDLE (2337)
	☐ Attribute-type: INT-U16
	☐ Attribute-value: Any value different than 0
	b) WAN PCD-01 message
	PCD-01 message does not include segments with Handle attribute value

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-072		
TP label		Whitepaper. CGM Status Enumeration Object - Type Attribute		
Coverage	Spec	[Bluetooth PHDT v1.6]		
	Testable items	CGM Enumeration 2; M		
Test purpose		Check that:  PHG includes CGM Status Enumeration Object – Type attribute in transcoder output.  [AND]		
Applicability	<u> </u>	Type is set to MDC_PART_PHD_DM   MDC_CGM_DEV_STAT  C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043		
Other PICS				
Initial condition The PHG under test and the simulated PHD are in the Standby state.		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.</li> </ol>		
		2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:		
		a. CGM Feature (0x2AA8)		
		i. Field: CGM Feature		
		Format: 24 bit		

- Value: 0000 0000 0000 0101 1011 1111 (MSB → LSB). Sensor Type Error Detection supported, Device Specific Alert supported, Calibration supported, Sensor Temperature High-Low Detection supported, Patient High/Low Alerts supported, Hypo Alerts supported, Hyper Alerts supported, Rate of Increase/Decrease Alerts supported, Sensor Result High-Low Detection supported.
- ii. Field: CGM Type

• Format: 4 bit

Value: not relevant

iii. Field: CGM Sample Location

• Format: 4 bit

Value: not relevant

iv. Field: E2E-CRC

• Format: uint16

Value: not relevant

b. CGM Status (0x2AA8)

i. Field: Time Offset

Format: uint16

· Value: not relevant.

ii. Field: CGM Status

Format: 24 bit

Value: not relevant

iii. Field: E2E-CRC

· This field is not included

c. CGM Measurement (0x2AA7)

i. Field: Size

Format: uint8

ii. Field: Flags

Format: 8 bit

- Value: 0010 0000 (MSB → LSB). CGM Trend information not present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.
- iii. Field: CGM Glucose Concentration (mg/dL)

Format: SFLOAT

Value: not Relevant

iv. Field: Time Offset

Format: uint16

Value: not relevant

v. Field: Sensor Status Annunciation

• Format: 8 bit

Value: not relevant

vi. Field: CGM Trend Information (mg/dL)

This field is not included

vii. Field: CGM Quality

This field is not included

	Ţ		
	viii. Field: E2E-CRC		
	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), force the PHG under test to read the CGM Feature and CGM Session Start Time characteristics.		
	5. The simulated PHD sends the Measurement to the PHG under test.		
	6. Check in the PHG transcoder output CGM Status Enumeration Object - Type attribute.		
	7. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP). The simulated PHD sends the temporarily stored CGM measurement to the PHG under test.		
	8. Check in the PHG transcoder output the CGM Status Enumeration Object - Type attribute.		
	<ol><li>Force the PHG under test to read the CGM Status characteristic to actively request the status of the CGM sensor.</li></ol>		
	<ol> <li>Check in the PHG transcoder output the CGM Status Enumeration Object - Type attribute.</li> </ol>		
Pass/Fail criteria	In Step 6, 8 and 10, the CGM Status Enumeration Object - Type attribute is present and set to MDC_PART_PHD_DM   MDC_CGM_DEV_STAT		
Notes	Possible values in typical points of observation after transcoder output are:		
(To assist manual testing)	a) IEEE 11073 Objects and Attributes		
testing)	Type attribute is not present, or if it is present then:		
	□ Object: CGM Status Enumeration Object		
	☐ Attribute-id: MDC_ATTR_ID_TYPE (2351)		
	☐ Attribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}		
	☐ Attribute-value:		
	<ul> <li>partition: MDC_PART_PHD_DM or 128 (dec) or 00 80 (hex)</li> </ul>		
	<ul> <li>code: MDC_CGM_DEV_STAT or 29452 (dec) or 73 0C (hex)</li> </ul>		
	b) WAN PCD-01 message		
	PCD-01 message includesa segments like this with Type attribute (check OBX-3):		
	OBX n CWE 8418060^MDC_CGM_DEV_STAT^MDC  m.0.0.a [value]     R   [date_time]		

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-073		
TP label		Whitepaper. CGM Status Enumeration Object – Metric-Spec-Small Attribute		
Coverage	Spec	[Bluetooth PHDT v1.6]		
	Testable items	CGM Enumeration 3; M		
Test purpose		Check that:		
		PHG includes CGM Status Enumeration Object – Metric-Spec-Small attribute in transcoder output.		
		[AND]		
		Metric-Spec-Small is set to {0x F040}.		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043		

Other PICS	
Initial condition	The PHG under test and the simulated PHD are in the Standby state.
Test procedure	The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.
	2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:
	a. CGM Feature (0x2AA8)
	i. Field: CGM Feature
	Format: 24 bit
	<ul> <li>Value: 0000 0000 0101 1011 1111 (MSB → LSB). Sensor Type Error Detection supported, Device Specific Alert supported, Calibration supported, Sensor Temperature High-Low Detection supported, Patient High/Low Alerts supported, Hypo Alerts supported, Hyper Alerts supported, Rate of Increase/Decrease Alerts supported, Sensor Result High-Low Detection supported.</li> </ul>
	ii. Field: CGM Type
	Format: 4 bit
	Value: not relevant
	iii. Field: CGM Sample Location
	Format: 4 bit
	Value: not relevant
	iv. Field: E2E-CRC
	Format: uint16
	Value: not relevant
	b. CGM Status (0x2AA8)
	i. Field: Time Offset
	Format: uint16
	Value: not relevant.
	ii. Field: CGM Status
	Format: 24 bit
	Value: not relevant
	iii. Field: E2E-CRC
	This field is not included
	c. CGM Measurement (0x2AA7)
	i. Field: Size
	Format: uint8
	ii. Field: Flags
	• Format: 8 bit
	<ul> <li>Value: 0010 0000 (MSB → LSB). CGM Trend information not present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.</li> </ul>
	iii. Field: CGM Glucose Concentration (mg/dL)
	Format: SFLOAT
	Value: not Relevant

	iv. Field: Time Offset
	Format: uint16
	Value: not relevant
	v. Field: Sensor Status Annunciation
	Format: 8 bit
	Value: not relevant
	vi. Field: CGM Trend Information (mg/dL)
	This field is not included
	vii. Field: CGM Quality
	This field is not included
	viii. Field: E2E-CRC
	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), force the PHG under test to read the CGM Feature and CGM Session Start Time characteristics.
	5. The simulated PHD sends the Measurement to the PHG under test.
	6. Check in the PHG transcoder output CGM Status Enumeration Object – Metric-Spec-Small attribute.
	7. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP). The simulated PHD sends the temporarily stored CGM measurement to the PHG under test
	8. Check in the PHG transcoder output the CGM Status Enumeration Object - Metric-Spec-Small attribute.
	9. Force the PHG under test to read the CGM Status characteristic to actively request the status of the CGM sensor.
	10. Check in the PHG transcoder output the CGM Status Enumeration Object - Metric-Spec-Small attribute.
Pass/Fail criteria	In Step 6, 8 and 10, the CGM Status Enumeration Object - Metric-Spec-Small attribute is present and set to 0xF040 (mss-avail-intermittent   mss-upd-aperiodic   mss-msmt-aperiodic   mss-acc-agent-initiated   mss-avail-stored-data)
Notes	Possible values in typical points of observation after transcoder output are:
(To assist manual testing)	a) IEEE 11073 Objects and Attributes
testing)	Metric-Spec-Small attribute is present:
	□ Object: CGM Status Enumeration Object
	☐ Attribute-id: MDC_ATTR_METRIC_SPEC_SMALL (2630)
	☐ Attribute-type: BITS-16
	Attribute-value: 0xF040 (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 Metric-Spec-Small attribute value

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-074
TP label		Whitepaper. CGM Status Enumeration Object – Base-Offset-Time-Stamp Attribute
Coverage	Spec	[Bluetooth PHDT v1.6]

	Testable tems	CGM Enum	eration 4; M	BaseOffset 3; M			
Test purpose		Check that:					
<del>-</del>			PHG includes CGM Status Enumeration Object Base-Offset-Time-Stamp attribute in				
		transcoder o	output.				
		[AND]	<b>T</b>		" . D . O" "		
		stamp derivation	-Time-Stamp att ation	ribute is set to the correct value	e according to Base-Offset time		
Applicability		C_MAN_BL	E_000 AND C_N	MAN_BLE_002 AND C_MAN_E	BLE_043		
Other PICS							
Initial condition	n	The PHG ur	nder test and the	simulated PHD are in the Star	ndby state.		
Test procedure		speciali state (it tempora	zation), it has a is discoverable) arily stored.	CGM measurement ready to be	lucose Monitoring Profile (device e sent and it is in the Advertising an identical CGM measurement		
			for this Test Cas		enstics. The characteristics of		
		a. CG	M Feature (0x2/	AA8)			
		i.	Field: CGM Fe	ature			
			• Format: 24	4 bit			
			Detection supported High/Low Rate of Ind	supported, Device Specific Ale , Sensor Temperature High-Lo	w Detection supported, Patient supported, Hyper Alerts supported,		
		ii.	Field: CGM Ty	ре			
			• Format: 4	bit			
			Value: not	relevant			
		iii.	Field: CGM Sa	mple Location			
			• Format: 4	bit			
			Value: not	relevant			
		iv.	Field: E2E-CR	С			
			Format: ui	nt16			
			Value: not	relevant			
		b. CG	M Status (0x2A	A8)			
		i.	Field: Time Off	fset			
			Format: ui	nt16			
			• Value: 5 (r	min)			
		ii.	Field: CGM Sta	atus			
			• Format: 24	4 bit			
			Value: not	relevant			
		iii.	Field: E2E-CR	С			
			This field i	s not included			
		c. CG	M Measuremen	t (0x2AA7)			
		i.	Field: Size				

- Format: uint8
- ii. Field: Flags
  - Format: 8 bit
  - Value: 0010 0000 (MSB → LSB). CGM Trend information not present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.
- iii. Field: CGM Glucose Concentration (mg/dL)
  - Format: SFLOAT
  - · Value: not Relevant
- iv. Field: Time Offset
  - Format: uint16
  - Value: 20 (min)
- v. Field: Sensor Status Annunciation
  - Format: 8 bit
  - Value: not relevant
- vi. Field: CGM Trend Information (mg/dL)
  - This field is not included
- vii. Field: CGM Quality
  - · This field is not included
- viii. Field: E2E-CRC
  - This field is not included
- d. CGM Session Start Time (0x2AAA)
  - i. Field: Session Start Time
    - Format: {uint16, uint8, uint8, uint8, uint8, uint8}
    - Value: {2016, 5, 12, 16, 39, 27} (May 12, 2016, 16:39:27)
  - ii. Field: Time Zone
    - Format: sint8
    - Value: 4 (UTC+1:00)
  - iii. Field: DST-Offset
    - Format: uint8
    - Value: 4 (Daylight Time (+1h))
  - iv. Field: E2E-CRC
    - · This field is not included
- 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), force the PHG under test to read the CGM Feature and CGM Session Start Time characteristics.
- 5. The simulated PHD sends the Measurement to PHG under test.
- Check in the PHG transcoder output CGM Status Enumeration Object Base-Offset-Time-Stamp attribute.
- 7. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP). The simulated PHD sends the temporarily stored CGM measurement to the PHG under test
- Check in the PHG transcoder output the CGM Status Enumeration Object Base-Offset-Time-Stamp attribute.

	<ol> <li>Force the PHG under test to read the CGM Status characteristic to actively request the status of the CGM sensor.</li> </ol>	
	<ol> <li>Check in the PHG transcoder output the CGM Status Enumeration Object - Base-Offse Time-Stamp attribute.</li> </ol>	t-
Pass/Fail criteria	In Step 6 and 8 the CGM Status Enumeration Object - Base-Offset-Time-Stamp attribution is present and set is to the addition of CGM Session Start Time characteristic's Session Start Time (May 12, 2016, 14:39:27) field plus CGM Measurement characteristic's Time Offset field (20 min).	1
	In Step 10 the CGM Status Enumeration Object - Base-Offset-Time-Stamp attribute is present and set is to the addition of CGM Session Start Time characteristic's Session Start Time (May 12, 2016, 14:39:27) field plus CGM Status characteristic's Time Offset field (5 min).	
Notes	Possible values in typical points of observation after transcoder output are:	
(To assist manual	a) IEEE 11073 Objects and Attributes	
testing)	Base-Offset-Time-Stamp attribute is present:	
	Object: CGM Status Enumeration Object	
	☐ Attribute-id: MDC_ATTR_TIME_STAMP_BO (2690)	
	Attribute-type: SEQUENCE {bo-seconds (INT-U32), bo-fraction (INT-U16), bo-time offset (INT-I16)}	:-
	☐ Attribute-value: addition of	
	<ul> <li>CGM Session Start Time characteristic Session Start Time field (May 12, 2016 14:39:27)</li> </ul>	<b>ò</b> ,
	• Steps 6 & 8	
	CGM Measurement characteristic Time Offset field (20m)	
	• Step 10	
	CGM Status characteristic Time Offset field (5m)	
	Note that the same Base-Offset-Time-Stamp can have different representation depending on bo-time-offset value. If it is set to 20 min (CGM Measurement or CGM Status characteristic Time Offset field), then Base-Offset-Time-Stamp value shall be {3672059967, 0, 20} or {3672059967, 0, 5}	
	b) WAN PCD-01 message	
	PCD-01 message includes a segment like this with Base-Offset-Time-Stamp attribute value (check OBX-14):	
	OBX n CWE 8418060^MDC_CGM_DEV_STAT^MDC m.0.0.a [value]     R   [value described in a) coded in DTM format]	

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-075		
TP label		Whitepaper. CGM Status Enumeration Object – Enum-Observed-Value-Simple-Bit-Str		
Coverage	Spec	[Bluetooth PHDT v1.6]		
	Testable items	CGM Enumeration 4; M		
Test purpose		Check that:  PHG includes CGM Status Enumeration Object – Enum-Observed-Value-Simple-Bit-Str attribute in transcoder output.  [AND]  Enum-Observed-Value-Simple-Bit-Str is set to the correct value.		
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043		

Other PICS	
Initial condition	The PHG under test and the simulated PHD are in the Standby state.
Test procedure	<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.</li> </ol>
	2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:
	a. CGM Feature (0x2AA8)
	i. Field: CGM Feature
	Format: 24 bit
	<ul> <li>Value: 0000 0000 0000 0101 1011 1111 (MSB → LSB). Sensor Type Error Detection supported, Device Specific Alert supported, Calibration supported, Sensor Temperature High-Low Detection supported, Patient High/Low Alerts supported, Hypo Alerts supported, Hyper Alerts supported, Rate of Increase/Decrease Alerts supported, Sensor Result High-Low Detection supported.</li> </ul>
	ii. Field: CGM Type
	Format: 4 bit
	Value: not relevant
	iii. Field: CGM Sample Location
	Format: 4 bit
	Value: not relevant
	iv. Field: E2E-CRC
	Format: uint16
	Value: not relevant
	b. CGM Status (0x2AA8)
	i. Field: Time Offset
	Format: uint16
	Value: 20 (min)
	ii. Field: CGM Status
	Format: 24 bit
	<ul> <li>Value: 0000 0000 0000 0000 0001 (MSB -&gt; LSB). Session stopped.</li> </ul>
	iii. Field: E2E-CRC
	This field is not included
	c. CGM Measurement (0x2AA7)
	i. Field: Size
	• Format: uint8
	ii. Field: Flags
	Format: 8 bit
	<ul> <li>Value: 1000 0000 (MSB → LSB). CGM Trend information not present, CGM Quality not present, Sensor Status Annunciation Field (Warning-Octet) not present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) present.</li> </ul>
	iii. Field: CGM Glucose Concentration (mg/dL)
	Format: SFLOAT
	Value: not Relevant

- iv. Field: Time Offset
  - Format: uint16
  - Value: not relevant
- v. Field: Sensor Status Annunciation
  - Format: 8 bit
  - Value: 0000 0001 (MSB -> LSB). Session stopped.
- vi. Field: CGM Trend Information (mg/dL)
  - · This field is not included
- vii. Field: CGM Quality
  - This field is not included
- viii. Field: E2E-CRC
  - 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).
- When the pairing has been completed (Connection state), force the PHG under test to read the CGM Feature and CGM Session Start Time characteristics.
- 5. The simulated PHD sends the Measurement to the PHG under test.
- Check in the PHG transcoder output the CGM Status Enumeration Object Enum-Observed-Value-Simple-Bit-Str attribute
- The PHG under test requests the simulated PHD to report stored records by performing a
  writing operation in the Record Access Control Point (RACP). The simulated PHD sends
  the temporarily stored CGM measurement to the PHG under test.
- Check in the PHG transcoder output the CGM Status Enumeration Object Enum-Observed-Value-Simple-Bit-Str attribute
- Force the PHG under test to read the CGM Status characteristic to actively request the status of the CGM sensor.
- Check in the PHG transcoder output the CGM Status Enumeration Object Enum-Observed-Value-Simple-Bit-Str attribute
- 11. End current CGM session and start a new one. The simulated PHD will now have the following values in the specified fields:
  - a. CGM Status (0x2AA8)
    - i. Field: CGM Status
      - Format: 24 bit
      - Value: 0000 0000 0000 0000 0100 (MSB -> LSB). Sensor type incorrect for device.
  - b. CGM Measurement (0x2AA7)
    - i. Field: Flags
      - Format: 8 bit
      - Value: 1000 0000 (MSB → LSB). CGM Trend information not present, CGM Quality not present, Sensor Status Annunciation Field (Warning-Octet) not present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) present.
    - ii. Field: Sensor Status Annunciation
      - Format: 8 bit
      - Value: 0000 0100 (MSB -> LSB). Sensor type incorrect for device.

- 12. End current CGM session and start a new one. The simulated PHD will now have the following values in the specified fields:
  - a. CGM Status (0x2AA8)
    - Field: CGM Status
      - Format: 24 bit
      - Value: 0000 0000 0000 0000 0000 1000 (MSB -> LSB). Sensor malfunction.
  - b. CGM Measurement (0x2AA7)
    - i. Field: Flags
      - Format: 8 bit
      - Value: 1000 0000 (MSB → LSB). CGM Trend information not present, CGM
        Quality not present, Sensor Status Annunciation Field (Warning-Octet) not
        present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present,
        Sensor Status Annunciation Field (Status-Octet) present.
    - ii. Field: Sensor Status Annunciation
      - Format: 8 bit
      - Value: 0000 1000 (MSB -> LSB). Sensor malfunction.

- 13. End current CGM session and start a new one. The simulated PHD will now have the following values in the specified fields:
  - a. CGM Status (0x2AA8)
    - Field: CGM Status
      - Format: 24 bit
      - Value: 0000 0000 0000 0000 0001 0000 (MSB -> LSB). Device specific alert.
  - b. CGM Measurement (0x2AA7)
    - i. Field: Flags
      - Format: 8 bit
      - Value: 1000 0000 (MSB → LSB). CGM Trend information not present, CGM Quality not present, Sensor Status Annunciation Field (Warning-Octet) not present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) present.
    - ii. Field: Sensor Status Annunciation
      - Format: 8 bit
      - Value: 0001 0000 (MSB -> LSB). Device specific alert.

- 14. End current CGM session and start a new one. The simulated PHD will now have the following values in the specified fields:
  - a. CGM Status (0x2AA8)
    - i. Field: CGM Status
      - Format: 24 bit
      - Value: 0000 0000 0000 0010 0000 0000 (MSB -> LSB). Calibration not allowed.
  - b. CGM Measurement (0x2AA7)
    - i. Field: Flags
      - Format: 8 bit

- Value: 0100 0000 (MSB → LSB). CGM Trend information not present, CGM
  Quality not present, Sensor Status Annunciation Field (Warning-Octet) not
  present, Sensor Status Annunciation Field (Cal/Temp-Octet) present,
  Sensor Status Annunciation Field (Status-Octet) not present.
- ii. Field: Sensor Status Annunciation
  - Format: 8 bit
  - Value: 0000 0010 (MSB -> LSB). Calibration not allowed.

- 15. End current CGM session and start a new one. The simulated PHD will now have the following values in the specified fields:
  - a. CGM Status (0x2AA8)
    - Field: CGM Status
      - Format: 24 bit
      - Value: 0000 0000 0000 0100 0000 0000 (MSB -> LSB). Calibration recommended.
  - b. CGM Measurement (0x2AA7)
    - i. Field: Flags
      - Format: 8 bit
      - Value: 0100 0000 (MSB → LSB). CGM Trend information not present, CGM Quality not present, Sensor Status Annunciation Field (Warning-Octet) not present, Sensor Status Annunciation Field (Cal/Temp-Octet) present, Sensor Status Annunciation Field (Status-Octet) not present.
    - ii. Field: Sensor Status Annunciation
      - Format: 8 bit
      - Value: 0000 0100 (MSB -> LSB). Calibration recommended.

The rest of the fields will remain with the same value as in step 2. Repeat steps 3-10 to check in PHG transcoder output the CGM Status Enumeration Object – Enum-Observed-Value-Simple-Bit-Str attribute like in 6, 8 and 10.

- 16. End current CGM session and start a new one. The simulated PHD will now have the following values in the specified fields:
  - a. CGM Status (0x2AA8)
    - Field: CGM Status
      - Format: 24 bit
      - Value: 0000 0000 0000 1000 0000 0000 (MSB -> LSB). Calibration required.
  - b. CGM Measurement (0x2AA7)
    - i. Field: Flags
      - Format: 8 bit
      - Value: 0100 0000 (MSB → LSB). CGM Trend information not present, CGM Quality not present, Sensor Status Annunciation Field (Warning-Octet) not present, Sensor Status Annunciation Field (Cal/Temp-Octet) present, Sensor Status Annunciation Field (Status-Octet) not present.
    - ii. Field: Sensor Status Annunciation
      - Format: 8 bit
      - Value: 0000 1000 (MSB -> LSB). Calibration required.

- 17. End current CGM session and start a new one. The simulated PHD will now have the following values in the specified fields:
  - a. CGM Status (0x2AA8)
    - Field: CGM Status
      - Format: 24 bit
      - Value: 0000 0000 0001 0000 0000 0000 (MSB -> LSB). Sensor temperature too high for valid test/result at time of measurement.
  - b. CGM Measurement (0x2AA7)
    - i. Field: Flags
      - Format: 8 bit
      - Value: 0100 0000 (MSB → LSB). CGM Trend information not present, CGM Quality not present, Sensor Status Annunciation Field (Warning-Octet) not present, Sensor Status Annunciation Field (Cal/Temp-Octet) present, Sensor Status Annunciation Field (Status-Octet) not present.
    - ii. Field: Sensor Status Annunciation
      - Format: 8 bit
      - Value: 0001 0000 (MSB -> LSB). Sensor temperature too high for valid test/result at time of measurement.

- 18. End current CGM session and start a new one. The simulated PHD will now have the following values in the specified fields:
  - a. CGM Status (0x2AA8)
    - Field: CGM Status
      - Format: 24 bit
      - Value: 0000 0000 0010 0000 0000 0000 (MSB -> LSB). Sensor temperature too low for valid test/result at time of measurement.
  - b. CGM Measurement (0x2AA7)
    - i. Field: Flags
      - Format: 8 bit
      - Value: 0100 0000 (MSB → LSB). CGM Trend information not present, CGM
        Quality not present, Sensor Status Annunciation Field (Warning-Octet) not
        present, Sensor Status Annunciation Field (Cal/Temp-Octet) present,
        Sensor Status Annunciation Field (Status-Octet) not present.
    - ii. Field: Sensor Status Annunciation
      - Format: 8 bit
      - Value: 0010 0000 (MSB -> LSB). Sensor temperature too low for valid test/result at time of measurement.

- 19. End current CGM session and start a new one. The simulated PHD will now have the following values in the specified fields:
  - a. CGM Status (0x2AA8)
    - i. Field: CGM Status
      - Format: 24 bit
      - Value: 0000 0001 0000 0000 0000 0000 (MSB -> LSB). Sensor result lower than the patient low level.
  - b. CGM Measurement (0x2AA7)

- i. Field: Flags
  - Format: 8 bit
  - Value: 0010 0000 (MSB → LSB). CGM Trend information not present, CGM Quality not present, Sensor Status Annunciation Field (Warning-Octet) present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.
- ii. Field: Sensor Status Annunciation
  - Format: 8 bit
  - Value: 0000 0001 (MSB -> LSB). Sensor result lower than the patient low level.

- 20. End current CGM session and start a new one. The simulated PHD will now have the following values in the specified fields:
  - a. CGM Status (0x2AA8)
    - i. Field: CGM Status
      - Format: 24 bit
      - Value: 0000 0010 0000 0000 0000 0000 (MSB -> LSB). Sensor result higher than the patient low level.
  - b. CGM Measurement (0x2AA7)
    - i. Field: Flags
      - Format: 8 bit
      - Value: 0010 0000 (MSB → LSB). CGM Trend information not present, CGM Quality not present, Sensor Status Annunciation Field (Warning-Octet) present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.
    - ii. Field: Sensor Status Annunciation
      - Format: 8 bit
      - Value: 0000 0010 (MSB -> LSB). Sensor result higher than the patient low level.

- 21. End current CGM session and start a new one. The simulated PHD will now have the following values in the specified fields:
  - CGM Status (0x2AA8)
    - i. Field: CGM Status
      - Format: 24 bit
      - Value: 0000 0100 0000 0000 0000 (MSB -> LSB). Sensor result lower than the hypo level.
  - b. CGM Measurement (0x2AA7)
    - i. Field: Flags
      - Format: 8 bit
      - Value: 0010 0000 (MSB → LSB). CGM Trend information not present, CGM Quality not present, Sensor Status Annunciation Field (Warning-Octet) present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.
    - ii. Field: Sensor Status Annunciation
      - Format: 8 bit

• Value: 0000 0100 (MSB -> LSB). Sensor result lower than the hypo level.

The rest of the fields will remain with the same value as in step 2. Repeat steps 3-10 to check in PHG transcoder output the CGM Status Enumeration Object – Enum-Observed-Value-Simple-Bit-Str attribute like in 6, 8 and 10.

- 22. End current CGM session and start a new one. The simulated PHD will now have the following values in the specified fields:
  - a. CGM Status (0x2AA8)
    - Field: CGM Status
      - Format: 24 bit
      - Value: 0000 1000 0000 0000 0000 0000 (MSB -> LSB). Sensor result lower than the hyper level.
  - b. CGM Measurement (0x2AA7)
    - i. Field: Flags
      - Format: 8 bit
      - Value: 0010 0000 (MSB → LSB). CGM Trend information not present, CGM Quality not present, Sensor Status Annunciation Field (Warning-Octet) present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.
    - ii. Field: Sensor Status Annunciation
      - Format: 8 bit
      - Value: 0000 1000 (MSB -> LSB). Sensor result lower than the hyper level.

The rest of the fields will remain with the same value as in step 2. Repeat steps 3-10 to check in PHG transcoder output the CGM Status Enumeration Object – Enum-Observed-Value-Simple-Bit-Str attribute like in 6, 8 and 10.

- 23. End current CGM session and start a new one. The simulated PHD will now have the following values in the specified fields:
  - a. CGM Status (0x2AA8)
    - i. Field: CGM Status
      - Format: 24 bit
      - Value: 0001 0000 0000 0000 0000 (MSB -> LSB). Sensor rate of decrease exceeded.
  - b. CGM Measurement (0x2AA7)
    - i. Field: Flags
      - Format: 8 bit
      - Value: 0010 0000 (MSB → LSB). CGM Trend information not present, CGM Quality not present, Sensor Status Annunciation Field (Warning-Octet) t present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.
    - ii. Field: Sensor Status Annunciation
      - Format: 8 bit
      - Value: 0001 0000 (MSB -> LSB). Sensor rate of decrease exceeded.

The rest of the fields will remain with the same value as in step 2. Repeat steps 3-10 to check in PHG transcoder output the CGM Status Enumeration Object – Enum-Observed-Value-Simple-Bit-Str attribute like in 6, 8 and 10.

- 24. End current CGM session and start a new one. The simulated PHD will now have the following values in the specified fields:
  - CGM Status (0x2AA8)
    - Field: CGM Status
      - Format: 24 bit

- Value: 0010 0000 0000 0000 0000 (MSB -> LSB). Sensor rate of increase exceeded.
- b. CGM Measurement (0x2AA7)
  - i. Field: Flags
    - Format: 8 bit
    - Value: 0010 0000 (MSB → LSB). CGM Trend information not present, CGM Quality not present, Sensor Status Annunciation Field (Warning-Octet) present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.
  - ii. Field: Sensor Status Annunciation
    - Format: 8 bit
    - Value: 0010 0000 (MSB -> LSB). Sensor rate of increase exceeded.

The rest of the fields will remain with the same value as in step 2. Repeat steps 3-10 to check in PHG transcoder output the CGM Status Enumeration Object – Enum-Observed-Value-Simple-Bit-Str attribute like in 6, 8 and 10.

- 25. End current CGM session and start a new one. The simulated PHD will now have the following values in the specified fields:
  - a. CGM Status (0x2AA8)
    - i. Field: CGM Status
      - Format: 24 bit
      - Value: 0100 0000 0000 0000 0000 0000 (MSB -> LSB). Sensor result lower than the device can process.
  - b. CGM Measurement (0x2AA7)
    - Field: Flags
      - Format: 8 bit
      - Value: 0010 0000 (MSB → LSB). CGM Trend information not present, CGM Quality not present, Sensor Status Annunciation Field (Warning-Octet) present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.
    - ii. Field: Sensor Status Annunciation
      - Format: 8 bit
      - Value: 0100 0000 (MSB -> LSB). Sensor result lower than the device can process.

The rest of the fields will remain with the same value as in step 2. Repeat steps 3-10 to check in PHG transcoder output the CGM Status Enumeration Object – Enum-Observed-Value-Simple-Bit-Str attribute like in 6, 8 and 10.

- 26. End current CGM session and start a new one. The simulated PHD will now have the following values in the specified fields:
  - a. CGM Status (0x2AA8)
    - i. Field: CGM Status
      - Format: 24 bit
      - Value: 1000 0000 0000 0000 0000 0000 (MSB -> LSB). Sensor result higher than the device can process.
  - b. CGM Measurement (0x2AA7)
    - i. Field: Flags
      - Format: 8 bit
      - Value: 0010 0000 (MSB → LSB). CGM Trend information not present, CGM Quality not present, Sensor Status Annunciation Field (Warning-Octet) present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.

- ii. Field: Sensor Status Annunciation
  - Format: 8 bit
  - Value: 1000 0000 (MSB -> LSB). Sensor result higher than the device can process.

The rest of the fields will remain with the same value as in step 2. Repeat steps 3-10 to check in PHG transcoder output the CGM Status Enumeration Object – Enum-Observed-Value-Simple-Bit-Str attribute like in 6, 8 and 10.

#### Pass/Fail criteria

- In Step 6, 8 and 10, the CGM Status Enumeration Object Enum-Observed-Value-Simple-Bit-Str is present with bit 0 set to 1 (sensor-session-stopped). Rest of bits set to 0.
- In Step 11, the CGM Status Enumeration Object Enum-Observed-Value-Simple-Bit-Str is present with bit 2 set to 1 (sensor-type-incorrect). Rest of bits set to 0.
- In Step 12, the CGM Status Enumeration Object Enum-Observed-Value-Simple-Bit-Str is present with bit 3 set to 1 (sensor-malfunction). Rest of bits set to 0.
- In Step 13, the CGM Status Enumeration Object Enum-Observed-Value-Simple-Bit-Str is present with bit 4 set to 1 (device-specific-alert). Rest of bits set to 0.
- In Step 14, the CGM Status Enumeration Object Enum-Observed-Value-Simple-Bit-Str is present with bit 7 set to 1 (sensor-calibration-not-allowed). Rest of bits set to 0.
- In Step 15, the CGM Status Enumeration Object Enum-Observed-Value-Simple-Bit-Str is present with bit 8 set to 1 (sensor-calibration-recommended). Rest of bits set to 0.
- In Step 16, the CGM Status Enumeration Object Enum-Observed-Value-Simple-Bit-Str is present with bit 9 set to 1 (sensor-calibration-required). Rest of bits set to 0.
- In Step 17, the CGM Status Enumeration Object Enum-Observed-Value-Simple-Bit-Str is present with bit 10 set to 1 (sensor-temp-too-high). Rest of bits set to 0.
- In Step 18, the CGM Status Enumeration Object Enum-Observed-Value-Simple-Bit-Str is present with bit 11 set to 1 (sensor-temp-too-low). Rest of bits set to 0.
- In Step 19, the CGM Status Enumeration Object Enum-Observed-Value-Simple-Bit-Str is present with bit 12 set to 1 (sensor-result-below-patient-low). Rest of bits set to 0.
- In Step 20, the CGM Status Enumeration Object Enum-Observed-Value-Simple-Bit-Str is present with bit 13 set to 1 (sensor-result-above-patient-high). Rest of bits set to 0.
- In Step 21, the CGM Status Enumeration Object Enum-Observed-Value-Simple-Bit-Str is present with bit 14 set to 1 (sensor-low-hypo). Rest of bits set to 0.
- In Step 22, the CGM Status Enumeration Object Enum-Observed-Value-Simple-Bit-Str is present with bit 15 set to 1 (sensor-high-hyper). Rest of bits set to 0.
- In Step 23, the CGM Status Enumeration Object Enum-Observed-Value-Simple-Bit-Str is present with bit 16 set to 1 (sensor-rate-decrease-exceeded). Rest of bits set to 0.
- In Step 24, the CGM Status Enumeration Object Enum-Observed-Value-Simple-Bit-Str is present with bit 17 set to 1 (sensor-rate-increase-exceeded). Rest of bits set to 0.
- In Step 25, the CGM Status Enumeration Object Enum-Observed-Value-Simple-Bit-Str is present with bit 18 set to 1 (sensor-result-too-low). Rest of bits set to 0.
- In Step 26, the CGM Status Enumeration Object Enum-Observed-Value-Simple-Bit-Str is present with bit 19 set to 1 (sensor-result-too-high). Rest of bits set to 0.

#### Notes (To assist manual testing)

Possible values in typical points of observation after transcoder output are:

a) IEEE 11073 Objects and Attributes

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

- □ Object: PHD DM Status Enumeration Object
- □ Attribute-id: MDC\_ATTR\_ENUM\_OBS\_VAL\_SIMP\_BIT\_STR (2661)
- ☐ Attribute-type: BITS-32
- ☐ Attribute-value (Steps 6,8,10): 00 00 00 01 (hex)
- □ Attribute-value (Step 11): 00 00 00 04 (hex)
- ☐ Attribute-value (Step 12): 00 00 00 08 (hex)
- Attribute-value (Step 13): 00 00 00 10 (hex)
- □ Attribute-value (Step 14): 00 00 00 80 (hex)
- ☐ Attribute-value (Step 15): 00 00 01 00 (hex)
- ☐ Attribute-value (Step 16): 00 00 02 00 (hex)
- Attribute-value (Step 17): 00 00 04 00 (hex)
- Attribute-value (Step 18): 00 00 08 00 (hex)
- Attribute-value (Step 19): 00 00 10 00 (hex)
- ☐ Attribute-value (Step 20): 00 00 20 00 (hex)
- □ Attribute-value (Step 21): 00 00 40 00 (hex)
- ☐ Attribute-value (Step 22): 00 00 80 00 (hex)
- ☐ Attribute-value (Step 23): 00 01 00 00 (hex)
- □ Attribute-value (Step 24): 00 02 00 00 (hex)
- → Attribute-value (Step 25): 00 04 00 00 (hex)
- ☐ Attribute-value (Step 26): 00 08 00 00 (hex)

#### b) WAN PCD-01 message

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

Steps 6, 8 & 10

 $\label{eq:obx_n_constraint} OBX|n|CWE|8418060^MDC\_CGM\_DEV\_STAT^MDC|1.0.0.a|1^sensor-session-stopped(0)|||||R|||[date\_time]$ 

Step 11

OBX|n|CWE|8418060^MDC\_CGM\_DEV\_STAT^MDC|1.0.0.a|1^sensor-type-incorrect(2)|||||R|||[date\_time]

• Step 12

 $OBX|n|CWE|8418060^{M}DC\_CGM\_DEV\_STAT^{M}DC|1.0.0.a|1^{sensor-malfunction}(3)|||||R|||[date\_time]$ 

Step 13

 $OBX|n|CWE|8418060^{\wedge}MDC\_CGM\_DEV\_STAT^{\wedge}MDC|1.0.0.a|1^{\wedge}device-specificalert(4)||||||R|||[date\_time]$ 

Step 14

 $OBX|n|CWE|8418060^{M}DC\_CGM\_DEV\_STAT^{M}DC|1.0.0.a|1^{sensor-calibration-not-allowed}(7)|||||R|||[date\_time]$ 

Step 15

OBX|n|CWE|8418060^MDC\_CGM\_DEV\_STAT^MDC|1.0.0.a|1^sensor-calibration-recommended(8)|||||R|||[date\_time]

Step 16

OBX|n|CWE|8418060^MDC\_CGM\_DEV\_STAT^MDC|1.0.0.a|1^sensor-calibration-required(9)|||||R|||[date\_time]

• Step 17

 $OBX|n|CWE|8418060^{M}DC\_CGM\_DEV\_STAT^{M}DC|1.0.0.a|1^{sensor-temp-too-high}(10)|||||R|||[date\_time]$ 

Step 18

 $OBX[n]CWE|8418060^{M}DC\_CGM\_DEV\_STAT^{M}DC|1.0.0.a|1^{sensor-temp-too-low}(11)|||||R|||[date\_time]$ 

Step 19

 $OBX|n|CWE|8418060^{M}DC\_CGM\_DEV\_STAT^{M}DC|1.0.0.a|1^{sensor-result-below-patient-low}(12)|||||R|||[date\_time]$ 

• Step 20

 $OBX|n|CWE|8418060^{M}DC\_CGM\_DEV\_STAT^{M}DC|1.0.0.a|1^{sensor-result-above-patient-high(13)|||||R|||[date\_time]$ 

Step 21

 $OBX|n|CWE|8418060^{M}DC\_CGM\_DEV\_STAT^{M}DC|1.0.0.a|1^{sensor-low-hypo}(14)|||||R|||[date\_time]$ 

Step 22

 $OBX|n|CWE|8418060^{M}DC\_CGM\_DEV\_STAT^{M}DC|1.0.0.a|1^{sensor-high-hyper(15)||||||R|||[date\_time]$ 

Step 23

 $OBX|n|CWE|8418060^{M}DC\_CGM\_DEV\_STAT^{M}DC|1.0.0.a|1^{sensor-rate-decrease-exceeded(16)|||||R|||[date\_time]$ 

Step 24

 $OBX|n|CWE|8418060^{M}DC\_CGM\_DEV\_STAT^{M}DC|1.0.0.a|1^{sensor-rate-increase-exceeded}(17)|||||R|||[date\_time]$ 

Step 25

 $OBX|n|CWE|8418060^{M}DC\_CGM\_DEV\_STAT^{M}DC|1.0.0.a|1^{sensor-result-too-low}(18)||||||R|||[date\_time]$ 

Step 26

 $OBX|n|CWE|8418060^{M}DC\_CGM\_DEV\_STAT^{M}DC|1.0.0.a|1^{sensor-result-too-high(19)|||||R|||[date\_time]$ 

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-076			
TP label		Whitepaper. Glucose Numeric Object value			
Coverage	ge Spec [Bluetooth PHDT v1.6]				
	Testable	Short Float Type 1; C	BaseOffset 3; M	Glucose Numeric 7; M	
	items	Glucose Numeric 8; M			
Test purpos	se	Check that:			
		PHG processes correctly the values of the CGM Glucose Concentration field (mg/dL) and the Time Offset field (m) of the CGM Measurement characteristic and the CGM Session Start Time field of the CGM Session Start Time characteristic.			
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043			
Other PICS					
Initial condition		The PHG under test and the si	mulated PHD are in the Standby	state.	

#### Test procedure

- The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.
- The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:
  - a. CGM Session Start Time (0x2AAA)
    - i. Field: Session Start Time
      - Format: {uint16, uint8, uint8, uint8, uint8, uint8}
      - Value: {2016, 5, 12, 16, 39, 27} (May 12, 2016, 16:39:27)
    - ii. Field: Time Zone
      - Format: sint8
      - Value: 4 (UTC+1:00)
    - iii. Field: DST-Offset
      - Format: uint8
      - Value: 4 (Daylight Time (+1h))
    - iv. Field: E2E-CRC
      - This field is not included
  - b. CGM Measurement (0x2AA7)
    - i. Field: Size
      - Format: uint8
    - ii. Field: Flags
      - Format: 8 bit
      - Value: 0000 0000 (MSB → LSB). CGM Trend information not present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) not present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.
    - iii. Field: CGM Glucose Concentration (mg/dL)
      - Format: SFLOAT
      - Value: 160.0
    - iv. Field: Time Offset
      - Format: uint16
      - Value: 20
    - v. Field: Sensor Status Annunciation
      - This field is not included
    - vi. Field: CGM Trend Information
      - This field is not included
    - vii. Field: CGM Quality
      - · This field is not included
    - viii. Field: E2E-CRC
      - 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), force the PHG under test to read the CGM Features and CGM Session Start Time characteristics.
- 5. The simulated PHD sends the Measurement to the PHG under test.

	Check that the PHG accepts the measurement and decodes its value properly (glucose concentration value, units and time stamp)
	7. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP). The simulated PHD sends the temporarily stored CGM measurement to the PHG under test
	Check that the PHG accepts the measurement and decodes its value properly (glucose concentration value, units and time stamp)
Pass/Fail criteria	In Steps 6 and 8, the PHG under test shows the following measurement: Glucose Concentration = 160(mg/dL) with timestamp '2016-05-12 16:59:27'
Notes (To assist manual testing)	

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-077				
TP label		Whitepaper. Sensor Calibration Numeric Object value				
Coverage Spec		[Bluetooth P	HDT v1.6]			
	Testable	Short Float	Гуре 1; С	BaseOffset 3; M	SensCal Numeric 11; M	
	items	SensCal Nu	meric 12; M			
Test purpos	se	Check that:				
		PHG processes correctly the values of the Calibration Value – Glucose concentration of Calibration field (mg/dL) and the Calibration Time field (m) of the CGM Specific Ops Control Point characteristic when it receives a Calibration Value Response, and the CGM Session Start Time field of the CGM Session Start Time characteristic.				
Applicabilit	у	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043				
Other PICS						
Initial cond	ition	The PHG under test and the simulated PHD are in the Standby state.				
Test procedure		The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). The simulated PHD has a Calibration Data Record stored.				
		2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:				
		a. CGM Session Start Time (0x2AAA)				
		i. Field: Session Start Time				
			Format: {uint	16, uint8, uint8, uint8, uint8, ι	uint8}	
			• Value: {2016	, 5, 12, 16, 39, 27} (May 12, 2	2016, 16:39:27)	
		ii. Field: Time Zone				
			Format: sint8	}		
			• Value: 4 (UT	C+1:00)		
		iii.	Field: DST-Offset			
			Format: uint8	3		
			• Value: 4 (Day	ylight Time (+1h))		
		iv.	Field: E2E-CRC			
			This field is n	ot included		
		b. CG	M Feature (0x2AA	8)		

- i. Field: CGM Feature
  - Format: 24 bit
  - Value: 0000 0000 0000 0000 0001 (MSB → LSB). Calibration supported.
- ii. Field: CGM Type
  - Format: 4 bit
  - Value: not relevant
- iii. Field: CGM Sample Location
  - Format: 4 bit
  - Value: not relevant
- iv. Field: E2E-CRC
  - Format: uint16
  - Value: not relevant
- c. CGM Specific Ops Control Point (0x2AAC)
  - i. Field: Op Code
    - Format: uinnt8
    - Value: 0x06 (Glucose Calibration Value Response)
  - ii. Field: Calibration Value Glucose concentration of Calibration (mg/dL)
    - Format: SFLOAT (mg/dL)
    - Value: 115.3
  - iii. Field: Calibration Value Calibration Time
    - Format: uint16 (min)
    - Value: 20
  - iv. Field: Calibration Value Calibration Type
    - Format: 4 bit
    - Value: not relevant
  - v. Field: Calibration Value Calibration Sample Location
    - Format: 4 bit
    - Value: not relevant
  - vi. Field: Calibration Value Next Calibration Time
    - Format: uint16
    - Value: not relevant
  - vii. Field: Calibration Value Calibration Data Record Number
    - Format: uint16
    - Value: not relevant
  - viii. Field: Calibration Value Calibration Status
    - Format: 8 bit
    - Value: not relevant
  - ix. Field: E2E-CRC
    - · This field is not present
- 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, force the PHG to read CGM Feature and CGM Session Start Time characteristics, and then to perform a Glucose Calibration procedure

	using Op Code "Get Glucose Calibration value" (0x05) with Operand "0xFFFF" (by performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code and Calibration Data Record Number fields respectively).			
	5. The simulated PHD will respond with an indication including a "Calibration Value Response" Op Code (0x06) and a Calibration Data Record containing the requested calibration information.			
	<ol><li>Check that the PHG accepts the measurement and decodes its value properly (glucose concentration calibration value, units and time stamp).</li></ol>			
Pass/Fail criteria	In Step 6, the PHG under test shows the following measurement: Glucose Concentration of Calibration= 115.3(mg/dL) with timestamp '2016-05-12 16:59:27'			
Notes (To assist manual testing)				

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-078					
TP label		Whitepaper. Sensor Run-time Numeric Object value					
Coverage	Spec	[Bluetooth PHDT v1.6]					
	Testable items	BaseOffset	2; M	SRT Numeric 5; M	SRT Numeric 6; M		
Test purpos	se	Check that:					
		PHG processes correctly the values of the Session Run Time field (h) of the CGM Session Run Time characteristic and the CGM Session Start Time field of the CGM Session Start Time characteristic.					
Applicabilit	ty	C_MAN_BI	_E_000 AND C_MA	N_BLE_002 AND C_MAN_BL	E_043		
Other PICS							
Initial cond	ition	The PHG under test and the simulated PHD are in the Standby state.					
Test procedure		<ol> <li>The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization).</li> <li>The simulated PHD implements several BTLE characteristics. The characteristics of</li> </ol>					
			t for this Test Case				
			GM Session Start T				
		i.	Field: Session St		:(0)		
			-	t16, uint8, uint8, uint8, uint8, ui	•		
		ii.	<ul> <li>Value: {2016</li> <li>Field: Time Zone</li> </ul>	5, 5, 12, 16, 39, 27} (May 12, 2	016, 16.39.27)		
			Format: sint8				
			Value: 4 (UT)				
		iii.		•			
			Format: uinta	8			
			Value: 4 (Da	ylight Time (+1h))			
		iv.					
			This field is r	not included			
		b. Co	GM Session Run Ti	me (0x2AAB)			
		i.	Field: Session Ru	un Time			

	Format: uint16 (h)		
	• Value: 168		
	ii. Field: E2E-CRC		
	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, force the PHG to read CGM Feature, CGM Session Start Time and CGM Session Run Time characteristics.		
	5. Check that the PHG decodes values properly (session run time, units and time stamp).		
Pass/Fail criteria	In Step 5, the PHG under test shows the following measurement: Sensor Run Time = 168 (h) with timestamp '2016-05-12 16:39:27'		
Notes (To assist manual testing)			

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-079				
TP label		Whitepaper. Glucose Sampling Interval Numeric Object value				
Coverage	Spec	[Bluetooth PHDT v1.6]				
	Testable items	BaseOffset	1; M	GSI Numeric 8; M		
Test purpos	se	Check that:				
		PHG processes correctly the value of the Operand field (m) of the CGM Specific Ops Control Point when it receives a Communication Interval Response, and sets the timestamp to the collector's time of the collection				
Applicabilit	у	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043				
Other PICS						
Initial cond	ition	The PHG under test and the simulated PHD are in the Standby state.				
Test proced	dure	The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). PHD has a manually entered communication interval value stored.				
		2. The simulated PHD implements several BTLE characteristics. The characteristic of interest for this Test Case is:				
		a. CGM Specific Ops Control Point (0x2AAC)				
		i. Field: Op Code				
		Format: uint8				
		Value: 0x03				
		ii. Field: Operand				
			Format: uint8	3 (min)		
			<ul> <li>Value: 15</li> </ul>			
		iii.	Field: E2E-CRC			
			This field is r	not present		
		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, force the PHG to perform a CGM Communication Interval procedure using Op Code "Get CGM Communication Interval" (0x02) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code field).
	<ol> <li>The simulated PHD will respond with an indication including a "Communication Interval Response" Op Code (0x03) and an UINT8 containing the communication interval in minutes.</li> </ol>
	6. Check that the PHG decodes values properly (glucose sampling interval and units)
Pass/Fail criteria	In Step 6, the PHG under test shows the following measurement: Glucose Sampling Interval = 15 (m) with timestamp set to the collector's time of the collection
Notes (To assist manual testing)	

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-080			
TP label		Whitepaper. 0	Glucose trend Nui	meric Object value	
Coverage Spec		[Bluetooth Ph	IDT v1.6]		
	Testable items	Short Float T	ype 1; C	BaseOffset 3; M	GT Numeric 6; M
	items	GT Numeric 7	7; M		
Test purpos	se	Check that:			
		PHG processes correctly the values of the CGM Trend Information field ((mg/dL)/min) and the Time Offset field (m) of the CGM Measurement characteristic and the CGM Session Start Time field of the CGM Session Start Time characteristic.			
Applicabilit	у	C_MAN_BLE	_000 AND C_MA	N_BLE_002 AND C_M	IAN_BLE_043
Other PICS					
Initial condi	tion	The PHG under test and the simulated PHD are in the Standby state.			
Test procedure		1. The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.			
		2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:			
		a. CGM Feature (0x2AA8)			
		i.	Field: CGM Featu	ire	
			Format: 24 b	it	
			<ul> <li>Value: 0000 information s</li> </ul>		0000 (MSB → LSB). CGM trend
		ii.	Field: CGM Type		
			Format: 4 bit		
			<ul> <li>Value: not re</li> </ul>	levant	
		iii.	Field: CGM Samp	ole Location	
			Format: 4 bit		
			<ul> <li>Value: not re</li> </ul>	levant	
		iv.	Field: E2E-CRC		
		Format: uint16			

- · Value: not relevant
- b. CGM Measurement (0x2AA7)
  - i. Field: Size
    - Format: uint8
  - ii. Field: Flags
    - Format: 8 bit
    - Value: 0000 0001 (MSB → LSB). CGM Trend information present, CGM
      Quality nor present, Sensor Status Annunciation Field (Warning-Octet) not
      present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present,
      Sensor Status Annunciation Field (Status-Octet) not present.
  - iii. Field: CGM Glucose Concentration (mg/dL)
    - Format: SFLOAT
    - · Value: not relevant
  - iv. Field: Time Offset
    - Format: uint16
    - Value: 20 (min)
  - v. Field: Sensor Status Annunciation
    - · This field is not included
  - vi. Field: CGM Trend Information (mg/dL)/min
    - Format: SFLOAT
    - Value: 3.6
  - vii. Field: CGM Quality
    - This field is not included
  - viii. Field: E2E-CRC
    - · This field is not included
- c. CGM Session Start Time (0x2AAA)
  - i. Field: Session Start Time
    - Format: {uint16, uint8, uint8, uint8, uint8, uint8}
    - Value: {2016, 5, 12, 16, 39, 27} (May 12, 2016, 16:39:27)
  - ii. Field: Time Zone
    - Format: sint8
    - Value: 4 (UTC+1:00)
  - iii. Field: DST-Offset
    - Format: uint8
    - Value: 4 (Daylight Time (+1h))
  - iv. Field: E2E-CRC
    - · 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), force the PHG under test to read the CGM Feature and CGM Session Start Time characteristics.
- 5. The simulated PHD sends the Measurement to the PHG under test.
- 6. Check that the PHG accepts the measurement and decodes its value properly (glucose trend value, units and time stamp).

	7. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP). The simulated PHD sends the temporarily stored CGM measurement to the PHG under test.
	8. Check that the PHG accepts the measurement and decodes its value properly (glucose trend value, units and time stamp).
Pass/Fail criteria	In Steps 6 and 8, the PHG under test shows the following measurement: Glucose Trend = 3.6 (mg/dL/min) with timestamp '2016-05-12 16:59:27'
Notes (To assist manual testing)	

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-081				
TP label		Whitepaper. Patient low/high thresholds Compound Numeric Object value				
Coverage	Spec	[Bluetooth PHDT v1.6]				
	Testable items	Short Float	Гуре 1; С	BaseOffset 1; M	PLH Numeric 9; M	
		PLH Numeri	c 10; M			
Test purpos	se	Check that:			(man/III ) of the OOM On a life On a	
		PHG processes correctly the values of the Operand fields (mg/dL) of the CGM Specific Ops Control Point characteristic when it receives a Patient High Alert Level Response and a Patient Low Alert Level Response, and sets the timestamp to the collector's time of the collection				
Applicabilit	у	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND C_MAN_BLE_046 AND C_MAN_BLE_048				
Other PICS						
Initial cond	ition	The PHG under test and the simulated PHD are in the Standby state.				
Test proced	dure	The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). PHD has manually entered Patient Low Alert Level and Patient High Alert Level values stored.				
		2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:				
		a. CGM Feature (0x2AA8)				
		i. Field: CGM Feature				
		Format: 24 bit				
			Value: 0000 ( Alerts support		0 (MSB → LSB). Patient High/Low	
		ii.	Field: CGM Type			
			• Format: 4 bit			
			<ul> <li>Value: not re</li> </ul>	levant		
		iii. Field: CGM Sample Location				
			• Format: 4 bit			
			Value: not re	levant		
		iv.	Field: E2E-CRC			
			<ul> <li>Format: uint1</li> </ul>	6		
			<ul> <li>Value: not re</li> </ul>	evant		

	b. CGM Specific Ops Control Point (0x2AAC)	
	i. Field: Op Code	
	Format: uint8	
	<ul> <li>Value: 0x09 (Patient High Alert Level Response) / 0x0C (Patient Low Alert Level Response)</li> </ul>	
	ii. Field: Operand	
	Format: SFLOAT (mg/dL)	
	<ul> <li>Value: 72.0 (Patient Low threshold) / 144.0 (Patient High threshold)</li> </ul>	
	iii. Field: E2E-CRC	
	This field is not present	
	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, force the PHG to read CGM Feature and CGM Session Start Time characteristics, and then to perform a Patient High Alert procedure using Op Code "Get Patient High Alert Level" (0x08) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code).	
	5. The simulated PHD will respond with an indication including a "Patient High Alert Level Response" (0x09) Op Code and an SFLOAT containing the requested value in mg/dL.	
	6. Force the PHG to perform a Patient Low Alert procedure using Op Code "Get Patient Low Alert Level" (0x0B) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code).	
	7. The simulated PHD will respond with an indication including a "Patient Low Alert Level Response" (0x0C) Op Code and an SFLOAT containing the requested value in mg/dL.	
	8. Check that the PHG accepts the measurement and decodes its value properly (patient low and high thresholds and units).	
Pass/Fail criteria	In Step 8, the PHG under test shows the following measurement: Patient Low threshold = 72.0 (mg/dL), Patient High threshold = 144.0 (mg/dL) with timestamp set to the collector's time of the collection	
Notes (To assist manual testing)		

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-082				
TP label		Whitepaper. Device hypo/hyper thresholds Compound Numeric Object value				
Coverage	Spec	[Bluetooth PHDT v1.6]				
	Testable	Short Float Type 1; C	BaseOffset 1; M	DHH Numeric 9; M		
	items	DHH Numeric 10; M				
Test purpose		Check that:				
		PHG processes correctly the values of the Operand fields (mg/dL) of the CGM Specific Ops Control Point characteristic when it receives a Hypo Alert Level Response and a Hyper Alert Level Response, and sets the timestamp to the collector's time of the collection				
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND (C_MAN_BLE_050 OR C_MAN_BLE_052)				
Other PICS						
Initial condition		The PHG under test and the simulated PHD are in the Standby state.				

### Test procedure The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). PHD has manually entered Hypo and Hyper Alert Level values stored. The simulated PHD implements several BTLE characteristics. The characteristics of 2. interest for this Test Case are: CGM Feature (0x2AA8) Field: CGM Feature Format: 24 bit Value: 0000 0000 0000 0000 0000 1100 (MSB → LSB). Hypo Alerts and Hyper Alerts supported. Field: CGM Type Format: 4 bit Value: not relevant Field: CGM Sample Location Format: 4 bit Value: not relevant iv. Field: E2E-CRC Format: uint16 Value: not relevant CGM Specific Ops Control Point (0x2AAC) Field: Op Code Format: uint8 Value: 0x0F (Hypo Alert Level Response) / 0x12 (Hyper Alert Level Response) ii. Field: Operand Format: SFLOAT (mg/dL) Value: 36.0 (Hypo Alert Level Response) / 360.0 (Hyper Alert Level Response) iii. Field: E2E-CRC This field is not present 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, force the PHG to read CGM Feature and CGM Session Start Time characteristics. IF C\_MAN\_BLE\_050 = TRUE, force the PHG to perform a Hypo Alert procedure using Op Code "Get Hypo Alert Level" (0x0E) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code). The simulated PHD will respond with an indication including a "Hypo Alert Level Response" (0x0F) Op Code and an SFLOAT containing the requested alert level in mg/dL. IF C\_MAN\_BLE\_052 = TRUE, force the PHG to perform a Hyper Alert procedure using Op Code "Get Hyper Alert Level" (0x11) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code). The simulated PHD will respond with an indication including a "Hyper Alert Level Response" (0x12) Op Code and an SFLOAT containing the requested alert level in mg/dL. Check that the PHG accepts the measurement and decodes its value properly (hypo and hyper thresholds and units).

Pass/Fail criteria

Notes

collection

In Step 7, the PHG under test shows the following measurement: Hypo threshold = 36.0 (mg/dL), Hyper threshold = 360.0 (mg/dL) with timestamp set to the collector's time of the

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-083					
TP label		Whitepaper.Glucose rate of charge thresholds Compound Numeric Object value					
Coverage	[Bluetooth PHDT v1.6]						
	Testable items	Short Flo	oat Typ	pe 1; C	BaseOffset 1; M	GRC Numeric 9; M	
	itomo	GRC Nu	meric	10; M			
Test purpos	se	Check th	nat:				
		PHG processes correctly the values of the Operand fields (mg/dL) of the CGM Specific Ops Control Point characteristic when it receives a Rate of Decrease Alert Level Response and a Rate of Decrease Alert Level Response, and sets the timestamp to the collector's time of the collection					
Applicabilit	у	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND C_MAN_BLE_054 AND C_MAN_BLE_056					
Other PICS							
Initial cond	ition	The PHO	3 unde	er test and the si	mulated PHD are in the	Standby state.	
Test proced	dure	The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). The PHD has manually entered Rate of Decrease and Increase Alert Level values stored.					
		<ol><li>The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:</li></ol>					
		a. CGM Feature (0x2AA8)					
		i. Field: CGM Feature					
		Format: 24 bit					
		<ul> <li>Value: 0000 0000 0000 0001 0000 (MSB → LSB). Rate of Increase/Decrease Alerts supported.</li> <li>ii. Field: CGM Type</li> </ul>					
			•	Format: 4 bit			
			•	Value: not re	levant		
			iii. F	ield: CGM Samp	ole Location		
	Format: 4 bit						
			•	Value: not re	levant		
			iv. F	ield: E2E-CRC			
			•	Format: uint1			
		Value: not relevant					
		b. CGM Specific Ops Control Point (0x2AAC)					
			i. F	ield: Op Code			
			•	Format: uint8			
			•	Increase Ale	(Rate of Decrease Alert rt Level Response)	Level Response) / 0x18 (Rate of	
			ii. F	ield: Operand			
			•	Format: SFL	OAT (mg/dL/min)		

	<ul> <li>Value: 9.0 (Rate of Decrease Alert Level Response) / 9.0 (Rate of Increase Alert Level Response)</li> </ul>
	iii. Field: E2E-CRC
	This field is not present
	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, force the PHG to read CGM Feature and CGM Session Start Time characteristics, and then to perform a Rate of Decrease Alert Level procedure using Op Code "Get Rate of Decrease Alert Level" (0x14) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code).
	5. The simulated PHD will respond with an indication including a "Rate of Decrease Alert Level Response" (0x15) Op Code and an SFLOAT containing the requested alert level in mg/dL/min.
	<ol> <li>Force the PHG to perform a Rate of Increase Alert Level procedure using Op Code "Get Rate of Increase Alert Level" (0x17) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code).</li> </ol>
	7. The simulated PHD will respond with an indication including a "Rate of Increase Alert Level Response" (0x18) Op Code and an SFLOAT containing the requested alert level in mg/dL/min.
	8. Check that PHG accepts the measurement and decodes its value properly (glucose rate of decrease and increase thresholds and units).
Pass/Fail criteria	In Step 8, the PHG under test shows the following measurement: Glucose rate of decrease threshold = 9.0 (mg/dL/min), Glucose rate of increase threshold = 9.0 (mg/dL/min) with timestamp set to the collector's time of the collection
Notes (To assist manual testing)	

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-084					
TP label		Whitepaper. PHD DM Status Enumeration Object value					
Coverage	Spec	[Bluetooth PHDT v1.6]					
	Testable items	BaseOffset 3; M	PHDM Enumeration 6; M				
Test purpose		Check that:  PHG processes correctly the values of the Sensor Status Annunciation field and the Time Offset field (m) of the CGM Measurement characteristic, the CGM Status field of the CGM Status characteristic and the CGM Session Start Time field of the CGM Session Start Time characteristic.					
Applicability		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043					
Other PICS							
Initial cond	ition	The PHG under test and the simulated PHD are in the Standby state.					
Test procedure		The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.					
		2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:					
		a. CGM Feature (0x2AA8)					

- i. Field: CGM Feature
  - Format: 24 bit
  - Value: 0000 0000 0000 1010 0000 0000 (MSB → LSB). Low Battery detection supported, General Device Fault supported.
- ii. Field: CGM Type
  - Format: 4 bit
  - Value: not relevant
- iii. Field: CGM Sample Location
  - Format: 4 bit
  - Value: not relevant
- iv. Field: E2E-CRC
  - Format: uint16
  - Value: not relevant
- b. CGM Status (0x2AA8)
  - i. Field: Time Offset
    - Format: uint16
    - · Value: not relevant.
  - ii. Field: CGM Status
    - Format: 24 bit
    - Value: 0000 0000 0000 0000 0010 (MSB -> LSB). Device Battery Low.
  - iii. Field: E2E-CRC
    - · This field is not included
- c. CGM Measurement (0x2AA7)
  - i. Field: Size
    - Format: uint8
  - ii. Field: Flags
    - Format: 8 bit
    - Value: 0010 0000 (MSB → LSB). CGM Trend information not present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.
  - iii. Field: CGM Glucose Concentration (mg/dL)
    - Format: SFLOAT
    - Value: not Relevant
  - iv. Field: Time Offset
    - Format: uint16
    - Value: not relevant
  - v. Field: Sensor Status Annunciation
    - Format: 8 bit
    - Value: 0000 0010 (MSB -> LSB). Device Battery Low.
  - vi. Field: CGM Trend Information (mg/dL)
    - · This field is not included
  - vii. Field: CGM Quality
    - This field is not included

	viii. Field: E2E-CRC	
	This field is not included	
	d. CGM Session Start Time (0x2AAA)	
	i. Field: Session Start Time	
	Format: {uint16, uint8, uint8, uint8, uint8}	
	• Value: {2016, 5, 12, 16, 39, 27} (May 12, 2016, 16:39:27)	
	ii. Field: Time Zone	
	Format: sint8	
	• Value: 4 (UTC+1:00)	
	iii. Field: DST-Offset	
	Format: uint8	
	Value: 4 (Daylight Time (+1h))	
	iv. Field: E2E-CRC	
	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), force the PHG under test to read the CGM Feature and CGM Session Start Time characteristics.	
	5. The simulated PHD sends the Measurement to the PHG under test.	
	6. Check that the PHG accepts the measurement and decodes its value properly (sensor status and time stamp).	
	7. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP). The simulated PHD sends the temporarily stored CGM measurement to the PHG under test.	
	8. Check that the PHG accepts the measurement and decodes its value properly (sensor status and time stamp).	
	9. Force the PHG under test to read the CGM Status characteristic to actively request the status of the CGM sensor.	
	10. Check that the PHG accepts the measurement and decodes its value properly (sensor status and time stamp).	
Pass/Fail criteria	In Step 6, 8 and 10, the PHG under test shows the following measurement: PHD DM Status = 'device-status-battery-low' (1) with timestamp '2016-05-12 16:59:27'	
Notes (To assist manual testing)		

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-085				
TP label		Whitepaper. CGM Status Enumeration Object value				
Coverage	Spec	[Bluetooth PHDT v1.6]	etooth PHDT v1.6]			
	Testable items	BaseOffset 3; M CGM Enumeration 4; M CGM Enumeration 5; M				
Test purpose		Offset field (m) of the CGM Mea	alues of the Sensor Status Annu asurement characteristic, the CC GM Session Start Time field of t	GM Status field of the CGM		

Applicability	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043			
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 Continuous Glucose Monitoring Profile (device specialization), it has a CGM measurement ready to be sent and it is in the Advertising state (it is discoverable). The simulated PHD also has an identical CGM measurement temporarily stored.			
	2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:			
	a. CGM Feature (0x2AA8)			
	i. Field: CGM Feature			
	Format: 24 bit			
	<ul> <li>Value: 0000 0000 0000 0101 1011 1111 (MSB → LSB). Sensor Type Error Detection supported, Device Specific Alert supported, Calibration supported, Sensor Temperature High-Low Detection supported, Patient High/Low Alerts supported, Hypo Alerts supported, Hyper Alerts supported, Rate of Increase/Decrease Alerts supported, Sensor Result High-Low Detection supported.</li> </ul>			
	ii. Field: CGM Type			
	Format: 4 bit			
	Value: not relevant			
	iii. Field: CGM Sample Location			
	Format: 4 bit			
	Value: not relevant			
	iv. Field: E2E-CRC			
	Format: uint16			
	Value: not relevant			
	b. CGM Status (0x2AA8)			
	i. Field: Time Offset			
	Format: uint16			
	• Value: 20 (min)			
	ii. Field: CGM Status			
	Format: 24 bit			
	<ul> <li>Value: 0000 0000 0000 0000 0001 (MSB -&gt; LSB). Session stopped.</li> </ul>			
	iii. Field: E2E-CRC			
	This field is not included			
	c. CGM Measurement (0x2AA7)			
	i. Field: Size			
	Format: uint8			
	ii. Field: Flags			
	Format: 8 bit			
	<ul> <li>Value: 0010 0000 (MSB → LSB). CGM Trend information not present, CGM Quality nor present, Sensor Status Annunciation Field (Warning-Octet) present, Sensor Status Annunciation Field (Cal/Temp-Octet) not present, Sensor Status Annunciation Field (Status-Octet) not present.</li> </ul>			
	iii. Field: CGM Glucose Concentration (mg/dL)			

	Format: SFLOAT
	Value: not Relevant
	iv. Field: Time Offset
	Format: uint16
	Value: 20 (min)
	v. Field: Sensor Status Annunciation
	Format: 8 bit
	<ul> <li>Value: 0000 0001 (MSB -&gt; LSB). Session stopped.</li> </ul>
	vi. Field: CGM Trend Information (mg/dL)
	This field is not included
	vii. Field: CGM Quality
	This field is not included
	viii. Field: E2E-CRC
	This field is not included
	d. CGM Session Start Time (0x2AAA)
	i. Field: Session Start Time
	<ul> <li>Format: {uint16, uint8, uint8, uint8, uint8}</li> </ul>
	<ul> <li>Value: {2016, 5, 12, 16, 39, 27} (May 12, 2016, 16:39:27)</li> </ul>
	ii. Field: Time Zone
	Format: sint8
	<ul> <li>Value: 4 (UTC+1:00)</li> </ul>
	iii. Field: DST-Offset
	Format: uint8
	<ul> <li>Value: 4 (Daylight Time (+1h))</li> </ul>
	vi. Field: E2E-CRC
	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).
	<ol> <li>When the pairing has been completed (Connection state), force the PHG under test to read the CGM Feature and CGM Session Start Time characteristics.</li> </ol>
	5. The simulated PHD sends the Measurement to the PHG under test.
	<ol><li>Check that the PHG accepts the measurement and decodes its value properly (sensor status and time stamp).</li></ol>
	7. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP). The simulated PHD sends the temporarily stored CGM measurement to the PHG under test
	8. Check that the PHG accepts the measurement and decodes its value properly (sensor status and time stamp).
	9. Force the PHG under test to read the CGM Status characteristic to actively request the status of the CGM sensor.
	<ol><li>Check that the PHG accepts the measurement and decodes its value properly (sensor status and time stamp).</li></ol>
Pass/Fail criteria	In Step 6, 8 and 10, the PHG under test shows the following measurement: CGM Status = 'sensor-session-stopped' (0) with timestamp '2016-05-12 16:59:27'
Notes (To assist manual	

testing)		
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# Bibliography

[b-ITU-T H.810 (2013)]	Recommendation ITU-T H.810 (2013), <i>Interoperability design</i> guidelines for personal health systems.
[b-ITU-T H.810 (2015)]	Recommendation ITU-T H.810 (2015), <i>Interoperability design</i> guidelines for personal health systems.
[b-Bluetooth PHDT v1.3]	Bluetooth SIG (2012), <i>Personal Health Devices Transcoding White Paper</i> (version 1.3) <a href="https://www.bluetooth.org/docman/handlers/downloaddoc.ashx?doc_id=294540">https://www.bluetooth.org/docman/handlers/downloaddoc.ashx?doc_id=294540</a>
[b-CDG 1.0]	Continua Health Alliance, Continua Design Guidelines v1.0 (2008), <i>Continua Design Guidelines</i> .
[b-CDG 2010]	Continua Health Alliance, Continua Design Guidelines v1.5 (2010), <i>Continua Design Guidelines</i> .
[b-CDG 2011]	Continua Health Alliance, Continua Design Guidelines (2011), "Adrenaline", <i>Continua Design Guidelines</i> .
[b-CDG 2012]	Continua Health Alliance, Continua Design Guidelines (2012), "Catalyst", <i>Continua Design Guidelines</i> .
[b-CDG 2013]	Continua Health Alliance, Continua Design Guidelines (2013), "Endorphin", <i>Continua Design Guidelines</i> .
[b-CDG 2015]	Continua Health Alliance, Continua Design Guidelines (2015), "Genome", <i>Continua Design Guidelines</i> .
[b-CDG 2016]	Personal Connected Health Alliance, Continua Design Guidelines (2016), "Iris", <i>Continua Design Guidelines</i> .
[b-ETSI SR 001 262]	ETSI SR 001 262 v1.8.1 (2003-12), ETSI drafting rules. https://docbox.etsi.org/MTS/MTS/10-PromotionalMaterial/MBS-20111118/Referenced%20Documents/Drafting%20Rules.pdf
[b-PHD PICS & PIXIT]	PHD PICS and PIXIT Test Tool v7.0.2.0 – Excel sheet v1.13. http://handle.itu.int/11.1002/2000/12067
[b-PHG PICS & PIXIT]	PHG PICS and PIXIT Test Tool v7.0.2.0 – Excel sheet v1.11. http://handle.itu.int/11.1002/2000/12067
[b-TI]	PHD Testable items. Test Tool v7.0.2.0 – Excel sheet v1.10. http://handle.itu.int/11.1002/2000/12067

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