ITU-T

H.850.7

TELECOMMUNICATION STANDARDIZATION SECTOR OF ITU (08/2020)

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.

History

Edition	Recommendation	Approval	Study Group	Unique ID*
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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.

^{*} To access the Recommendation, type the URL http://handle.itu.int/ in the address field of your web browser, followed by the Recommendation's unique ID. For example, http://handle.itu.int/11.1002/1000/11830-en.

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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-CDG 2015]: • Adds WS/BCA BLE device specialization • Adds SABTE IEEE device specialization
1.5	2016-01-26	First maintenance release for Test Tool DG2015. It uses "TSS&TP_DG2015_LP-PAN_PART_10_v1.4.doc" as a baseline and adds some updates according to the Maintenance 2015 activity.
1.6	2016-09-20	Initial release for Test Tool DG2016. It uses "TSS&TP_DG2016_LP-PAN_PART_10_v1.5.doc" as a baseline and adds new features included in [ITU-T H.810 (2016)]/[b-CDG 2016]: • Adds PLX BLE device specialization • Adds PLX CGM device specialization
1.7	2017-07-18	Second Maintenance Release for Test Tool DG2016. It uses "TSS&TP_DG2016_LP-PAN_PART_10_v1.6.doc" as a baseline and corrects minor typos.
1.8	2018-10-17	It uses version 1.7 as a baseline and adds corrections due to the inclusion of CGM BLE profile test cases.
1.9	2020-06-02	Updates related to the value of the Reg-Cert-Data-List according to [b-CDG 2017].

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 Recommendation¹ 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 50: Sleep apnoea breathing therapy equipment (SABTE)
 - Part 5P: Continuous glucose monitor (CGM)

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 6: Device specializations. Personal Health Gateway
- Part 7: Continua Design Guidelines. BLE Personal Health Device
- Part 8: Continua Design Guidelines. BLE Personal Health Gateway
- 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. https://www.bluetooth.org/DocMan/handlers/DownloadDoc.ashx?doc_id=294539
[Bluetooth PHDT v1.5]	Bluetooth SIG (2014), <i>Personal Health Devices Transcoding White Paper</i> , v1.5. https://www.bluetooth.org/DocMan/handlers/DownloadDoc.ashx?doc_id=272346
[Bluetooth PHDT v1.6]	Bluetooth SIG (2015), <i>Personal Health Devices Transcoding White Paper</i> , v1.6. https://www.bluetooth.org/DocMan/handlers/DownloadDoc.ashx?doc_id=310657
[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, Health informatics – Personal

11073-20601:2010 Amd 1:2015. https://www.iso.org/standard/54331.html with https://www.iso.org/standard/63972.html

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

health device communication — Part 20601: Application profile — Optimized exchange protocol, including ISO/IEEE

11073-20601:2016/Cor.1:2016.

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

[IHE PCD TF 1] IHE PCD TF 1 (2012), IHE Patient Care Device Technical

Framework – Revision 2.0. Volume 1: Integration Profiles. http://www.ihe.net/Technical_Framework/upload/IHE_PCD_TF_Rev2-

0 Vol1 FT 2012-08-16.pdf

[IHE PCD TF 2] IHE PCD TF 2 (2012), IHE Patient Care Device Technical

Framework – Revision 2.0. Volume 2: Transactions. http://www.ihe.net/Technical Framework/upload/IHE PCD TF Rev2-

0_Vol2_FT_2012-08-16.pdf

[IHE PCD TF 3] IHE PCD TF 3 (2012), IHE Patient Care Device Technical

Framework – Revision 2.0. Volume 3: Semantic Content. http://www.ihe.net/Technical_Framework/upload/IHE_PCD_TF_Rev2-

0_Vol3_FT_2012-08-16.pdf

3 Definitions

3.1 Terms defined elsewhere

This Recommendation uses the following terms defined elsewhere:

- **3.1.1 agent** [ISO/IEEE 11073-20601-2016C]: A node that collects and transmits personal health data to an associated manager.
- **3.1.2** manager [ISO/IEEE 11073-20601-2016C]: A node receiving data from one or more agent systems. Some examples of managers include a cellular phone, health appliance, set top box, or a computer system.

3.2 Terms defined in this Recommendation

None.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

ATS Abstract Test Suite

CDG Continua Design Guidelines

CGM Continuous Glucose Monitor

DUT Device Under Test

GUI Graphical User Interface

INR International Normalized Ratio

IP Insulin Pump

IUT Implementation Under Test

LSB Least Significant Bit

MDS Medical Device System

MSB Most Significant Bit

NFC Near Field Communication

PAN Personal Area Network

PCD Patient Care Device

PCO Point of Control and Observation

PCT Protocol Conformance Testing

PHD Personal Health Device

PHDC Personal Healthcare Device Class

PHG Personal Health Gateway

PICS Protocol Implementation Conformance Statement

PIXIT Protocol Implementation extra Information for Testing

RACP Record Access Control Point

SABTE Sleep Apnoea Breathing Therapy Equipment

SCR Static Conformance Review

SDP Service Discovery Protocol

SOAP Simple Object Access Protocol

TCRL Test Case Reference List

TCWG Test and Certification Working Group

TP Test Purposes

TSS Test Suite Structure
USB Universal Serial Bus
WDM Windows Driver Model

5 Conventions

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

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

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

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

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

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

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

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

CDG release	Transposed as	Version	Description	Designation
2016 plus errata	[ITU-T H.810 (2016)]	6.1	Release 2016 plus errata noting all ratified bugs [b-CDG 2016].	_
2016	_	6.0	Release 2016 of the CDG including maintenance updates of the CDG 2015 and additional guidelines that cover new functionalities.	Iris
2015 plus errata	[b-ITU-T H.810 (2015)]	5.1	Release 2015 plus errata noting all ratified bugs [b-CDG 2015]. The 2013 edition of ITU-T H.810 is split into eight parts in the ITU-T H.810-series.	-
2015	_	5.0	Release 2015 of the CDG including maintenance updates of the CDG 2013 and additional guidelines that cover new functionalities.	Genome
2013 plus errata	[b-ITU-T H.810 (2013)]	4.1	Release 2013 plus errata noting all ratified bugs [b-CDG 2013].	_
2013	_	4.0	Release 2013 of the CDG including maintenance updates of the CDG 2012 and additional guidelines that cover new functionalities.	Endorphin
2012 plus errata	_	3.1	Release 2012 plus errata noting all ratified bugs [b-CDG 2012].	_
2012	_	3.0	Release 2012 of the CDG including maintenance updates of the CDG 2011 and additional guidelines that cover new functionalities.	Catalyst
2011 plus errata	_	2.1	CDG 2011 integrated with identified errata.	-
2011	_	2.0	Release 2011 of the CDG including maintenance updates of the CDG 2010 and additional guidelines that cover new functionalities [b-CDG 2011].	Adrenaline
2010 plus errata	_	1.6	CDG 2010 integrated with identified errata.	_
2010	_	1.5	Release 2010 of the CDG with maintenance updates of the CDG Version 1 and additional guidelines that cover new functionalities [b-CDG 2010].	1.5
1.0	_	1.0	First released version of the CDG [b-CDG 1.0].	_

6 Test suite structure

The test purposes (TP) for the Personal Health Devices interface have been divided into the groups and subgroups specified below. Annex A describes the TPs for subgroup 2.4.8 (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)
 - O Subgroup 1.3.5: Thermometer (TH)
 - Subgroup 1.3.6: Cardiovascular (CV)
 - Subgroup 1.3.7: Strength (ST)
 - Subgroup 1.3.8: Activity hub (HUB)
 - Subgroup 1.3.9: Adherence monitor (AM)
 - Subgroup 1.3.10: Insulin pump (IP)
 - Subgroup 1.3.11: Peak flow (PF)
 - Subgroup 1.3.12: Body composition analyser (BCA)
 - Subgroup 1.3.13: Basic electrocardiograph (ECG)
 - Subgroup 1.3.14: International normalized ratio (INR)
 - Subgroup 1.3.15: Sleep apnoea breathing therapy equipment (SABTE)
 - Subgroup 1.3.16: Continuous glucose monitor (CGM)
 - Group 1.4: Personal health device transcoding whitepaper (PHDTW)
 - Subgroup 1.4.1: Whitepaper general requirements (GEN)
 - Subgroup 1.4.2: Whitepaper thermometer requirements (TH)
 - Subgroup 1.4.3: Whitepaper blood pressure requirements (BPM)

- O Subgroup 1.4.4: Whitepaper heart rate requirements (HR)
- Subgroup 1.4.5: Whitepaper glucose meter requirements (GL)
- Subgroup 1.4.6: Whitepaper weight scale requirements (WS)
- Subgroup 1.4.7: Whitepaper pulse oximeter requirements (PLX)
- Subgroup 1.4.8: Whitepaper continuous glucose monitoring requirements (CGM)

- Group 2: Personal Health Gateway (PHG)

- Group 2.1: Transport (TR)
 - Subgroup 2.1.1: Design guidelines: Common (DGC)
 - Subgroup 2.1.2: USB design guidelines (UDG)
 - Subgroup 2.1.3: Bluetooth design guidelines (BDG)
 - Subgroup 2.1.4: Cardiovascular design guidelines (CVDG)
 - Subgroup 2.1.5: Activity hub design guidelines (HUBDG)
 - Subgroup 2.1.6: ZigBee design guidelines (ZDG)
 - Subgroup 2.1.7: Bluetooth low energy design guidelines (BLEDG)
 - Subgroup 2.1.8: NFC design guidelines (NDG)
- Group 2.2: IEEE 20601 Optimized exchange protocol (OXP)
 - Subgroup 2.2.1: General (GEN)
 - Subgroup 2.2.2: PHD domain information model (DIM)
 - Subgroup 2.2.3: PHD service model (SER)
 - Subgroup 2.2.4: PHD communication model (COM)
- Group 2.3: Devices class specializations (CLASS)
 - Subgroup 2.3.1: Weighing scales (WEG)
 - Subgroup 2.3.2: Glucose meter (GL)
 - Subgroup 2.3.3: Pulse oximeter (PO)
 - Subgroup 2.3.4: Blood pressure monitor (BPM)
 - Subgroup 2.3.5: Thermometer (TH)
 - Subgroup 2.3.6: Cardiovascular (CV)
 - Subgroup 2.3.7: Strength (ST)
 - Subgroup 2.3.8: Activity hub (HUB)
 - Subgroup 2.3.9: Adherence monitor (AM)
 - Subgroup 2.3.10: Insulin pump (IP)
 - Subgroup 2.3.11: Peak flow (PF)
 - Subgroup 2.3.12: Body composition analyser (BCA)
 - Subgroup 2.3.13: Basic electrocardiograph (ECG)
 - Subgroup 2.3.14: International normalized ratio (INR)
 - Subgroup 2.3.15: Sleep apnoea breathing therapy equipment (SABTE)
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- Group 2.4: Personal health device transcoding whitepaper (PHDTW)
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 - Subgroup 2.4.2: Whitepaper thermometer requirements (TH)
 - Subgroup 2.4.3: Whitepaper blood pressure measurement requirements (BPM)

- O Subgroup 2.4.4: Whitepaper heart rate requirements (HR)
- Subgroup 2.4.5: Whitepaper glucose meter requirements (GL)
- Subgroup 2.4.6: Whitepaper weight scale requirements (WS)
- Subgroup 2.4.7: Whitepaper pulse oximeter requirements (PLX)
- Subgroup 2.4.8: Whitepaper continuous glucose monitoring requirements (CGM)

7 Electronic attachment

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

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

Annex A

Test purposes

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

A.1 TP definition conventions

The test purposes (TPs) are defined according to the following rules:

- TP Id: This is a unique identifier (TP/<TT>/<DUT>/<GR>/<SGR>/<XX> <NNN>). It is specified according to the naming convention defined below:
 - Each test purpose identifier is introduced by the prefix "TP".
 - <TT>: This is the test tool that will be used in the test case.
 - o 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.
 - BV: Valid behaviour test
 - BI: Invalid behaviour test
 - <NNN>: This is a sequential number that identifies a test purpose.
- TP label: This is the TP's title.
- Coverage: This contains the specification reference and clause to be checked by the TP.
 - Spec: This indicates the earliest version of the specification from which the testable items to be checked by the TP were included.
 - Testable item: This contains the testable items to be checked by the TP.
- Test purpose: This is a description of the requirements to be tested.
- Applicability: This contains the PICS items that define if the test case is applicable or not for a specific device. When a TP contains an "ALL" in this field it means that it applies to the device under test within that scope of the test (specialization, transport used, etc.).
- Other PICS: This contains additional PICS items (apart from the PICS specified in the Applicability row) which are used within the test case implementation and can modify the final verdict. When this row is empty, it means that only the PICS specified in the Applicability row are used within the test case implementation.
- Initial condition: This indicates the state to which the DUT needs to be moved at the beginning of TC execution.
- Test procedure: This describes the steps to be followed in order to execute the test case.
- Pass/Fail criteria: This provides criteria to decide whether the DUT passes or fails the test case.

A.2 Subgroup 2.4.8 – Whitepaper Continuous glucose monitoring requirements (CGM)

TP ld		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]		
Coverage	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	v	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043		
Other PICS	·	6_11// 11_52E_000 / 1115 6_11// 11_52E_002 / 1115 6_11// 11_52E_0 10		
Initial condi	tion	The PHG under test and the simulated Personal Health Device (PHD) are in the Standby state.		
Test proced	lure	 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). 		
		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.		
		4. 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=""></not>		
		b) WAN PCD-01 message		
		PCD-01 message does not include segments with System-Type attribute value (67974^MDC_ATTR_SYS_TYPE^MDC)		

		T		
TP Id TP/LP-PAN/PHG/PHDTW/CGM/BV-001				
TP label		Whitepaper. Continuous Glucos	se Monitoring MDS Object - Dev-	Configuration-Id Attribute
Coverage	Spec	[Bluetooth PHDT v1.6]		
	Testable items	Common MDS 17; M		
Test purpos	se .	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	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.		state.		
Test procedure			igured with a Continuous Glucos asurement ready to be sent and	• •

	 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.
	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 (To assist manual testing)	Possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes
testing)	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 Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-002			
TP label		Whitepaper. Continuous Glucose Monitoring MDS Object - System-Type-Spec-List Attribute			
Coverage	Spec	[Bluetooth PHDT v1.6]			
	Testable items	Common MDS 15; M CGM Specific MDS 2; M			
Test purpos	е	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)			
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 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 (it is discoverable).			
		2. The PHG under test initiates a discovery process (Scanning state), it discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state).			
		When the pairing has been completed (Connection state) the simulated PHD sends the Measurement to the PHG under test.			
		4. Check in PHG transcoder output the MDS Object – System-Type-Spec-List attribute			
Pass/Fail cr	In Step 4, the MDS Object – System-Type-Spec-List attribute is present, its value is (MDC_DEV_SPEC_PROFILE_CGM, Version 1)				
Notes		Possible values in typical points of observation after transcoder output are:			
(To assist material testing)	anual	a) IEEE 11073 Objects and Attributes			
3,		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) W	/AN PCD-01 message
	CD-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 R

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-003			
TP label		Whitepaper. Continuous Glucose Monitoring MDS Object - Reg-Cert-Data-List Attribute			
Coverage	Spec	[Bluetooth PHDT v1.6]			
	Testable items	Common MDS 14; M Regulatory Conv 1; M			
Test purpo	se	Check that:			
	PHG transcodes IEEE 11073-20601 Regulatory Certification Data List characteristic into I Object – Reg-Cert-Data-List attribute				
Applicabili	ty	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043			
Other PICS	3				
Initial cond	dition	The PHG under test and the simulated PHD are in the Standby state.			
Test proce	dure	 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). 			
		The simulated PHD implements several BTLE characteristics. The characteristic of interest for this Test Case is:			
		a. IEEE 11073-20601 Regulatory Certification Data List (0x2A2A)			
		Format: reg-cert-data-list (opaque structure)			
		Value: 00 02 00 12 02 01 00 08 08 00 00 01 00 02 80 1A 02 02 00 02 80 00 (hex)			
		i. Element:			
		auth-body-and-struc-type:			
		- auth-body: 02 (hex) auth-body-continua(2)			
		- auth-body-struc-type: 01 (hex). continua-version-struct(1)			
		auth-body-data:			
		- major-IG-version: 08 (hex)			
		- minor-IG-version: 00 (hex)			
		- certified-devices: 80 1A (hex) BLE Continuous Glucose Monitor			
		ii. Element:			
		auth-body-and-struc-type:			
		- auth-body: 02 (hex). auth-body-continua(2)			
		- auth-body-struc-type: 02 (hex). continua-reg-struct(2)			
		auth-body-data:			
		- regulation-bit-field: 80 00 (hex). Unregulated device			
		3. The PHG under test initiates a discovery process (Scanning state), it discovers the simulated PHD and it starts a pairing process with simulated PHD.			
		4. 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 (To assist manual testing)	Possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes		
	Reg-Cert-Data-List attribute is present:		
	☐ Object: MDS Object		
	☐ Attribute-id: MDC_ATTR_REG_CERT_DATA_LIST (2635)		
	☐ Attribute-type: SEQUENCE OF [{auth-body-and-struc-type, auth-body-data}, {}]		
	Attribute-value: 00 02 00 12 02 01 00 08 08 00 00 01 00 02 80 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]		
	i. Reg-Cert-Data Element:		
	auth-body-and-struc-type:		
	- auth-body: 02 (hex) auth-body-continua(2)		
	- auth-body-struc-type: 01 (hex). continua-version-struct(1)		
	auth-body-data:		
	- major-IG-version: 08 (hex)		
	- minor-IG-version: 00 (hex)		
	- certified-devices: 80 1A (hex). BLE Continuous Glucose Monitor		
	ii. Reg-Cert-Data Element:		
	auth-body-and-struc-type:		
	- auth-body: 02 (hex). auth-body-continua(2)		
	- auth-body-struc-type: 02 (hex). continua-reg-struct(2)		
	auth-body-data:		
	- regulation-bit-field: 80 00 (hex). Unregulated device		
	b) WAN PCD-01 message		
	PCD-01 message includes five segments like these with Reg-Cert-Data-List attribute value (check OBX-5 in five segments):		
	OBX ? CWE 68218^MDC_REG_CERT_DATA_AUTH_BODY^MDC 1.0.0.a 2^auth-body-continua R		
	OBX ? ST 532352^MDC_REG_CERT_DATA_CONTINUA_VERSION^MDC 1.0.0.a.x 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^MDC_REG_CERT_DATA_AUTH_BODY^MDC 1.0.0.b 2^auth-body-continua R		
	OBX ? CWE 532354^MDC_REG_CERT_DATA_CONTINUA_REG_STATUS^MDC 1.0.0.b.z 1^unregulated-device(0) R		

TP Id TP/LP-PAN/PHG/PHDTW/C		TP/LP-PAN/PHG/PHDTW/CGM/BV-004		
TP label	Plabel Whitepaper. Glucose Numeric Object - Handle Attribute			
Coverage	Spec	[Bluetooth PHDT v1.6]		
	Testable items	Glucose Numeric 1; O		
Test purpose		Check that:		
		PHG does not include Glucose Numeric (Object – Handle Attribute in transcoder output.	

	IOPI		
	[OR] If PHG includes Glucose 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.		
	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		
	 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: 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		
	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, 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.		
	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 (To assist manual	Possible values in typical points of observation after transcoder output are:		

testing)	a)	IEEE 11073 Objects and Attributes	
		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 ld		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 purpos	е	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_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), 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 0000 0000 (MSB → LSB). No extra features supported. 			
		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
- 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: SFLOATValue: not relevant

iv. Field: Time OffsetFormat: 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).
- 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
- 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) 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
- 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 38 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** Possible values in typical points of observation after transcoder output are: (To assist manual IEEE 11073 Objects and Attributes testing) 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

 $OBX[n]NM]160196^{M}DC_CONC_GLU_VENOUS_PLASMA^{M}DC[m.0.0.x|[value]]\\ 264274^{M}DC_DIM_MILLI_G_PER_DL^{M}DC[||||R|||[date_time]]$

Step 12

 $\label{eq:obx_non_conc_glu_arterial_wholeblood_mdc} OBX|n|NM|160200^MDC_CONC_GLU_ARTERIAL_WHOLEBLOOD^MDC|\\ m.0.0.x|[value]|264274^MDC_DIM_MILLI_G_PER_DL^MDC|||||R|||[date_time]$

• Step 13

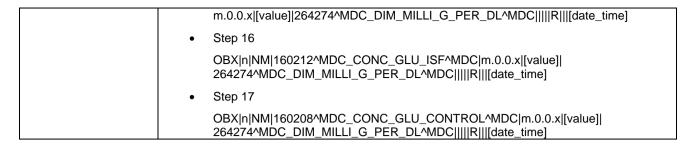
OBX|n|NM|160204^MDC_CONC_GLU_ARTERIAL_PLASMA^MDC|m.0.0.x|[value]| 264274^MDC_DIM_MILLI_G_PER_DL^MDC|||||R|||[date_time]

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

OBX|n|NM|160368^MDC_CONC_GLU_UNDETERMINED_PLASMA^MDC|



TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-006			
TP label					
Coverage	Spec	[Bluetooth PHDT v1.6]			
Coverage	Testable				
	items	Glucose Numeric 3; O			
Test purpos	ie .	Check that:			
		PHG may include Glucose Numeric Object – Supplemental-Types attribute in transcoder output.			
		[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 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), 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 0000 0000 (MSB → LSB). No extra features supported. 			
		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			

- 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: SFLOATValue: not relevant

iv. Field: Time OffsetFormat: 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).
- 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 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)
- b) 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

OBX n CWE 68193^MDC_ATTR_SUPPLEMENTAL_TYPES^MDC m.0.0.x.y 8417848^MDC_CTXT_GLU_SAMPLELOCATION_FINGER^MDC R
• Step 9
OBX n CWE 68193^MDC_ATTR_SUPPLEMENTAL_TYPES^MDC m.0.0.x.y 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

TDII		TRUE BRANCHOURING CAMPLY CO.			
TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-007			
TP label		Whitepaper. Glucose Numeric Object - Metric-Spec-Small Attribute			
Coverage	Spec	[Bluetooth PHDT v1.6]			
	Testable items	Glucose Numeric 4; M			
Test purpos	e	Check that:			
		PHG includes Glucose Numeric Object – Metric-Spec-Small attribute in transcoder output.			
		[AND]			
		Metric-Spec-Small is set to {0xC042}.			
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 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 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: 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). 		
	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		
	 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 – 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 testing)	a) IEEE 11073 Objects and Attributes		
,g,	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 ld		TP/LP-PAN/	PHG/PHDTW/CGM/F	3V-008		
TP label		Whitepaper.	Glucose Numeric Ob	oject – Measurement-Status A	Attribute	
Coverage	Spec	[Bluetooth PHDT v1.6]				
3	Testable items	Glucose Nu	•			
Test purpos	se	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	у	C_MAN_BL	E_000 AND C_MAN_	BLE_002 AND C_MAN_BLE	_043	
Other PICS						
Initial condi	tion	The PHG ur	der test and the simu	lated PHD are in the Standby	/ state.	
Test proced	lure	speciali state (it	zation), it has a CGM	ured with a Continuous Gluco measurement ready to be se simulated PHD also has an i	nt and it is in the Advertising	
			ulated PHD impleme for this Test Case are	nts several BTLE characterist e:	tics. The characteristics of	
		a. CG	M Feature (0x2AA8)			
		i. Field: CGM Feature				
		Format: 24 bit				
			supported, pati- alerts supported alert supported high-low detect low battery dete	d, rate of increase/decrease a	hypo alerts supported, hyper alerts supported, device specific a supported, sensor temperature high-low detection supported,	
		ii.	Field: CGM Type			
			Format: 4 bit			
			Value: not relevant	/ant		
		iii.	Field: CGM Sample	Location		
			Format: 4 bit			
			Value: not relevant	/ant		
		iv.	Field: E2E-CRC			
			Format: uint16			
			Value: not relevant	/ant		
		b. CG	M Measurement (0x2	2AA7)		
		i.	Field: Size			
			• Format: uint8			
		ii.	Field: Flags			
			• Format: 8 bit			
			Quality nor prespresent, Senso	sent, Sensor Status Annuncia	d information not present, CGM tion Field (Warning-Octet) not Cal/Temp-Octet) present, Sensor present.	
		iii.	Field: CGM Glucose	e 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

- 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 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.
- 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 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	Possible values in typical points of observation after transcoder output are:
(To assist manual testing)	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
	Step 8

OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL MDC INV X [date_time] 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] • Step 13 OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL ^MDC ALACT R [date_time] • Step 14 OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL ^MDC INV X [date_time] • Step 15 OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL	
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]] Step 13 OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL_MDC ALACT R [date_time]] Step 14 OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL_MDC ALACT R [date_time]] Step 14 OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL_MDC INV X [date_time]] Step 15 OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL_MDC INV X [date_time]]	• Step 9
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] Step 13 OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL ^MDC ALACT R [date_time] Step 14 OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL ^MDC INV X [date_time] Step 15 OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL ^MDC INV X [date_time]	
 AMDC 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] Step 13 OBX n NM GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL_^MDC ALACT R [date_time] Step 14 OBX n NM GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL_^MDC INV X [date_time] Step 15 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 12 OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL ^MDC ALACT R [date_time] • Step 13 OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL ^MDC ALACT R [date_time] • Step 14 OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL ^MDC INV X [date_time] • Step 15 OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL ^MDC INV X [date_time]	
 ^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] Step 13 OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL_^MDC ALACT R [date_time] Step 14 OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL_^MDC INV X [date_time] Step 15 OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL_MDC INV X INV X INV X INV X X X X 	• Step 11
OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL ^MDC ALACT R [date_time] • Step 13 OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL ^MDC ALACT R [date_time] • Step 14 OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL ^MDC INV X [date_time] • Step 15 OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL	11 16 21 21 = = = = =
 AMDC ALACT R [date_time] Step 13 OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL_^MDC ALACT R [date_time] Step 14 OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL_^MDC INV X [date_time] Step 15 OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL	• Step 12
OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL ^MDC ALACT R [date_time] Step 14 OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL ^MDC INV X [date_time] Step 15 OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL	
AMDC ALACT R [date_time] Step 14 OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL_AMDC INV X [date_time] Step 15 OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL_AMDC_DIM_MILLI_AMDC_DIM_MI	• Step 13
OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL ^MDC INV X [date_time] Step 15 OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL	
^MDC INV X [date_time] ■ Step 15 OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL	• Step 14
. OBX n NM [GlucoseType] m.0.0.x [value] 264274^MDC_DIM_MILLI_G_PER_DL	
	Step 15

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		
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 characteristic of interest for this Test Case is:		
		a. 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: 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		
	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 testing)	a) IEEE 11073 Objects and Attributes		
	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 Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-010		
TP label		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 outpu				
	[AND] Base-Offset-Time-Stamp attribute is set to the correct value according to Base-Offset time				
	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), 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 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 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: 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).			
	 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 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.			
	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			
tooting,	Base-Offset-Time-Stamp attribute is present:			
	☐ Object: Glucose 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			
	 CGM Session Start Time characteristic Session Start Time field (May 12, 2016, 16:39:27) 			
	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			

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-011_A		
TP label		Whitepaper. Glucose Numeric Object – Basic-Nu-Observed-Value Attribute		
Coverage	Spec	[Bluetooth PHDT v1.6]		
	Testable items	Glucose Numeric 8; M		
Test purpose		Check that:		
		PHG includes Glucose 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			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 characteristic of interest for this Test Case is:			
	a. 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: 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). 			
	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 the PHG under test.			
	 Check in the PHG transcoder output the Glucose Numeric Object –Basic-Nu-Observed-Value attribute 			
	6. The PHG under test requests the simulated PHD to report stored records by performing a writing operation in the Record Access Control Point (RACP). 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			
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			
10011119/	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)
b) V	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 [GlucoseType] m.0.0.x 160 264274^MDC_DIM_MILLI_G_PER_DL^MDC R [date_time]

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		meric 9; M	Glucose Numeric 10; M	Float Type 1; C		
	items	Float Type 2	2; M				
Test purpos	se	Check that:					
		PHG transcodes CGM Glucose Concentration field of CGM Measurement characteristic into Glucose Numeric Object – Basic-Nu-Observed-Value attribute					
		[AND]					
			s the following spec nd -INFINITY (0x08)	cial values: NaN (0x07FF), NRes 02)	s (0x0800), +INFINITY		
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 ur	nder test and the sir	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. CG	M Feature (0x2AA	8)			
		i.	Field: CGM Featu	ire			
			• Format: 24 bi	it			
			supported, pa alerts support alert supporte high-low dete low battery de	2000 0000 1111 1111 1111 (MS) atient high/low alerts supported, leted, rate of increase/decrease alled, sensor malfunction detection apported, sensor result hierection supported, sensor type of fault supported.	hypo alerts supported, hyper erts supported, device specific supported, sensor temperature igh-low detection supported,		
		ii.	Field: CGM Type				
			• Format: 4 bit				
			Value: not rel	levant			
		iii.	Field: CGM Samp	le Location			
			Format: 4 bit				
			Value: not rel	levant			
		iv.	Field: E2E-CRC				
			Format: uint1	6			
			Value: not rel	levant			
		b. CG	M Measurement (0	x2AA7)			

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: 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

- 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), 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
- 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: 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.
- 10. 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: 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

- 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				
	 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: 07 FE(hex). Special value: +INFINITY				
	iv. Field: Time Offset				
	Format: uint16				
	Value: not relevant				
	v. Field: Sensor Status Annunciation				
	Format: 8 bit				
	 Value: 1000 0000 (MSB → LSB) (sensor result higher 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				
	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 testing)	a) IEEE 11073 Objects and Attributes				
, 	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) WAN 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 purpos	se	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	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), 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, hyper 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: 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 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
- 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), 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
- 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.
- 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)

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 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

11. 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				
	13. 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	Possible values in typical points of observation after transcoder output are:				
(To assist manual testing)	a) IEEE 11073 Objects and Attributes				
	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	1	Whitepaper. Sensor Calibration Numeric Object - Handle Attribute					
Coverage	Spec	[Bluetooth PHDT v1.6]					
	Testable items	SensCal Numeric 1; O					
Test purpos	se	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	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). The simulated PHD has a Calibration Data Record 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 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).					
	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 – 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	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: Sensor Calibration 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-014
TP label	Whitepaper. Sensor Calibration Numeric Object - Type Attribute

Coverage	Spec	[Blueto	oth P	HDT v1.6]		
	Testable	SensC	al Nu	meric 2; M		
	items					
Test purpos	e	Check that:				
		PHG includes Sensor Calibration Numeric Object – Type attribute in transcoder output.				
		[AND]				
		Type is	set t	o MDC_PART_PF	D_DM MDC_CGM_SENSOR_C	CALIBRATION
Applicability	/	C_MAN	N_BL	E_000 AND C_MA	N_BLE_002 AND C_MAN_BLE_	043
Other PICS						
Initial condi	tion	The Ph	IG ur	der test and the si	mulated 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. 			
				ulated PHD imple for this Test Case	nents several BTLE characteristic are:	cs. The characteristics of
		a.	CG	M Feature (0x2AA	8)	
			i.	Field: CGM Feat	ıre	
				☐ Format: 24 b	it	
				□ Value: 0000 supported.	0000 0000 0000 0000 000 1 (MSE	3 → LSB). Calibration
			ii.	Field: CGM Type		
			☐ Format: 4 bit			
			☐ Value: not relevant			
		iii. Field: CGM Sample Location				
				☐ Format: 4 bit		
				□ Value: not re	levant	
			iv.	Field: E2E-CRC		
				☐ Format: uint	6	
				□ Value: not re	levant	
		b.	CG	M Specific Ops Co	ontrol Point (0x2AAC)	
			i.	Field: Op Code		
				☐ Format: uint		
				□ Value: 0x06	(Glucose Calibration Value Respo	onse)
			ii.		Value – Glucose concentration o	f Calibration (mg/dL)
				☐ Format: SFL		
				□ Value: not re		
			iii.		Value – Calibration Time	
				☐ Format: uint		
			□ Value: not re			
			iv.		Value – Calibration Type	
				□ Format: 4 bit		
				□ Value: not re		
			V.		Value – Calibration Sample Loca	tion
				□ Format: 4 bit		
				□ Value: not re		
			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.
	6. Check in PHG transcoder output the Sensor Calibration Numeric Object – Type attribute
Pass/Fail criteria	In Step 6, the Sensor Calibration Numeric Object – Type attribute is present and set to MDC_PART_PHD_DM MDC_CGM_SENSOR_CALIBRATION
Notes	Possible values in typical points of observation after transcoder output are:
(To assist manual testing)	a) IEEE 11073 Objects and Attributes
l tooming,	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:
	 partition: MDC_PART_PHD_DM or 128 (dec) or 00 80 (hex)
	code: MDC_CGM_SENSOR_CALIBRATION or 29428 (dec) or 72 F4 (hex)
	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	SensCal Numeric 3; O					
Test purpos	se .	Check that:						
		PHG may include Sensor Calibration Numeric Object – Supplemental-Types attribute in transcoder output.						
		[AND]						
		If present, Supplemental-Types in Calibration Data Record	s is set to the correct value accord	ding to Sample Location Nibble				

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 six different Calibration Data Records 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 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 (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.	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 "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 – 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 present, 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 Possible values in typical points of observation after transcoder output are: (To assist manual IEEE 11073 Objects and Attributes testing) 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) 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): 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

OBXInICWEI68193^MDC ATTR SUPPLEMENTAL TYPES^MDCIm.0.0.x.yl

Step 8

	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		Whitepaper. Sensor Calibration Numeric Object - Metric-Spec-Small Attribute 1							
Coverage	Spec	[Bluetooth PHDT v1.6]							
	Testable items	SensCal Numeric 4; M SensCal Numeric 6; M							
Test purpos	se	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	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	lure	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)							

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	□ 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).
	4. When the pairing has been completed, force the PHG to read CGM Feature and CGM Session Start Time characteristics, and then to request the las 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).
	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, which was manually updated by the user.
	Check in PHG transcoder output the Sensor Calibration Numeric Object – Metric-Spec- Small attribute
Pass/Fail criteria	In Step 6, the Sensor Calibration 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: Sensor Calibration Numeric Object
	☐ Attribute-id: MDC_ATTR_METRIC_SPEC_SMALL (2630)
	☐ Attribute-type: BITS-16
	Attribute-value: 0x604C (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/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 Nu	ımeric 4; M	SensCal Numeric 5; M				
Test purpos	e	Check that:						
		PHG includ output.	es Sensor Calibrati	on Numeric Object – Metric-Spec	:-Small attribute in transcoder			
		[AND] Metric-Spec-Small is set to {0x6044} when the Glucose Calibration procedure has been executed.						
Applicability	/	C_MAN_BL	E_000 AND C_MA	N_BLE_002 AND C_MAN_BLE_	043			
Other PICS								
Initial condi	tion	The PHG u	nder test and the si	mulated PHD are in the Standby	state.			
Test proced	ure		nulated PHD is conization).	figured with a Continuous Glucos	e Monitoring Profile (device			
			nulated PHD impler for this Test Case	ments several BTLE characteristicare:	cs. The characteristics of			
		a. CC	GM Feature (0x2AA	8)				
		i.	Field: CGM Featu	ure				
			☐ Format: 24 b	it				
			□ Value: 0000 supported.	0000 0000 0000 0000 000 1 (MSI	B → LSB). Calibration			
		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: uint1	16				
			□ Value: not re	levant				
		b. CC	SM Specific Ops Co	ontrol Point (0x2AAC)				
		i.	Field: Op Code					
			☐ Format: uint8	3				
			□ Value: 0x06	(Glucose Calibration Value Resp	onse)			
		ii.	Field: Calibration	Value – Glucose concentration of	f Calibration (mg/dL)			
			☐ Format: SFL	OAT				
			□ Value: not re	levant				
		iii.	Field: Calibration	Value – Calibration Time				
			☐ Format: uint1	16				
			□ Value: not re	levant				
		iv.	Field: Calibration	Value – Calibration Type				
			☐ Format: 4 bit					
			□ Value: not re	levant				

	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
	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, force the PHG to read CGM Feature and CGM Session Start Time characteristics.
	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.
	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 testing)	a) IEEE 11073 Objects and Attributes
	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 ld		TP/	LP-P	AN/	PHG/PHDTW/CGI	M/BV-017	
TP label	Wh	itepa	per.	Sensor Calibration	n Numeric Object – Measurer	nent-Status Attribute	
Coverage	Spec	[Bluetooth PHDT v1.6]					
	Testable items	Ser	nsCal	l Nu	meric 7; O	SensCal Numeric 8; M	SensCal Numeric 9; M
Test purpos	se	Che	eck th	nat:			
					clude Sensor Calib output.	oration Numeric Object – Mea	surement-Status attribute in
		[AN	ID]				
	If present and related to the Sensor Status Annunciation field, Measurement-Status is set to the correct value						
Applicabilit	у	C_I	MAN	_BLI	E_000 AND C_MA	N_BLE_002 AND C_MAN_B	LE_043
Other PICS							
Initial condi	ition	The	PH(G ur	der test and the si	mulated PHD are in the Stand	dby state.
Test proced	lure	1.					ucose Monitoring Profile (device alibration Data Records stored.
		2.			ulated PHD impler for this Test Case		ristics. The characteristics of
			a.	CG	M Feature (0x2AA	.8)	
				i.	Field: CGM Featu	ure	
					☐ Format: 24 b	it	
					□ Value: 0000 supported.	0000 0000 0000 0000 0001 (MSB → LSB). Calibration
				ii.	Field: CGM Type		
					☐ Format: 4 bit		
					☐ Value: not re	elevant	
				iii.	Field: CGM Samp	ple Location	
					☐ Format: 4 bit		
					□ Value: not re	elevant	
				iv.	Field: E2E-CRC		
					☐ Format: uint1	16	
					□ Value: not re	elevant	
			b.	CG	M Specific Ops Co	ontrol Point (0x2AAC)	
				i.	Field: Op Code		
					☐ Format: uint8	3	
					□ Value: 0x06	(Glucose Calibration Value R	esponse)
				ii.	Field: Calibration	Value – Glucose concentration	on of Calibration (mg/dL)
					☐ Format: SFL	OAT	
					□ Value: not re	elevant	
				iii.	Field: Calibration	Value – Calibration Time	
					☐ Format: uint1	16	
					□ Value: not re		
				iv.	Field: Calibration	Value – Calibration Type	
					☐ Format: 4 bit		
					□ Value: not re	elevant	
				٧.	Field: Calibration	Value - Calibration Sample I	_ocation

	D. Francis Abit
	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: 1 to 4 (four Calibration Data Records (CDR) stored)
	viii. Field: Calibration Value – Calibration Status
	☐ Format: 8 bit
	□ Value (CDR number 1): 0000 0001 (calibration data rejected)
	□ Value (CDR number 2): 0000 0010 (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
	5. 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, 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).
	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
	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
	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
	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, 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	Possible values in typical points of observation after transcoder output are:
(To assist manual) IEEE 11073 Objects and Attributes

testing)		If N	leasurement-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)
			Attribute-value (Step 7): "invalid" (0x8000)
			Attribute-value (Step 8): "calibration-ongoing" (0x1000)
			Attribute-value (Step 9): "validated-data" (0x0080)
	b)	WA	N PCD-01 message
			leasurement-Status is present, PCD-01 message includes a segment like this with asurement-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	e	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	/	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.						
		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
	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, 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.
	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	Possible values in typical points of observation after transcoder output are:				
(To assist manual testing)	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	[Blue	tooth	PHD	T v1.6]		_			
	Testable items	SensCal Numeric 11; M				BaseOffset 3; M				
Test purpos	e	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_M	AN_B	LE_0	00 AND C_MA	N_BLE_002 AND C_MAN_BLE_	043			
Other PICS										
Initial condi	tion	The	PHG ι	ınder	test and the si	mulated 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. 							
					ted PHD impler this Test Case	ments several BTLE characteristi are:	cs. The characteristics of			
		;	a. C	GM S	Session Start Ti	ime (0x2AAA)				
			i.	Fie	eld: Session Sta	art Time				
					Format: {uint	16, uint8, uint8, uint8, uint8, uint8	3}			
					Value: {2016	, 5, 12, 16, 39, 27} (May 12, 2010	6, 16:39:27)			
			ii.	Fie	eld: Time Zone					
					Format: sint8	3				
					Value: 4 (UT	C+1:00)				
			iii	Fie	eld: DST-Offset	t				
					Format: uint8	3				
					Value: 4 (Day	ylight Time (+1h))				
			iv	. Fie	eld: E2E-CRC					
					This field is r	not included				
			b. C		eature (0x2AA	,				
			i.	Fie	eld: CGM Featu					
					Format: 24 b	it				

			Value: 0000 0000 0000 0000 0001 (MSB → LSB). Calibration supported.
	ii	. Fie	eld: CGM Type
			Format: 4 bit
			Value: not relevant
	iii	i. Fie	eld: CGM Sample Location
			Format: 4 bit
			Value: not relevant
	i۱	. Fie	eld: E2E-CRC
			Format: uint16
			Value: not relevant
	c. C	GM S	Specific Ops Control Point (0x2AAC)
	i.	Fie	eld: Op Code
			Format: uint8
			Value: 0x06 (Glucose Calibration Value Response)
	ii	. Fie	eld: Calibration Value – Glucose concentration of Calibration (mg/dL)
			Format: SFLOAT
			Value: not relevant
	iii	i. Fie	eld: Calibration Value – Calibration Time
			Format: uint16 (min)
			Value: 20
	iv	. Fie	eld: Calibration Value – Calibration Type
			Format: 4 bit
			Value: not relevant
	٧	. Fie	eld: Calibration Value – Calibration Sample Location
			Format: 4 bit
			Value: not relevant
	V	i. Fie	eld: Calibration Value - Next Calibration Time
			Format: uint16
			Value: not relevant
	٧	ii. Fie	eld: Calibration Value – Calibration Data Record Number
			Format: uint16
			Value: not relevant
	٧	iii. Fie	eld: Calibration Value – Calibration Status
			Format: 8 bit
			Value: not relevant
	ίχ	. 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.	Session using performance perf	on Sta Op C ming	pairing has been completed, force the PHG to read CGM Feature and CGM art Time characteristics, and then to perform a Glucose Calibration procedure ode "Get Glucose Calibration value" (0x05) with Operand "0xFFFF" (by a write operation to the CGM Specific Ops Control Point characteristic's Op Calibration Data Record Number fields respectively).
5.			ted PHD will respond with an indication including a "Calibration Value Op Code (0x06) and a Calibration Data Record containing the requested

	calibration information.			
	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			
O,	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			
	CGM Session Start Time characteristic Session Start Time field (May 12, 2016, 16:39:27)			
	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 purpos	se	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	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). The simulated PHD has a Calibration Data Record 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 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.	റ്ദ	M Specific Ops Control Point (0x2AAC)
		i.	Field: Op Code
		١.	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
		ıv.	Format: 4 bit
			□ Value: not relevant
		v.	Field: Calibration Value – Calibration Sample Location
		v.	Fried. Calibration value – Calibration Sample Location
			□ Value: not relevant
		vi.	Field: Calibration Value - Next Calibration Time
		VI.	Format: uint16
			□ Value: not relevant
		vii	Field: Calibration Value – Calibration Data Record Number
		VII.	Format: uint16
			□ Value: not relevant
		.,;;;	Field: Calibration Value – Calibration Status
		vill.	Fried. Calibration value – Calibration Status Format: 8 bit
			□ Value: not relevant
		ix.	Field: E2E-CRC
		IX.	☐ This field is not present
3.	The	пЦ	G under test initiates a discovery process (Scanning state), it discovers the
Э.			d PHD and it starts a pairing process with the simulated PHD (Initiating state).
4.	Sess using perfo	sion g O 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 to Code "Get Glucose Calibration value" (0x05) with Operand "0xFFFF" (by one a write operation to the CGM Specific Ops Control Point characteristic's Op d Calibration Data Record Number fields respectively).
5.	Resp	oon	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 – 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 (To assist manual testing)	Possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Basic-Nu-Observed-Value attribute is present: Object: 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 ld		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	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	lure	 The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). 								
		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).
	 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 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
liceg,	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

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-022							
TP label		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							
Applicabilit	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 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).				
	 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 the PHG transcoder output the Sensor Run-time Numeric Object – Type attribute				
Pass/Fail criteria	n 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				
3,	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:				
	 partition: MDC_PART_PHD_DM or 128 (dec) or 00 80 (hex) 				
	 code: MDC_CGM_SENSOR_RUN_TIME or 29432 (dec) or 72 F8 (hex) 				
	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 purpose		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 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	The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization).					
	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					
	Value: not relevant					
	ii. 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, 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	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: 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 ld	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		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					
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). 					
		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					
		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).					
		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 – Unit-Code attribute					
Pass/Fail cr	criteria In Step 5 the Sensor Run-time Numeric Object – Unit-Code attribute is present and its set to MDC_DIM_HR						
Notes	_	Possible values in typical points of observation after transcoder output are:					
(To assist m testing)	nanual	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-Stamp Attribute				
Coverage	Spec	[Bluetooth PHDT v1.6]					
	Testable items	-			c 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_N	IAN_	_BLE	E_000 AND C_MA	AN_BLE_002 AND C_MAN_BLE_043	
Other PICS							
Initial condit	ion	The	PHO	3 un	der test and the si	simulated PHD are in the Standby state.	
Test procedure		2.	spe The	cializ sim rest	zation). ulated PHD impler for this Test Case M Session Start Ti Field: Session Start • Format: {uint	Time (0x2AAA)	
		iv b. C i.			 Format: uint8 Value: 4 (Daylight Time (+1h)) 		

	simulated PHD and it starts a pairing process with the simulated PHD (Initiating state).				
	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 – 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 testing)	a) IEEE 11073 Objects and Attributes				
	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 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.				
Applicabilit	у	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043				
Other PICS						
Initial condi	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 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 (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).				
	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 – 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				
,g,	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				e Attribute	
Coverage	Spec	[Bluetooth PHDT v1.6]			
	Testable items	GSI Numeric 1; O			
Test purpose		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 output, then its value shall be different than 0			andle attribute in transcoder		
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). 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: not relevant		
	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). 		
	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).		
	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 – Handle attribute		
Pass/Fail criteria	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		
Notes	Possible values in typical points of observation after transcoder output are:		
(To assist manual testing)	IEEE 11073 Objects and Attributes		
3,	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		Attribute	
Coverage	ge 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 transcod [OR]		·			
		Type is set to MDC_PART_PHD_DM MDC_CGM_SENSOR_SAMPLE_INTERVAL			
Applicabilit	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	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		
	 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 – 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		
	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:		
	 partition: MDC_PART_PHD_DM or 128 (dec) or 00 80 (hex) 		
	 code: MDC_CGM_SENSOR_SAMPLE_INTERVAL or 29436 (dec) or 72 FC (hex) 		
	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/PHDTW/CGM/BV-029_A		
TP label		Whitepaper. Glucose Sampling Interval Numeric Object - Metric-Spec-Small Attribute 1		
Coverage	Spec	[Bluetooth PHDT v1.6]		
Testable items		GSI Numeric 3; M	GSI Numeric 5; M	
Test purpos	se	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.		
	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		
,g,	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		

TP ld	TP/LP-PAN/PHG/PHDTW/CGM/BV-029_B	
TP label	Whitepaper. Glucose Sampling Interval Numeric Object - Metric-Spec-Small Attribute 2	

Coverage	Spec	[Bluetooth PHDT v1.6]				
	Testable items	GSI Numeric 3; M	GSI Numeric 4; M			
Test purpos	ie	Check that:				
		PHG includes Glucose Sampling Interval Numeric Object – Metric-Spec-Small attribute in transcoder output.				
		[AND]				
		Metric-Spec-Small is se been executed	et to {0x6044} when the CGM Commi	unication Interval procedure has		
Applicability	у	C_MAN_BLE_000 AND	C_MAN_BLE_002 AND C_MAN_B	LE_043 AND C_MAN_BLE_044		
Other PICS						
Initial condi	tion	The PHG under test and	d the simulated PHD are in the Stand	dby state.		
Test proced	lure	The simulated PHD specialization).	is configured with a Continuous Glu	ucose Monitoring Profile (device		
		The simulated PHD interest for this Tes	D implements several BTLE characte st Case is:	ristics. The characteristic of		
		a. CGM Specific	Ops Control Point (0x2AAC)			
		i. Field: Op	Code			
		• Forma	at: uint8			
		• Value	e: 0x03			
		іі. Field: Оре	erand			
		• Forma	at: uint8 (min)			
		• Value	e: not relevant			
		iii. Field: E2E	E-CRC			
		• This f	ield is not present			
			st initiates a discovery process (Scan d it starts a pairing process with the s			
		performing a CGM Communication Int write operation to the Operand fields, res	as been completed, force the PHG to Communication Interval procedure userval" (0x01) followed by a valid UIN he CGM Specific Ops Control Point opectively). The simulated PHD will rede value of "Success".	rsing Op Code "Set CGM T8 value in minutes (performing a characteristic's Op Code and		
		"Get CGM Commu	G to perform a CGM Communication nication Interval" (0x02) (performing ol Point characteristic's Op Code field	a write operation to the CGM		
			O will respond with an indication include (0x03) and an UINT8 containing the			
		Check in the PHG transcoder output the Glucose Sampling Interval Numeric Object – Metric-Spec-Small attribute				
Pass/Fail cr	iteria	In Step 7, the Sensor Calibration Numeric Object – Metric-Spec-Small attribute is prese its value is {0x6044} (mss-avail-stored-data mss-upd-aperiodic mss-acc-agent-initiate mss-cat-setting)				
Notes	_	Possible values in typic	al points of observation after transco	der output are:		
(To assist manual testing)		a) IEEE 11073 Object	ts and Attributes			
		Metric-Spec-Small	attribute is present:			
		☐ Object: Glucos	se Sampling Interval Numeric Object			
		☐ Attribute-id: MI	DC_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) V	VAN PCD-01 message
Р	PCD-01 message does not include segments with Metric-Spec-Small attribute value

TP Id		TD// D DAN/DUC/DUDTW/CCM/DV 020			
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]			
	Testable items	GSI Numeric 6; M			
Test purpos	е	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 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). 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: 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 the PHG transcoder output the Glucose Sampling Interval Numeric Unit-Code attribute				
Pass/Fail cri	iteria	In Step 6 the Glucose Sampling Interval Numeric Object – Unit-Code attribute is present and its value is set to MDC_DIM_MIN			
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: 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)	
WAN PCD-01 message	
PCD-01 message includes a segment like this with Unit-Code attribute value (chec 6):	ck OBX-
OBX n NM 8418044^MDC_CGM_SENSOR_SAMPLE_INTERVAL^MDC m.0.0.x [value] 264352^MDC_DIM_MIN^MDC R [date_time]	

TP ld		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	se	Check that:				
		PHG includes Glucose Sampling Interval 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 (Base-Offset-Time-Stamp attribute will be derived from the collector's time at the time of collection)				
Applicability	у	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043				
Other PICS						
Initial condi	ition	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 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: 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 cr	iteria	In Step 6 the Glucose Sampling Interval Numeric Object – Base-Offset-Time-Stamp attribute 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: 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 Id		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	e	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.			
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	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: 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).			
		 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 – 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 (To assist manual testing)	Possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes Basic-Nu-Observed-Value attribute is present: Object: 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 ld		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 purpos	е	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 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), 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 1000 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 Field: Flegg
	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
	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
3 ,	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 ld		TP/I P-PA	N/PHG/PHDTW/CGM/BV-034				
TP label		Whitepaper. Glucose trend Numeric Object - Type Attribute					
Coverage	Spec		PHDT v1.6]				
Coverage	Testable items	GT Nume					
Test purpos	е	Check tha	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	/	C_MAN_E	BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043				
Other PICS							
Initial condit	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), 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.					
			imulated PHD implements several BTLE characteristics. The characteristics of st for this Test Case are:				
		a. C	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				
		ii	i. Field: CGM Sample Location				
			Format: 4 bit				
			Value: not relevant				
		iv	v. Field: E2E-CRC				
			Format: uint16				
			Value: not relevant				
		b. C	CGM Measurement (0x2AA7)				
		i.	Field: Size				
			Format: uint8				
		ii	5				
			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. 				
		ii	i. 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).	
	 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– 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. 	
	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	
3,	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:	
	 partition: MDC_PART_PHD_DM or 128 (dec) or 00 80 (hex) 	
	code: MDC_CONC_GLU_TREND or 29400 (dec) or 72 D8 (hex)	
	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 ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-035		
TP label		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 Nur	meric Object – Metric-Spec-Sma	all 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		
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 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	
	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– 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.	
	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	Possible values in typical points of observation after transcoder output are:	
(To assist manual testing)	a) IEEE 11073 Objects and Attributes	
, g,	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	
	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-036		
TP label		Whitepaper. Glucose trend Numeric Object – Measurement-Status Attribute		
Coverage	Spec	[Bluetooth PHDT v1.6]		
	Testable items	GT Numeric 4; O		
Test purpos	e	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.		
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
 - Value: 0000 0000 1000 0000 0001 0000 (MSB → LSB). CGM trend information supported, rate of increase/decrease alert 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.

	6.	Check in the PHG transcoder output the Glucose trend Numeric Object– Measurement- Status 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 – 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	•	In Step 6 and 8 the Glucose trend Numeric Object – Measurement-Status attribute, if present, is set to "measurement outside threshold boundaries" (bit 14).
	•	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.
Notes	Pos	ssible values in typical points of observation after transcoder output are:
(To assist manual testing)	a)	IEEE 11073 Objects and Attributes
testing)		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)
	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 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		
Coverage	Spec	[Bluetooth PHDT v1.6]		
	Testable items	GT Numeric 5; M		
Test purpos	ie .	Check that:		
		PHG includes Glucose trend Numeric Object – Unit-Code attribute in transcoder output.		
		[AND]		
		Unit-Code attribute value is set to MDC_DIM_MILLI_G_PER_DL_PER_MIN		
Applicability		C_MAN_BLE_000 AND C_MAI	N_BLE_002 AND C_MAN_BLE_0	043
Other PICS				
Initial condition		The PHG under test and the simulated PHD are in the Standby state.		
Test procedure		specialization), it has a CG	igured with a Continuous Glucos M measurement ready to be sen ne simulated PHD also has an ide	t and it is in the Advertising

- 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
- 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 Glucose trend Numeric Object- Unit-Code 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 PHG transcoder output the Glucose trend Numeric Object – Unit-Code attribute	
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	
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: 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] 266868^MDC_DIM_MILLI_G_PER_DL_PER_MIN^MDC R [date_time]	

TP Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-038					
TP label		Whitepaper. Glucose trend Numeric Object – Base-Offset-Time-Stamp Attribute					
Coverage Spec		[Bluetooth PHDT v1.6]					
Testable items		GT Nume	eric 6; M		BaseOffset 3; M		
Test purpose		Check th	at:				
		PHG includes Glucose trend 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		spec state	cialization),	it has a CG verable). T	M measurement ready	to be ser	se Monitoring Profile (device nt and it is in the Advertising dentical CGM measurement
		The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:					
		a.	CGM Feat	ure (0x2AA	8)		
			i. Field:	CGM Featu	ire		
			• Fo	ormat: 24 bi	it		
				alue: 0000 (formation s	0000 1 000 0000 0000 0 upported.	0000 (MS	B → LSB). CGM trend
			ii. Field:	CGM Type			
			• Fo	ormat: 4 bit			
			• Va	alue: not re	levant		

- 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
- 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– 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 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
Notes	Possible values in typical points of observation after transcoder output are:
(To assist manual testing)	a) IEEE 11073 Objects and Attributes
,g,	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
	 CGM Session Start Time characteristic Session Start Time field (May 12, 2016, 16:39:27)
	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 purpos	se .	Check that:		
		PHG includes Glucose trend Numeric Object Basic-Nu-Observed-Value attribute in transcoder output.		
		[AND]		
		Basic-Nu-Observed-Value attrib	oute 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		specialization), it has a CG	igured with a Continuous Glucos M measurement ready to be sen ne simulated PHD also has an id	t and it is in the Advertising

- 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: 3.6
 - 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 the PHG transcoder output the Glucose trend 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.	
	8. 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 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), 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 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

- 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

 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.
- 8. 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: 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 	
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: SFLOAT Value: not relevant iv. Field: Time Offset	
Value: not relevant iv. Field: Time Offset	
iv. Field: Time Offset	
• Format: uint16	
• Format. unit 10	
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.	
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 Possible values in typical points of observation after transcoder output are:	
(To assist manual testing) 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"	or
Attribute-value (Step 10): readable description of the threshold notification "sensor rate of increase exceeded"	
b) WAN PCD-01 message	
Threshold-Notification-Text-String attribute is not included in PCD-01 message	

TP ld		TP/LP-PAN/PHG/PHDTW/CGN	//BV-041	
TP label		Whitepaper. Patient low/high thresholds Compound Numeric Object - Handle Attribute		
Coverage	Spec	[Bluetooth PHDT v1.6]		
	Testable	PLH Numeric 1; O		

items			
Test purpose	Check that:		
	PHG does not include Patient low/high thresholds Compound Numeric Object – Handle Attribute in transcoder output.		
	[OR]		
	If PHG includes Patient low/high thresholds Compound 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 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 Al 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		
	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		
	 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 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			
,g,	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. 			
		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			

				D. Voluse not relevent			
				☐ Value: not relevant			
			IV.	Field: E2E-CRC			
				Format: uint16			
				Value: not relevant			
		b.		SM 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	ssion ng O	ne pairing has been completed, force the PHG to read CGM Feature and CGM Start Time characteristics, and then to perform a Patient High Alert procedure to Code "Get Patient High Alert Level" (0x08) (performing a write operation to the pecific Ops Control Point characteristic's Op Code).			
	5.	The simulated PHD will respond with an indication including a "Patient High Alert Le Response" (0x09) Op Code and an SFLOAT containing the requested value in mg/d					
	6.	Force the PHG to perform a Patient Low Alert procedure using Op Code "Get Patient Alert Level" (0x0B) (performing a write operation to the CGM Specific Ops Control Pocharacteristic'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 - Type attribute			
Pass/Fail criteria	pre	Step 8, the Patient low/high thresholds Compound Numeric Object – Type attribute is essent and set to MDC_PART_PHD_DM					
Notes		MDC_CONC_GLU_PATIENT_THRESHOLDS_LOW_HIGH					
Notes (To assist manual	١.			ues in typical points of observation after transcoder output are:			
testing)	a)			1073 Objects and Attributes			
				tribute is present:			
		_	•	ject: Patient low/high thresholds Compound Numeric Object			
		_		ribute-id: MDC_ATTR_ID_TYPE (2351)			
				ribute-type: SEQUENCE {partition (INT-U16), code (INT-U16)}			
			Attr	ribute-value:			
			•	partition: MDC_PART_PHD_DM or 128 (dec) or 00 80 (hex)			
			•	code: MDC_CONC_GLU_PATIENT_THRESHOLDS_LOW_HIGH or 29404 (dec) or 72 DC (hex)			
	b)	WA	N P	CD-01 message			
		PCI	D-01	message includes a segment like this with Type attribute (check OBX-3):			
				X n 8418012^MDC_CONC_GLU_PATIENT_THRESHOLDS_LOW_HIGH^MDC D.x.0 X [date_time]			

TP ld		TP/LP-	PAN	/PHG/PHDTW/CG	M/BV-043_A					
TP label	T	Whitep Attribut		Patient low/high tl	hresholds Compound Numeric O	bject - Metric-Spec-Small				
Coverage	Spec	[Blueto	oth P	PHDT v1.6]	T	1				
	Testable items	PLH N	umeri	ic 3; M	PLH Numeric 5; M					
Test purpos	se .	Check	that:							
		PHG includes Patient low/high thresholds Compound Numeric Object – Metric-Spec-Small attribute in transcoder output.								
		[AND]								
				-Small is set to {0x the user	:604C} when the patient low/high	thresholds were updated				
Applicability	y			E_000 AND C_MA N_BLE_048	N_BLE_002 AND C_MAN_BLE_	_043 AND C_MAN_BLE_046				
Other PICS										
Initial condi	tion	The Ph	HG ur	nder test and the si	mulated PHD are in the Standby	state.				
Test proced	lure	sp	eciali		figured with a Continuous Glucos manually entered Patient Low Ale					
				nulated PHD imple for this Test Case	ments several BTLE characteristi are:	ics. The characteristics of				
		a.	CG	GM Feature (0x2AA	A8)					
			i. Field: CGM Feature							
				☐ Format: 24 b	24 bit					
				□ Value: 0000 0000 0000 0000 0000 0010 (MSB → LSB). Patient High/Low Alerts supported.						
			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					
				☐ Value: not re	elevant					
		b.	CG	SM Specific Ops Co	ontrol Point (0x2AAC)					
			i.	Field: Op Code						
				☐ Format: uint	8					
				□ Value: 0x09 Level Respo	(Patient High Alert Level Respon inse)	se) / 0x0C (Patient Low Alert				
			ii.	Field: Operand						
				☐ Format: SFL	OAT (mg/dL)					
				□ Value: not re	elevant					
			iii.	Field: E2E-CRC						
				☐ This field is r	•					
					es a discovery process (Scannin ts a pairing process with the simu					
		4. WI	hen tl	he pairing has bee	n completed, force the PHG to re	ead 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 PHG transcoder output the Patient low/high thresholds Compound Numeric Object – Type attributeCheck in PHG transcoder output the Patient low/high thresholds Compound Numeric Object – Metric-Spec-Small attribute			
Pass/Fail criteria	attr	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	Pos	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: Patient low/high 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/PHDT\	W/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 Numeric 3; M	PLH Numeri	c 4; M				
Test purpos	e	Check that:						
		PHG includes Patient lov attribute in transcoder ou	•	mpound Numeric (Object – Metric-Spec-Small			
		[AND]						
		Metric-Spec-Small is set to {0x6044} when the Patient High/Low Alert Level procedure has been executed						
Applicability	/	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND C_MAN_BLE_045 AND C_MAN_BLE_046 AND C_MAN_BLE_047 AND C_MAN_BLE_048						
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 implements several BTLE characteristics. The characteristics of interest for this Test Case are:						
		a. CGM Feature (0x2AA8)						
		i. Field: CGM	Feature					
		☐ Forma	t: 24 bit					

Value: 0000 0000 0000 0000 0010 (MSB → LSB). Patient High/Low Alerts supported.		
Format: 4 bit Value: not relevant		· · · · · · · · · · · · · · · · · · ·
Value: not relevant iii. Field: CGM Sample Location Format: 4 bit Value: not relevant iv. Field: EZE-CRC Format: uint16 Value: not relevant vi. Field: EZE-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: Op Code Format: SFLOAT (mg/dL) Value: not relevant iii. Field: EZE-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 paining process with the simulated PHD (Initiating state). 4. When the paining has been completed, force the PHG to read CGM Feature and CGM Session Start Time characteristics. 5. Force the PHG to set the patient high threshold by performing a Patient High Alert procedure using Op Code "Set Patient High Alert Level" (0x07) followed by a valid SFLOAT value (performing a wite operation to the CGM Specific Ops Control Point characteristics op Code and Operand fields respectively). The simulated PHD will respond with an indication including a Response Op Code value of "Success". 6. Force the PHG to set the patient low threshold by performing a Patient Low Alert procedure using Op Code "Set Patient Lavel" (0x0A) followed by a valid SFLOAT value (performing a write operation to the CGM Specific Ops Control Point characteristics of Op Code and Operand fields respectively). The simulated PHD will respond with an indication including a Response Op Code value of "Success". 7. Then, force the PHG to perform a Patient Low Alert Level" (0x0A) followed by a valid SFLOAT value (performing a write operation to the CGM Specific Ops Control Point characteristics of Op Code and an SFLOAT containing the requested value in mg/dL. 9. Force the PHG to perform a Patient Low Alert procedure using Op Code "Get Patient Lipich Alert Level" (0x0B) (performing a write operation to the CGM Specific Ops Control Point cha		ii. Field: CGM Type
iii. Field: CGM Sample Location Format: 4 bit Value: not relevant		☐ Format: 4 bit
Format: 4 bit Valuer: not relevant		☐ Value: not relevant
Value: not relevant iv. Field: E2E-CRC Format: uint16 Value: not relevant b. C6M 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: self-OAT (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. Force the PHG to set the patient high threshold by performing a Patient High Alert procedure using Op Code "Set Patient High Alert Level" (0x07) followed by a valid SFLOAT value (performing a write operation to the CGM Specific Ops Control Point characteristics ©p Code and Operand fields respectively). The simulated PHD will respond with an indication including a Response Op Code value of "Success". 6. Force the PHG to set the patient low threshold by performing a Patient Low Alert procedure using Op Code "Set Patient Low Alert Level" (0x0A) followed by a valid SFLOAT value (performing a vinite operation to the CGM Specific Ops Control Point characteristics ©p Code and Operand fields respectively). The simulated PHD will respond with an indication including a Response Op Code value of "Success". 6. Force the PHG to set the patient low threshold by performing a Patient Low Alert procedure using Op Code "Set Patient Low Alert Level" (0x0A) followed by a valid SFLOAT value in indication including a Response Op Code value of "Success". 7. Then, force the PHG to perform a Patient High Alert procedure using Op Code "Get Patient Ligh Alert Level" (0x0B) (performing a write operation to the CGM Specific Ops Control Point characteristics Op Code and an SFLOAT containing the requested value in mg/dL. 9. Force the PHG to perform a Patient Low Alert		iii. Field: CGM Sample Location
iv. Field: EZE-CRC Format: uint16 Value: not relevant		☐ Format: 4 bit
□ 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) □ Format: SFLOAT (mg/dL) □ Value: not relevant □ Format: SFLOAT (mg/dL) □ Value: not relevant □ Format: SFLOAT (mg/dL) □ Value: not relevant □ 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), and the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state), and Session Start Time characteristics. 5. Force the PHG to set the patient high threshold by performing a Patient High Alert procedure using Op Code "Set Patient High Alert Level" (0x07) followed by a valid SFLOAT value (performing a virtle operation to the CGM Specific Ops Control Point characteristics Op Code and Operand fields respectively). The simulated PHD will respond with an indication including a Response Op Code value of "Success". 6. Force the PHG to set the patient low threshold by performing a Patient Low Alert procedure using Op Code "Set Patient Low Alert Level" (0x07) followed by a valid SFLOAT value (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". 7. Then, force the PHG to perform a Patient High Alert procedure using Op Code "Get Patient High Alert Level" (0x0A) followed by a valid SFLOAT value (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code and an SFLOAT containing the requested value in mg/dL. 9. Force the PHG to perform a Patient High Alert procedure using Op Code "Get Patient High Alert Level" (0x0B) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code). 8. The simulate		☐ Value: not relevant
b. CGM Specific Ops Control Point (0x2AAC) i. Field: Op Code □ Format: uint8 □ Value: 0x00 (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. 5. Force the PHG to set the patient high threshold by performing a Patient High Alert procedure using Op Code "Set Patient High Alert Level" (0x07) followed by a valid SFLOAT value (performing a write operation to the CGM Specific Ops Control Point characteristics o Op Code and Operand fields respectively). The simulated PHD will respond with an indication including a Response Op Code value of "Success". 6. Force the PHG to set the patient low threshold by performing a Patient Low Alert procedure using Op Code "Set Patient Low Alert Level" (0x0A) followed by a valid SFLOAT value (performing a write operation to the CGM Specific Ops Control Point characteristics op Code and Operand fields respectively). The simulated PHD will respond with an indication including a Response Op Code value of "Success". 7. Then, force the PHG to perform a Patient Low Alert Level" (0x0A) followed by a valid SFLOAT value (performing a write operation to the CGM Specific Ops Control Point characteristics op Code and Operand fields respectively). The simulated PHD will respond with an indication including a "Patient High Alert Level" (0x0B) (performing a write operation to the CGM Specific Ops Control Point characteristics op Code). 8. The simulated PHD will respond with an indication including a "Patient High Alert Level (0x0B) (performing a write operation to the CGM Specific Ops Control Point characteristics op Code). 9. Force the PHG to perform a Pat		iv. Field: E2E-CRC
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. 5. Force the PHG to set the patient high threshold by performing a Patient High Alert procedure using Op Code "Set Patient High Alert Level" (0x07) followed by a valid SFLOAT value (performing a write operation to the CGM Specific Ops Control Point characteristics Op Code and Operand fields respectively). The simulated PHD will respond with an indication including a Response Op Code value of "Success". 6. Force the PHG to set the patient low threshold by performing a Patient Low Alert procedure using Op Code "Set Patient Low Alert Level" (0x0A) followed by a valid SFLOAT value (performing a write operation to the CGM Specific Ops Control Point characteristics op Code and Operand fields respectively). The simulated PHD will respond with an indication including a Response Op Code value of "Success". 7. Then, force the PHG to perform a Patient High Alert procedure using Op Code "Get Patient High Alert Level" (0x0B) (performing a write operation to the CGM Specific Ops Control Point characteristics Op Code). 8. The simulated PHD will respond with an indication including a "Patient High Alert Level Response" (0x0B) (performing a write operation to the CGM Specific Ops Control Point characteristics Op Code). 9. Force the PHG to perform a Patient Low Alert procedure using Op Code "Get Patient High Alert Level" (0x0B) (performing a write operation to the CGM Specific Ops Control Point characteristics Op Code). 10. The simulated PHD will res		☐ Format: uint16
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 Value: not of the ximulated PHD (initiating state). Value: not death of ximulated PHD and it starts a pairing process with the simulated PHD (initiating state). Value: not he pairing has been completed, force the PHG to read CGM Feature and CGM Session Start Time characteristics. Session Start Value: New Year Value: New Year Value of Year Value (performing a write operation to the CGM Specific Ops Control Point characteristics op Code and Operand fields respectively). The simulated PHD will respond with an indication including a Response Op Code value of Ysuccess. Session Value: New Year Value: V		☐ Value: not relevant
Format: uint8 Value: 0x09 (Patient High Alert Level Response) / 0x0C (Patient Low Alert Level Response)		b. CGM Specific Ops Control Point (0x2AAC)
Value: 0x09 (Patient High Alert Level Response) / 0x0C (Patient Low Alert Level Response) ii. Field: Operand Format: SFLOAT (mg/dL) Value: not relevant Value: not rel		i. Field: Op Code
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. Force the PHG to set the patient high threshold by performing a Patient High Alert procedure using Op Code "Set Patient High Alert Level" (0x07) followed by a valid SFLOAT value (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". 6. Force the PHG to set the patient low threshold by performing a Patient Low Alert procedure using Op Code "Set Patient Low Alert Level" (0x0A) followed by a valid SFLOAT value (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". 7. Then, force the PHG 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). 8. 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. 9. Force the PHG to perform a Patient Low Alert procedure using Op Code "Get Patient Low Alert Level" (0x08) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code). 10. The simulated PHD will respond with an indication including a "Patient Low Alert Level Response" (0x00) Op Code and an SFLOAT containing the requested value in mg/dL. 11. Check in PHG transcoder outpu		☐ Format: uint8
□ 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. Force the PHG to set the patient high threshold by performing a Patient High Alert procedure using Op Code "Set Patient High Alert Level" (0x07) followed by a valid SFLOAT value (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". 6. Force the PHG to set the patient low threshold by performing a Patient Low Alert procedure using Op Code "Set Patient Low Alert Level" (0x0A) followed by a valid SFLOAT value (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". 7. Then, force the PHG to perform a Patient High Alert procedure using Op Code "Get Patient Ligh Alert Level" (0x08) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code). 8. 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. 9. Force the PHG to perform a Patient Low Alert procedure using Op Code "Get Patient Low Alert Level" (0x08) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code). 10. The simulated PHD will respond with an indication including a "Patient Hugh Alert Level Response" (0x0C) Op Code and an SFLOAT containing the requested value in mg/dL. 11. Check in PHG transcoder output the Patient low/high thresholds Compound Numeric Ob		
□ 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. Force the PHG to set the patient high threshold by performing a Patient High Alert procedure using Op Code "Set Patient High Alert Level" (0x07) followed by a valid SFLOAT value (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". 6. Force the PHG to set the patient low threshold by performing a Patient Low Alert procedure using Op Code "Set Patient Low Alert Level" (0x0A) followed by a valid SFLOAT value (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". 7. Then, force the PHG 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). 8. 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. 9. Force the PHG to perform a Patient Low Alert procedure using Op Code "Get Patient Low Alert Level" (0x08) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code). 10. The simulated PHD will respond with an indication including a "Patient Low Alert Level Response" (0x00) Op Code and an SFLOAT containing the requested value in mg/dL. 11. Check in PHG transcoder output the Patient low/high thresholds Compound Numeric Object — Type attri		ii. Field: Operand
iii. Field: EZE-CRC This field is not present This field is not present		☐ Format: SFLOAT (mg/dL)
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. Force the PHG to set the patient high threshold by performing a Patient High Alert procedure using Op Code "Set Patient High Alert Level" (0x07) followed by a valid SFLOAT value (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". 6. Force the PHG to set the patient low threshold by performing a Patient Low Alert procedure using Op Code "Set Patient Low Alert Level" (0x0A) followed by a valid SFLOAT value (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". 7. Then, force the PHG 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). 8. 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. 9. 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). 10. 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. 11. Check in PHG transcoder output the Patient low/high thresholds Compound Numeric Object — Type attributeCheck in PHG transcoder output the Patient low/high thresholds Com		☐ Value: not relevant
3. The PHG under test initiates a discovery process (Scanning state), it discovers the simulated PHD and it starts a pairing process with the simulated PHD (Initiating state). 4. When the pairing has been completed, force the PHG to read CGM Feature and CGM Session Start Time characteristics. 5. Force the PHG to set the patient high threshold by performing a Patient High Alert procedure using Op Code "Set Patient High Alert Level" (0x07) followed by a valid SFLOAT value (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". 6. Force the PHG to set the patient low threshold by performing a Patient Low Alert procedure using Op Code "Set Patient Low Alert Level" (0x0A) followed by a valid SFLOAT value (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". 7. Then, force the PHG 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). 8. 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. 9. 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). 10. 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. 11. Check in PHG transcoder output the Patient low/high thresholds Compound Numeric Object – Metric-Spec-Small attribute is present and its value is (0x6044) (mss-avail-store		iii. 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. 5. Force the PHG to set the patient high threshold by performing a Patient High Alert procedure using Op Code "Set Patient High Alert Level" (0x07) followed by a valid SFLOAT value (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". 6. Force the PHG to set the patient low threshold by performing a Patient Low Alert procedure using Op Code "Set Patient Low Alert Level" (0x0A) followed by a valid SFLOAT value (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". 7. Then, force the PHG 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). 8. 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. 9. 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). 10. 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. 11. Check in PHG transcoder output the Patient low/high thresholds Compound Numeric Object — Type attributeCheck in PHG transcoder output the Patient low/high thresholds Compound Numeric Object — Metric-Spec-Small attribute is present and its value is (0x6044) (☐ This field is not present
Session Start Time characteristics. 5. Force the PHG to set the patient high threshold by performing a Patient High Alert procedure using Op Code "Set Patient High Alert Level" (0x07) followed by a valid SFLOAT value (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". 6. Force the PHG to set the patient low threshold by performing a Patient Low Alert procedure using Op Code "Set Patient Low Alert Level" (0x0A) followed by a valid SFLOAT value (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". 7. Then, force the PHG 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). 8. 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. 9. Force the PHG to perform a Patient Low Alert procedure using Op Code "Get Patient Low Alert Level" (0x08) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code). 10. 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. 11. Check in PHG transcoder output the Patient low/high thresholds Compound Numeric Object – Type attributeCheck in PHG transcoder output the Patient low/high 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)		
procedure using Op Code "Set Patient High Alert Level" (0x07) followed by a valid SFLOAT value (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". 6. Force the PHG to set the patient low threshold by performing a Patient Low Alert procedure using Op Code "Set Patient Low Alert Level" (0x0A) followed by a valid SFLOAT value (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". 7. Then, force the PHG 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). 8. 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. 9. 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). 10. 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. 11. Check in PHG transcoder output the Patient low/high thresholds Compound Numeric Object – Type attributeCheck in PHG transcoder output the Patient low/high 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)		
procedure using Op Code "Set Patient Low Alert Level" (0x0A) followed by a valid SFLOAT value (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". 7. Then, force the PHG 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). 8. 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. 9. 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). 10. 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. 11. Check in PHG transcoder output the Patient low/high thresholds Compound Numeric Object – Type attributeCheck in PHG transcoder output the Patient low/high thresholds Compound Numeric Object – Metric-Spec-Small attribute Pass/Fail criteria In Step 11, the Patient low/high 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)		procedure using Op Code "Set Patient High Alert Level" (0x07) followed by a valid SFLOAT value (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code and Operand fields respectively). The simulated PHD will
Patient High Alert Level" (0x08) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code). 8. 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. 9. 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). 10. 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. 11. Check in PHG transcoder output the Patient low/high thresholds Compound Numeric Object – Type attributeCheck in PHG transcoder output the Patient low/high thresholds Compound Numeric Object – Metric-Spec-Small attribute Pass/Fail criteria In Step 11, the Patient low/high 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)		procedure using Op Code "Set Patient Low Alert Level" (0x0A) followed by a valid SFLOAT value (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code and Operand fields respectively). The simulated PHD will
Response" (0x09) Op Code and an SFLOAT containing the requested value in mg/dL. 9. 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). 10. 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. 11. Check in PHG transcoder output the Patient low/high thresholds Compound Numeric Object – Type attributeCheck in PHG transcoder output the Patient low/high thresholds Compound Numeric Object – Metric-Spec-Small attribute Pass/Fail criteria In Step 11, the Patient low/high 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)		Patient High Alert Level" (0x08) (performing a write operation to the CGM Specific Ops
Alert Level" (0x0B) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code). 10. 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. 11. Check in PHG transcoder output the Patient low/high thresholds Compound Numeric Object – Type attributeCheck in PHG transcoder output the Patient low/high thresholds Compound Numeric Object – Metric-Spec-Small attribute Pass/Fail criteria In Step 11, the Patient low/high 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)		
Response" (0x0C) Op Code and an SFLOAT containing the requested value in mg/dL. 11. Check in PHG transcoder output the Patient low/high thresholds Compound Numeric Object – Type attributeCheck in PHG transcoder output the Patient low/high thresholds Compound Numeric Object – Metric-Spec-Small attribute Pass/Fail criteria In Step 11, the Patient low/high 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)		Alert Level" (0x0B) (performing a write operation to the CGM Specific Ops Control Point
Object – Type attributeCheck in PHG transcoder output the Patient low/high thresholds Compound Numeric Object – Metric-Spec-Small attribute Pass/Fail criteria In Step 11, the Patient low/high 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)		
attribute is present and its value is {0x6044} (mss-avail-stored-data mss-upd-aperiodic mss-acc-agent-initiated mss-cat-setting)		Object – Type attributeCheck in PHG transcoder output the Patient low/high thresholds
Notes Possible values in typical points of observation after transcoder output are:	Pass/Fail criteria	attribute is present and its value is {0x6044} (mss-avail-stored-data mss-upd-aperiodic mss-
	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: Patient low/high thresholds Compound 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 ld		TP/I	I P-F	ΡΔΝ/	PHG	S/PHDTW/CGN	///B\/-0	44					
TP label		Whi	Whitepaper. Patient low/high thresholds Compound Numeric Object – Metric-Structure-Small Attribute										
Coverage	Spec	[Blu	[Bluetooth PHDT v1.6]										
	Testable items	PLH	PLH Numeric 6; M										
Test purpos	e	Che	ck t	hat:									
		PHG includes Patient low/high thresholds Compound Numeric Object – Metric-Structure-Small attribute in transcoder output.											
		[AN	D]										
		Met	ric-S	Struc	ture-	Small is set to	{0x40,	0x02}					
Applicability	/					00 AND C_MA _E_048	N_BLE	_002 ANI	D C_MAN	_BLE_	043 AND C	C_MAN_BLE	_046
Other PICS													
Initial condi	tion	The	PH	G ur	nder t	test and the sir	mulated	d PHD are	e in the St	andby	state.		
Test proced	ure	 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.				ed PHD implen his Test Case		everal BT	TLE chara	cteristi	cs. The cha	aracteristics (of
			a.	CG	M Fe	eature (0x2AA	8)						
				i.	Fie	ld: CGM Featu	ıre						
						Format: 24 b	it						
						Value: 0000 (Alerts suppor		000 0000	0000 001	IO (MSI	B → LSB).	Patient High	/Low
				ii.	Fie	ld: CGM Type							
						Format: 4 bit							
						Value: not re	levant						
				iii.	Fie	ld: CGM Samp	ole Loca	ation					
						Format: 4 bit							
						Value: not re	levant						
				iv.	Fie	ld: E2E-CRC							
						Format: uint1	16						
						Value: not re	levant						
			b.	CG	M S	pecific Ops Co	ntrol P	oint (0x2A	AAC)				
				i.	Fie	ld: 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	Step 8, the Patient low/high thresholds Compound Numeric Object – Metric-Structure-Small ribute 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				
, g ,	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 thi	resholds Compound Numeric Ob	ject – Metric-Id-List Attribute		
Coverage	Spec	[Bluetooth PHDT v1.6]				
	Testable items	PLH Numeric 7; M				
Test purpos	e e	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 }				
Applicability	/	C_MAN_BLE_000 AND C_MAN	N_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.			
	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-Id-List attribute			
Pass/Fail criteria	In Step 8, the Patient low/high 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_PATIENT_THRESHOLD_LOW,			

	MDC	MDC_CONC_GLU_PATIENT_THRESHOLD_HIGH				
Notes	Poss	Possible values in typical points of observation after transcoder output are:				
(To assist manual testing)	a) I	EEE 11073 Objects and Attributes				
	ľ	Metric-Id-List attribute is present:				
	Į.	☐ Object: Patient low/high thresholds Compound Numeric Object				
		☐ Attribute-id: MDC_ATTR_ID_PHYSIO_LIST (2678)				
	Į.	☐ 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_PATIENT_THRESHOLD_LOW (0x72DD) 				
		Second element: MDC_CONC_GLU_PATIENT_THRESHOLD_HIGH (0x72DE)				
	b) \) WAN PCD-01 message				
	1	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]						
Coverage	•							
	Testable items	PLH Numeric 8; M						
Test purpos	e	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 proced	ure	 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. 						
		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.					
	 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 Poin characteristic's Op Code). 					
	7. The simulated PHD will respond with an indication including a "Patient Low Alert Lev Response" (0x0C) Op Code and an SFLOAT containing the requested value in mg/d					
	 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					
, ,	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 ld	TP/LP-PAN/PHG/PHDTW/CGM/BV-047
TP label	Whitepaper. Patient low/high thresholds Compound Numeric Object – Base-Offset-Time-Stamp Attribute

Coverage	Spec	[Bluetooth PHDT v1.6]						
	Testable items	PLH N	Numeri	c 9; M	BaseOffset 1; M			
Test purpos	e	Check that:						
		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 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 Patient Low Alert Level and Patient High Alert Level values stored.						
		The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:						
		а	. CG	M Feature (0x2AA	8)			
			i.	Field: CGM Featu	ure			
				☐ Format: 24 b	it			
				☐ Value: 0000 Alerts suppo	·	MSB → LSB). Patient High/Low		
			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: uint1	16			
				□ Value: not re	levant			
		b	. CG	M Specific Ops Co	ontrol Point (0x2AAC)			
			i.	Field: Op Code				
				☐ Format: uint8				
				☐ Value: 0x09 Level Respo		oonse) / 0x0C (Patient Low Alert		
			ii.	Field: Operand				
				☐ Format: SFL	OAT (mg/dL)			
				□ Value: not re	levant			
			iii.	Field: E2E-CRC				
				☐ This field is r	·			
					es a discovery process (Scan s a pairing process with the si	ning state), it discovers the mulated PHD (Initiating state).		
		S	ession sing O	Start Time charac p Code "Get Patie	cteristics, and then to perform	read CGM Feature and CGM a Patient High Alert procedure rforming a write operation to the le).		

	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 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)	a) IEEE 11073 Objects and Attributes				
(County)		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 purpose		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	1	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		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.							
		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 Ale Level Response)	rt		
	ii. Field: Operand			
	☐ Format: SFLOAT (mg/dL)			
	☐ Value: 72.0 (Patient Low threshold) / 144.0 (Patient High threshold)			
	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).			
	 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 Lo 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 – Compound-Basic-Nu-Observed-Value attribute			
Pass/Fail criteria	In Step 8, the Patient low/high thresholds Compound Numeric Object – Compound-Basic-N Observed-Value attribute is set to 0x0002 (count of components is 2), 0x0004 (component length is 4 octets), the Patient Low Alert Level Response Operand followed by the Patient Halert Level Response Operand	list		
Notes	Possible values in typical points of observation after transcoder output are:			
(To assist manual testing)	a) IEEE 11073 Objects and Attributes			
testing)	Compound-Basic-Nu-Observed-Value attribute is present:			
	□ Object: Patient low/high 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			
	 First element (Patient Low Alert Level Response Operand): 00 48 (hex) or F2 (hex) or 72.0 (dec) 	D0		
	 Second element (Patient High Level Response Operand): 00 90 (hex) or F5 A (hex) or 144.0 (dec) 	۰0		

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-F	PAN/	PHG/PHDTW/	CGM	1/BV-049				
TP label		Whitepaper. Device hypo/hyper thresholds Compound Numeric Object - Handle Attribute								
Coverage	Spec	[Bluetooth PHDT v1.6]								
oo tolago	Testable items	DHH Nu								
Test purpos	e	Check t	hat:							
				ot include Devi		ypo/hyper thres	sholds Compound	d Numeric Object – Handle		
		[OR]	[OR]							
						per thresholds shall be differ		eric Object – Handle attribute in		
Applicability	/			E_000 AND C_ _BLE_052)	_MAN	N_BLE_002 AN	D C_MAN_BLE_	_043 AND (C_MAN_BLE_050		
Other PICS										
Initial condi	tion	The PH	G un	der test and th	ne sin	nulated PHD ar	e in the Standby	state.		
Test proced	ure							se Monitoring Profile (device Hyper Alert Level values stored.		
			2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:							
		a.	a. CGM Feature (0x2AA8)							
			i. Field: CGM Feature							
				• Format: 2	24 bit	t				
						0000 0000 0000 supported.	0000 11 00 (MS	B → LSB). Hypo Alerts and		
			ii.	Field: CGM T	ype					
				• Format:	4 bit					
				Value: no	ot rele	evant				
			iii.	Field: CGM S	Samp	le Location				
				• Format:	4 bit					
				Value: no	ot rele	evant				
			iv.	Field: E2E-CI	RC					
				Format:	uint1	6				
				• Value: no	ot rele	evant				
		b.	CG	M Specific Op	s Cor	ntrol Point (0x2	AAC)			
			i.	Field: Op Coo	de					
				☐ Format:	uint8					
				☐ Value: 0x Respons		Hypo Alert Lev	el Response) / 0	x12 (Hyper Alert Level		
			ii.	Field: Operar	nd					

	☐ 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 Specif 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 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					
loomig)	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 items	DHH Numeric 2; M						
Test purpos	se .	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	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 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.						
		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 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.	Эр
	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 Spec 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	
1301119,	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:
 partition: MDC_PART_PHD_DM or 128 (dec) or 00 80 (hex)
 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 Id 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]			v1.6]					
	Testable items	DHH N	Numer	ric 3;	M	DHH Numeric 4; M				
Test purpos	ie .	Check	that:							
		PHG includes Device hypo/hyper thresholds Compound Numeric Object – Metric-Spec-Small attribute in transcoder output.								
		[AND]								
		Metric by the	-	-Sma	all is set to {0x6	604C} when the hypo/hyper thres	sholds were updated manually			
Applicability	/				00 AND C_MAI =_052)	N_BLE_002 AND C_MAN_BLE_	_043 AND (C_MAN_BLE_050			
Other PICS										
Initial condi	tion	The P	HG ur	nder t	test and the sir	mulated 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.							
		The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:								
		a. CGM Feature (0x2AA8)								
			i.	Fie	ld: CGM Featu	ire				
					Format: 24 b	it				
					Value: 0000 (Hyper Alerts	0000 0000 0000 0000 11 00 (MS) supported.	B → LSB). Hypo Alerts and			
			ii.	Fie	ld: CGM Type					
					Format: 4 bit					
					Value: not re	levant				
			iii.	Fie	ld: CGM Samp	ole Location				
					Format: 4 bit					
					Value: not re	levant				
			iv.	Fie	ld: E2E-CRC					
					Format: uint1	6				
					Value: not re	levant				
		b.	CG	M S	pecific Ops Co	ntrol Point (0x2AAC)				
			i.	Fie	ld: Op Code					
					Format: uint8	}				
					Value: 0x0F	(Hypo Alert Level Response) / 0x	(12 (Hyper Alert Level			

	Response)			
	ii. Field: Operand			
	☐ Format: SFLOAT (mg/dL)			
	☐ Value: not relevant			
	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).			
	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.			
	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			
loomig,	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			
	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-051_B						
TP label		Whitepaper. Device hypo/hyper thresholds Compound Numeric Object - Metric-Spec-Small Attribute 2						
Coverage	Spec	[Bluetooth PHDT v1.6]	[Bluetooth PHDT v1.6]					
	Testable items	DHH Numeric 3; M	DHH Numeric 3; M DHH Numeric 4; M					
Test purpos	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 {0x6044} when either the Hypo Alert or Hyper Alert procedure has been executed						
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) AND (C_MAN_BLE_049 OR C_MAN_BLE_051)						

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 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: 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_049 = TRUE, force the PHG to set the Hypo Alert Level by performing a Hypo Alert procedure using Op Code "Set Hypo Alert Level" (0x0D) followed by a valid SFLOAT value (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".			
	6. IF C_MAN_BLE_051 = TRUE, force the PHG to set the Hyper Alert Level by performing a Hyper Alert procedure using Op Code "Set Hyper Alert Level" (0x10) followed by a valid SFLOAT value (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".			
	7. 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.			
	8. 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. 9. Check in PHG transcoder output the Device hypo/hyper thresholds Compound Numeric Object – Metric-Spec-Small attribute				
Pass/Fail criteria	In Step 9, the Device hypo/hyper 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	Possible values in typical points of observation after transcoder output are:				
testing)	a) IEEE 11073 Objects and Attributes				
	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: 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 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	[Bluetooth PHDT v1.6]							
	Testable items	HH Numeric 6; M							
Test purpos	e	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	/	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. 							
		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							

	T
	□ 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).
	 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.
	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
3,	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 ld		TP/	LP-P	PAN	PHG/PI	HDTW/CGI	M/BV-0)53						
TP label	T		Whitepaper. Device hypo/hyper thresholds Compound Numeric Object – Metric-Id-List Attribute											
Coverage	Spec	[Blu	etoo	th P	HDT v1	1.6]	1							
	Testable items	DHI	OHH Numeric 7; M											
Test purpos	se	Che	eck th	nat:										
			PHG includes Device hypo/hyper thresholds Compound Numeric Object – Metric-Id-List attribute in transcoder output.											
		[AND]												
						to { 0x0002 _THRESHC			_CONC_	_GLU_TI	HRESHO	DLD_H\	PO,	
Applicability	y				E_000 <i>A</i> _BLE_0	AND C_MA 052)	N_BLE	_002 AN	D C_MA	AN_BLE	_043 AN	D (C_M	IAN_BLE_0	050
Other PICS														
Initial condi	tion	The	PHO	G ur	der test	t and the si	mulate	d PHD ar	e in the	Standby	state.			
Test proced	lure	1.				PHD is cont The PHD h								
		2.				PHD impler Test Case		several B	TLE cha	racterist	ics. The	charact	eristics of	
			a.	CG	M Feat	ure (0x2AA	.8)							
				i.	Field:	CGM Featu	ure							
					☐ Fo	ormat: 24 b	oit							
						alue: 0000 lyper Alerts			0000 1	100 (MS	B → LSI	В). Нур	o Alerts and	d
				ii.	Field:	CGM Type								
					☐ Fo	ormat: 4 bit								
					□ Va	'alue: not re	levant							
				iii.	Field:	CGM Samp	ple Loc	ation						
					☐ Fo	ormat: 4 bit	:							
					□ Va	'alue: not re	levant							
				iv.	Field:	E2E-CRC								
					☐ Fo	ormat: uint1	16							
					□ Va	alue: not re	levant							
			b.	CG	M Spec	cific Ops Co	ontrol P	Point (0x2)	AAC)					
				i.	Field:	Op Code								
						ormat: uint8								
						alue: 0x0F (esponse)	(Нуро	Alert Leve	el Respo	onse) / 0:	х12 (Нур	er Aler	Level	
				ii.	Field:	Operand								
					☐ Fo	ormat: SFL	OAT (r	ng/dL)						
					☐ Va	'alue: not re	levant							
				iii.	Field:	E2E-CRC								
					☐ Th	his field is n	not pres	sent						
		3.				er test initiate and it start).
		4.	4. When the pairing has been completed, force the PHG to read CGM Feature and CGM Session Start Time characteristics.								Л			

	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.	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	attri	tep 7, the Device hypo/hyper thresholds Compound Numeric Object – Metric-Id-List bute is present and set to 0x0002 (count of metric ids is 2), 0x0004 (list length is 4 octets), C_CONC_GLU_THRESHOLD_HYPER							
Notes	Pos	sible values in typical points of observation after transcoder output are:							
(To assist manual testing)	a)	a) IEEE 11073 Objects and Attributes							
,		Metric-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							
		 First element: MDC_CONC_GLU_THRESHOLD_HYPO (0x72E1) 							
		 Second element: MDC_CONC_GLU_THRESHOLD_HYPER (0x72E2) 							
	b)	WAN PCD-01 message							
	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							
		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-054					
TP label		Whitepaper. Device hypo/hyper three	esholds Compound Numeric	Object – Unit-Code Attribute			
Coverage	Spec	[Bluetooth PHDT v1.6]					
	Testable items	DHH Numeric 8; M					
Test purpos	ie .	Check that:					
		PHG includes Device hypo/hyper 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_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 configure	ed with a Continuous Glucos	e Monitoring Profile (device			

2. The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are: a. CGM Feature (Cy2AR) i. Field: CGM Feature □ Format: 24 bit □ Value: 0000 0000 0000 0000 0000 1100 (MSB → LSB). Hype 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: unint6 □ Value: not relevant b. CGM Specific Ops Control Point (0x2AAC) i. Field: DCGM Specific Ops Control Point (0x2AAC) i. Field: Op Code □ Format: unint8 □ Value: xoxF (Hypo Alert Level Response) / 0x12 (Hyper Alert Level Response) ii. Field: Operand □ Format: SFLOAT (mgdL) □ 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" (XP) (performing a write operation to the CGM Specific Ops Control Point characteristics Op Code). The simulated PHD will respond with an indication including a "Hypo Alert Level" (XP) (performing a write operation to the CGM Specific Ops Control Point characteristics Op Code). The simulated PHD will respond with an indication including a "Hypo Alert Level" (XP) (XP) 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 Hypor Alert procedure using Op Code "Get Hypor Alert Level" (XP) (XP) (XP) 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 — Unit-Code attribute is present and set to MDC_DIM MILLI G_PER_DL iiii. Field: CPA DA BLE_052 = T		specialization). The PHD has manually entered Hypo and Hyper Alert Level values stored.
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 Hypor Alerts supported. iii. Field: CGM Type □ Format: 4 bit □ Value: not relevant iii. Field: CGM Sample Location □ 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: Not Field: Point (0x2AAC) ii. Field: Op Code □ Format: uint8 □ Value: Not Field: Point (0x2AAC) iii. Field: Operand □ Format: SFLOAT (mg/dL) □ Value: not relevant iii. Field: Derand □ 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 (milesting 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 characteristics So D 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 Response" (0x12) 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 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 — Unit-Code attribute is present a		
i. Field: CGM Feature Format: 24 bit Value: 0000 0000 0000 0000 1100 (MSB → LSB). Hypo Alerts and Hyper Alerts supported.		
Format: 24 bit Value: 0000 0000 0000 0000 1100 (MSB → LSB). Hypo Alerts and Hyper Alerts supported.		
Value: 0000 0000 0000 1100 (MSB → LSB). Hypo Alerts and Hyper Alerts supported.		
Hyper Alerts supported. ii. Field: CGM Type Format: 4 bit Value: not relevant Field: CGM Sample Location Format: 4 bit Value: not relevant Value: not relevant Format: 4 bit Value: not relevant Value: not relevant Value: not relevant Value: not relevant Format: 4 bit Value: not relevant Format: 4 bit Value: not relevant Format: 4 bit Value: 0x0F (Hypo Alert Level Response) / 0x12 (Hyper Alert Level Response) Format: 5FLOAT (mg/dL) Value: not relevant Format: 5FLOAT (mg/dL) Value: not relevant Format: 5FLOAT (mg/dL) Value: not relevant Field: 2EE-CRC This field is not present This field is not present This field is not present When the pairing has been completed, force the PHG to read CGM Feature and CGM Session Start Time characteristics. FC 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 characteristics 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. FC MAN BLE 052 = TRUE, force the PHG to perform a Hyper Alert procedure using Op Code" Cot Phypo Alert Level Response" (0x0F) Op Code and an SFLOAT containing the requested alert level in mg/dL. FC MAN BLE 052 = TRUE, force the PHG to perform a Hyper Alert procedure using Op Code" Cot the perform and the performance write operation to the CGM Specific Ops Control Point characteristics 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. FC MAN BLE 052 = TRUE, force the PHG to perform a Hyper Alert procedure using Op Code of the performance write operation to the CGM Specific Ops Control Point characteristics O		
□ 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) iii. Field: Op Format: uint8 □ Value: 0x0F (Hypo Alert Level Response) / 0x12 (Hyper Alert Level Response) iii. 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' (Oxe1) (performing a write operation to the CGM Specific Ops Control Point characteristics '0p Code). The simulated PHD will respond with an indication including a "Hypo Alert Level (Rox11) (performing a write operation to the CGM Specific Ops Control Point characteristics '0p Code). The simulated PHD will respond with an indication including a "Hypo Alert Level (Ox11) (performing a write operation to the CGM Specific Ops Control Point characteristics '0p Code). The simulated PHD will respond with an indication including a "Hypor Alert Level Response" (0x12) 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 Hypor Alert procedure using Op Code 'Get Hypor 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 hyporhyper thresholds Compound Numeric Object — Unit-Code attribute is present and set to MDC_DIM_MILLL_G_PER_DL.		
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: not Physo Alert Level Response) / 0x12 (Hyper Alert Level Response) ii. Field: Op Code Format: uint8 Value: not Physo Alert Level Response) / 0x12 (Hyper Alert Level Response) iii. 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" (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" (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" (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" (0x11) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code). The simulated PHD will respond with an indication includi		ii. Field: CGM Type
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: xxiv (Hypo Alert Level Response) / 0x12 (Hyper Alert Level Response) ii. Field: Cyperand 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 characteristics 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 characteristics Op Code). The simulated PHD will respond with an indication including a "Hyper 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 characteristics 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 – Unit-Code attribute is present and set to MDC_DIM_MILLI_G_PER_D.		☐ Format: 4 bit
Format: 4 bit Value: not relevant		☐ Value: not relevant
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" (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" (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 "Hypor 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" (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" (0x11) (performing the present and set to MDC DIM MilLLI G PER DL Pass/Fail criteria		iii. Field: CGM Sample Location
iv. Field: E2E-CRC Format: uint16 Value: not relevant Format: uint16 Value: not relevant Format: uint16 Value: not relevant Format: uint8 Value: 0x0F (Hypo Alert Level Response) / 0x12 (Hyper Alert Level Response) Format: uint8 Value: 0x0F (Hypo Alert Level Response) / 0x12 (Hyper Alert Level Response) Format: SFLOAT (mg/dL) Value: not relevant Field: E2E-CRC This field is not present Field: Canada When the pairing has been completed, force the PHG to read CGM Feature and CGM Session Start Time characteristics. FI 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 characteristics Op Code). The simulated PHD will have indication including a "Hypo Alert Level Response" (0x0F) Op Code and an SFLOAT containing the requested alert level in mg/dL. FI 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 characteristics Op Code). The simulated PHD will be requested alert level in mg/dL. FI 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 characteristics Op Code). The simulated PHD will be present and set to MDC_0M_MILLI_G_PER_DL Figure Page Page Page Page Page Page Page Pag		☐ Format: 4 bit
□ 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" (1x11) (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 "Hypor Alert Level" (1x11) (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 "Hypor Alert Level" (1x11) (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" (1x11) (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" (1x11) (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" (1x11) (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" (1x11) (performing to the PHD will respond		☐ Value: not relevant
□ 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" (0x0E) operform 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" (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" (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. 6. IF C_MAN_BLE_052 = TRUE, force the PHG to perform a Hyper Alert procedure using Op Code "Get 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 — Unit-Code attribute is present and set to MDC_DIM_MILLI_G_PER_DL Possible values in typical points of observation after transcoder output are: a) I		iv. Field: E2E-CRC
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" (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 — Unit-Code attribute is present and set to MDC_DIM_MILLI_G_PER_DL 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		☐ Format: uint16
i. Field: Op Code Format: uint8 Value: 0x0F (Hypo Alert Level Response) / 0x12 (Hyper Alert Level Response) Field: Operand Format: SFLOAT (mg/dL) Value: not relevant Value: not relevant		☐ Value: not relevant
Format: uint8 Value: 0x0F (Hypo Alert Level Response) / 0x12 (Hyper Alert Level Response)		b. CGM Specific Ops Control Point (0x2AAC)
Value: 0x0F (Hypo Alert Level Response) / 0x12 (Hyper Alert Level Response)		i. Field: Op Code
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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 — Unit-Code attribute 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 (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:		☐ This field is not present
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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 – 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 (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:		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
Numeric Object – Unit-Code attribute 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 (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:		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
is present and set to MDC_DIM_MILLI_G_PER_DL		
(To assist manual testing) a) IEEE 11073 Objects and Attributes Unit-Code attribute is present:	Pass/Fail criteria	
da) IEEE 11073 Objects and Attributes Unit-Code attribute is present:	Notes	Possible values in typical points of observation after transcoder output are:
Unit-Code attribute is present:		
·	waing)	
Object. Device hyporhyper thresholds dellipound numeric Object.		☐ 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 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 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	[Bluetooth P	Bluetooth PHDT v1.6]								
	Testable items	DHH Numer	ric 9;	М	BaseOffset 1; M						
Test purpos	e	Check that:									
			PHG includes Device hypo/hyper thresholds Compound Numeric Object – Base-Offset-Time-Stamp Attribute								
		[AND]									
			ation	(Base-Offset-	ute is set to the correct value acc Time-Stamp attribute will be deriv						
Applicability	/	C_MAN_BL OR C_MAN			N_BLE_002 AND C_MAN_BLE_	.043 AND (C_MAN_BLE_050					
Other PICS											
Initial condi	tion	The PHG ur	The PHG under test and the simulated PHD are in the Standby state.								
Test proced	ure	speciali 2. The sim	zatio nulate	n). The PHD h ed PHD implen	igured with a Continuous Glucos as manually entered Hypo and H nents several BTLE characteristi	Hyper Alert Level values stored.					
		interest for this Test Case are: a. CGM Feature (0x2AA8)									
		i. Field: CGM Feature									
		١.	☐ Format: 24 bit								
					0000 0000 0000 0000 1100 (MSI	B → LSB). Hypo Alerts and					
		ii.	Fie	ld: CGM Type							
				Format: 4 bit							
				Value: not rel	levant						
		iii.	Fie	ld: CGM Samp	ole Location						
				Format: 4 bit							
				Value: not rel	levant						
		iv.	Fie	ld: E2E-CRC							
				Format: uint1	6						
				Value: not rel	levant						
		b. CGM Specific Ops Control Point (0x2AAC)									

	: Fields On Code
	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
	 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, 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 PHG transcoder output the Device hypo/hyper thresholds Compound Numeric Object – Base-Offset-Time-Stamp attribute
Pass/Fail criteria	In Step 7, the Device hypo/hyper 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
testing)	Base-Offset-Time-Stamp attribute is present:
	☐ Object: Device hypo/hyper 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 Type attribute (check OBX-14):
	OBX n 8418016^MDC_CONC_GLU_THRESHOLDS_HYPO_HYPER^MDC m.0.x.0 X [value described in a) coded in DTM format]

TP ld		TP/LP-F	PAN/I	PHG/PHDTW/CGI	M/BV-056 A						
TP label	Whitepa	Whitepaper. Device hypo/hyper thresholds Compound Numeric Object – Compound-Basic-Nu-Observed-Value Attribute									
Coverage	Spec	[Bluetoo	[Bluetooth PHDT v1.6]								
	Testable items	DHH N	DHH Numeric 10; M								
Test purpos	е	Check t	hat:								
		PHG includes Device hypo/hyper thresholds Compound Numeric Object Compound-Basic-Nu-Observed-Value attribute in transcoder output.									
		[AND]	[AND]								
		Compo	und-E	Basic-Nu-Observe	d-Value attribute is set to the cor	rect value.					
Applicability	1			E_000 AND C_MA _BLE_052)	N_BLE_002 AND C_MAN_BLE_	_043 AND (C_MAN_BLE_050					
Other PICS											
Initial condi	tion	The PH	G un	der test and the si	mulated PHD are in the Standby	state.					
Test proced	ure				figured with a Continuous Gluco nas manually entered Hypo and I						
				ulated PHD impler for this Test Case	ments several BTLE characterist are:	ics. The characteristics of					
		a.	CGI	M Feature (0x2AA	.8)						
			i.	Field: CGM Feat	ure						
				☐ Format: 24 b	pit						
				☐ 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 re	elevant						
			iii.	Field: CGM Sam	ple Location						
				☐ Format: 4 bit							
				☐ Value: not re	elevant						
			iv.	Field: E2E-CRC							
				☐ Format: uint	16						
				□ Value: not re	elevant						
		b.	CGI	M Specific Ops Co	ontrol Point (0x2AAC)						
			i.	Field: Op Code							
				☐ Format: uint8	3						
				□ Value: 0x0F Response)	(Hypo Alert Level Response) / 0:	x12 (Hyper Alert Level					
			ii.	Field: Operand							
				☐ Format: SFL	OAT (mg/dL)						
				☐ Value: 36.0 (Response)	(Hypo Alert Level Response) / 36	0.0 (Hyper Alert Level					
			iii.	Field: E2E-CRC							
				☐ This field is r	not present						
					es a discovery process (Scannin is a pairing process with the simu						

	5.	Code " Ops Co indicat	MAN_BLE_050 = TRUE, force the PHG to perform a Hypo Alert procedure using Op Get Hypo Alert Level" (0x0E) (performing a write operation to the CGM Specific ontrol Point characteristic's Op Code). The simulated PHD will respond with an ion including a "Hypo Alert Level Response" (0x0F) Op Code and an SFLOAT ning the requested alert level in mg/dL.					
	6.	Op Co Ops Co indicat	MAN_BLE_052 = TRUE, force the PHG to perform a Hyper Alert procedure using de "Get Hyper Alert Level" (0x11) (performing a write operation to the CGM Specific control Point characteristic's Op Code). The simulated PHD will respond with an ion including a "Hyper Alert Level Response" (0x12) Op Code and an SFLOAT ning the requested alert level in mg/dL.					
	7.		in PHG transcoder output the Device hypo/hyper thresholds Compound Numeric - Compound-Basic-Nu-Observed-Value attribute					
Pass/Fail criteria	Nu- list	In Step 7, the Device hypo/hyper thresholds Compound Numeric Object – Compound-Basic-Nu-Observed-Value attribute is 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	Pos	ssible va	ulues in typical points of observation after transcoder output are:					
(To assist manual testing)	a)	IEEE 1	1073 Objects and Attributes					
testing)		Compo	ound-Basic-Nu-Observed-Value attribute is present:					
		□ OI	oject: Device hypo/hyper thresholds Compound Numeric Object					
		☐ At	tribute-id: MDC_ATTR_NU_CMPD_VAL_OBS_BASIC (2677)					
		☐ At	tribute-type: SEQUENCE OF [{SFLOAT}]					
			tribute-value: 0x0002 (number of elements), 0x0004 (length of the sequence), llowed by					
		•	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). IF C_MAN_BLE_050 = FALSE, first element will be set to NaN (0x07FF)					
		•	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)					
	b)	WAN F	PCD-01 message					
		segme	Hypo/Hyper Alert Level Responses are received,PCD-01 message includes two nts like these with Compound-Basic-Nu-Observed-Value attribute value (check in both segments):					
			BX n NM 8418017^MDC_CONC_GLU_THRESHOLD_HYPO^MDC m.0.x.a 36.0 4274^MDC_DIM_MILLI_G_PER_DL^MDC R					
			BX n NM 8418018^MDC_CONC_GLU_THRESHOLD_HYPER^MDC m.0.x.b 360.0 4274^MDC_DIM_MILLI_G_PER_DL^MDC R					
			f one of the responses is not available, its related segment will appear with en [value], the value "NAN" in OBX-8 and the value "X" in OBX-11					

TP ld		TP/LP-PAN/PHG/PHDTW/CGN	P/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	ie .	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.						
	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						
	 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, 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_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. Fie	eld: CGM Type		
			Format: 4 bit		
			Value: not relevant		
		iii. Fie	eld: CGM Sample Location		
			Format: 4 bit		
			Value: not relevant		
		iv. Fie	eld: E2E-CRC		
			Format: uint16		
			Value: not relevant		
	b.	CGM S	Specific Ops Control Point (0x2AAC)		
			Field: Op Code		
			Format: uint8		
			Value: 0x12 (Hyper Alert Level Response)		
		i. Fie	eld: Operand		
			Format: SFLOAT (mg/dL)		
			Value: 360.0 (Hyper Alert Level Response)		
		ii. Fie	eld: 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			
	perfo (per Cod	orm a H forming e). The	airing has been completed, IF C_MAN_BLE_052 = TRUE, force the PHG to lyper Alert procedure using Op Code "Get Hyper Alert Level" (0x11) a write operation to the CGM Specific Ops Control Point characteristic's Op simulated PHD will respond with an indication including a "Hyper Alert Level (0x12) Op Code and an SFLOAT containing the requested alert level in mg/dL.		
			BLE_052 = TRUE, Check in PHG transcoder output the Device hypo/hyper Compound Numeric Object – Compound-Basic-Nu-Observed-Value attribute		
Pass/Fail criteria	Com 2), 0	pound- x0004	is checked, the Device hypo/hyper thresholds Compound Numeric Object – Basic-Nu-Observed-Value attribute is set to 0x0002 (count of components is (component list length is 4 octets), the Hypo Alert Level Response Operand the special value NaN (0x07FF)		
	Com 2), 0	pound- x0004	ras checked, the Device hypo/hyper thresholds Compound Numeric Object – Basic-Nu-Observed-Value attribute is set to 0x0002 (count of components is (component list length is 4 octets), the special value NaN (0x07FF) followed by lert Level Response Operand		
Notes	Possible	values	in typical points of observation after transcoder output are:		
(To assist manual testing)	a) IEEI	E 11073	3 Objects and Attributes		
loomig,	Com	pound-	Basic-Nu-Observed-Value attribute is present:		
		Object:	Device hypo/hyper thresholds Compound Numeric Object		
		Attribut	e-id: MDC_ATTR_NU_CMPD_VAL_OBS_BASIC (2677)		
		Attribut	e-type: SEQUENCE OF [{SFLOAT}]		
			e-value (If Step 6 was checked): 0x0002 (number of elements), 0x0004 (length sequence), followed by		
			st element (Hypo Alert Level Response Operand): 00 24 (hex) or F1 68 (hex) EE 10 (hex) or 36.0 (dec)		
		• Se	cond 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

TDU		TD/I D DAN/DUO/DUDTA//OOM/DV 057						
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 PHDT v1.6]						
	Testable items	GRC Numeric 1; O						
Test purpos	е	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						
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	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 Rate of Decrease and Increase 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						
		☐ 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		
	2.	CGM S	pecific 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.		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 procedu	start Time characteristics, and then to perform a Rate of Decrease Alert Level are 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.		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.	Force the PHG to perform a Rate of Increase Alert Level procedure using Op Code "G Rate of Increase Alert Level" (0x17) (performing a write operation to the CGM Specific Ops Control Point characteristic's Op Code).			
	7.		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 – Handle attribute		
Pass/Fail criteria			e Glucose rate of charge thresholds Compound Numeric Object – Handle attribute at or, if it is present then its value is different than 0		
Notes	Pos	ssible val	ues in typical points of observation after transcoder output are:		
(To assist manual testing)	a)	IEEE 11	073 Objects and Attributes		
3,		Handle	attribute is not present, or if it is present then:		
		☐ Obj	ect: Glucose rate of charge thresholds Compound Numeric Object		
		☐ Attr	ibute-id: MDC_ATTR_ID_HANDLE (2337)		
		☐ Attr	ibute-type: INT-U16		
		☐ Attr	ibute-value: Any value different than 0		
	b)	WAN P	CD-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	y	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	lure	 The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device specialization). The PHD has manually entered Rate of Decrease and Increase Alert Levalues 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).					

	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 testing)	a) IEEE 11073 Objects and Attributes						
looming,	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:						
	 partition: MDC_PART_PHD_DM or 128 (dec) or 00 80 (hex) 						
	code: MDC_CONC_GLU_RATE_THRESHOLDS or 29412 (dec) or 72 E4 (hex)						
	b) WAN PCD-01 message						
	PCD-01 message includes a 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/PHDTW/CGM/BV-059_A								
TP label		Whitepaper. Glucose rate of charge thresholds Compound Numeric Object - Metric-Spec-Small Attribute 1								
Coverage	Spec	[Bluetooth PHDT v1.6]	[Bluetooth PHDT v1.6]							
	Testable items	GRC Numeric 3; M	GRC Numeric 3; M GRCNumeric 5; M							
Test purpos	se .	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 manually by the user.								
Applicability	y	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	ne 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 Rate of Decrease and Increase 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								

					Format: 24 bit			
					Value: 0000 0000 0000 0000 0001 0000 (MSB \rightarrow LSB). Rate of Increase/Decrease Alerts supported.			
		i	ii.	Field	d: CGM Type			
					Format: 4 bit			
					Value: not relevant			
		i	iii.	Field	d: CGM Sample Location			
					Format: 4 bit			
					Value: not relevant			
		i	iv.	Field	d: E2E-CRC			
					Format: uint16			
					Value: not relevant			
	ı	b. (CGN	И Sp	ecific Ops Control Point (0x2AAC)			
		i	i.	Field	d: Op Code			
					Format: uint8			
		i	ii.	Field	d: Op Code – Response Codes			
					Format: 8 bit			
					Value: 0x15 (Rate of Decrease Alert Level Response) / 0x18 (Rate of Increase Alert Level Response)			
		i	iii.	Field	d: Operand			
					Format: SFLOAT (mg/dL/min)			
					Value: not relevant			
		i	iv.	Field	d: E2E-CRC			
					This field is not present			
					der test initiates a discovery process (Scanning state), it discovers the ID and it starts a pairing process with the simulated PHD (Initiating state).			
	:	Sess proce	ion edur	Star e us	iring has been completed, force the PHG to read CGM Feature and CGM t Time characteristics, and then to perform a Rate of Decrease Alert Level ing Op Code "Get Rate of Decrease Alert Level" (0x14) (performing a write the CGM Specific Ops Control Point characteristic's Op Code).			
	I		l Re	spor	d PHD will respond with an indication including a "Rate of Decrease Alert nse" (0x15) Op Code and an SFLOAT containing the requested alert level in			
	ı	Rate	of I	ncre	G to perform a Rate of Increase Alert Level procedure using Op Code "Get ase Alert Level" (0x17) (performing a write operation to the CGM Specific Point characteristic's Op Code).			
	I		l Re	spor	d PHD will respond with an indication including a "Rate of Increase Alert nse" (0x18) Op Code and an SFLOAT containing the requested alert level in			
					PHG transcoder output the Glucose rate of charge thresholds Compound ect – Metric-Spec-Small attribute			
Pass/Fail criteria	attrib	oute i	s pr	eser	ient low/high thresholds Compound Numeric Object – Metric-Spec-Small and its value is {0x604C} (mss-avail-stored-data mss-upd-aperiodic mss-d mss-cat-manual mss-cat-setting)			
Notes	Poss	sible	valu	es ir	n typical points of observation after transcoder output are:			
(To assist manual testing)	a)	IEEE	110	073 (Objects and Attributes			
		Metri	ic-S _l	pec-	Small attribute is present:			
			Obje	ect: (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) W	AN PCD-01 message
PC	CD-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	[Blueto	[Bluetooth PHDT v1.6]								
	Testable items	GRC Numeric 3; M				GRCNumeric 4; 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 {0x6044} when the Rate of Increase/Decrease Alert Level									
					een executed	•					
Applicabilit	у					N_BLE_002 AND C_MA C_MAN_BLE_053 AND (043 AND C_MAN_BLE_054 BLE_055			
Other PICS											
Initial condi	tion	The PH	IG ur	nder	test and the sir	mulated 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 implements several BTLE characteristics. The characteristics of interest for this Test Case are:									
		a. CGM Feature (0x2AA8)									
			i.	Fie	ld: CGM Featu	ire					
					Format: 24 b	it					
						0000 0000 0000 000 1 0 crease Alerts supported.	000 (MS	B → LSB). Rate of			
			ii.	Fie	ld: CGM Type						
					Format: 4 bit						
					Value: not re	levant					
			iii.	Fie	ld: CGM Samp	ole Location					
					Format: 4 bit						
					Value: not re	levant					
			iv.	Fie	ld: E2E-CRC						
					Format: uint1	6					
					Value: not re	levant					
		b.	CG	SM S	pecific Ops Co	ntrol Point (0x2AAC)					
			i.	Fie	ld: Op Code						
					Format: uint8	3					
			ii.	Fie	ld: Op Code –	Response Codes					
					Format: 8 bit						
						(Rate of Decrease Alert t Level Response)	Level Re	esponse) / 0x18 (Rate of			

	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).
	When the pairing has been completed, force the PHG to read CGM Feature and CGM Session Start Time characteristics.
	5. Force the PHG to set the Rate of Decrease Alert Level by performing a Rate of Decrease Alert Level procedure using Op Code "Set Rate of Decrease Alert Level" (0x13) followed by a valid SFLOAT value (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".
	6. Force the PHG to set the Rate of Increase Alert Level by performing a Rate of Increase Alert Level procedure using Op Code "Set Rate of Increase Alert Level" (0x16) followed by a valid SFLOAT value (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".
	7. Then, force the PHG 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).
	8. 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.
	9. 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).
	10. 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 – 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	Possible values in typical points of observation after transcoder output are:
(To assist manual testing)	a) IEEE 11073 Objects and Attributes
, g,	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-I	PAN/	PHG/PHDTW/CG	M/BV-060		
TP label		Whitepaper. Glucose rate of charge thresholds Compound Numeric Object – Metric-Structure-Small Attribute					
Coverage	Spec	[Bluetoo	oth P	HDT v1.6]			
	Testable items	GRC N	GRC Numeric 6; M				
Test purpos	se	Check t	hat:				
		PHG includes Glucose rate of charge thresholds Compound Numeric Object – Metric-Structure-Small attribute in transcoder output.					
		[AND]					
		Metric-S	Struc	ture-Small is set to	(0x40, 0x02)		
Applicabilit	у			E_000 AND C_MA N_BLE_056	N_BLE_002 AND C_MAN_BLE	_043 AND C_MAN_BLE_054	
Other PICS							
Initial condi	tion	The PH	G ur	der test and the si	mulated PHD are in the Standby	y state.	
Test proced	lure	spe	eciali		figured with a Continuous Gluconas manually entered Rate of De	ose Monitoring Profile (device ecrease and Increase Alert Level	
				ulated PHD imple for this Test Case	ments several BTLE characteris are:	tics. The characteristics of	
		a.	CG	M Feature (0x2AA	.8)		
			i.	Field: CGM Feat	ure		
				☐ Format: 24 b	pit		
					0000 0000 0000 0001 0000 (MS crease Alerts supported.	SB → LSB). Rate of	
			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		
				☐ Value: not re	elevant		
		b.	CG	M Specific Ops Co	ontrol Point (0x2AAC)		
			i.	Field: Op Code			
				☐ Format: uint	8		
					(Rate of Decrease Alert Level R rt Level Response)	esponse) / 0x18 (Rate of	
			ii.	Field: Operand			
				☐ Format: SFL	OAT (mg/dL/min)		
				☐ Value: not re	elevant		
			iii.	Field: E2E-CRC			
				☐ This field is i	not present		
					es a discovery process (Scannings a pairing process with the sim		
					n completed, force the PHG to recteristics, and then to perform a		

	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-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	Possible values in typical points of observation after transcoder output are:		
(To assist manual testing)	a) IEEE 11073 Objects and Attributes		
,g,	Metric-Structure-Small attribute is present:		
	☐ Object: Glucose rate of charge 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-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	se	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_054 AND C_MAN_BLE_056			
Other PICS					
Initial condi	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 PHD has manually entered Rate of Decrease and Increase 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
				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 d PHD and it starts a pairing process with the simulated PHD (Initiating state).
	4.	Sess	sion edu	e 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.		l Re	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 in.
	6.	Rate	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 Introl Point characteristic's Op Code).
	7.		l Re	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 in.
	8.			n PHG transcoder output the Glucose rate of charge thresholds Compound Object – Metric-Id-List attribute
Pass/Fail criteria	attri MD	bute i	is pi ONC	e Glucose rate of charge thresholds Compound Numeric Object – Metric-Id-List resent and set to 0x0002 (count of metric ids is 2), 0x0004 (list length is 4 octets), E_GLU_RATE_THRESHOLD_INCREASE, E_GLU_RATE_THRESHOLD_DECREASE
Notes	Pos	sible	valu	ues in typical points of observation after transcoder output are:
To assist manual esting)	a)	IEEE	<u> </u>	073 Objects and Attributes
esung)	•			J-List attribute is present:
			Obj	ect: Glucose rate of charge thresholds Compound Numeric Object
			-	ibute-id: MDC_ATTR_ID_PHYSIO_LIST (2678)
				ibute-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)
 Second element: MDC_CONC_GLU_RATE_THRESHOLD_DECREASE (0x72E6)
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 Id		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 purpos	se	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					
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. 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).
	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 – 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	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: Glucose rate of charge thresholds Compound 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 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 BaseOffset 1; M				

T	Objects that			
Test purpose	Check that: PHG includes Glucose rate of charge thresholds Compound Numeric Object – Base-Offset-			
	ime-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_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.			
	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			
	☐ 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).			
	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 – Base-Offset-Time-Stamp attribute
Pass/Fail criteria	In Step 8, the Glucose rate of charge 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
,g,	Base-Offset-Time-Stamp attribute is present:
	□ 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) WAN PCD-01 message
	PCD-01 message includes a segments like this with Base-Offset-Time-Stamp attribute (check 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 Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-064			
TP label		Whitepaper. Glucose rate of charge thresholds Compound Numeric Object – Compound-Basic-Nu-Observed-Value Attribute			
Coverage	Spec	[Bluetooth PHDT v1.6]			
	Testable items	GRC Numeric 10; M			
Test purpos	е	Check that:			
		PHG includes Glucose rate of charge 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	1	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. 			
		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: 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. 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 – Compound-Basic-Nu-Observed-Value attribute					
Pass/Fail criteria	In Step 8, the Glucose rate of charge thresholds Compound Numeric Object – Compound-Basic-Nu-Observed-Value attribute is set to 0x0002 (count of components is 2), 0x0004 (component list length is 4 octets), the Rate of Increase Alert Level Response Operand followed by the Rate of Decrease 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					
	Compound-Basic-Nu-Observed-Value attribute is present:					
	☐ Object: Glucose rate of charge 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					
	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)	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 8391521^MDC_CONC_GLU_RATE_THRESHOLD_INCREASE^MDC m.0.x.a 9.0 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 9.0 266868^MDC_DIM_MILLI_G_PER_DL_PER_MIN^MDC R

TP ld		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	Enun	neration 1; O				
Test purpos	e	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							
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. 						
				ulated PHD implements several BTLE characteristics. The characteristics of for this Test Case are:				
		a.	CG	M 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.	CG	M 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

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: 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.
- The simulated PHD sends the Measurement to PHG under test
- Check in the PHG transcoder output the PHD DM 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
- Check in the PHG transcoder output the PHD DM Status Enumeration Object Handle 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 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 testing)	a)	IEEE 11073 Objects and Attributes			
		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 purpos	е	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		C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043						
Other PICS								
Initial condit	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), 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 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: not relevant

iii. Field: E2E-CRC

This field is not included

c. 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: 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

- 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.
- 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

In Step 6, 8 and 10, the PHD DM Status Enumeration Object – Type attribute is present and its value is MDC_PART_PHD_DM | MDC_PHD_DM_DEV_STAT

Notes (To assist manual testing)	Possible values in typical points of observation after transcoder output are: a) IEEE 11073 Objects and Attributes
, g,	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
	PCD-01 message includes a segments like this with Type attribute (check OBX-3):
	OBX n CWE 8408608^MDC_PHD_DM_DEV_STAT^MDC m.0.0.a [value] R [date_time]

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 purpos	e	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	/	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), 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 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: not relevant

iii. Field: E2E-CRC

This field is not included

c. 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: 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
- 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 Supplemental-Types 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 – 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		
3 ,	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:		
	 partition: MDC_PART_PHD_DM or 128 (dec) or 00 80 (hex) followed by one of: 		
	code: MDC_CGM_DEV_TYPE_SENSOR or 29460 (dec) or 73 14 (hex)		
	code: MDC_CGM_DEV_TYPE_TRANSMITTER or 29461 (dec) or 73 15 (hex)		
	code: MDC_CGM_DEV_TYPE_RECEIVER or 29462 (dec) or 73 16 (hex)		
	code: MDC_CGM_DEV_TYPE_OTHER or 29463 (dec) or 73 17 (hex)		
	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 items	PHDM Enumeration 4; M	
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}.		Metric-Spec-Small is set to {0xF040}.	
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 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.
- 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: not relevant
 - iii. Field: E2E-CRC
 - This field is not included
 - c. 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: not Relevant
 - iv. Field: Time Offset
 - Format: uint16
 - · Value: not relevant
 - v. Field: Sensor Status Annunciation
 - Format: 8 bit

	1	
	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). 	
	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– 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.	
	Check in the PHG transcoder output the PHD DM Status Enumeration Object – Metric-Spec-Small attribute	
	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	
3,	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 Id		TP/LP-PAN/PHG/PHDTW/CGM/BV-069		
TP label		Whitepaper. PHD DM Status Enumeration Object – Base-Offset-Time-Stamp Attribute		t-Time-Stamp Attribute
Coverage	Spec	[Bluetooth PHDT v1.6]	[Bluetooth PHDT v1.6]	
	Testable items	PHDM Enumeration 5; M	BaseOffset 3; M	
Test purpose		Check that:		
		PHG includes PHD DM Status Enumeration Object Base-Offset-Time-Stamp attribute in transcoder output.		
		[AND]		
		Base-Offset-Time-Stamp attribution	ute is set to the correct value acc	cording to Base-Offset 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.
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 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: 5 (min)
	ii. Field: CGM Status
	Format: 24 bit
	Value: not relevant
	iii. 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

	N/1 - 22 / 1)
	Value: 20 (min) Title 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}
	• 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.
	Check in the PHG transcoder output PHD DM 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 PHD DM Status Enumeration Object - Base-Offset-Time-Stamp 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 - 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	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: 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 Id		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 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 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 0000 0010 (MSB -> LSB). Device Battery Low.

iii. Field: E2E-CRC

Format: uint16

Value: not relevant

c. 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: 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
- 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.
- 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)
 - i. Field: CGM Status
 - Format: 24 bit
 - Value: 0000 0000 0000 0000 0010 0000 (MSB -> LSB). General device fault has occurred 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 occurred in the sensor.

- 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)
 - i. 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. 	Simple-Bit-Str is present with bit 25 set to 1 (device-status-battery-low). Rest of bits set to	
	 In Step 11, the PHD DM Status Enumeration Object – Enum-Observed-Value-Simple-Bi Str is present with bit 5 set to 1 (device-status-error). Rest of bits set to 0. 	t-	
	 In Step 12, the PHD DM Status Enumeration Object – Enum-Observed-Value-Simple-Bi Str is present with bit 16 set to 1 (device-status-service-time-sync-required). Rest of bits set to 0. 		
Notes	Possible values in typical points of observation after transcoder output are:		
(To assist manual testing)	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]		
	Testable items	CGM Enumeration 1; O		
Test purpos	e	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		
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 condition		The PHG under test and the simulated PHD are in the Standby state.		
		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 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					
	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.					
	Check in the PHG transcoder output the CGM Status Enumeration Object - Handle 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 - 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					
,g,	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 ld		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 purpos	se	Check that:			
		PHG includes CGM Status Enumeration Object – Type attribute in transcoder output.			
		[AND]			
		Type is set to MDC_PART_PHD_DM MDC_CGM_DEV_STAT			
Applicability	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), 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 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
 - 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: 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				
	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				
	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 - Type attribute.				
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				
3,	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:				
	 partition: MDC_PART_PHD_DM or 128 (dec) or 00 80 (hex) 				
	code: MDC_CGM_DEV_STAT or 29452 (dec) or 73 0C (hex)				
	b) WAN PCD-01 message				
	PCD-01 message includes a segment 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 ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-073		
TP label		Whitepaper. CGM Status Enumeration Object – Metric-Spec-Small Attribute		
Coverage	verage 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	<u></u>			
Initial condition	The PHG under test and the simulated PHD are in the Standby state.			
Test procedure	The First under test and the simulated First are in the standard state. The simulated PHD is configured with a Continuous Glucose Monitoring Profile (device).			
rest procedure	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 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 Polovent
	Value: not Relevant iv. Field: Time Offset
	• Format: uint16
	Value: not relevant Sinkly Consequence Outrop Agreement time.
	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 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
	Check in the PHG transcoder output the CGM Status Enumeration Object - Metric-Spec-Small 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 - 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
3,	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 ld		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		CGM Enumeration 4; M BaseOffset 3; M				
	items	O O IVI E II UI		Dado on cot o, in		
Test purpos	е	Check that	:			
		PHG includes CGM Status Enumeration Object Base-Offset-Time-Stamp attribute in transcoder output.				
		[AND]				
		Base-Offse stamp deri		oute is set to the correct value acc	ording to Base-Offset time	
Applicability	<i>I</i>	C_MAN_B	LE_000 AND C_MA	AN_BLE_002 AND C_MAN_BLE_	043	
Other PICS						
Initial condi	tion	The PHG ι	under test and the si	imulated PHD are in the Standby	state.	
Test proced	ure	specia state (lization), it has a CC	ofigured with a Continuous Glucos GM measurement ready to be sen The simulated PHD also has an id	t and it is in the Advertising	
			mulated PHD imple st for this Test Case	ments several BTLE characteristic are:	cs. The characteristics of	
		a. C	GM Feature (0x2AA	A8)		
		i.	Field: CGM Feat	ure		
		Format: 24 bit				
			Detection su Sensor Tem supported, H	0000 0000 0101 1011 1111 (MSI apported, Device Specific Alert supperature High-Low Detection supplypo Alerts supported, Hyper Alert crease Alerts supported, Sensor I	oported, Calibration supported, ported, Patient High/Low Alerts ts supported, Rate of	
		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		
			Value: not re	elevant		
		b. C	GM Status (0x2AA8	3)		
		i.	Field: Time Offse	et		
			Format: uint:	16		
			Value: 5 (min	n)		
		ii.	Field: CGM Statu	JS		
			• Format: 24 b	oit		
			Value: not re	elevant		
			. Field: E2E-CRC			
			This field is r	not included		
		c. C	GM 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)

ii. 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.
- 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 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 CGM Status Enumeration Object - Base-Offset- Time-Stamp attribute.			
Pass/Fail criteria	In Step 6 and 8 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 Measurement characteristic's Time Offset field (20 min).			
	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 testing)	a) IEEE 11073 Objects and Attributes			
	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			
	CGM Session Start Time characteristic Session Start Time field (May 12, 2016, 14:39:27)			
	• 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 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 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 purpos	se	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

- 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 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)
 - Field: Time Offset
 - Format: uint16
 - Value: 20 (min)
 - ii. Field: CGM Status
 - Format: 24 bit
 - Value: 0000 0000 0000 0000 0001 (MSB -> LSB). Session stopped.
 - iii. Field: E2E-CRC
 - · This field is not included
 - c. 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 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.
 - 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).
- 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 CGM 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.
- 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)
 - 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)
 - i. 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.

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.

- 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)
 - i. Field: CGM Status
 - Format: 24 bit
 - Value: 0000 0000 0000 0000 0001 0000 (MSB -> LSB). Device specific alert.
 - b. CGM Measurement (0x2AA7)
 - 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.
 - i. Field: Sensor Status Annunciation

• Format: 8 bit

• Value: 0000 0010 (MSB -> LSB). Calibration not allowed.

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.

- 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)

i. 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.

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.

- 17. 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 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.

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.

- 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)
 - i. 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:
 - 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.

- Field: Sensor Status Annunciation
 - Format: 8 bit
 - Value: 0000 0001 (MSB -> LSB). Sensor result lower than the patient low 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.

- 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.

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.

- 21. 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 0100 0000 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:

- CGM Status (0x2AA8)
 - i. Field: CGM Status
 - Format: 24 bit
 - Value: 0000 1000 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.

- 24. 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: 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)
 - 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: 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)
 - 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.

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) 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|8418060^MDC_CGM_DEV_STAT^MDC|1.0.0.a|1^sensor-sessionstopped(0)|||||R|||[date_time] Step 11 OBX|n|CWE|8418060^MDC_CGM_DEV_STAT^MDC|1.0.0.a|1^sensor-typeincorrect(2)|||||R|||[date_time] Step 12 OBX|n|CWE|8418060^MDC_CGM_DEV_STAT^MDC|1.0.0.a|1^sensormalfunction(3)|||||R|||[date_time] Step 13 OBX|n|CWE|8418060^MDC CGM DEV STAT^MDC|1.0.0.a|1^device-specificalert(4)|||||R|||[date_time] Step 14 OBX|n|CWE|8418060^MDC_CGM_DEV_STAT^MDC|1.0.0.a|1^sensor-calibrationnot-allowed(7)|||||R|||[date_time] Step 15 OBX|n|CWE|8418060^MDC_CGM_DEV_STAT^MDC|1.0.0.a|1^sensor-calibrationrecommended(8)|||||R|||[date_time] Step 16 OBX|n|CWE|8418060^MDC CGM DEV STAT^MDC|1.0.0.a|1^sensor-calibrationrequired(9)|||||R|||[date_time] Step 17 OBX|n|CWE|8418060^MDC_CGM_DEV_STAT^MDC|1.0.0.a|1^sensor-temp-toohigh(10)|||||R|||[date_time] Step 18 OBX|n|CWE|8418060^MDC_CGM_DEV_STAT^MDC|1.0.0.a|1^sensor-temp-toolow(11)|||||R|||[date_time] Step 19 OBX|n|CWE|8418060^MDC_CGM_DEV_STAT^MDC|1.0.0.a|1^sensor-result-belowpatient-low(12)|||||R|||[date_time] Step 20 OBX|n|CWE|8418060^MDC_CGM_DEV_STAT^MDC|1.0.0.a|1^sensor-result-abovepatient-high(13)|||||R|||[date_time] Step 21 OBX|n|CWE|8418060^MDC_CGM_DEV_STAT^MDC|1.0.0.a|1^sensor-lowhypo(14)|||||R|||[date_time]

Step 22

OBX n CWE 8418060^MDC_CGM_DEV_STAT^MDC 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^MDC_CGM_DEV_STAT^MDC 1.0.0.a 1^sensor-rate-increase-exceeded(17) R [date_time]
• Step 25
OBX n CWE 8418060^MDC_CGM_DEV_STAT^MDC 1.0.0.a 1^sensor-result-too-low(18) R [date_time]
• Step 26
OBX n CWE 8418060^MDC_CGM_DEV_STAT^MDC 1.0.0.a 1^sensor-result-too-high(19) R [date_time]

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-076				
TP label		Whitepaper. Glucose Numeric Object value				
Coverage	Spec	[Bluetooth PHDT v1.6]				
	Testable	Short Float Type 1; C			BaseOffset 3; M	Glucose Numeric 7; M
	items	Gluco	se Nu	meric 8; M		
Test purpos	e	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_MA	N_BL	E_000 AND C_MAI	N_BLE_002 AND C_MAN_	_BLE_043
Other PICS						
Initial condi	tion	The P	HG ur	nder test and the sir	nulated PHD are in the Sta	andby 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:			
		а	. CG	M Session Start Ti	me (0x2AAA)	
		i. Field: Session Start Time				
				Format: {uint:	16, uint8, uint8, uint8, uint8	3, 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		
				 Value: 4 (Day 	/light Time (+1h))	
			iv.	Field: E2E-CRC		
				This field is n	ot included	
		b	. CG	GM Measurement (0	x2AA7)	
			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 PHDT v1.6]		
	Testable	Short Float Type 1; C	BaseOffset 3; M	SensCal Numeric 11; M
	items	SensCal Numeric 12; M		
Test purpose		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.		

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 a Calibration Data Record 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}		
	 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 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. 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		

	T	
	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.	
	Check that the PHG accepts the measurement and decodes its value properly (glucose concentration calibration value, units and time stamp).	
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 purpose		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.		
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 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 Session Run Time (0x2AAB)		
	i. Field: Session Run Time		
	Format: uint16 (h)		
	• Value: 168		
	ii. 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, 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 Id		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 purpose		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		
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.		
		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 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	TP label		Whitepaper. Glucose trend Numeric Object value						
Coverage	Spec	[Bluetooth PHDT v1.6]							
	Testable	Short Float Ty	/pe 1; C	BaseOffset 3; M	GT Numeric 6; M				
	items	GT Numeric 7	7; M						
Test purpos	е	Check that:							
		Time Offset fi	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.						
Applicability	/	C_MAN_BLE	_000 AND C_MAI	N_BLE_002 AND C_MAN_BLE_	043				
Other PICS									
Initial condi	tion	The PHG und	ler test and the sir	nulated 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 (information s 	B → 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

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).
	 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 that the PHG accepts the measurement and decodes its value properly (glucose trend value, units and time stamp).
	 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	Short Float	Type 1; C	BaseOffset 1; M	PLH Numeric 9; M			
	items	PLH Numer	ic 10; M					
Test purpos	e	Check that:						
		Control Poir	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					
Applicability	/		.E_000 AND C_MAI N_BLE_048	N_BLE_002 AND C_MAN_BLE_	043 AND C_MAN_BLE_046			
Other PICS								
Initial condi	tion	The PHG u	nder test and the sir	nulated PHD are in the Standby	state.			
Test proced	ure	 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. 						
		The simulated PHD implements several BTLE characteristics. The characteristics of interest for this Test Case are:						
			a. CGM Feature (0x2AA8)					
		i.	Field: CGM Featu	re				
			Format: 24 bi	t				
			 Value: 0000 (Alerts support 	0000 0000 0000 0000 00 1 0 (MS) ted.	B → LSB). Patient High/Low			
		ii.	Field: CGM Type					
			• Format: 4 bit					
			 Value: not rel 	evant				
		iii.	Field: CGM Samp	le Location				
			Format: 4 bit					
			 Value: not rel 	evant				
		iv.	Field: E2E-CRC					
			Format: uint1	6				
			Value: not rel	evant				

		b. CO	GM 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: 72.0 (Patient Low threshold) / 144.0 (Patient High threshold) 		
		iii.	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.	Session using C	he pairing has been completed, force the PHG to read CGM Feature and CGM Start Time characteristics, and then to perform a Patient High Alert procedure Op Code "Get Patient High Alert Level" (0x08) (performing a write operation to the pecific 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.	Alert Le	the PHG to perform a Patient Low Alert procedure using Op Code "Get Patient Low evel" (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 nse" (0x0C) Op Code and an SFLOAT containing the requested value in mg/dL.		
	8.		that the PHG accepts the measurement and decodes its value properly (patient low h thresholds and units).		
Pass/Fail criteria	(m		ne PHG under test shows the following measurement: Patient Low threshold = 72.0 tient High threshold = 144.0 (mg/dL) with timestamp set to the collector's time of in		
Notes (To assist manual testing)					

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-082							
TP label		Whitepaper. Device hypo/hype	thresholds Compound Numeric	Object value					
Coverage	Spec	[Bluetooth PHDT v1.6]	[Bluetooth PHDT v1.6]						
	Testable	Short Float Type 1; C	BaseOffset 1; M	DHH Numeric 9; M					
	items	DHH Numeric 10; M							
Test purpos	se	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 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).
	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 that the PHG accepts the measurement and decodes its value properly (hypo and hyper thresholds and units).
Pass/Fail criteria	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 collection
Notes (To assist manual testing)	

TP ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-083
TP label		Whitepaper. Glucose rate of charge thresholds Compound Numeric Object value
Coverage Spec		[Bluetooth PHDT v1.6]

	Testable	Short Float	Гуре 1; С	BaseOffset 1; M	GRC Numeric 9; M				
	items	GRC Numer							
Test purpos	se	Check that:	,						
		Control Poin	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						
Applicability	y	C_MAN_BLE_000 AND C_MAN_BLE_002 AND C_MAN_BLE_043 AND C_MAN_BL AND C_MAN_BLE_056							
Other PICS									
Initial condi	tion	The PHG un	nder test and the sir	mulated PHD are in the Standby	state.				
Test proced	lure		zation). The PHD h	figured with a Continuous Glucos as manually entered Rate of Dec					
			ulated PHD implen for this Test Case	nents several BTLE characteristi are:	cs. The characteristics of				
		a. CG	M Feature (0x2AA	8)					
		i.	Field: CGM Featu	ıre					
			Format: 24 bit	it					
				0000 0000 0000 000 1 0000 (MS) crease Alerts supported.	B → 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 rel 	levant					
		iv.	Field: E2E-CRC						
			• Format: uint1	6					
			Value: not rel	levant					
		b. CG	M Specific Ops Co	ntrol Point (0x2AAC)					
		i.	Field: Op Code						
			Format: uint8	}					
				(Rate of Decrease Alert Level Re rt Level Response)	esponse) / 0x18 (Rate of				
		ii.	Field: Operand						
			Format: SFL0	OAT (mg/dL/min)					
			 Value: 9.0 (R Alert Level R 	ate of Decrease Alert Level Respense)	ponse) / 9.0 (Rate of Increase				
		iii.	Field: E2E-CRC						
			This field is n	ot present					
				es a discovery process (Scannings a pairing process with the simu					
		Session procedu	Start Time characure using Op Code	n completed, force the PHG to re teristics, and then to perform a R "Get Rate of Decrease Alert Lev cific Ops Control Point character	tate of Decrease Alert Level el" (0x14) (performing a write				
				spond with an indication including p Code and an SFLOAT containi					

		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 that PHG accepts the measurement and decodes its value properly (glucose rate of decrease and increase thresholds and units).
Pass/Fail criteria	thre	Step 8, the PHG under test shows the following measurement: Glucose rate of decrease eshold = 9.0 (mg/dL/min), Glucose rate of increase threshold = 9.0 (mg/dL/min) with estamp 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	[Blu	[Bluetooth PHDT v1.6]							
	Testable items	Bas	BaseOffset 3; M PHDM Enumeration 5; M PHDM Enumeration 6; M							
Test purpos	e	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_I	MAN	_BLI	E_000	AND C_MAI	N_BLE_002 AND C_MAN_BL	E_043		
Other PICS										
Initial condi	tion	The	e PH	G ur	nder te	st and the sir	nulated PHD are in the Standl	by state.		
Test procedure		1.	spe stat tem	cose Monitoring Profile (device sent and it is in the Advertising in identical CGM measurement stics. The characteristics of						
			a.	CG						
				i.						
					• F	Format: 24 bi	it			
							0000 0000 1 010 0000 0000 (Noported, General Device Fault			
				ii.	Field	: CGM Type				
					• F	Format: 4 bit				
				• \	Value: not rel	levant				
				iii.	Field	: CGM Samp	le Location			
				• F	Format: 4 bit					
				• \	Value: not rel	levant				
				iv.	Field	: E2E-CRC				
					• F	Format: uint1	6			
					• \	Value: not rel	levant			
			b.	CG	M Stat	tus (0x2AA8)				

- i. Field: Time Offset
 - Format: uint16
 - Value: not relevant.
- ii. Field: CGM Status
 - Format: 24 bit
 - Value: 0000 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, 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).
	 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 that the PHG accepts the measurement and decodes its value properly (sensor status and time stamp).
	 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 (sensor status and time stamp).
	Force the PHG under test to read the CGM Status characteristic to actively request the status of the CGM sensor.
	 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 ld		TP/LP-PAN/PHG/PHDTW/CGM/BV-085					
TP label		Whitepaper. CGM Status Enumeration Object value					
Coverage	Spec	[Bluetooth PHDT v1.6]					
_	Testable items	BaseOffset	3; M	CGM Enumeration 4; M	CGM Enumeration 5; 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 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					
			Detection sup Sensor Temp supported, H	2000 0000 0101 1011 1111 (MSI oported, Device Specific Alert supperature High-Low Detection suppopo Alerts supported, Hyper Alert supported, Sensor I	pported, Calibration supported, ported, Patient High/Low Alerts ts supported, 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. CGM Status (0x2AA8)

i. Field: Time Offset

Format: uint16

Value: 20 (min)

ii. Field: CGM Status

Format: 24 bit

• Value: 0000 0000 0000 0000 0001 (MSB -> LSB). Session stopped.

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: 20 (min)

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

d. CGM Session Start Time (0x2AAA)

. 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))
	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).
	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 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
	Check that the PHG accepts the measurement and decodes its value properly (sensor status and time stamp).
	Force the PHG under test to read the CGM Status characteristic to actively request the status of the CGM sensor.
	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: CGM Status = 'sensor-session-stopped' (0) with timestamp '2016-05-12 16:59:27'
Notes (To assist manual testing)	

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