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ITU-T H.845.16

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SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

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

Conformance of ITU-T H.810 personal health system: Personal Health Devices interface Part 5P: Continuous glucose monitor

Recommendation ITU-T H.845.16

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Recommendation ITU-T H.845.16

Conformance of ITU-T H.810 personal health system: Personal Health Devices interface Part 5P: Continuous glucose monitor

Summary

Recommendation ITU-T H.845.16 provides a test suite structure (TSS) and the test purposes (TP) for the continuous glucose monitor in the Personal Health Device (PHD) interface, based on the requirements defined in the Recommendations of the ITU-T H.810 sub-series, 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.845.16 is a transposition of Continua Test Tool DG2016, Test Suite Structure & Test Purposes, Personal Health Devices Interface, Part 5P: Device Specializations. Personal Health Device, Continuous Glucose Monitor (CGM), Version 1.1 (2017-03-14).

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

History

Edition	Recommendation	Approval	Study Group	Unique ID*
1.0	ITU-T H.845.16	2017-04-13	16	11.1002/1000/13235
1.1	ITU-T H.845.16 (2017) Cor. 1	2017-11-29	16	11.1002/1000/13426

Keywords

Conformance testing, Continua Design Guidelines, continuous glucose monitor, e-health, ITU-T H.810, IEEE 11073 device specialization, Personal Health Devices interface, personal area network, personal connected health devices, 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.

FOREWORD

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The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

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

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure, e.g., interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

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

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

Introduction

This Recommendation is the transposition of Continua Test Tool DG2016, Test Suite Structure & Test Purposes, Personal Health Devices Interface, Part 5P: Device Specializations. Personal Health Device, (Continuous Glucose Monitor -CGM-), Version 1.1 (2017-03-14) 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	2016-09-20	Initial release for Test Tool DG2016 based on the requirements in [ITU-T H.810 (2016)]/[b-CDG 2016].
1.1	2017-03-14	This uses "TSS&TP_DG2016_PHD_PART_5P_ v1.0.doc" as a baseline and adds new features included in Continua DG 2016 + Errata and it adds some updates according to the maintenance 2016 activity.

Recommendation ITU-T H.845.16

Conformance of ITU-T H.810 personal health system: Personal Health Devices interface Part 5P: Continuous glucose monitor

1 Scope

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

The TSS and TP for the Personal Health Devices interface has been divided into the parts specified below. This Recommendation covers Part 5, subpart 5P.

– Part 1: Optimized Exchange Protocol. Personal Health Device
– Part 2: Optimized Exchange Protocol. Personal Health Gateway
– Part 3: Continua Design Guidelines. Personal Health Device
– Part 4: Continua Design Guidelines. Personal Health Gateway
– Part 5: Device Specializations. Personal Health Devices interface. This document is divided into the following subparts:
  - Part 5A: Weighing scales
  - Part 5B: Glucose meter
  - Part 5C: Pulse oximeter
  - Part 5D: Blood pressure monitor
  - Part 5E: Thermometer
  - Part 5F: Cardiovascular fitness and activity monitor
  - Part 5G: Strength fitness equipment
  - Part 5H: Independent living activity hub
  - Part 5I: Adherence monitor
  - Part 5J: Insulin pump
  - Part 5K: Peak expiratory flow monitor
  - Part 5L: Body composition analyser
  - Part 5M: Basic electrocardiograph
  - Part 5N: International normalized ratio monitor
  - Part 5O: Sleep apnoea breathing therapy equipment (SABTE)
  - **Part 5P: Continuous glucose monitor (CGM)**
– Part 6: Device specializations. Personal Health Gateway
– Part 7: Continua Design Guidelines. BLE Personal Health Device
– Part 8: Continua Design Guidelines. BLE Personal Health Gateway
– Part 9: Personal Health Devices Transcoding Whitepaper. Personal Health Devices
– Part 10: Personal Health Devices Transcoding Whitepaper. Personal Health Gateway

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

2 References

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

[ITU-T H.810 (2016)] Recommendation ITU-T H.810 (2016), *Interoperability design guidelines for personal health systems*.

[ITU-T H.811] Recommendation ITU-T H.811 (2016), *Interoperability design guidelines for personal health systems: TAN/PAN/LAN interface*.

[ITU-T H.812] Recommendation ITU-T H.812 (2016), *Interoperability design guidelines for personal health systems: WAN interface*.

[ITU-T H.812.1] Recommendation ITU-T H.812.1 (2016), *Interoperability design guidelines for personal health systems: WAN interface: Observation upload*.

[ITU-T H.812.2] Recommendation ITU-T H.812.2 (2016), *Interoperability design guidelines for personal health systems: WAN interface: Questionnaires*.

[ITU-T H.812.3] Recommendation ITU-T H.812.3 (2016), *Interoperability design guidelines for personal health systems: WAN interface: Capability exchange*.

[ITU-T H.812.4] Recommendation ITU-T H.812.4 (2016), *Interoperability design guidelines for personal health systems: WAN interface: Authenticated persistent session*.

[ITU-T H.813] Recommendation ITU-T H.813 (2016), *Interoperability design guidelines for personal health systems: HRN interface*.

[ISO/IEEE 11073-10425] ISO/IEEE 11073-10425:2016, *Health informatics – Personal health device communication – Part 10425: Device specialization – Continuous glucose monitor (CGM)*.
https://www.iso.org/standard/67821.html

[ISO/IEEE 11073-20601-2016C] ISO/IEEE 11073-20601:2016, *Health informatics – Personal health device communication – Part 20601: Application profile – Optimized exchange protocol, including ISO/IEEE 11073-20601:2016/Cor.1:2016*.
https://www.iso.org/standard/66717.html with
https://www.iso.org/standard/71886.html

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

MDS Medical Device System

NFC Near Field Communication

PAN Personal Area Network

PCT Protocol Conformance Testing

PCO Point of Control and Observation

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

SABTE Sleep Apnoea Breathing Therapy Equipment

SCR Static Conformance Review

SDP Service Discovery Protocol

SOAP Simple Object Access Protocol

TCWG Test and Certification Working Group

TP Test Purpose

TSS Test Suite Structure

USB Universal Serial Bus

WDM Windows Driver Model

5 Conventions

The key words "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "MAY", "MAY NOT" in this document are to be interpreted as in [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.

Generic reference to the ITU-T H.810 series (listed in clause 2) is made through the label [ITU-T H.810 series.

Reference is made in the ITU-T H.820-H.850-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 H.810 is split into eight parts in the 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

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

CDG release	Transposed as	Version	Description	Designation
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 (TSS)

The test purposes (TPs) for the Personal Health Devices interface have been divided into the main subgroups specified below. Annex A describes the TPs for subgroup 1.3.16 (shown in bold):

The Test Purposes (TP) has been divided in two main groups:

– Group 1: Personal Health Device (PHD)
  - Group 1.1: Transport (TR)
    - Subgroup 1.1.1: Design guidelines: Common (DGC)
    - Subgroup 1.1.2: USB design guidelines (UDG)
    - Subgroup 1.1.3: Bluetooth design guidelines (BDG)
    - Subgroup 1.1.4: Pulse oximeter design guidelines (PODG)
    - Subgroup 1.1.5: Cardiovascular design guidelines (CVDG)
    - Subgroup 1.1.6: Activity hub design guidelines (HUBDG)
    - Subgroup 1.1.7: ZigBee design guidelines (ZDG)
    - Subgroup 1.1.8: Glucose meter design guidelines (GLDG)
    - Subgroup 1.1.9: Bluetooth low energy design guidelines (BLEDG)
    - Subgroup 1.1.10: Basic electrocardiograph design guidelines (ECGDG)
    - Subgroup 1.1.11: NFC design guidelines (NDG)
  - Group 1.2: IEEE 20601 Optimized exchange protocol (OXP)
    - Subgroup 1.2.1: PHD domain information model (DIM)
    - Subgroup 1.2.2: PHD service model (SER)
    - Subgroup 1.2.3: PHD communication model (COM)

- Group 1.3: Devices class specializations (CLASS)
  - Subgroup 1.3.1: Weighing scales (WEG)
  - Subgroup 1.3.2: Glucose meter (GL)
  - Subgroup 1.3.3: Pulse oximeter (PO)
  - Subgroup 1.3.4: Blood pressure monitor (BPM)
  - Subgroup 1.3.5: Thermometer (TH)
  - Subgroup 1.3.6: Cardiovascular (CV)
  - Subgroup 1.3.7: Strength (ST)
  - Subgroup 1.3.8: Activity hub (HUB)
  - Subgroup 1.3.9: Adherence monitor (AM)
  - Subgroup 1.3.10: Insulin pump (IP)
  - Subgroup 1.3.11: Peak flow (PF)
  - Subgroup 1.3.12: Body composition analyser (BCA)
  - Subgroup 1.3.13: Basic electrocardiograph (ECG)
  - Subgroup 1.3.14: International normalized ratio (INR)
  - Subgroup 1.3.15: Sleep apnoea breathing therapy equipment (SABTE)
  - **Subgroup 1.3.16: Continuous glucose monitor (CGM)**
- Group 1.4: Personal Health Device transcoding whitepaper (PHDTW)
  - Subgroup 1.4.1: Whitepaper general requirements (GEN)
  - Subgroup 1.4.2: Whitepaper thermometer requirements (TH)
  - Subgroup 1.4.3: Whitepaper blood pressure requirements (BPM)
  - Subgroup 1.4.4: Whitepaper heart rate requirements (HR)
  - Subgroup 1.4.5: Whitepaper glucose meter requirements (GL)
  - Subgroup 1.4.6: Whitepaper weight scale requirements (WS)
  - Subgroup 1.4.7: Whitepaper pulse oximeter requirements (PLX)
  - Subgroup 1.4.8: Whitepaper continuous glucose monitoring requirements (CGM)

– Group 2: Personal Health Gateway (PHG)

- Group 2.1: Transport (TR)
  - Subgroup 2.1.1: Design guidelines: Common (DGC)
  - Subgroup 2.1.2: USB design guidelines (UDG)
  - Subgroup 2.1.3: Bluetooth design guidelines (BDG)
  - Subgroup 2.1.4: Cardiovascular design guidelines (CVDG)
  - Subgroup 2.1.5: Activity hub design guidelines (HUBDG)
  - Subgroup 2.1.6: ZigBee design guidelines (ZDG)
  - Subgroup 2.1.7: Bluetooth low energy design guidelines (BLEDG)
  - Subgroup 2.1.8: NFC design guidelines (NDG)
- Group 2.2: IEEE 20601 Optimized exchange protocol (OXP)
  - Subgroup 2.2.1: General (GEN)
  - Subgroup 2.2.2: PHD domain information model (DIM)
  - Subgroup 2.2.3: PHD service model (SER)
  - Subgroup 2.2.4: PHD communication model (COM)

- Group 2.3: Devices class specializations (CLASS)
  - Subgroup 2.3.1: Weighing scales (WEG)
  - Subgroup 2.3.2: Glucose Meter (GL)
  - Subgroup 2.3.3: Pulse oximeter (PO)
  - Subgroup 2.3.4: Blood pressure monitor (BPM)
  - Subgroup 2.3.5: Thermometer (TH)
  - Subgroup 2.3.6: Cardiovascular (CV)
  - Subgroup 2.3.7: Strength (ST)
  - Subgroup 2.3.8: Activity hub (HUB)
  - Subgroup 2.3.9: Adherence monitor (AM)
  - Subgroup 2.3.10: Insulin pump (IP)
  - Subgroup 2.3.11: Peak flow (PF)
  - Subgroup 2.3.12: Body composition analyser (BCA)
  - Subgroup 2.3.13: Basic electrocardiograph (ECG)
  - Subgroup 2.3.14: International normalized ratio (INR)
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  - Subgroup 2.4.5: Whitepaper glucose meter requirements (GL)
  - Subgroup 2.4.6: Whitepaper weight scale requirements (WS)
  - Subgroup 2.4.7: Whitepaper pulse oximeter requirements (PLX)
  - Subgroup 2.4.8: Whitepaper continuous glucose monitoring requirements (CGM)

7 Electronic attachment

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

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

Annex A

Test purposes

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

A.1 TP definition conventions

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

- **TP Id**: This is a unique identifier (TP/<TT>/<DUT>/<GR>/<SGR>/<XX> – <NNN>). It is specified according to the naming convention defined below:
  - Each test purpose identifier is introduced by the prefix "TP".
  - <TT>: This is the test tool that will be used in the test case.
    - PAN: Personal area network (Bluetooth or USB)
    - LAN: Local area network (ZigBee)
    - PAN-LAN: Personal area network (Bluetooth or USB) - Local area network (ZigBee)
    - LP-PAN: Low power personal area network (Bluetooth Low Energy)
    - TAN: Touch area network (NFC)
    - PLT: Personal area network (Bluetooth or USB) – Local area network (ZigBee) – Touch area network (NFC)
  - <DUT>: This is the device under test
    - PHD: Personal Health Device
    - PHG: Personal Health Gateway
  - <GR>: This identifies a group of test cases
  - <SGR>: This identifies a subgroup of test cases
  - <XX>: This identifies the type of testing
    - BV: Valid behaviour test
    - BI: Invalid behaviour test
  - <NNN>: This is a sequential number that identifies the 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 1.3.16: Continuous glucose monitor (CGM)

<table>
<tr><td colspan="2">TP Id</td><td colspan="3">TP/PLT/PHD/CLASS/CGM/BV-000_A</td></tr>
<tr><td colspan="2">TP label</td><td colspan="3">Get MDS Object for Continuous Glucose Monitor specialization: Mandatory, Conditional and Optional Attributes.</td></tr>
<tr><td rowspan="4">Coverage</td><td>Spec</td><td colspan="3">[ISO/IEEE 11073-10425]</td></tr>
<tr><td rowspan="3">Testable items</td><td>MDSAttrCGM 3; M</td><td>MDSAttrCGM 4; M</td><td>MDSAttrCGM 6; M</td></tr>
<tr><td>MDSAttrCGM 7; M</td><td>MDSAttrCGM 12; R</td><td>MDSAttrCGM 15; R</td></tr>
<tr><td>MDSAttrCGM 16; R</td><td>MDSAttrCGM 17; R</td><td>MDSAttrCGM 18; R</td></tr>
<tr><td colspan="2">Test purpose</td><td colspan="3">Check that:
The MDS Object contains the attributes specified for a Continuous Glucose Monitor agent</td></tr>
<tr><td colspan="2">Applicability</td><td colspan="3">C_AG_OXP_000 AND C_AG_OXP_157</td></tr>
<tr><td colspan="2">Other PICS</td><td colspan="3">C_AG_OXP_181</td></tr>
<tr><td colspan="2">Initial condition</td><td colspan="3">The simulated Personal Health Gateway (PHG) and the Personal Health Device (PHD) under test are in the Operating state.</td></tr>
<tr><td colspan="2">Test procedure</td><td colspan="3">1. The simulated PHG issues “roiv-cmip-get” command with handle set to 0 (to request for MDS object) and attribute-id-list set to 0 to indicate all attributes.
2. The PHD responds with a “rors-cmip-get” service message in which the attribute-list contains a list of all implemented attributes of the MDS object:
MDS Attributes:
a. Attribute System-Type must not be present.
b. Mandatory attribute System-Type-Spec_List
❑ attribute-id = MDC_ATTR_SYS_TYPE_SPEC_LIST
❑ attribute-type = TypeVerList
❑ attribute-value.length = 4 bytes for each configuration supported
❑ attribute-value = { MDC_DEV_SPEC_PROFILE_CGM, 1} must be found in the list
c. Mandatory attribute System-model
❑ attribute-id = MDC_ATTR_ID_MODEL (0x09 0x28)
❑ attribute-type = SystemModel
❑ atribute-value.length = <Variable>
❑ attribute-value =
• Manufacturer = Check against PIXIT I_AG_OXP_003
• Model = Check against PIXIT I_AG_OXP_004
d. Mandatory attribute Dev-Configuration-Id
❑ attribute-id = MDC_ATTR_DEV_CONFIG_ID
❑ attribute-type = ConfigId
❑ attribute-value.length = 2 bytes
❑ attribute-value =
• IF NOT C_AG_OXP_181 then attribute-value = 0x 09C4
• ELSE attribute-value = < between 0x4000 and 0x7FFF>
e. If recommended attribute Base-Offset-Time is present</td></tr>
</table>

	❑ attribute-id = MDC_ATTR_TIME_BO (0x0A 0x81) ❑ attribute-type = BaseOffsetTime ❑ attribute-value.length = 8 bytes ❑ attribute-value = <not relevant> f. If recommended attribute Date-and-Time-Adjustment is present ❑ attribute-id = MDC_ATTR_TIME_ABS_ADJUST (0x0A 0X62) ❑ attribute-type = AbsoluteTimeAdjust ❑ attribute-value.length = 6 bytes ❑ attribute-value = <not relevant> g. If recommended attribute Power-Status is present ❑ attribute-id = MDC_ATTR_POWER_STAT ❑ attribute-type = PowerStatus (BITS-16) ❑ attribute-value.length = 2 bytes ❑ attribute-value = • ON_BATTERY(0x4000) • ON_MAINS (0x8000) h. If recommended attribute Battery-Level is present ❑ attribute-id = MDC_ATTR_VAL_BATT_CHARGE (0X09 0X9C) ❑ attribute-type = INT-U16 ❑ attribute-value.length = 2 bytes ❑ attribute-value = <not relevant> i. If recommended attribute Remain-Battery-Time is present ❑ attribute-id = MDC_ATTR_TIME_BATT_REMAIN (0X09 0X88) ❑ attribute-type = BatMeasure ❑ attribute-value.length = 6 bytes ❑ attribute-value = <not relevant>
Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	

TP Id		TP/PLT/PHD/CLASS/CGM/BV-000_B		
TP label		MDS Configuration objects events for Continuous Glucose Monitor specialization.		
Coverage	**Spec**	[ISO/IEEE 11073-10425]		
	Testable items	MDSEventsCGM 1; M		
Test purpose		Check that: A Continuous Glucose Monitor agent shall send the [MDS-Configuration-Event] using a [Confirmed] event report. The [MDS-Configuration-Event] shall include the event-info [ConfigReport]		
Applicability		C_AG_OXP_000 AND C_AG_OXP_157		
Other PICS		C_AG_OXP_010, C_AG_OXP_181		
Initial condition		The simulated PHG and the PHD under test are in the Unassociated state.		

Test procedure	1. The simulated PHG receives an association request from the PHD under test. 2. The simulated PHG responds with a result = accepted-unknown-config 3. The PHD responds with a “Remote Operation Invoke | Confirmed Event Report” message with an MDC_NOTI_CONFIG event to send its configuration to the PHG: a. APDU Type ❑ field- type = PrstApdu ❑ field-length =2 bytes ❑ field-value =0xE7 0x00 b. invoke-id ❑ field- type = InvokeIDType ❑ field-length =INT-U16 ❑ field- value =<Not relevant for this test> c. message ❑ field- type = roiv-cmip-confirmed-event-report ❑ field-length =two bytes ❑ field- value =0x01 0x01 (EventReportArgumentSimple) d. obj-handle (EventReportArgumentSimple) ❑ field- type = HANDLE ❑ field-length =INT-U16 e. event-time (EventReportArgumentSimple) ❑ field- type = Relative Time ❑ field-length =INT-U32 ❑ field-value = • IF NOT C_AG_OXP_010 THEN value = 0xFF 0xFF 0xFF 0xFF f. event-type (EventReportArgumentSimple) ❑ field- type = OID-Type ❑ field-length =INT-U16 ❑ field- value=0x0D 0x1C (MDC_NOTI_CONFIG) g. config-report-id (ConfigReport) ❑ field- type = ConfigId ❑ field-length = INT-U16 ❑ field value = <It matches the tested configuration> • IF NOT C_AG_OXP_181 THEN attribute-value = 0x09C4 (2500) • ELSE attribute-value = <between 0x40 0x00 and 0x7F 0xFF > for extended configuration. h. obj-class (ConfigReport → ConfigObjectList (ConfigObject)) ❑ field- type = OID-Type ❑ field-length = INT-U16 ❑ field- value = At least one MDC_MOC_VMO_METRIC_NU
Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	

<table>
<tr><td colspan="2">TP Id</td><td colspan="3">TP/PLT/PHD/CLASS/CGM/BV-000_C</td></tr>
<tr><td colspan="2">TP label</td><td colspan="3">MDS objects events for Continuous Glucose Monitor specialization.</td></tr>
<tr><td rowspan="6">Coverage</td><td>Spec</td><td colspan="3">[ISO/IEEE 11073-10425]</td></tr>
<tr><td rowspan="5">Testable items</td><td>MDSEventsCGM 3; M</td><td>MDSEventsCGM 4; M</td><td>MDSEventsCGM 5; M</td></tr>
<tr><td>MDSEventsCGM 6; M</td><td>MDSEventsCGM 7; M</td><td>MDSEventsCGM 8; M</td></tr>
<tr><td>MDSEventsCGM 9; M</td><td>MDSEventsCGM 10; M</td><td>ObjAccServCGM 1; M</td></tr>
<tr><td>ObjAccServCGM 2; M</td><td></td><td></td></tr>
<tr><td colspan="2">Test purpose</td><td colspan="3">Check that:
MDS Event reports shall be used in confirmed mode
[AND]
Agent-initiated mode shall be supported for measurement data transmission
[AND]
A Continuous Glucose Monitor PHD shall send the [MDS-Dynamic-Data-Update-Fixed] using a [Confirmed] event report. The [MDS-Dynamic-Data-Update-Fixed] shall include the event-info [ScanReportInfoFixed]
[OR]
A Continuous Glucose Monitor PHD shall send the [MDS-Dynamic-Data-Update-Var] using a [Confirmed] event report. The [MDS-Dynamic-Data-Update-Var] shall include the event-info [ScanReportInfoVar]
[OR]
A Continuous Glucose Monitor PHD shall send the [MDS-Dynamic-Data-Update-MP-Fixed] using a [Confirmed] event report. The [MDS-Dynamic-Data-Update-MP-Fixed] shall include the event-info [ScanReportInfoMPFixed]
[OR]
A Continuous Glucose Monitor PHD shall send the [MDS-Dynamic-Data-Update-MP-Var] using a [Confirmed] event report. The [MDS-Dynamic-Data-Update-MP-Var] shall include the event-info [ScanReportInfoMPVar]</td></tr>
<tr><td colspan="2">Applicability</td><td colspan="3">C_AG_OXP_000 AND C_AG_OXP_157 AND (C_AG_OXP_182 OR C_AG_OXP_183 OR C_AG_OXP_184 OR C_AG_OXP_189)</td></tr>
<tr><td colspan="2">Other PICS</td><td colspan="3"></td></tr>
<tr><td colspan="2">Initial condition</td><td colspan="3">The simulated PHG and the PHD under test are in the Operating state.</td></tr>
<tr><td colspan="2">Test procedure</td><td colspan="3">1. Take Measurements for every supported Object in the PHD under test.
2. Wait to receive every event report and check:
a. APDU Type
❑ field- type = Event Report
❑ field-length = 2 bytes
❑ field- value=0x01 0x01 (EventReportArgumentSimple, confirmed)
This field identifies the type of message sent by the PHD, for the confirmed event configuration, roiv-cmip-confirmed-event-report.</td></tr>
<tr><td colspan="2">Pass/Fail criteria</td><td colspan="3">Check that every received report is one of the following confirmed Data APDU
• MDC_NOTI_SCAN_REPORT_FIXED
• MDC_NOTI_SCAN_REPORT_MP_FIXED
• MDC_NOTI_SCAN_REPORT_VAR</td></tr>
</table>

	• MDC_NOTI_SCAN_REPORT_MP_VAR
Notes	

TP Id		TP/PLT/PHD/CLASS/CGM/BV-001		
TP label		Objects for Continuous Glucose Monitor specialization - Standard Configuration		
Coverage	**Spec**	[ISO/IEEE 11073-10425]		
	Testable items	Glucose 1; M	SensCal 2; M	SensRun 2; M
		GluSampInt 2; M	GluTrend 2; M	PHighLow 2; M
		DevHypoHyper 2; M	GluRateChange 2; M	PHDDMStatus 2; M
		CGMStatus 2; M		
Test purpose		Check that: The Glucose Numeric object with Type {MDC_PART_SCADA | MDC_CONC_GLU_ISF} is supported by a Continuous Glucose Monitor PHD with Standard Configuration 2500 (0x09C4). [AND] No more objects are supported by a Continuous Glucose Monitor (CGM) PHD with Standard Configuration 2500 (0x09C4).		
Applicability		C_AG_OXP_000 AND C_AG_OXP_157 AND (NOT_C_AG_OXP_181)		
Other PICS				
Initial condition		The simulated PHG and the PHD under test are in the Unassociated state.		
Test procedure		1. The simulated PHG receives an association request from the PHD under test. 2. The simulated PHG responds with a result = accepted-unknown-config 3. The PHD responds with a “Remote Operation Invoke | Confirmed Event Report” message with an MDC_NOTI_CONFIG event to send its configuration to the PHG. 4. Check that the field Dev-Config-Id is set to 0x09C4 (2500), if it is not, PHG responds with a “unsupported-config” and waits for a new configuration. 5. Once the PHD under test sends a standard configuration, Check that: Attribute-List: a. attribute-value (ConfigReport → ConfigObjectList (ConfigObject) → Attribute List), this value depends on the attribute Type. Values to be checked are: ❑ The Glucose numeric object is present once→ MDC_PART_SCADA (0x00 0x02), MDC_CONC_GLU_ISF (0x71 0xD4)		
Pass/Fail criteria		All checked values are as specified in the test procedure and no other object is listed.		
Notes				

TP Id		TP/PLT/PHD/CLASS/CGM/BV-002		
TP label		Objects for Continuous Glucose Monitor specialization - Extended Configuration		
Coverage	**Spec**	[ISO/IEEE 11073-10425]		
	Testable	Glucose 1; M	SensCal 1; O	SensRun 1; O

	items	GluSampInt 1; O	GluTrend 1; O	PHighLow 1; O
		DevHypoHyper 1; O	GluRateChange 1; O	PHDDMStatus 1; O
		CGMStatus 1; O		
Test purpose		Check that: The Glucose numeric object with Type {MDC_PART_SCADA | MDC_CONC_GLU_ISF or MDC_CONC_GLU_CAPILLARY_WHOLEBLOOD or MDC_CONC_GLU_CAPILLARY_PLASMA or MDC_CONC_GLU_VENOUS_WHOLEBLOOD or MDC_CONC_GLU_VENOUS_PLASMA or MDC_CONC_GLU_ARTERIAL_WHOLEBLOOD or MDC_CONC_GLU_ARTERIAL_PLASMA or MDC_CONC_GLU_CONTROL or MDC_CONC_GLU_UNDETERMINED_WHOLEBLOOD or MDC_CONC_GLU_UNDETERMINED_PLASMA} is supported by a Continuous Glucose Monitor PHD with extended configuration. Only one object is allowed. [AND] The Sensor calibration numeric object with Type {MDC_PART_PHD_DM | MDC_CGM_SENSOR_CALIBRATION} may be present in the CGM extended configuration. Only one object is allowed. [AND] The Sensor run-time numeric object with Type {MDC_PART_PHD_DM | MDC_CGM_SENSOR_RUN_TIME} may be present in the CGM extended configuration. Only one object is allowed. [AND] The Glucose Sampling Interval numeric object with Type {MDC_PART_PHD_DM | MDC_CGM_SENSOR_SAMPLE_INTERVAL} may be present in the CGM extended configuration. Only one object is allowed. [AND] The Glucose Trend numeric object with Type {MDC_PART_PHD_DM | MDC_CONC_GLU_TREND} may be present in the CGM extended configuration. Only one instance is allowed. [AND] The Patient low/high threshold compound numeric object with Type {MDC_PART_PHD_DM | MDC_CONC_GLU_PATIENT_THRESHOLDS_LOW_HIGH} may be present in the CGM extended configuration. Only one instance is allowed. [AND] The Device hypo/hyper thresholds compound numeric object with Type {MDC_PART_PHD_DM | MDC_CONC_GLU_THRESHOLDS_HYPO_HYPER} may be present in the CGM extended configuration. Only one instance is allowed. [AND] The Glucose rate of change thresholds compound numeric object with Type {MDC_PART_PHD_DM | MDC_CONC_GLU_RATE_THRESHOLDS} may be present in the CGM extended configuration. Only one instance is allowed. [AND] The PHD DM status enumeration object with Type {MDC_PART_PHD_DM | MDC_PHD_DM_DEV_STAT} may be present in the CGM extended configuration. Multiple PHD DM status enumeration are allowed if they have different [Supplemental-Types] attribute values. [AND]		

	The CGM status enumeration object with Type {MDC_PART_PHD_DM | MDC_CGM_DEV_STAT} may be present in the CGM extended configuration. Only one instance is allowed.
Applicability	C_AG_OXP_000 AND C_AG_OXP_157 AND C_AG_OXP_181
Other PICS	C_AG_CGM_001, C_AG_CGM_002, C_AG_CGM_003, C_AG_CGM_004, C_AG_CGM_005, C_AG_CGM_006, C_AG_CGM_007, C_AG_CGM_008, C_AG_CGM_009, C_AG_CGM_010, C_AG_CGM_011, C_AG_CGM_012, C_AG_CGM_013, C_AG_CGM_014, C_AG_CGM_015, C_AG_CGM_016, C_AG_CGM_017, C_AG_CGM_018, C_AG_CGM_019
Initial condition	The simulated PHG and PHD under test are in the Unassociated state.
Test procedure	1. The simulated PHG receives an association request from the PHD under test. 2. The simulated PHG responds with a result = accepted-unknown-config 3. The PHD responds with a "Remote Operation Invoke | Confirmed Event Report" message with an MDC_NOTI_CONFIG event to send its configuration to the PHG. 4. Check that the field Dev-Config-Id is in the extended range; if it is not, PHG responds with a "unsupported-config" and waits for a new configuration. 5. Once the PHD under test sends an extended configuration, Check that: Attribute-List: a. atribute-value(ConfigReport → ConfigObjectList (ConfigObject)→Attribute List), this value depends on the attribute type. The values we have to check are: • The Glucose numeric object is present once → MDC_PART_SCADA (0x00 0x02), MDC_CONC_GLU_ISF (0x71 0xD4) ❑ Any of these objects may be present: • IF C_AG_CGM_001 THEN the Sensor calibration numeric Object is present once→ MDC_PART_PHD_DM (0x00 0x80), MDC_CGM_SENSOR_CALIBRATION (0x72 0xF4) • IF C_AG_CGM_002 THEN the Sensor run-time numeric Object is present at least once→ MDC_PART_PHD_DM (0x00 0x80), MDC_CGM_SENSOR_RUN_TIME (0x72 0xF8) • IF C_AG_CGM_003 THEN one instance of the Glucose Sampling Interval numeric object is present → MDC_PART_PHD_DM (0x00 0x80), MDC_CGM_SENSOR_SAMPLE_INTERVAL (0x72 0xFC) • IF C_AG_CGM_004 THEN the Glucose Trend numeric Object is present once→ MDC_PART_PHD_DM (0x00 0x80), MDC_CONC_GLU_TREND (0x72 0xD8) • IF C_AG_CGM_005 THEN the Insulin to Patient low/high threshold compound numeric Object is present once→ MDC_PART_PHD_DM (0x00 0x80), MDC_CONC_GLU_PATIENT_THRESHOLDS_LOW_HIGH (0x72 0xDC) • IF C_AG_CGM_006 THEN the Device hypo/hyper thresholds compound numeric Object is present once→ MDC_PART_PHD_DM (0x00 0x80), MDC_CONC_GLU_THRESHOLDS_HYPO_HYPER (0x72 0xE0) • IF C_AG_CGM_007 THEN the Glucose rate of change thresholds compound numeric Object is present once→ MDC_PART_PHD_DM (0x00 0x80), MDC_CONC_GLU_RATE_THRESHOLDS (0x72 0xE4) • IF C_AG_CGM_008 THEN the PHD DM status enumeration object is present at least once→ MDC_PART_PHD_DM (0x00 0x80), MDC_PHD_DM_DEV_STAT (0x4E 0x20). If multiple PHD DM status enumeration objects are present, check that they have different [Supplemental-Types] attribute values. • IF C_AG_CGM_009 THEN the CGM status enumeration object is present once→ MDC_PART_PHD_DM (0x00 0x80), MDC_CGM_DEV_STAT (0x73 0x0C)

Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	

TP Id		TP/PLT/PHD/CLASS/CGM/BV-003		
TP label		Glucose Numeric Object - Standard configuration		
Coverage	**Spec**	[ISO/IEEE 11073-10425]		
	Testable items	Glucose 2; M	Glucose 4; M	Glucose 6; M
		Glucose 8; M	Glucose 10; M	Glucose 12; M
		Glucose 14; M	Glucose 16; M	Glucose 18; M
		Glucose 20; NR	Glucose 22; NR	Glucose 27; M
Test purpose		Check that: The Glucose Numeric object contains the attributes specified for Standard Configuration.		
Applicability		C_AG_OXP_000 AND C_AG_OXP_157 AND (NOT C_AG_OXP_181)		
Other PICS		C_AG_OXP_009, C_AG_OXP_014, C_AG_OXP_293		
Initial condition		The simulated PHG and PHD under test are in the Unassociated state.		
Test procedure		1. The simulated PHG receives an association request from the PHD under test. 2. The simulated PHG responds with a result = accepted-unknown-config. The PHD responds with a “Remote Operation Invoke | Confirmed Event Report” message with an MDC_NOTI_CONFIG event to send its configuration to the PHG. 3. Check that the field Dev-Config-Id is set to 0x09C4 (2500). If it is not, PHG responds with a “unsupported-config” and waits for a new configuration. 4. IF C_AG_OXP_293 THEN: a. Once in Configuring/Sending GetMDS substate simulated PHG issues roiv-cmip-get command with handle set to 0 (to request for MDS object) and attribute-id-list set to 0 to indicate all attributes. b. The PHD responds with a rors-cmip-get service message in which the attribute-list contains a list of all implemented attributes of the MDS object. c. IF the mds-time-mgr-set-time bit is set: ❑ The PHG moves to Configuring/Sending Set Time substate and: • IF C_AG_OXP_009 THEN it issues the Set-Time action command. • IF C_AG_OXP_014 THEN it issues the Set-Base-Offset-Time action command. ❑ Once its internal time setting operation is completed, the PHD responds to the PHG. 5. The PHD under test sends an Event Report to the simulated PHG including a measurement reported by the object under test. 6. Once the PHD under test sends a standard configuration and a measurement, check that the Glucose Numeric Object attributes are: a. Mandatory attribute Handle ❑ attribute-id = MDC_ATTR_ID_HANDLE ❑ attribute-type = HANDLE ❑ attribute-value = 0x00 0x01		

	b. Mandatory attribute Type ❑ attribute-id = MDC_ATTR_ID_TYPE ❑ attribute-type = TYPE ❑ attribute-value = MDC_PART_SCADA (0x00 0x02) | MDC_CONC_GLU_ISF (0x71 0xD4) c. Mandatory attribute Supplemental-Types ❑ attribute-id = MDC_ATTR_ID_TYPE ❑ attribute-type = MDC_ATTR_SUPPLEMENTAL_TYPES ❑ attribute-value.length = SEQUENCE OF (SIZE (4)) ❑ attribute-value = { MDC_PART_PHD_DM (0x00 0x80),. MDC_CTXT_GLU_SAMPLELOCATION_SUBCUTANEOUS (0x72 0x39) } d. Mandatory attribute Metric-Spec-Small ❑ attribute-id = MDC_ATTR_METRIC_SPEC_SMALL ❑ attribute-type = MetricSpecSmall (BITS-16) ❑ attribute-value.length = 2 bytes ❑ attribute-value ≠ 0x00 0x00 • Bit 0 (mss-avail-intermittent(0)), must be set • Bit 1 (mss-avail-stored-data(1)), must be set • Bit 9 (mss-acc-agent-initiated(9)), must be set • Bit 14 (mss-cat-calculation(14)), must be set • Rest shall be set to 0. e. Mandatory attribute Unit-Code ❑ attribute-id = MDC_ATTR_UNIT_CODE ❑ attribute-type = OID-Type(INT-U16) ❑ attribute-value.length = 2 bytes ❑ attribute-value = MDC_DIM_MILLI_G_PER_DL (0x08 0x52) f. Mandatory attribute Attribute-Value-Map ❑ attribute-id = MDC_ATTR_ATRIBUTE_VAL_MAP ❑ attribute-type = AttrValMap (sequence of attribute-id(OID-Type) and attribute-length(INT-U16)) ❑ attribute-value.length=<variable> ❑ attribute-value= MDC_ATTR_NU_VAL_OBS_BASIC, then MDC_ATTR_TIME_STAMP_BO g. If not recommended attribute Measurement-Confidence-95 is present ❑ attribute-id = MDC_ATTR_MSMT_CONFIDENCE_95 (0x0A 0x8C) ❑ attribute-type = MeasurementConfidence95 ❑ attribute-value.length = 4 bytes ❑ attribute-value = <not relevant> h. If not recommended attribute Threshold-Notification-Text-String is present ❑ attribute-id = MDC_ATTR_THRES_NOTIF_TEXT_STRING (0x0A 0x88) ❑ attribute-type = OCTET STRING ❑ attribute-value.length = <variable> ❑ attribute-value = <Text not relevant> i. No other attribute shall be present at configuration
Pass/Fail criteria	• All checked values are as specified in the test procedure.

	• The Attribute-Value-Map attribute SHALL contain the attribute ID and attribute length information of the Basic-Nu-Observed-Value and Base-Offset-Time-Stamp attribute in the same order as indicated in f.
Notes	

TP Id		TP/PLT/PHD/CLASS/CGM/BV-004		
TP label		Glucose Numeric Object - Extended configuration		
Coverage	**Spec**	[ISO/IEEE 11073-10425]		
	Testable items	Glucose 5; M	Glucose 7; O	Glucose 9; M
		Glucose 11; R	Glucose 13; M	Glucose 17; R
		Glucose 19; R	Glucose 21; O	Glucose 23; O
		Glucose 24; C		
Test purpose		Check that: The Glucose Numeric Object contains the attributes specified for Extended Configuration.		
Applicability		C_AG_OXP_000 AND C_AG_OXP_157 AND C_AG_OXP_181		
Other PICS		C_AG_OXP_009, C_AG_OXP_014, C_AG_OXP_041, C_AG_OXP_183, C_AG_OXP_189, C_AG_OXP_293		
Initial condition		The simulated PHG and PHD under test are in the Unassociated state.		
Test procedure		1. The simulated PHG receives an association request from the PHD under test. 2. The simulated PHG responds with a result = accepted-unknown-config. The PHD responds with a “Remote Operation Invoke | Confirmed Event Report” message with an MDC_NOTI_CONFIG event to send its configuration to the PHG. 3. Check that the field Dev-Config-Id is set in the extended range; if it is not, PHG responds with “unsupported-config” and waits for a new configuration. 4. IF C_AG_OXP_293 THEN: a. Once in Configuring/Sending GetMDS substate simulated PHG issues roiv-cmip-get command with handle set to 0 (to request for MDS object) and attribute-id-list set to 0 to indicate all attributes. b. The PHD responds with a rors-cmip-get service message in which the attribute-list contains a list of all implemented attributes of the MDS object. c. IF the mds-time-mgr-set-time bit is set: ❑ The PHG moves to Configuring/Sending Set Time substate and: • IF C_AG_OXP_009 THEN it issues the Set-Time action command. • IF C_AG_OXP_014 THEN it issues the Set-Base-Offset-Time action command. ❑ Once its internal time setting operation is completed, the PHD responds to the manager. 5. pHD under test sends an Event Report to the simulated PHG including a measurement reported by the object under test. 6. Once the PHD under test sends an extended configuration and a measurement, check that the Glucose Numeric Object attributes are: a. Mandatory attribute Type ❑ attribute-id = MDC_ATTR_ID_TYPE ❑ attribute-type = TYPE		

	❑ attribute-value = MDC_PART_SCADA (0x00 0x02) | MDC_CONC_GLU_ISF (0x71 0xD4) or MDC_CONC_GLU_CAPILLARY_WHOLEBLOOD (0x71 0xB8) or MDC_CONC_GLU_CAPILLARY_PLASMA (0x71 0xBC) or MDC_CONC_GLU_VENOUS_WHOLEBLOOD (0x71 0xC0) or MDC_CONC_GLU_VENOUS_PLASMA (0x71 0xC4) or MDC_CONC_GLU_ARTERIAL_WHOLEBLOOD (0x71 0xC8) or MDC_CONC_GLU_ARTERIAL_PLASMA (0x71 0xCC) or MDC_CONC_GLU_CONTROL (0x71 0xD0) or MDC_CONC_GLU_UNDETERMINED_WHOLEBLOOD (0x72 0x6C) or MDC_CONC_GLU_UNDETERMINED_PLASMA (0x72 0x70) b. If optional attribute Supplemental-Types is present ❑ attribute-id = MDC_ATTR_SUPPLEMENTAL_TYPES ❑ attribute-type = SupplementalTypeList ❑ attribute-value.length = SEQUENCE OF (SIZE (4)) ❑ attribute-value = { MDC_PART_PHD_DM (0x00 0x80), MDC_CTXT_GLU_SAMPLELOCATION_FINGER (0x72 0x38) or MDC_CTXT_GLU_SAMPLELOCATION_AST (0x72 0x3C) or MDC_CTXT_GLU_SAMPLELOCATION_EARLOBE (0x72 0x40) or MDC_CTXT_GLU_SAMPLELOCATION_CTRLSOLUTION (0x72 0x44) or MDC_CTXT_GLU_SAMPLELOCATION_SUBCUTANEOUS (0x72 0x39) or MDC_CTXT_GLU_SAMPLELOCATION_UNDETERMINED (0x72 0x35) or MDC_CTXT_GLU_SAMPLELOCATION_OTHER (0x72 0x36) } c. Mandatory attribute Metric-Spec-Small ❑ attribute-id = MDC_ATTR_METRIC_SPEC_SMALL ❑ attribute-type = MetricSpecSmall (BITS-16) ❑ attribute-value.length = 2 bytes • Bit 0 (mss-avail-intermittent(0)), must be set • Bit 1 (mss-avail-stored-data(1)), must be set • Bit 9 (mss-acc-agent-initiated(9)), must be set • Bit 14 (mss-cat-calculation(14)), must be set • Rest of bits set to 0 d. If recommended attribute Measurement-Status is present ❑ attribute-id = MDC_ATTR_MSMT_STAT ❑ attribute-type = MeasurementStatus ❑ attribute-value.length = 2 bytes ❑ attribute-value = • Bit msmt-state-in-alarm(14) may be set to indicate that the measurement is outside threshold boundaries. • Bit msmt-state-al-inhibited(15) may be set to indicate that the threshold indication is disabled and should not cause a displayed annunciation ❑ If thresholding is to be used, this attribute is mandatory e. Mandatory attribute Unit-Code ❑ attribute-id = MDC_ATTR_UNIT_CODE ❑ attribute-type = OID-Type(INT-U16) ❑ attribute-value.length = 2 bytes ❑ attribute-value = one of: • MDC_DIM_MILLI_G_PER_DL (0x08 0x52) • MDC_DIM_MILLI_MOLE_PER_L (0x12 0x72) f. If recommended attribute Base-Offset-Time-Stamp is present ❑ attribute-id = MDC_ATTR_TIME_STAMP_BO

	❑ attribute-type = BaseOffsetTime ❑ attribute-value.length = 8 bytes g. If recommended attribute Basic-Nu-Observed-Value is present ❑ attribute-id = MDC_ATTR_NU_VAL_OBS_BASIC ❑ attribute-type = BasicNuObsValue ❑ attribute-value.length = 2 bytes h. If optional attribute Threshold-Notification-Text-String is present ❑ attribute-id = MDC_ATTR_THRES_NOTIF_TEXT_STRING (0x0A 0x88) ❑ attribute-type = OCTET STRING ❑ attribute-value.length = <variable> ❑ attribute-value = <Text related to the current threshold notification> ❑ If this attribute is present (thresholding is to be used), Measurement-Status attribute is mantatory
Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	

TP Id		TP/PLT/PHD/CLASS/CGM/BV-005		
TP label		Sensor Calibration Numeric Object - Extended configuration		
Coverage	**Spec**	[ISO/IEEE 11073-10425]		
	Testable items	SensCal 3; M	SensCal 4; O	SensCal 5; M
		SensCal 6; R	SensCal 7; M	SensCal 8; R
		SensCal 9; R		
Test purpose		Check that: The Sensor Calibration Numeric Object contains the attributes specified for Extended Configuration.		
Applicability		C_AG_OXP_000 AND C_AG_OXP_157 AND C_AG_OXP_181 AND C_AG_CGM_001		
Other PICS		C_AG_OXP_009, C_AG_OXP_014, C_AG_OXP_041, C_AG_OXP_183, C_AG_OXP_189, C_AG_OXP_293		
Initial condition		The simulated PHG and PHD under test are in the Unassociated state.		
Test procedure		1. The simulated PHG receives an association request from the PHD under test. 2. The simulated PHG responds with a result = accepted-unknown-config. The PHD responds with a “Remote Operation Invoke | Confirmed Event Report” message with an MDC_NOTI_CONFIG event to send its configuration to the PHG. 3. Check that the field Dev-Config-Id is set in the extended range; if it is not, PHG responds with “unsupported-config” and waits for a new configuration. 4. IF C_AG_OXP_293 THEN: a. Once in Configuring/Sending GetMDS substate simulated PHG issues roiv-cmip-get command with handle set to 0 (to request for MDS object) and attribute-id-list set to 0 to indicate all attributes. b. The PHD responds with a rors-cmip-get service message in which the attribute-list contains a list of all implemented attributes of the MDS object. c. IF the mds-time-mgr-set-time bit is set:		

	❑ The PHG moves to Configuring/Sending Set Time substate and: • IF C_AG_OXP_009 THEN it issues the Set-Time action command. • IF C_AG_OXP_014 THEN it issues the Set-Base-Offset-Time action command. ❑ Once its internal time setting operation is completed, the PHD responds to the manager. 5. The PHD under test sends an Event Report to the simulated PHG including a measurement reported by the object under test. 6. Once the PHD under test sends an extended configuration and a measurement, check that the Sensor Calibration Numeric Object attributes are: a. Mandatory attribute Type ❑ attribute-id = MDC_ATTR_ID_TYPE ❑ attribute-type = TYPE ❑ attribute-value = MDC_PART_PHD_DM (0x00 0x80) | MDC_CGM_SENSOR_CALIBRATION (0x72 0xF4) b. If optional attribute Supplemental-Types is present ❑ attribute-id = MDC_ATTR_SUPPLEMENTAL_TYPES ❑ attribute-type = SupplementalTypeList ❑ attribute-value.length = SEQUENCE OF (SIZE (4)) ❑ attribute-value = { MDC_PART_PHD_DM (0x00 0x80), MDC_CTXT_GLU_SAMPLELOCATION_FINGER (0x72 0x38) or MDC_CTXT_GLU_SAMPLELOCATION_AST (0x72 0x3C) or MDC_CTXT_GLU_SAMPLELOCATION_EARLOBE (0x72 0x40) or MDC_CTXT_GLU_SAMPLELOCATION_SUBCUTANEOUS (0x72 0x39) or MDC_CTXT_GLU_SAMPLELOCATION_UNDETERMINED (0x72 0x35) or MDC_CTXT_GLU_SAMPLELOCATION_OTHER (0x72 0x36) } c. Mandatory attribute Metric-Spec-Small ❑ attribute-id = MDC_ATTR_METRIC_SPEC_SMALL ❑ attribute-type = MetricSpecSmall (BITS-16) ❑ attribute-value.length = 2 bytes • Bit 1 (mss-avail-stored-data(1)), must be set • Bit 2 (mss-upd-aperiodic(2)), must be set • Bit 9 (mss-acc-agent-initiated(9)), must be set • Bit 12 (mss-cat-manual(12)), must be set if the reading is manually entered • Bit 13 (mss-cat-setting(13)), must be set • Rest of bits set to 0 d. If recommended attribute Measurement-Status is present ❑ attribute-id = MDC_ATTR_MSMT_STAT ❑ attribute-type = MeasurementStatus ❑ attribute-value.length = 2 bytes e. Mandatory attribute Unit-Code ❑ attribute-id = MDC_ATTR_UNIT_CODE ❑ attribute-type = OID-Type(INT-U16) ❑ attribute-value.length = 2 bytes ❑ attribute-value = one of: • MDC_DIM_MILLI_G_PER_DL (0x08 0x52) • MDC_DIM_MILLI_MOLE_PER_L (0x12 0x72)

	f. If recommended attribute Base-Offset-Time-Stamp is present ❑ attribute-id = MDC_ATTR_TIME_STAMP_BO ❑ attribute-type = BaseOffsetTime ❑ attribute-value.length = 8 bytes g. If recommended attribute Basic-Nu-Observed-Value is present ❑ attribute-id = MDC_ATTR_NU_VAL_OBS_BASIC ❑ attribute-type = BasicNuObsValue ❑ attribute-value.length = 2 bytes
Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	

TP Id		TP/PLT/PHD/CLASS/CGM/BV-006		
TP label		Sensor run-time Numeric Object - Extended configuration		
Coverage	**Spec**	[ISO/IEEE 11073-10425]		
	Testable items	SensRun 3; M	SensRun 4; M	SensRun 5; M
		SensRun 6; R	SensRun 7; R	
Test purpose		Check that: The Sensor runtime Numeric Object contains the attributes specified for Extended Configuration.		
Applicability		C_AG_OXP_000 AND C_AG_OXP_157 AND C_AG_OXP_181 AND C_AG_CGM_002		
Other PICS		C_AG_OXP_009, C_AG_OXP_014, C_AG_OXP_041, C_AG_OXP_183, C_AG_OXP_189, C_AG_OXP_293		
Initial condition		The simulated PHG and the PHD under test are in the Unassociated state.		
Test procedure		1. The simulated PHG receives an association request from the PHD under test. 2. The simulated PHG responds with a result = accepted-unknown-config. The PHD responds with a “Remote Operation Invoke | Confirmed Event Report” message with an MDC_NOTI_CONFIG event to send its configuration to the PHG. 3. Check that the field Dev-Config-Id is set in the extended range; if it is not, PHG responds with “unsupported-config” and waits for a new configuration. 4. IF C_AG_OXP_293 THEN: a. Once in Configuring/Sending GetMDS substate simulated PHG issues roiv-cmip-get command with handle set to 0 (to request for MDS object) and attribute-id-list set to 0 to indicate all attributes. b. The PHD responds with a rors-cmip-get service message in which the attribute-list contains a list of all implemented attributes of the MDS object. c. IF the mds-time-mgr-set-time bit is set: ❑ The PHG moves to Configuring/Sending Set Time substate and: • IF C_AG_OXP_009 THEN it issues the Set-Time action command. • IF C_AG_OXP_014 THEN it issues the Set-Base-Offset-Time action command. ❑ Once its internal time setting operation is completed, the PHD responds to the PHG. 5. The PHD under test sends an Event Report to the simulated PHG including a		

	measurement reported by the object under test. 6. Once the PHD under test sends an extended configuration and a measurement, check that the Sensor run-time Numeric Object attributes are: a. Mandatory attribute Type ❑ attribute-id = MDC_ATTR_ID_TYPE ❑ attribute-type = TYPE ❑ attribute-value = MDC_PART_PHD_DM (0x00 0x80) | MDC_CGM_SENSOR_RUN_TIME (0x72 0xF8) b. Mandatory attribute Metric-Spec-Small ❑ attribute-id = MDC_ATTR_METRIC_SPEC_SMALL ❑ attribute-type = MetricSpecSmall (BITS-16) ❑ attribute-value.length = 2 bytes • Bit 1 (mss-avail-stored-data(1)), must be set • Bit 2 (mss-upd-aperiodic(2)), must be set • Bit 3 (mss-msmt-aperiodic(3)), must be set • Bit 9 (mss-acc-agent-initiated(9)), must be set • Bit 13 (mss-cat-setting(13)), must be set • Bit 14 (mss-cat-calculation(14)), must be set • Rest of bits set to 0 c. Mandatory attribute Unit-Code ❑ attribute-id = MDC_ATTR_UNIT_CODE ❑ attribute-type = OID-Type(INT-U16) ❑ attribute-value.length = 2 bytes ❑ attribute-value = MDC_DIM_HR (0x08 0xC0) d. If recommended attribute Base-Offset-Time-Stamp is present ❑ attribute-id = MDC_ATTR_TIME_STAMP_BO ❑ attribute-type = BaseOffsetTime ❑ attribute-value.length = 8 bytes e. If recommended attribute Basic-Nu-Observed-Value is present ❑ attribute-id = MDC_ATTR_NU_VAL_OBS_BASIC ❑ attribute-type = BasicNuObsValue ❑ attribute-value.length = 2 bytes
Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	

TP Id		TP/PLT/PHD/CLASS/CGM/BV-007		
TP label		Glucose sampling interval Numeric Object - Extended configuration		
Coverage	**Spec**	[ISO/IEEE 11073-10425]		
	Testable items	GluSampInt 3; M	GluSampInt 4; M	GluSampInt 5; M
		GluSampInt 6; R	GluSampInt 7; R	
Test purpose		Check that:		

	The Glucose sampling interval Numeric Object contains the attributes specified for Extended Configuration.
Applicability	C_AG_OXP_000 AND C_AG_OXP_157 AND C_AG_OXP_181 AND C_AG_CGM_003
Other PICS	C_AG_OXP_009, C_AG_OXP_014, C_AG_OXP_041, C_AG_OXP_183, C_AG_OXP_189, C_AG_OXP_293
Initial condition	The simulated PHG and the PHD under test are in the Unassociated state.
Test procedure	1. The simulated PHG receives an association request from the PHD under test. 2. The simulated PHG responds with a result = accepted-unknown-config. The PHD responds with a "Remote Operation Invoke | Confirmed Event Report" message with an MDC_NOTI_CONFIG event to send its configuration to the PHG. 3. Check that the field Dev-Config-Id is set in the extended range; if it is not, PHG responds with "unsupported-config" and waits for a new configuration. 4. IF C_AG_OXP_293 THEN: a. Once in Configuring/Sending GetMDS substate simulated PHG issues roiv-cmip-get command with handle set to 0 (to request for MDS object) and attribute-id-list set to 0 to indicate all attributes. b. The PHD responds with a rors-cmip-get service message in which the attribute-list contains a list of all implemented attributes of the MDS object. c. IF the mds-time-mgr-set-time bit is set: ❑ The PHG moves to Configuring/Sending Set Time substate and: • IF C_AG_OXP_009 THEN it issues the Set-Time action command. • IF C_AG_OXP_014 THEN it issues the Set-Base-Offset-Time action command. ❑ Once its internal time setting operation is completed, the PHD responds to the PHG. 5. The PHD under test sends an Event Report to the simulated PHG including a measurement reported by the object under test. 6. Once the PHD under test sends an extended configuration and a measurement, check that the Glucose sampling interval Numeric Object attributes are: a. Mandatory attribute Type ❑ attribute-id = MDC_ATTR_ID_TYPE ❑ attribute-type = TYPE ❑ attribute-value = MDC_PART_PHD_DM (0x00 0x80) | MDC_CGM_SENSOR_SAMPLE_INTERVAL (0x72 0xFC) b. Mandatory attribute Metric-Spec-Small ❑ attribute-id = MDC_ATTR_METRIC_SPEC_SMALL ❑ attribute-type = MetricSpecSmall (BITS-16) ❑ attribute-value.length = 2 bytes • Bit 1 (mss-avail-stored-data(1)), must be set • Bit 2 (mss-upd-aperiodic(2)), must be set • Bit 9 (mss-acc-agent-initiated(9)), must be set • Bit 12 (mss-cat-manual(12)), must be set • Bit 13 (mss-cat-setting(13)), must be set • Rest of bits set to 0 c. Mandatory attribute Unit-Code ❑ attribute-id = MDC_ATTR_UNIT_CODE ❑ attribute-type = OID-Type(INT-U16)

	❑ attribute-value.length = 2 bytes ❑ attribute-value = MDC_DIM_MIN (0x08 0xA0) d. If recommended attribute Base-Offset-Time-Stamp is present ❑ attribute-id = MDC_ATTR_TIME_STAMP_BO ❑ attribute-type = BaseOffsetTime ❑ attribute-value.length = 8 bytes e. If recommended attribute Basic-Nu-Observed-Value is present ❑ attribute-id = MDC_ATTR_NU_VAL_OBS_BASIC ❑ attribute-type = BasicNuObsValue ❑ attribute-value.length = 2 bytes
Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	

TP Id		TP/PLT/PHDCLASS/CGM/BV-008		
TP label		Glucose trend Numeric Object - Extended configuration		
Coverage	**Spec**	[ISO/IEEE 11073-10425]		
	Testable items	GluTrend 3; M	GluTrend 4; M	GluTrend 5; M
		GluTrend 6; R	GluTrend 7; R	GluTrend 8; O
		GluTrend 9; C		
Test purpose		Check that: The Glucose trend Numeric Object contains the attributes specified for Extended Configuration.		
Applicability		C_AG_OXP_000 AND C_AG_OXP_157 AND C_AG_OXP_181 AND C_AG_CGM_004		
Other PICS		C_AG_OXP_009, C_AG_OXP_014, C_AG_OXP_041, C_AG_OXP_183, C_AG_OXP_189, C_AG_OXP_293		
Initial condition		The simulated PHG and the PHD under test are in the Unassociated state.		
Test procedure		1. The simulated PHG receives an association request from the PHD under test. 2. The simulated PHG responds with a result = accepted-unknown-config. The PHD responds with a “Remote Operation Invoke | Confirmed Event Report” message with an MDC_NOTI_CONFIG event to send its configuration to the PHG. 3. Check that the field Dev-Config-Id is set in the extended range; if it is not, PHG responds with “unsupported-config” and waits for a new configuration. 4. IF C_AG_OXP_293 THEN: a. Once in Configuring/Sending GetMDS substate simulated PHG issues roiv-cmip-get command with handle set to 0 (to request for MDS object) and attribute-id-list set to 0 to indicate all attributes. b. The PHD responds with a rors-cmip-get service message in which the attribute-list contains a list of all implemented attributes of the MDS object. c. IF the mds-time-mgr-set-time bit is set: ❑ The PHG moves to Configuring/Sending Set Time substate and: • IF C_AG_OXP_009 THEN it issues the Set-Time action command. • IF C_AG_OXP_014 THEN it issues the Set-Base-Offset-Time action		

	command. ❑ Once its internal time setting operation is completed, the PHD responds to the PHG. 5. The PHD under test sends an Event Report to the simulated PHG including a measurement reported by the object under test. 6. Once the PHD under test sends an extended configuration and a measurement, check that the Glucose trend Numeric Object attributes are: a. Mandatory attribute Type ❑ attribute-id = MDC_ATTR_ID_TYPE ❑ attribute-type = TYPE ❑ attribute-value = MDC_PART_PHD_DM (0x00 0x80) | MDC_CONC_GLU_TREND (0x72 0xD8) b. Mandatory attribute Metric-Spec-Small ❑ attribute-id = MDC_ATTR_METRIC_SPEC_SMALL ❑ attribute-type = MetricSpecSmall (BITS-16) ❑ attribute-value.length = 2 bytes c. Mandatory attribute Unit-Code ❑ attribute-id = MDC_ATTR_UNIT_CODE ❑ attribute-type = OID-Type(INT-U16) ❑ attribute-value.length = 2 bytes ❑ attribute-value = one of: • MDC_DIM_ MILLI_G_PER_DL_PER_MIN (0x12 0x74) • MDC_DIM_MILLI_MOLE_PER_L_PER_MIN (0x12 0x78) d. If recommended attribute Base-Offset-Time-Stamp is present ❑ attribute-id = MDC_ATTR_TIME_STAMP_BO ❑ attribute-type = BaseOffsetTime ❑ attribute-value.length = 8 bytes e. If recommended attribute Basic-Nu-Observed-Value is present ❑ attribute-id = MDC_ATTR_NU_VAL_OBS_BASIC ❑ attribute-type = BasicNuObsValue ❑ attribute-value.length = 2 bytes f. If optional attribute Threshold-Notification-Text-String is present ❑ attribute-id = MDC_ATTR_THRES_NOTIF_TEXT_STRING (0x0A 0x88) ❑ attribute-type = OCTET STRING ❑ attribute-value.length = <variable> ❑ attribute-value = <Text related to the current threshold notification> ❑ If this attribute is present (thresholding is to be used), Measurement-Status attribute is mantatory g. If conditional attribute Measurement-Status is present ❑ attribute-id = MDC_ATTR_MSMT_STAT ❑ attribute-type = MeasurementStatus ❑ attribute-value.length = 2 bytes ❑ attribute-value = • Bit msmt-state-in-alarm(14) may be set to indicate that the measurement is outside threshold boundaries. • Bit msmt-state-al-inhibited(15) may be set to indicate that the threshold

	indication is disabled and should not cause a displayed annunciation If thresholding is to be used, this attribute is mandatory
Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	

TP Id		TP/PLT/PHD/CLASS/CGM/BV-009		
TP label		Patient low/high thresholds Compound Numeric Object - Extended configuration		
Coverage	**Spec**	[ISO/IEEE 11073-10425]		
	Testable items	PHighLow 3; M	PHighLow 4; M	PHighLow 5; M
		PHighLow 6; M	PHighLow 7; M	PHighLow 8; R
		PHighLow 9; R		
Test purpose		Check that: The Patient low/high thresholds Compound Numeric Object contains the attributes specified for Extended Configuration.		
Applicability		C_AG_OXP_000 AND C_AG_OXP_157 AND C_AG_OXP_181 AND C_AG_CGM_005		
Other PICS		C_AG_OXP_009, C_AG_OXP_014, C_AG_OXP_041, C_AG_OXP_183, C_AG_OXP_189, C_AG_OXP_293		
Initial condition		The simulated PHG and the PHD under test are in the Unassociated state.		
Test procedure		1. The simulated PHG receives an association request from the PHD under test. 2. The simulated PHG responds with a result = accepted-unknown-config. The PHD responds with a “Remote Operation Invoke | Confirmed Event Report” message with an MDC_NOTI_CONFIG event to send its configuration to the PHG. 3. Check that the field Dev-Config-Id is set in the extended range; if it is not, PHG responds with “unsupported-config” and waits for a new configuration. 4. IF C_AG_OXP_293 THEN: a. Once in Configuring/Sending GetMDS substate simulated PHG issues roiv-cmip-get command with handle set to 0 (to request for MDS object) and attribute-id-list set to 0 to indicate all attributes. b. The PHD responds with a rors-cmip-get service message in which the attribute-list contains a list of all implemented attributes of the MDS object. c. IF the mds-time-mgr-set-time bit is set: ❑ The PHG moves to Configuring/Sending Set Time substate and: • IF C_AG_OXP_009 THEN it issues the Set-Time action command. • IF C_AG_OXP_014 THEN it issues the Set-Base-Offset-Time action command. ❑ Once its internal time setting operation is completed, the PHD responds to the PHG. 5. The PHD under test sends an Event Report to the simulated PHG including a measurement reported by the object under test. 6. Once the PHD under test sends an extended configuration and a measurement, check that the Patient low/high thresholds Compound Numeric Object attributes are: a. Mandatory attribute Type ❑ attribute-id = MDC_ATTR_ID_TYPE ❑ attribute-type = TYPE		

	❑ attribute-value = MDC_PART_PHD_DM (0x00 0x80) | MDC_CONC_GLU_PATIENT_THRESHOLDS_LOW_HIGH (0x72 0xDC) b. Mandatory attribute Metric-Spec-Small ❑ attribute-id = MDC_ATTR_METRIC_SPEC_SMALL ❑ attribute-type = MetricSpecSmall (BITS-16) ❑ attribute-value.length = 2 bytes c. Mandatory attribute Metric-Structure-Small ❑ attribute-id = MDC_ATTR_METRIC_STRUCTURE_SMALL ❑ attribute-type = MetricStructureSmall ❑ attribute-value = {ms-struct-compound-fix, 2} d. Mandatory attribute Metric-Id-List ❑ attribute-id = MDC_ATTR_ID_PHYSIO_LIST ❑ attribute-type = MetricIdList ❑ attribute-value.length = SEQUENCE OF (SIZE 2) ❑ attribute-value = MDC_CONC_GLU_PATIENT_THRESHOLD_LOW (0x72 0xDD), then MDC_CONC_GLU_PATIENT_THRESHOLD_HIGH (0x72 0xDE) e. Mandatory attribute Unit-Code ❑ attribute-id = MDC_ATTR_UNIT_CODE ❑ attribute-type = OID-Type(INT-U16) ❑ attribute-value.length = 2 bytes ❑ attribute-value = one of: • MDC_DIM_MILLI_G_PER_DL (0x08 0x52) • MDC_DIM_MILLI_MOLE_PER_L (0x12 0x72) f. If recommended attribute Base-Offset-Time-Stamp is present ❑ attribute-id = MDC_ATTR_TIME_STAMP_BO ❑ attribute-type = BaseOffsetTime ❑ attribute-value.length = 8 bytes g. If recommended attribute Compound-Basic-Nu-Observed-Value is present ❑ attribute-id = MDC_ATTR_NU_CMPD_VAL_OBS_BASIC ❑ attribute-type = BasicNuObsValueCmp ❑ attribute-value.length = SEQUENCE OF (SIZE(4)) ❑ attribute-value = it shall include first the patient low threshold (MDC_CONC_GLU_PATIENT_THESHOLD_LOW) followed by the patient high threshold (MDC_CONC_GLU_PATIENT_THESHOLD_HIGH).
Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	

TP Id		TP/PLT/PHDCLASS/CGM/BV-010		
TP label		Device hypo/hyper thresholds Compound Numeric Object - Extended configuration		
Coverage	**Spec**	[ISO/IEEE 11073-10425]		
	Testable items	DevHypoHyper 3; M	DevHypoHyper 4; M	DevHypoHyper 5; M
		DevHypoHyper 6; M	DevHypoHyper 7; M	DevHypoHyper 8; R

		DevHypoHyper 9; R		
Test purpose		Check that: The Device hypo/hyper thresholds Compound Numeric Object contains the attributes specified for Extended Configuration.		
Applicability		C_AG_OXP_000 AND C_AG_OXP_157 AND C_AG_OXP_181 AND C_AG_CGM_006		
Other PICS		C_AG_OXP_009, C_AG_OXP_014, C_AG_OXP_041, C_AG_OXP_183, C_AG_OXP_189, C_AG_OXP_293		
Initial condition		The simulated PHG and the PHD under test are in the Unassociated state.		
Test procedure		1. The simulated PHG receives an association request from the PHD under test. 2. The simulated PHG responds with a result = accepted-unknown-config. The PHD responds with a "Remote Operation Invoke | Confirmed Event Report" message with an MDC_NOTI_CONFIG event to send its configuration to the PHG. 3. Check that the field Dev-Config-Id is set in the extended range; if it is not, PHG responds with "unsupported-config" and waits for a new configuration. 4. IF C_AG_OXP_293 THEN: a. Once in Configuring/Sending GetMDS substate simulated PHG issues roiv-cmip-get command with handle set to 0 (to request for MDS object) and attribute-id-list set to 0 to indicate all attributes. b. The PHD responds with a rors-cmip-get service message in which the attribute-list contains a list of all implemented attributes of the MDS object. c. IF the mds-time-mgr-set-time bit is set: ❑ The PHG moves to Configuring/Sending Set Time substate and: • IF C_AG_OXP_009 THEN it issues the Set-Time action command. • IF C_AG_OXP_014 THEN it issues the Set-Base-Offset-Time action command. ❑ Once its internal time setting operation is completed, the PHD responds to the PHG. 5. The PHD under test sends an Event Report to the simulated PHG including a measurement reported by the object under test. 6. Once the PHD under test sends an extended configuration and a measurement, check that the Device hypo/hyper thresholds Compound Numeric Object attributes are: a. Mandatory attribute Type ❑ attribute-id = MDC_ATTR_ID_TYPE ❑ attribute-type = TYPE ❑ attribute-value = MDC_PART_PHD_DM (0x00 0x80) | MDC_CONC_GLU_THRESHOLDS_HYPO_HYPER (0x72 0xE0) b. Mandatory attribute Metric-Spec-Small ❑ attribute-id = MDC_ATTR_METRIC_SPEC_SMALL ❑ attribute-type = MetricSpecSmall (BITS-16) ❑ attribute-value.length = 2 bytes c. Mandatory attribute Metric-Structure-Small ❑ attribute-id = MDC_ATTR_METRIC_STRUCTURE_SMALL ❑ attribute-type = MetricStructureSmall ❑ attribute-value = {ms-struct-compound-fix, 2} d. Mandatory attribute Metric-Id-List ❑ attribute-id = MDC_ATTR_ID_PHYSIO_LIST ❑ attribute-type = MetricIdList		

	❑ attribute-value.length = SEQUENCE OF (SIZE 2) ❑ attribute-value = MDC_CONC_GLU_THRESHOLD_HYPO (0x72 0xE1), then MDC_CONC_GLU_THRESHOLD_HYPER (0x72 0xE2) e. Mandatory attribute Unit-Code ❑ attribute-id = MDC_ATTR_UNIT_CODE ❑ attribute-type = OID-Type(INT-U16) ❑ attribute-value.length = 2 bytes ❑ attribute-value = one of: • MDC_DIM_MILLI_G_PER_DL (0x08 0x52) • MDC_DIM_MILLI_MOLE_PER_L (0x12 0x72) f. If recommended attribute Base-Offset-Time-Stamp is present ❑ attribute-id = MDC_ATTR_TIME_STAMP_BO ❑ attribute-type = BaseOffsetTime ❑ attribute-value.length = 8 bytes g. If recommended attribute Compound-Basic-Nu-Observed-Value is present ❑ attribute-id = MDC_ATTR_NU_CMPD_VAL_OBS_BASIC ❑ attribute-type = BasicNuObsValueCmp ❑ attribute-value.length = SEQUENCE OF (SIZE(4)) ❑ attribute-value = it shall include first the device hypo threshold (MDC_CONC_GLU_PATIENT_THESHOLD_HYPO) followed by the device hyper threshold (MDC_CONC_GLU_PATIENT_THESHOLD_HYPER).
Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	

TP Id		TP/PLT/AG/CLASS/CGM/BV-011		
TP label		Glucose rate-of-charge thresholds Compound Numeric Object - Extended configuration		
Coverage	**Spec**	[ISO/IEEE 11073-10425]		
	Testable items	GluRateChange 3; M	GluRateChange 4; M	GluRateChange 5; M
		GluRateChange 6; M	GluRateChange 7; M	GluRateChange 8; R
		GluRateChange 9; R		
Test purpose		Check that: The Glucose rate-of-charge thresholds Compound Numeric Object contains the attributes specified for Extended Configuration.		
Applicability		C_AG_OXP_000 AND C_AG_OXP_157 AND C_AG_OXP_181 AND C_AG_CGM_007		
Other PICS		C_AG_OXP_009, C_AG_OXP_014, C_AG_OXP_041, C_AG_OXP_183, C_AG_OXP_189, C_AG_OXP_293		
Initial condition		The simulated PHG and the PHD under test are in the Unassociated state.		
Test procedure		1. The simulated PHG receives an association request from the PHD under test. 2. The simulated PHG responds with a result = accepted-unknown-config. The PHD responds with a “Remote Operation Invoke | Confirmed Event Report” message with an MDC_NOTI_CONFIG event to send its configuration to the PHG.		

3. Check that the field Dev-Config-Id is set in the extended range; if it is not, PHG responds with “unsupported-config” and waits for a new configuration.
4. IF C_AG_OXP_293 THEN:
   a. Once in Configuring/Sending GetMDS substate simulated PHG issues roiv-cmip-get command with handle set to 0 (to request for MDS object) and attribute-id-list set to 0 to indicate all attributes.
   b. The PHD responds with a rors-cmip-get service message in which the attribute-list contains a list of all implemented attributes of the MDS object.
   c. IF the mds-time-mgr-set-time bit is set:
      - ❑ The PHG moves to Configuring/Sending Set Time substate and:
        - IF C_AG_OXP_009 THEN it issues the Set-Time action command.
        - IF C_AG_OXP_014 THEN it issues the Set-Base-Offset-Time action command.
      - ❑ Once its internal time setting operation is completed, the PHD responds to the PHG.
5. The PHD under test sends an Event Report to the simulated PHG including a measurement reported by the object under test.
6. Once the PHD under test sends an extended configuration and a measurement, check that the Glucose rate-of-charge thresholds Compound Numeric Object attributes are:
   a. Mandatory attribute Type
      - ❑ attribute-id = MDC_ATTR_ID_TYPE
      - ❑ attribute-type = TYPE
      - ❑ attribute-value = MDC_PART_PHD_DM (0x00 0x80) | MDC_CONC_GLU_RATE_THRESHOLDS (0x72 0xE4)
   b. Mandatory attribute Metric-Spec-Small
      - ❑ attribute-id = MDC_ATTR_METRIC_SPEC_SMALL
      - ❑ attribute-type = MetricSpecSmall (BITS-16)
      - ❑ attribute-value.length = 2 bytes
   c. Mandatory attribute Metric-Structure-Small
      - ❑ attribute-id = MDC_ATTR_METRIC_STRUCTURE_SMALL
      - ❑ attribute-type = MetricStructureSmall
      - ❑ attribute-value = {ms-struct-compound-fix, 2}
   d. Mandatory attribute Metric-Id-List
      - ❑ attribute-id = MDC_ATTR_ID_PHYSIO_LIST
      - ❑ attribute-type = MetricIdList
      - ❑ attribute-value.length = SEQUENCE OF (SIZE 2)
      - ❑ attribute-value = MDC_CONC_GLU_RATE_THRESHOLD_INCREASE (0x72 0xE5), then MDC_CONC_GLU_RATE_THRESHOLD_DECREASE (0x72 0xE6)
   e. Mandatory attribute Unit-Code
      - ❑ attribute-id = MDC_ATTR_UNIT_CODE
      - ❑ attribute-type = OID-Type(INT-U16)
      - ❑ attribute-value.length = 2 bytes
      - ❑ attribute-value = one of:
        - MDC_DIM_ MILLI_G_PER_DL_PER_MIN (0x12 0x74)
        - MDC_DIM_MILLI_MOLE_PER_L_PER_MIN (0x12 0x78)
   f. If recommended attribute Base-Offset-Time-Stamp is present
      - ❑ attribute-id = MDC_ATTR_TIME_STAMP_BO

	❑ attribute-type = BaseOffsetTime ❑ attribute-value.length = 8 bytes g. If recommended attribute Compound-Basic-Nu-Observed-Value is present ❑ attribute-id = MDC_ATTR_NU_CMPD_VAL_OBS_BASIC ❑ attribute-type = BasicNuObsValueCmp ❑ attribute-value.length = SEQUENCE OF (SIZE(4)) ❑ attribute-value = it shall include first the glucose rate increase threshold (MDC_CONC_GLU_RATE_THRESHOLD_INCREASE) followed by the glucose rate decrease threshold (MDC_CONC_GLU_RATE_THRESHOLD_DECREASE).
Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	

TP Id		TP/PLT/AG/CLASS/CGM/BV-012		
TP label		PHD DM Status Enumeration Object - Extended configuration		
Coverage	**Spec**	[ISO/IEEE 11073-10425]		
	Testable items	PHDDMStatus 3; M	PHDDMStatus 4; R	PHDDMStatus 5; M
		PHDDMStatus 6; R	PHDDMStatus 7; M	
Test purpose		Check that: The PHD DM Status Enumeration Object contains the attributes specified for Extended Configuration.		
Applicability		C_AG_OXP_000 AND C_AG_OXP_157 AND C_AG_OXP_181 AND C_AG_CGM_008		
Other PICS		C_AG_OXP_009, C_AG_OXP_014, C_AG_OXP_041, C_AG_OXP_183, C_AG_OXP_189, C_AG_OXP_293		
Initial condition		The simulated PHG and the PHD under test are in the Unassociated state.		
Test procedure		1. The simulated PHG receives an association request from the PHD under test. 2. The simulated PHG responds with a result = accepted-unknown-config. The PHD responds with a “Remote Operation Invoke | Confirmed Event Report” message with an MDC_NOTI_CONFIG event to send its configuration to the PHG. 3. Check that the field Dev-Config-Id is set in the extended range; if it is not, PHG responds with “unsupported-config” and waits for a new configuration. 4. IF C_AG_OXP_293 THEN: a. Once in Configuring/Sending GetMDS substate simulated PHG issues roiv-cmip-get command with handle set to 0 (to request for MDS object) and attribute-id-list set to 0 to indicate all attributes. b. The PHD responds with a rors-cmip-get service message in which the attribute-list contains a list of all implemented attributes of the MDS object. c. IF the mds-time-mgr-set-time bit is set: ❑ The PHG moves to Configuring/Sending Set Time substate and: • IF C_AG_OXP_009 THEN it issues the Set-Time action command. • IF C_AG_OXP_014 THEN it issues the Set-Base-Offset-Time action command. ❑ Once its internal time setting operation is completed, the PHD responds to the PHG.		

	5. The PHD under test sends an Event Report to the simulated PHG including a measurement reported by the object under test 6. Once the PHD under test sends an extended configuration and a measurement, check that the PHD DM Status Enumeration Object attributes are: a. Mandatory attribute Type ❑ attribute-id = MDC_ATTR_ID_TYPE ❑ attribute-type = TYPE ❑ attribute-value = MDC_PART_PHD_DM (0x00 0x80) | MDC_PHD_DM_DEV_STAT (0x4E 0x20) b. If recommended attribute Supplemental-Types is present ❑ attribute-id = MDC_ATTR_SUPPLEMENTAL_TYPES ❑ attribute-type = SupplementalTypeList ❑ attribute-value.length = SEQUENCE OF (SIZE (4)) ❑ attribute-value = { MDC_PART_PHD_DM (0x00 0x80), MDC_CGM_DEV_TYPE_SENSOR (0x73 0x14) or MDC_CGM_DEV_TYPE_TRANSMITTER (0x73 0x15) or MDC_CGM_DEV_TYPE_RECEIVER (0x73 0x16) or MDC_CGM_DEV_TYPE_OTHER (0x73 0x17) } c. Mandatory attribute Metric-Spec-Small ❑ attribute-id = MDC_ATTR_METRIC_SPEC_SMALL ❑ attribute-type = MetricSpecSmall (BITS-16) ❑ attribute-value.length = 2 bytes ❑ attribute-value ≠ 0x00 0x00 ▪ Bit 0 must be set (mss-avail-intermittent(0)) ▪ Bit 1 must be set (mss-avail-stored-data(1)) ▪ Bit 2 must be set (mss-upd-aperiodic (2)) ▪ Bit 9 must be set (mss-acc-agent-initiated(9)) d. If recommended attribute Base-Offset-Time-Stamp is present ❑ attribute-id = MDC_ATTR_TIME_STAMP_BO ❑ attribute-type = BaseOffsetTime ❑ attribute-value.length = 8 bytes e. If recommended attribute Enum-Observed-Value-Simple-Bit-Str is present ❑ attribute-id = MDC_ATTR_ENUM_OBS_VAL_SIMP_BIT_STR ❑ attribute-type = BITS-32 ❑ attribute-value.length = 4 bytes ❑ attribute-value = ▪ device-status-undetermined (Bit 0) may be set ▪ device-status-reset (Bit 1) may be set ▪ device-status-error (Bit 5) may be set ▪ device-status-error-mechanical (Bit 6) may be set ▪ device-status-error-electronic (Bit 7) may be set ▪ device-status-error-software (Bit 8) may be set ▪ device-status-error-battery (Bit 9) may be set ▪ device-status-service (Bit 15) may be set ▪ device-status-service-time-sync-required (Bit 16) may be set ▪ device-status-service-calibration-required (Bit 17) may be set

	▪ device-status-service-replenishment-required (Bit 18) may be set ▪ device-status-battery-low (Bit 25) may be set ▪ device-status-battery-depleted (Bit 26) may be set ▪ device-status-battery-replaced (Bit 27) may be set ▪ device-status-battery-interrupted (Bit 28) may be set
Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	

TP Id		TP/PLT/AG/CLASS/CGM/BV-013		
TP label		CGM status Enumeration Object - Extended configuration		
Coverage	**Spec**	[ISO/IEEE 11073-10425]		
	Testable items	CGMStatus 3; M	CGMStatus 4; M	CGMStatus 5; R
		CGMStatus 6; R		
Test purpose		Check that: The CGM status Enumeration Object contains the attributes specified for Extended Configuration.		
Applicability		C_AG_OXP_000 AND C_AG_OXP_157 AND C_AG_OXP_181 AND C_AG_CGM_009		
Other PICS		C_AG_OXP_009, C_AG_0XP_014, C_AG_OXP_041, C_AG_OXP_183, C_AG_OXP_189, C_AG_OXP_293		
Initial condition		The simulated PHG and the PHD under test are in the Unassociated state.		
Test procedure		1. The simulated PHG receives an association request from the PHD under test. 2. The simulated PHG responds with a result = accepted-unknown-config. The PHD responds with a “Remote Operation Invoke | Confirmed Event Report” message with an MDC_NOTI_CONFIG event to send its configuration to the PHG. 3. Check that the field Dev-Config-Id is set in the extended range; if it is not, PHG responds with “unsupported-config” and waits for a new configuration. 4. IF C_AG_OXP_293 THEN: a. Once in Configuring/Sending GetMDS substate simulated PHG issues roiv-cmip-get command with handle set to 0 (to request for MDS object) and attribute-id-list set to 0 to indicate all attributes. b. The PHD responds with a rors-cmip-get service message in which the attribute-list contains a list of all implemented attributes of the MDS object. c. IF the mds-time-mgr-set-time bit is set: ❑ The PHG moves to Configuring/Sending Set Time substate and: • IF C_AG_OXP_009 THEN it issues the Set-Time action command. • IF C_AG_OXP_014 THEN it issues the Set-Base-Offset-Time action command. ❑ Once its internal time setting operation is completed, the PHD responds to the PHG. 5. The PHD under test sends an Event Report to the simulated PHG including a measurement reported by the object under test 6. Once the PHD under test sends an extended configuration and a measurement, check that the CGM status Enumeration Object attributes are: a. Mandatory attribute Type		

	❑ attribute-id = MDC_ATTR_ID_TYPE ❑ attribute-type = TYPE ❑ attribute-value = MDC_PART_PHD_DM (0x00 0x80) | MDC_CGM_DEV_STAT (0x73 0x0C) b. Mandatory attribute Metric-Spec-Small ❑ attribute-id = MDC_ATTR_METRIC_SPEC_SMALL ❑ attribute-type = MetricSpecSmall (BITS-16) ❑ attribute-value.length = 2 bytes ❑ attribute-value ≠ 0x00 0x00 ▪ Bit 0 must be set (mss-avail-intermittent(0)) ▪ Bit 1 must be set (mss-avail-stored-data(1)) ▪ Bit 2 must be set (mss-upd-aperiodic (2)) ▪ Bit 3 must be set (mss-msmt-aperiodic (3)) ▪ Bit 9 must be set (mss-acc-agent-initiated(9)) c. If recommended attribute Base-Offset-Time-Stamp is present ❑ attribute-id = MDC_ATTR_TIME_STAMP_BO ❑ attribute-type = BaseOffsetTime ❑ attribute-value.length = 8 bytes d. If recommended attribute Enum-Observed-Value-Simple-Bit-Str is present ❑ attribute-id = MDC_ATTR_ENUM_OBS_VAL_SIMP_BIT_STR ❑ attribute-type = BITS-32 ❑ attribute-value.length = 4 bytes ❑ attribute-value = ▪ sensor-session-stopped (Bit 0) may be set ▪ sensor-type-incorrect (Bit 2) may be set ▪ sensor-malfunction (Bit 3) may be set ▪ device-specific-alert (Bit 4) may be set ▪ sensor-calibration-not-allowed (Bit 7) may be set ▪ sensor-calibration-recommended (Bit 8) may be set ▪ sensor-calibration-required (Bit 9) may be set ▪ sensor-temp-too-high (Bit 10) may be set ▪ sensor-temp-too-low (Bit 11) may be set ▪ sensor-result-below-patient-low (Bit 12) may be set ▪ sensor-result-above-patient-high (Bit 13) may be set ▪ sensor-low-hypo (Bit 14) may be set ▪ sensor-high-hyper (Bit 15) may be set ▪ sensor-rate-decrease-exceeded (Bit 16) may be set ▪ sensor-rate-increase-exceeded (Bit 17) may be set ▪ sensor-result-too-low (Bit 18) may be set ▪ sensor-result-too-high (Bit 19) may be set ▪ sensor-com-out-of-range (Bit 20) may be set
Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	

<table>
<tr><td colspan="2">TP Id</td><td colspan="3">TP/PLT/AG/CLASS/CGM/BV-014</td></tr>
<tr><td colspan="2">TP label</td><td colspan="3">PM-Store Attributes for Extended Configuration</td></tr>
<tr><td rowspan="5">Coverage</td><td>Spec</td><td colspan="3">[ISO/IEEE 11073-10425]</td></tr>
<tr><td rowspan="4">Testable items</td><td>PMStrObjAttCGM 2; M</td><td>PMStrObjAttCGM 4; M</td><td>PMStrObjAttCGM 5; M</td></tr>
<tr><td>PMStrObjAttCGM 6; M</td><td>PMStrObjAttCGM 8; NR</td><td>PMStrObjAttCGM 9; M</td></tr>
<tr><td>PMStrObjAttCGM 10; M</td><td>PMStrObjAttCGM 11; C</td><td>PMStrObjAttCGM 12; M</td></tr>
<tr><td>PMStrObjAttCGM 13; M</td><td></td><td></td></tr>
<tr><td colspan="2">Test purpose</td><td colspan="3">Check that:
PM-Store Object contains the attributes specified for Extended Configuration.</td></tr>
<tr><td colspan="2">Applicability</td><td colspan="3">C_AG_OXP_000 AND C_AG_OXP_157 AND C_AG_OXP_041 AND C_AG_OXP_181</td></tr>
<tr><td colspan="2">Other PICS</td><td colspan="3"></td></tr>
<tr><td colspan="2">Initial condition</td><td colspan="3">The simulated PHG and the PHD under test are in the Unassociated state.</td></tr>
<tr><td colspan="2">Test procedure</td><td colspan="3">1. The simulated PHG receives an association request from the PHD under test.
2. The simulated PHG responds with a result = accepted-unknown-config
3. The PHD responds with a “Remote Operation Invoke | Confirmed Event Report” message with an MDC_NOTI_CONFIG event to send its configuration to the PHG.
4. The simulated PHG shall send a Get request for the PM-Store object with an attribute-id-list set to 0 to indicate all PM-Store attributes.
5. The PHD issues a GET response with the PM-Store attributes it supports:
a. Mandatory attribute PM-Store-Capab
❑ attribute-id = MDC_ATTR_PM_STORE_CAPAB
❑ attribute-type = PmStoreCapab
❑ attribute-value.length = 2 bytes
❑ attribute-value
▪ pmsc-var-no-of-segm (bit 0) shall be set If the agent creates new segments either due to storing data of multiple sessions or due to time changes
▪ pmsc-epi-seg-entries (bit 4) shall be set
▪ pmsc-peri-seg-entries (bit 5) shall not be set
▪ All other bits are agent-specific
b. Mandatory Store-Capacity-Count
❑ attribute-id = MDC_ATTR_METRIC_STORE_CAPAC_CNT
❑ attribute-type = INT-U32
❑ attribute-value.length = 4 bytes
❑ attribute-value = See relation with next attribute
c. Mandatory attribute Store-Usage-Count
❑ attribute-id = MDC_ATTR_METRIC_STORE_USAGE_CNT
❑ attribute-type = INT-U32
❑ attribute-value.length = 4 bytes
❑ attribute-value = consistent with actual number of segments present and always ≤ than Storage-Capacity-Count</td></tr>
</table>

	d. Mandatory attribute Operational-State ❑ attribute-id = MDC_ATTR_OP_STAT ❑ attribute-type = OperationalState ❑ attribute-value.length = 2 bytes ❑ attribute-value = One of the next ▪ disabled (0x00 0x00) ▪ enabled (0x00 0x01) ▪ notAvailable (0x00 0x02) e. If not Recommended attribute Sample-Period is present ❑ attribute-id = MDC_ATTR_TIME_PD_SAMP ❑ attribute-type = RelativeTime ❑ attribute-value.length = 4 bytes ❑ attribute-value = <Not relevant in this test> f. Mandatory attribute Number-Of-Segments ❑ attribute-id = MDC_ATTR_NUM_SEG ❑ attribute-type = INT-U16 ❑ attribute-value.length = 2 bytes ❑ attribute-value = <Not relevant in this test> g. Mandatory attribute Clear-Timeout ❑ attribute-id = MDC_ATTR_CLEAR_TIMEOUT ❑ attribute-type = RelativeTime ❑ attribute-value.length = 4 bytes ❑ attribute-value = <Not relevant in this test>
Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	

TP Id		TP/PLT/AG/CLASS/CGM/BV-015		
TP label		PM-Segment Attributes for Extended Configuration		
Coverage	**Spec**	[ISO/IEEE 11073-10425]		
	Testable items	PMStoreObjCGM 4; M	PMStoreObjCGM 5; O	PMStoreObjCGM 6; M
		PMSegObjCGM 2; M	PMSegObjCGM 4; M	PMSegObjCGM 12; M
Test purpose		Check that: PM-Segment objects contain the attributes specified for Extended Configuration. [AND] A segment holding blood glucose measurements shall be present if a PM-store is implemented. [AND] The other segments are optional and hold observations from the further objects that are instantiated. [AND] Each entry shall include one of the time formats in the segm-entry-header so a PHG can correlate entries across the different segments.		

Applicability	C_AG_OXP_000 AND C_AG_OXP_157 AND C_AG_OXP_041 AND C_AG_OXP_181
Other PICS	
Initial condition	The simulated PHG and the PHD under test are in the Operating state.
Test procedure	1. The simulated PHG shall send a Get request for the PM-Store object with an attribute-id-list set to 0 to indicate all PM-Store attributes. 2. The simulated PHG shall send a Get-Segment-Info object action for the PM-Store object with SegmSelection = all-segments to indicate the PM-Segments attributes of all available PM-Segments. 3. The PHD issues a response with the PM-Segment attributes it supports: a. Mandatory attribute PM-Segment-Entry-Map ❑ SegmentEntryHeader.value = One of the next must be set: • seg-elem-hdr-relative-time(1) • seg-elem-hdr-hires-relative-time(2) • seg-elem-hdr-bo-time(3) ❑ SegmEntryElem: <Record the fields for later comparison> b. Mandatory attribute Segment-Usage-Count ❑ attribute-id = MDC_ATTR_SEG_USAGE_CNT ❑ attribute-type = INT-U32 ❑ attribute-value.length = 4 bytes ❑ attribute-value = <not relevant in this test> 4. Repeat for every PM-Segment object
Pass/Fail criteria	• All checked values are as specified in the test procedure • Every segm-entry-header must contain one of the time formats • At least one PM-Segment must reference the Glucose Numeric object in its PM-Segm-Entry-Map • If there are more PM-Segment objects, the rest of them must reference one of the objects defined in the spec in its PM-Segm-Entry-Map
Notes	

TP Id		TP/PLT/AG/CLASS/CGM/BV-016		
TP label		PM-Segment Object for Extended Configuration.MDS Event Reports		
Coverage	**Spec**	[ISO/IEEE 11073-10425]		
	Testable items	PMStoreObjCGM 3; M		
Test purpose		Check that: Any configuration with a PM-store for persistent storage shall enable access to the PM-store transmissions.		
Applicability		C_AG_OXP_000 AND C_AG_OXP_157 AND C_AG_OXP_041 AND C_AG_OXP_181		
Other PICS				
Initial condition		The simulated PHG and the PHD under test are in the Operating state.		
Test procedure		1. The simulated PHG shall send a Get request for the PM-Store object with an attribute-		

	id-list set to 0 to indicate all PM-Store attributes. 2. The simulated PHG shall send a Get-Segment-Info object action for the PM-Store object with SegmSelection = all-segments to indicate the PM-Segments attributes of all available PM-Segments. 3. The simulated PHG asks for a measurement. 4. Check event reports that are sent by the PHD.
Pass/Fail criteria	In step 4, the PHD shall not send the data with MDS event reports.
Notes	

TP Id		TP/PLT/AG/CLASS/CGM/BV-017		
TP label		Communication Model: Association Procedure		
Coverage	**Spec**	[ISO/IEEE 11073-10425]		
	Testable items	AgProcAsCGM 1; M	AgProcAsCGM 2; M	AgProcAsCGM 3; M
		AgProcAsCGM 4; M	AgProcAsCGM 5; M	AgProcAsCGM 6; M
		AgProcAsCGM 7; M	AgProcAsCGM 8; M	AgProcAsCGM 9; M
		AgProcAsCGM 10; M	AgProcAsCGM 11; M	AgProcAsCGM 12; M
		AgProcAsCGM 13; O		
Test purpose		Check that: The association procedure data exchange is correct		
Applicability		C_AG_OXP_000 AND C_AG_OXP_157		
Other PICS		C_AG_OXP_002, C_AG_OXP_017		
Initial condition		The simulated PHG and the PHD under test are in the Unassociated state.		
Test procedure		1. The PHD sends a message to associate to the simulated PHG, the expected fields sent by the PHD are: a. APDU Type ❑ field- type = AarqApdu ❑ field-length =2 bytes ❑ field-value =0xE2 0x00. b. assoc-version ❑ field- type = AssociationVersion ❑ field-length =BITS-32 ❑ field- value=0x80 0x00 0x00 0x00 (assoc-version1) c. data-proto-id ❑ field- type = DataProtoId(INT-U16) ❑ field-length =2 bytes ❑ field- value=0x50 0x79 (20601) d. protocol-version ❑ field- type = Protocol Version ❑ field-length = 4 bytes ❑ field- value= At least bit protocol-version2(1) is set to 1 (0x80 0x00 0x00 0x00		

	OR 0x40 0x00 0x00 0x00 OR 0x12 0x00 0x00 0x00) e. encoding rules ❑ field- type = EncodingRules ❑ field-length = 2 bytes ❑ field- value= • Bit 0 must be set (support for MDER) • Bits 1 (XER) and 2 (PER) may be set • All other bits must be 0. f. nomenclature version ❑ field- type = NomenclatureVersion ❑ field-length = 4 bytes ❑ field- value=0x80 0x00 0x00 0x00 ❑ This value indicates version1 is supported (nom-version1(0) is set). g. functional – units ❑ field- type = FunctionalUnits ❑ field-length = 4 bytes • Bit 0 must be 0. • Bits 1 and 2 may be set • The rest of the bits must not be set h. System type ❑ field- type = SystemType ❑ field-length = 4 bytes ❑ field- value = 0x00 0x80 0x00 0x00 (sys-type-agent) i. System-Id ❑ field- type = OCTET STRING ❑ field-length = 8 bytes ❑ field- value = 0xXX 0xXX 0xXX 0xXX 0xXX 0xXX 0xXX 0xXX (octet string length = 8 | UI-64 manufacturer and device) ❑ This value will be System Id attribute of MDS Object. j. dev-config-id ❑ field- type = ConfigId(INT-U16) ❑ field-length = 2 bytes ❑ field- value = • 0x09 0xC4 for standard configuration (2500). • <between 0x40 0x00 and 0x7F 0xFF > for extended configuration. k. data-req-mode-flags (DataReqModeCapab) ❑ field- type = DataReqModeFlags ❑ field-length = 2 bytes ❑ field.value = IF NOT C_AG_OXP_017 -> 0x00 0x01 (data-req-supp-init-agent) l. data-req-init-agent-count (DataReqModeCapab) ❑ field- type = INT-U8 ❑ field-length = 2 bytes ❑ field.value = IF NOT C_AG_OXP_017 -> 0x01 m. data-req-init-manager-count (DataReqModeCapab)

	❑ field- type = INT-U8 ❑ field-length = 2 bytes ❑ field.value = IF NOT C_AG_OXP_017 -> 0x00
Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	

TP Id		TP/PLT/AG/CLASS/CGM/BV-018		
TP label		Operating State. PHG to PHD Maximum APDU Size		
Coverage	**Spec**	[ISO/IEEE 11073-20601-2016C]		
	Testable items	CommonCharac 3; M		
	Spec	[ISO/IEEE 11073-10425]		
	Testable items	ComCharCGM 2; M	ComCharCGM 3; M	
Test purpose		Check that: Check that the total size of the response does not exceed of the maximum APDU size established by the specialization [AND] A CGM PHD implementing only this device specialization shall be capable of receiving any APDU up to the size of Nrx. For this standard, Nrx shall be 224 octets		
Applicability		C_AG_OXP_000 AND C_AG_OXP_157		
Other PICS		C_AG_OXP_041, C_AG_OXP_100		
Initial condition		The simulated PHG and the PHD are in the Operating state.		
Test procedure		1. The simulated PHG issues “Remote Operation Invoke | Get” command with: a. Obj-handle set to 0 (to request for MDS object) b. attribute-id-list.count = 103 c. attribute-id-list: (MDC_ATTR_ID_MODEL, MDC_ATTR_SYS_ID, MDC_ATTR_DEV_CONFIG_ID) repeated 34 times followed by an additonal MDC_ATTR_ID_MODEL 2. Check the response of the PHD. 3. The simulated PHG issues “Remote Operation Invoke | Get” command with handle set to 0 (to request for MDS object) and an empty attribute-id-list to indicate all attributes. 4. Check the response of the PHD.		
Pass/Fail criteria		• In step 2, the PHD under test may respond with a rors-cmip-get listing all the requested attributes, or with a roer message. If PICS C_AG_OXP_100 = TRUE and PHD does not respond with a rors-cmip-get message, and it responds with a roer message or rorj(resource-limitation) message, a WARNING will appear. o If the response is a get response, the total size of the response can not exceed the following APDU sizes: ▪ Continuous Glucose Monitor wihout PM-Store -> 896 octets ▪ Continuous Glucose Monitor with PM-Store -> 5120 octets o In case it responds with a roer, the reason must not be protocol-violation (23) • In step 4, the PHD must respond with a rors-cmip-get message.		

Notes	

TP Id		TP/PLT/AG/CLASS/CGM/BV-019		
TP label		Glucose measurement above the capabilities of the device sensor		
Coverage	**Spec**	[ISO/IEEE 11073-10425]		
	Testable items	Glucose 25; M		
Test purpose		Check that: For a CGM PHD with standard configuration, a glucose measurement that is above the capabilities of the device sensor shall be indicated with an observed value of +INFINITY		
Applicability		C_AG_OXP_000 AND C_AG_OXP_157 AND (NOT C_AG_OXP_181)		
Other PICS				
Initial condition		The simulated PHG and the PHD under test are in the Operating state.		
Test procedure		1. Place in the device sensor a blood sample with a blood glucose level above the capabilities of the device sensor and acquire a measurement with the PHD under test. 2. Test Tool simulated PHG waits to receive an event report from the PHD under test. The event report shall contain the following value: a. Data APDU ❑ event-type = MDC_NOTI_SCAN_REPORT_FIXED (0x0D 0x1D) ❑ obj-handle = 1 (1st Measurement is Glucose) ❑ obs-val-data = • Basic-Nu-Observed-Value = 0x07FE (+INFINITY) • Base-Offset-Time-Stamp = <Not relevant for this Test Case>		
Pass/Fail criteria		All checked values are as specified in the test procedure.		
Notes		Vendor must provide a blood sample (or a simulated blood glucose solution) with a glucose level above the capabilities of the device sensor.		

TP Id		TP/PLT/AG/CLASS/CGM/BV-020		
TP label		Glucose measurement below the capabilities of the device sensor		
Coverage	**Spec**	[ISO/IEEE 11073-10425]		
	Testable items	Glucose 26; M		
Test purpose		Check that: For a CGM PHD with standard configuration, a glucose measurement that is below the capabilities of the device sensor shall be indicated with an observed value of –INFINITY		
Applicability		C_AG_OXP_000 AND C_AG_OXP_157 AND (NOT C_AG_OXP_181)		
Other PICS				
Initial condition		The simulated PHG and the PHD under test are in the Operating state.		
Test procedure		1. Place in the device sensor a blood sample with a blood glucose level below the		

	capabilities of the device sensor and acquire a measurement with the PHD under test. 2. Test Tool simulated PHG waits to receive an event report from the PHD, under test. The even report shall contain the following value: a. Data APDU ❑ event-type = MDC_NOTI_SCAN_REPORT_FIXED (0x0D 0x1D) ❑ obj-handle = 1 (1st Measurement is Glucose) ❑ obs-val-data = • Basic-Nu-Observed-Value = 0x0802 (-INFINITY) • Base-Offset-Time-Stamp = <Not relevant for this Test Case>
Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	Vendor must provide a blood sample (or a simulated blood glucose solution) with a glucose level below the capabilities of the device sensor.

TP Id		TP/PLT/AG/CLASS/CGM/BV-021		
TP label		Set Time (Absolute Time) Continuous Glucose Monitor		
Coverage	**Spec**	[ISO/IEEE 11073-10425]		
	Testable items	MDSMethodsCGM 1; M		
Test purpose		Check that: If the PHD supports the [Absolute-Time-Stamp] attribute, the Set -Time method shall be implemented		
Applicability		C_AG_OXP_000 AND C_AG_OXP_155 AND C_AG_OXP_009		
Other PICS				
Initial condition		The simulated PHG and the PHD under test are in the Operating state.		
Test procedure		1. The simulated PHG sends a SET action: ❑ CHOICE = SetTimeInvoke ❑ action-type = MDC_ACT_SET_TIME ❑ the action-info-args are SetTimeInvoke ▪ date-time = <century, year ≤ 99, month ≤ 12, day ≤ 31, hour ≤ 24, minute ≤ 60, second ≤ 60, sec-fractions ≤ 100> ▪ accuracy = 0 2. The PHD under test response shall be a rors-cmip-confirmed-action: ❑ action-type = MDC_ACT_SET_TIME ❑ action-info-args shall be empty.		
Pass/Fail criteria		All checked values are as specified in the test procedure.		
Notes				

TP Id		TP/PLT/AG/CLASS/CGM/BV-022
TP label		Set Time (Base Offset Time) Continuous Glucose Monitor
Coverage	**Spec**	[ISO/IEEE 11073-10425]

	Testable items	MDSMethodsCGM 2; M		
Test purpose		Check that: If the PHD supports the [Base-Offset-Time-Stamp] attribute, the Set-Base-Offset-Time method shall be implemented		
Applicability		C_AG_OXP_000 AND C_AG_OXP_157 AND C_AG_OXP_014		
Other PICS				
Initial condition		The simulated PHG and the PHD under test are in the Operating state.		
Test procedure		1. The simulated PHG sends a SET action: ❑ CHOICE = SetBOTimeInvoke ❑ action-type = MDC_ACT_SET_BO_TIME ❑ the action-info-args are SetBOTimeInvoke ▪ date-time = bo-seconds = 0x00 0x00 0x00 0x00, bo-fractions = 0x00 0x00, bo-time-offset = 0x3C 2. The PHD under test response shall be a rors-cmip-confirmed-action: ❑ action-type = MDC_ACT_SET_BO_TIME ❑ action-info-args shall be empty.		
Pass/Fail criteria		All checked values are as specified in the test procedure.		
Notes				

Bibliography

[b-ITU-T H.810 (2013)] Recommendation ITU-T H.810 (2013), *Interoperability design guidelines for personal health systems*.

[b-ITU-T H.810 (2015)] Recommendation ITU-T H.810 (2015), *Interoperability design guidelines for personal health systems*.

[b-CDG 1.0] Continua Health Alliance, Continua Design Guidelines v1.0 (2008), *Continua Design Guidelines*.

[b-CDG 2010] Continua Health Alliance, Continua Design Guidelines v1.5 (2010), *Continua Design Guidelines*.

[b-CDG 2011] Continua Health Alliance, Continua Design Guidelines (2011), "Adrenaline", *Continua Design Guidelines.*

[b-CDG 2012] Continua Health Alliance, Continua Design Guidelines (2012), "Catalyst", *Continua Design Guidelines*.

[b-CDG 2013] Continua Health Alliance, Continua Design Guidelines (2013), "Endorphin", *Continua Design Guidelines*.

[b-CDG 2015] Continua Health Alliance, Continua Design Guidelines (2015), "Genome", *Continua Design Guidelines*.

[b-CDG 2016] Personal Connected Health Alliance, Continua Design Guidelines (2016), "Iris", *Continua Design Guidelines*.

[b-ETSI SR 001 262] ETSI SR 001 262 v1.8.1 (2003-12), *ETSI drafting rules.*

[b-PHD PICS & PIXIT] Personal Health Device DG2016 PICS and PIXIT excel sheet v1.11.
http://handle.itu.int/11.1002/2000/12067

[b-PHG PICS & PIXIT] Personal Health Gateway DG2016 PICS and PIXIT excel sheet v1.9.
http://handle.itu.int/11.1002/2000/12067

[b-TCRL] Test Case Reference List_DG2016_v1.11.
http://handle.itu.int/11.1002/2000/12067

[b-TI] Continua DG2016 PHD Testable items excel sheet v1.8.
http://handle.itu.int/11.1002/2000/12067

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