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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 5l: Medication adherence monitor

Recommendation ITU-T H.845.9

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Recommendation ITU-T H.845.9

Conformance of ITU-T H.810 personal health system: Personal Health Devices interface Part 5I: Medication adherence monitor

Summary

Recommendation ITU-T H.845.9 provides a test suite structure (TSS) and the test purposes (TP) for medication adherence monitors in the Personal Health Devices (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.845.9 is a transposition of Continua Test Tool DG2016, Test Suite Structure & Test Purposes, Personal Health Devices Interface; Part 5I: Device Specializations. Personal Health Device (Adherence Monitor) (Version 1.6, 2016-09-20), that was developed by the Personal Connected Health Alliance. A number of versions of this specification existed before transposition.

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

History

Edition	Recommendation	Approval	Study Group	Unique ID*
1.0	ITU-T H.845.9	2015-01-13	16	11.1002/1000/12270
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Keywords

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

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

FOREWORD

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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 a transposition of Continua Test Tool DG2016, Test Suite Structure & Test Purposes, Personal Health Devices Interface; Part 5I: Device Specializations. Personal Health Device (Adherence Monitor) (Version 1.6, 2016-09-20), 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
1.2	2012-10-05	Initial release for Test Tool DG2011. This is the same version as "TSS&TP_1.5_PAN-LAN_PART_5I_v1.2.doc" because new features included in [b-CDG 2011] do not affect the test procedures specified in this document.
1.3	2013-05-24	Initial release for Test Tool DG2012. This uses "TSS&TP_DG2011_ PAN-LAN_PART_5I_v1.2.doc" as a baseline and adds new features included in [b-CDG 2012]: • Max APDU size for GM, BCA and ECG
1.4	2014-01-24	Initial release for Test Tool DG2013. This uses "TSS&TP_DG2012_ PAN-LAN_PART_5I_v1.4.doc" as a baseline and adds new features included in [b-ITU-T H.810 (2013)]/[b-CDG 2013]: • Adds glucose meter BLE • Adds BLE SSP support • Adds NFC new transport • Adds INR device specialization
1.5	2014-04-24	TM Lite & Doc Enhancements (Test Tool v4.0 Maintenance release 1). It uses "TSS&TP_DG2013_PLT_PART_5I_v1.4.doc" as a baseline and adds new features included in Documentation Enhancements: • "Other PICS" row added
1.5	2015-07-01	Initial release for Test Tool DG2015. It is the same version as "TSS&TP_DG2013_PLT_PART_5I_v1.4.doc" because new features included in [b-ITU-T H.810 (2015)]/[b-CDG 2015] do not affect the test procedures specified in this document this document.
1.6	2016-09-20	Initial release for Test Tool DG2016. It uses "TSS&TP_DG2015_PLT_ PART_5I_v1.5.doc" as baseline and adds new features included in [ITU-T H.810 (2016)]/[b-CDG 2016]

Recommendation ITU-T H.845.9

Conformance of ITU-T H.810 personal health system: Personal Health Devices interface Part 5I: Medication adherence 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 have been divided into the parts specified below. This Recommendation covers Part 5, subpart 5I.

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

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

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

– Part 10: Personal Health Devices Transcoding Whitepaper. Personal Health Gateway

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*.

[ISO/IEEE 11073-10472] ISO/IEEE 11073-10472-2012, *Health informatics – Personal health device communication – Part 10472: Device specialization – Medication monitor*.
https://www.iso.org/standard/54364.html

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

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

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

DUT Device Under Test

CDG Continua Design Guidelines

CGM Continuous Glucose Monitor

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 Recommendation are to be interpreted as in [b-ETSI SR 001 262].

– SHALL is equivalent to 'must' or 'it is required to'.

– SHALL NOT is equivalent to 'must not' or 'it is not allowed'.

– SHOULD is equivalent to 'it is recommended to'.

– SHOULD NOT is equivalent to 'it is not recommended to'.

– MAY is equivalent to 'is permitted'.

– MAY NOT is equivalent to 'it is not required that'.

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

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

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

CDG release	Transposed as	Version	Description	Designation
2016 plus errata	[ITU-T H.810 (2016)]	6.1	Release 2016 plus errata noting all ratified bugs [b-CDG 2016].	–
2016	–	6.0	Release 2016 of the CDG including maintenance updates of the CDG 2015 and additional guidelines that cover new functionalities.	Iris
2015 plus errata	[b-ITU-T H.810 (2015)]	5.1	Release 2015 plus errata noting all ratified bugs [b-CDG 2015]. The 2013 edition of 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
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 1.3.9 (shown in bold).

– Group 1: Personal Health Device (PHD)
  - Group 1.1: Transport (TR)
    - Subgroup 1.1.1: Design guidelines: Common (DGC)
    - Subgroup 1.1.2: USB design guidelines (UDG)
    - Subgroup 1.1.3: Bluetooth design guidelines (BDG)
    - Subgroup 1.1.4: Pulse oximeter design guidelines (PODG)
    - Subgroup 1.1.5: Cardiovascular design guidelines (CVDG)
    - Subgroup 1.1.6: Activity hub design guidelines (HUBDG)
    - Subgroup 1.1.7: ZigBee design guidelines (ZDG)
    - Subgroup 1.1.8: Glucose meter design guidelines (GLDG)
    - Subgroup 1.1.9: Bluetooth low energy design guidelines (BLEDG)
    - Subgroup 1.1.10: Basic electrocardiograph design guidelines (ECGDG)
    - Subgroup 1.1.11: NFC design guidelines (NDG)
  - Group 1.2: IEEE 20601 Optimized exchange protocol (OXP)
    - Subgroup 1.2.1: PHD domain information model (DIM)
    - Subgroup 1.2.2: PHD service model (SER)
    - Subgroup 1.2.3: PHD communication model (COM)
  - Group 1.3: Devices class specializations (CLASS)
    - Subgroup 1.3.1: Weighing scales (WEG)
    - Subgroup 1.3.2: Glucose meter (GL)
    - Subgroup 1.3.3: Pulse oximeter (PO)
    - Subgroup 1.3.4: Blood pressure monitor (BPM)
    - Subgroup 1.3.5: Thermometer (TH)
    - Subgroup 1.3.6: Cardiovascular (CV)
    - Subgroup 1.3.7: Strength (ST)
    - Subgroup 1.3.8: Activity hub (HUB)
    - **Subgroup 1.3.9: Adherence monitor (AM)**
    - Subgroup 1.3.10: Insulin pump (IP)
    - Subgroup 1.3.11: Peak flow (PF)
    - Subgroup 1.3.12: Body composition analyser (BCA)
    - Subgroup 1.3.13: Basic electrocardiograph (ECG)
    - Subgroup 1.3.14: International normalized ratio (INR)
    - Subgroup 1.3.15: Sleep apnoea breathing therapy equipment (SABTE)
    - Subgroup 1.3.16: Continuous glucose monitor (CGM)
  - Group 1.4: Personal health device transcoding whitepaper (PHDTW)
    - Subgroup 1.4.1: Whitepaper general requirements (GEN)
    - Subgroup 1.4.2: Whitepaper thermometer requirements (TH)
    - Subgroup 1.4.3: Whitepaper blood pressure requirements (BPM)

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

– Group 2: Personal Health Gateway (PHG)

- Group 2.1: Transport (TR)
  - Subgroup 2.1.1: Design guidelines: Common (DGC)
  - Subgroup 2.1.2: USB design guidelines (UDG)
  - Subgroup 2.1.3: Bluetooth design guidelines (BDG)
  - Subgroup 2.1.4: Cardiovascular design guidelines (CVDG)
  - Subgroup 2.1.5: Activity hub design guidelines (HUBDG)
  - Subgroup 2.1.6: ZigBee design guidelines (ZDG)
  - Subgroup 2.1.7: Bluetooth low energy design guidelines (BLEDG)
  - Subgroup 2.1.8: NFC design guidelines (NDG)
- Group 2.2: IEEE 20601 Optimized exchange protocol (OXP)
  - Subgroup 2.2.1: General (GEN)
  - Subgroup 2.2.2: PHD domain information model (DIM)
  - Subgroup 2.2.3: PHD service model (SER)
  - Subgroup 2.2.4: PHD communication model (COM)
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  - Subgroup 2.3.3: Pulse oximeter (PO)
  - Subgroup 2.3.4: Blood pressure monitor (BPM)
  - Subgroup 2.3.5: Thermometer (TH)
  - Subgroup 2.3.6: Cardiovascular (CV)
  - Subgroup 2.3.7: Strength (ST)
  - Subgroup 2.3.8: Activity hub (HUB)
  - Subgroup 2.3.9: Adherence monitor (AM)
  - Subgroup 2.3.10: Insulin pump (IP)
  - Subgroup 2.3.11: Peak flow (PF)
  - Subgroup 2.3.12: Body composition analyser (BCA)
  - Subgroup 2.3.13: Basic electrocardiograph (ECG)
  - Subgroup 2.3.14: International normalized ratio (INR)
  - Subgroup 2.3.15: Sleep apnoea breathing therapy equipment (SABTE)
  - Subgroup 2.3.16: Continuous glucose monitor (CGM)
- Group 2.4: Personal health device transcoding whitepaper (PHDTW)
  - Subgroup 2.4.1: Whitepaper general requirements (GEN)
  - Subgroup 2.4.2: Whitepaper thermometer requirements (TH)
  - Subgroup 2.4.3: Whitepaper blood pressure measurement requirements (BPM)

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

7 Electronic attachment

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

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

Annex A

Test purposes

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

A.1 TP definition conventions

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

- **TP Id**: This is a unique identifier (TP/<TT>/<DUT>/<GR>/<SGR>/<XX> – <NNN>). It is specified according to the naming convention defined below:
  - Each test purpose identifier is introduced by the prefix "TP".
  - <TT>: This is the test tool that will be used in the test case:
    - PAN: Personal area network (Bluetooth or USB)
    - LAN: Local area network (ZigBee)
    - PAN-LAN: Personal area network (Bluetooth or USB) - Local area network (ZigBee)
    - LP-PAN: Low power personal area network (Bluetooth Low Energy)
    - TAN: Touch area network (NFC)
    - PLT: Personal area network (Bluetooth or USB) – Local area network (ZigBee) – Touch area network (NFC)
  - <DUT>: This is the device under test:
    - PHD: Personal Health Device
    - PHG: Personal Health Gateway
  - <GR>: This identifies a group of test cases.
  - <SGR>: This identifies a subgroup of test cases.
  - <XX>: This identifies the type of testing:
    - BV: Valid behaviour test
    - BI: Invalid behaviour test
  - <NNN>: This is a sequential number that identifies 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.1 Subgroup 1.3.9: Adherence monitor (AM)

TP Id		TP/PLT/PHD/CLASS/AM/BV-000		
TP label		Get MDS Object for Adherence Monitor specialization: Mandatory, Conditional and Optional Attributes		
Coverage	**Spec**	[ISO/IEEE 11073-10472]		
	Testable items	MM_MDSAttr1; M	MM_MDSAttr2; M	MM_MDSAttr3; M
		MM_MDSAttr4; R	MM_MDSAttr5; R	MM_MDSAttr6; R
		MM_MDSAttr7; M	MM_MDSAttr8; M	MM_GETServ1; M
		MM_GETServ4; M	MM_OperProc2; M	
Test purpose		Check that: The PHD supports a Get command that requests all attributes [AND] The MDS Object contains the attributes specified for a Medication Monitor PHD.		
Applicability		C_AG_OXP_168 AND C_AG_OXP_000		
Other PICS		C_AG_OXP_181, C_AG_AM_001, C_AG_AM_002, C_AG_AM_003, C_AG_AM_004		
Initial condition		The simulated PHG and the PHD under test are in the Operating state.		
Test procedure		1. The simulated PHG issues a "roiv-cmip-get" command with the handle set to 0 (to request for an MDS object) and the 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. Mandatory attribute System-model ❑ attribute-id = MDC_ATTR_ID_MODEL ❑ attribute-type = SystemModel ❑ attribute-value.length =<variable> ❑ attribute-value ={Manufacturer, Model} b. Mandatory attribute Dev-Configuration-Id ❑ attribute-id = MDC_ATTR_DEV_CONFIG_ID ❑ attribute-type = ConfigId ❑ attribute-value.length = 2 bytes ❑ attribute-value = – IF C_AG_AM_001 then attribute-value = 0x1C 0x20 – ELSE IF C_AG_AM_002 then attribute-value = 0x1C 0x21 – ELSE IF C_AG_AM_003 then attribute-value = 0x1C 0x22 – ELSE IF C_AG_AM_004 then attribute-value = 0x1C 0x23 – ELSE attribute-value = < between 0x4000 and 0x7FFF		

	c. Recommended attribute Power-Status ❑ attribute-id = MDC_ATTR_POWER_STAT ❑ attribute-type = PowerStatus (BITS-16) ❑ attribute-value.length = 2 bytes ❑ attribute-value = ON_MAINS (0x8000) or ON_BATTERY(0x4000) Only one of the following may be active: ▪ chargingFull(8), ▪ chargingTrickle(9), ▪ chargingOff(10). ▪ The rest of the bits must not be set d. Recommended attribute Battery-Level ❑ attribute-id = MDC_ATTR_VAL_BATT_CHARGE ❑ attribute-type = INT-U16 ❑ attribute-value.length = 2 bytes ❑ attribute-value = <undefined if value>100 > e. Recommended attribute Remaining-Battery-Time ❑ attribute-id = MDC_ATTR_TIME_BATT_REMAIN ❑ attribute-type = BatMeasure ❑ attribute-value.length = <variable> ❑ attribute-value = <units shall be set to one of: MDC_DIM_MIN, MDC_DIM_HR, MDC_DIM_DAY > f. Mandatory attribute System-Type-Spec_List ❑ attribute-id = MDC_ATTR_SYS_TYPE_SPEC_LIST ❑ attribute-type = TypeVerList ❑ attribute-value.length = 4 bytes attribute-value = MDC_DEV_SPEC_PROFILE_AI_MED_MINDER, 1 ❑ Attribute System-Type must not be present.
Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	

TP Id		TP/PLT/PHD/CLASS/AM/BV-001		
TP label		MDS Configuration objects events for Adherence Monitor		
Coverage	**Spec**	[ISO/IEEE 11073-10472]		
	Testable items	MedDispensed1; M	StatusRep1; O	UserFeedback1; O
		MM_StandConfig1; C	MM_StandConfig2;C	MM_StandConfig3;C
		MM_StandConfig4;C	MM_MDSEvent1; M	MM_GenNumObj1;M
		MM_GenNumObj2: O	FixedDosage1; M	VarDosage1; M
		StatReporter1; O	MM_EventRepServ1; M	MM_ConfProc1; M

Test purpose	Check that: A Medication Monitor shall send the [MDS-Configuration-Event] using a [Confirmed] event report. The [MDS-Configuration-Event] shall include the event-info [ConfigReport]. [AND] Check objects supported by the PHD (standard /extended configuration)
Applicability	C_AG_OXP_168 AND C_AG_OXP_000
Other PICS	C_AG_OXP_010, C_AG_OXP_181, C_AG_AM_001, C_AG_AM_002, C_AG_AM_003, C_AG_AM_004, C_AG_AM_005, C_AG_AM_006, C_AG_AM_007, C_AG_AM_008
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=0x 0D 0x 1C (MDC_NOTI_CONFIG) g. config-report-id (ConfigReport) ❑ field- type = ConfigId ❑ field-length = INT-U16 ❑ field- value = • IF C_AG_AM_001 then attribute-value = 0x1C 0x20 • ELSE IF C_AG_AM_002 then attribute-value = 0x1C 0x21

	• ELSE IF C_AG_AM_003 then attribute-value = 0x1C 0x22 • ELSE IF C_AG_AM_004 then attribute-value = 0x1C 0x23 • ELSE IF C_AG_OXP_181=TRUE then attribute-value = < between 0x4000 and 0x7FFF > h. obj-class (ConfigReport → ConfigObjectList (ConfigObject)). To check the objects that are supported by the PHD, Type Attribute will be checked in AttributeList. ❑ field- type = OID-Type ❑ field-length = INT-U16 ❑ field- value = • IF C_AG_AM_001 then 1 Fixed Dosage Medication object is present. • ELSE IF C_AG_AM_002 then 1 Fixed Dosage Medication, 1 Status Reporter and 1 User Feedback object are present. • ELSE IF C_AG_AM_003 then 1 Variable Dosage Medication object is present. • ELSE IF C_AG_AM_004 then 1 Variable Dosage Medication, 1 Status Reporter and 1 User Feedback object are present. • ELSE : ▪ IF C_AG_AM_005 then 1 Fixed Dosage Medication is present, ELSE this object is not present. ▪ IF C_AG_AM_006 then 1 Variable Dosage Medication is present, ELSE this object is not present. ▪ Exactly one of the fixed dosage medication dispensed numeric object or the variable dosage medication dispensed numeric object shall be supported. ▪ IF C_AG_AM_007 then User Feedback is present, ELSE this object is not present. ▪ IF C_AG_AM_008 then Status Reporter is present, ELSE this object is not present.
Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	

TP Id		TP/PLT/PHD/CLASS/AM/BV-002		
TP label		MDS objects events Adherence Monitor & PM-Store Object		
Coverage	**Spec**	[ISO/IEEE 11073-10472]		
	Testable items	MM_MDSEvent2; M	MM_MDSEvent3; M	MM_MDSEvent4; M
		MM_MDSEvent5; M	MM_MDSEvent6; M	MM_MDSEvent7; M
		MM_MDSEvent8; M	MM_MDSEvent9; M	MM_MDSEvent10; M
		MM_EventRepServ1; M	MM_OperProc11; M	MM_OperProc12; M
		MM_PMStoreGen1; M	MM_PMStoreGen2; M	MM_EventRepServ2; M
		MM_OperProc5; M	MM_OperProc6; M	

Test purpose	Check that: The PHD sends the MDS-Dynamic-Data-Update-Fixed using a confirmed event report and it includes the event-info ScanReportInfoFixed [AND/OR] The PHD sends the MDS-Dynamic-Data-Update-Var using a confirmed event report and it includes the event-info ScanReportInfoVar [AND/OR] The PHD sends the MDS-Dynamic-Data-Update-MP-Fixed using a confirmed event report and it includes the event-info ScanReportInfoMPFixed [AND/OR] The PHD sends the MDS-Dynamic-Data-Update-MP-Var using a confirmed event report and it includes the event-info ScanReportInfoMPVar [AND] A medication monitor PHD with standard configuration shall use the fixed format data update messages method for transmitting measurement data [AND] A medication monitor PHD with extended configuration may use either fixed or variable format data update messages for transmitting measurement data. [AND] Any configuration that does not include a PM-store object utilizes agent-initiated event reports to transmit all retained observations [AND] Any configuration with a PM-store for longer-term storage shall disable agent-initiated transmission and shall enable access to the PM-store transmissions
Applicability	C_AG_OXP_168 AND C_AG_OXP_000
Other PICS	C_AG_OXP_009, C_AG_OXP_014, C_AG_OXP_041, C_AG_OXP_181, C_AG_OXP_293, C_AG_AM_001, C_AG_AM_002, C_AG_AM_003, C_AG_AM_004
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 the tested configuration. If it is not, the PHG responds with an "unsupported-config" and waits for a new configuration. Repeat this step until a Dev-config-Id equal to the tested configuration is received. 5. IF C_AG_OXP_293: 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 it issues the Set-Time action command. • IF C_AG_OXP_014 it issues the Set-Base-Offset-Time action command. ❑ Once its internal time setting operation is completed, the PHD responds to the PHG. 6. Record the PHD configuration.

	7. Take Measurements for every supported object in the PHD under test. 8. Wait to receive every event report and check: • IF the PHD does not support PM-Store, THEN MDS-Event Report is sent by the PHD to report the measurements. • IF the PHD supports PM-Store, THEN the PHD shall not send MDS event reports. • For MDS Event Reports: ❑ 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.
Pass/Fail criteria	• Check that every received MDS Event report is a one of the following Data APDU and that it is confirmed. • For Standard Configuration (C_AG_AM_001 or C_AG_AM_002 or C_AG_AM_003 or C_AG_AM_004): the MDS Event Report is sent by the PHD to report measurements for every object. ❑ MDC_NOTI_SCAN_REPORT_FIXED ❑ MDC_NOTI_SCAN_REPORT_MP_FIXED • For an Extended Configuration that does not support the PM-Store object, an MDS Event Report is sent by the PHD to report measurements for every object: ❑ MDC_NOTI_SCAN_REPORT_FIXED ❑ MDC_NOTI_SCAN_REPORT_MP_FIXED ❑ MDC_NOTI_SCAN_REPORT_VAR ❑ MDC_NOTI_SCAN_REPORT_MP_VAR • For an Extended Configuration that supports the PM-Store object, an MDS Event Report is not sent by the PHD to report measurements for objects.
Notes	

TP Id		TP/PLT/PHD/CLASS/AM/BV-003		
TP label		Fixed Dosage Medication Dispensed Object for Standard Configuration (0x1C20 or 0x1C21)		
Coverage	**Spec**	[ISO/IEEE 11073-10472]		
	Testable items	FixedDosage2; M	FixedDosage3; M	FixedDosage4; R
		FixedDosage5; M	FixedDosage6; R	FixedDosage7; O
		FixedDosage8; R	FixedDosage9; R	FixedDosage10; R
		FixedDosage11; R	FixedDosage12; M	FixedDosage13; R
		FixedDosage14; O	FixedDosage15; O	FixedDosage16; C
		FixedDosage17; R	FixedDosage18; C	FixedDosage19; R
		FixedDosage20; C	FixedDosage21; C	FixedDosage22; C
		FixedDosage23; C	FixedDosage24; C	FixedDosage25; C
		FixedDosage26; R	FixedDosage39; M	MM_ConfProc2; M
Test purpose		Check that:		

	Fixed Dosage Medication Dispensed Numeric Object contains the attributes specified for Standard Configuration (0x1C20 or 0x1C21)
Applicability	C_AG_OXP_168 AND (C_AG_AM_001 OR C_AG_AM_002) AND C_AG_OXP_000
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 0x1C20 OR 0x1C21. If it is not, the PHG responds with an "unsupported-config" and waits for a new configuration. Repeat this step until a Dev-config-Id equal to 0x1C20 or 0x1C21 is received. 5. Once the PHD under test sends a standard configuration, check the Fixed Dosage Medication object. 6. The Fixed Dosage Medication object contents shall be: 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_PHD_AI, MDC_AI_MED_DISPENSED_FIXED c. Mandatory attribute Metric-Spec-Small ❑ attribute-id = MDC_ATTR_METRIC_SPEC_SMALL ❑ attribute-type = MetricSpecSmall ❑ 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 2 (mss-upd-aperiodic(2)) must be set. • Bit 3 (mss-msmt-aperiodic(3)) is set. • Bit 9 (mss-acc-agent-initiated(9)) is set. d. Mandatory attribute Attribute-Value-Map ❑ attribute-id = MDC_ATTR_ATTRIBUTE_VAL_MAP ❑ attribute-type = AttrValMap ❑ attribute-count = 2 ❑ attribute-value = (MDC_ATTR_TIME_STAMP_ABS ,8 MDC_ATTR_NU_VAL_OBS_BASIC,2) 7. Check that no other attributes are present in the initial configuration.
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/AM/BV-004</td></tr>
<tr><td colspan="2">TP label</td><td colspan="3">Fixed Dosage Medication Dispensed Object for Extended Configuration</td></tr>
<tr><td rowspan="5">Coverage</td><td>Spec</td><td colspan="3">[ISO/IEEE 11073-10472]</td></tr>
<tr><td rowspan="4">Testable items</td><td>FixedDosage27; M</td><td>FixedDosage28; R</td><td>FixedDosage29; R</td></tr>
<tr><td>FixedDosage30; O</td><td>FixedDosage31; R</td><td>FixedDosage32; R</td></tr>
<tr><td>FixedDosage33; R</td><td>FixedDosage34; R</td><td>FixedDosage35; R</td></tr>
<tr><td>FixedDosage36; R</td><td>FixedDosage37; R</td><td>FixedDosage38; R</td></tr>
<tr><td colspan="2">Test purpose</td><td colspan="3">Check that:
Fixed Dosage Medication Dispensed Numeric Object contains the attributes specified for Extended Configuration</td></tr>
<tr><td colspan="2">Applicability</td><td colspan="3">C_AG_OXP_168 AND C_AG_OXP_181 AND C_AG_AM_005 AND C_AG_OXP_000</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. Check that the field Dev-Config-Id is set to the tested extended configuration. If it is not, the PHG responds with an "unsupported-config" and waits for a new configuration. Repeat this step until a Dev-config-Id equal to the extended configuration is received.
5. Once the PHD under test sends the tested configuration, check the Fixed Dosage Medication object.
6. The Fixed Dosage Medication object contents shall be:
a. Mandatory attribute Type
❑ attribute-id = MDC_ATTR_ID_TYPE
❑ attribute-type = TYPE
attribute-value = = MDC_PART_PHD_AI, MDC_AI_MED_DISPENSED_FIXED
b. IF Not Recommended attribute Supplemental-Types
❑ attribute-id = MDC_ATTR_SPPLEMENTAL_TYPES
❑ attribute-type = SupplementalTypeList
❑ attribute-value.length = <variable>Sequence of TYPE (TYPE.length= 4 bytes)
❑ attribute-value = <Not relevant for this test>
c. IF Not recommended attribute Metric-Structure-Small is present
❑ attribute-id = MDC_ATTR_METRIC_STRUCTURE_SMALL
❑ attribute-type = MetricStructureSmall
❑ attribute-length = 2 bytes
❑ attribute-value = <Not relevant for this test>
d. IF Optional attribute Measurement-Status is present
❑ attribute-id = MDC_ATTR_MSMT_STAT
❑ attribute-type = MeasurementStatus
❑ attribute-value.length = 2 bytes
❑ attribute-value = <Not relevant for this test></td></tr>
</table>

	e. IF Not recommended attribute Metric-Id is present ❑ attribute-id = MDC_ATTR_ID_PHYSIO ❑ attribute-type = OID-Type(INT-U16) ❑ attribute-value.length =2 bytes ❑ attribute-value = <Not relevant for this test> f. IF Not Recommended attribute Metric-Id-List is present ❑ attribute-id = MDC_ATTR_ID_PHYSIO_LIS ❑ attribute-type = MetricIdList ❑ attribute-value = <Not relevant for this test> g. IF Not recommended attribute Metric-Id-Partition is present ❑ attribute-id = MDC_ATTR_METRIC_ID_PART ❑ attribute-type = NomPartition(INT-U16) ❑ attribute-value.length = 2 bytes ❑ attribute-value = <Not relevant for this test> h. IF Not recommended attribute Unit-Code ❑ attribute-id = MDC_ATTR_UNIT_CODE ❑ attribute-type = OID-Type(INT-U16) ❑ attribute-value.length = 2 bytes ❑ attribute-value = <Not relevant for this test> i. IF Not recommended attribute Source-Handle-Reference is present ❑ attribute-id = MDC_ATTR_SOURCE_HANDLE_REF ❑ attribute-type = HANDLE(INT-U16) ❑ attribute-value.length = 2 bytes ❑ attribute-value = <Not relevant for this test> j. IF Not recommended attribute Relative-Time-Stamp ❑ attribute-id = MDC_ATTR_TIME_STAMP_REL ❑ attribute-type = RelativeTime (INT-U32) ❑ attribute-value.length =4 bytes ❑ attribute-value = <Not relevant for this test> k. IF Not recommended attribute Measure-Active-Period ❑ attribute-id = MDC_ATTR_TIME_PD_MSMT_ACTIVE ❑ attribute-type = FLOAT-Type (INT-U32) ❑ attribute-value.length = 4 bytes ❑ attribute-value = <Not relevant for this test> l. IF Not Recommended attribute Accuracy is present ❑ attribute-id = MDC_ATTR_NU_ACCUR_MSMT ❑ attribute-type = FLOAT-Type (INT-U32) ❑ attribute-value.length = 4 bytes ❑ attribute-value = <Not relevant for this test>
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/AM/BV-005</td></tr>
<tr><td colspan="2">TP label</td><td colspan="3">Variable Dosage Medication Dispensed Object for Standard Configuration (0x1C22 or 0x1C23)</td></tr>
<tr><td rowspan="11">Coverage</td><td>Spec</td><td colspan="3">[ISO/IEEE 11073-10472]</td></tr>
<tr><td rowspan="10">Testable items</td><td>VarDosage2; M</td><td>VarDosage3; M</td><td>VarDosage4; R</td></tr>
<tr><td>VarDosage5; M</td><td>VarDosage6; R</td><td>VarDosage7; O</td></tr>
<tr><td>VarDosage8; R</td><td>VarDosage9; R</td><td>VarDosage10; R</td></tr>
<tr><td>VarDosage11; M</td><td>VarDosage12; M</td><td>VarDosage13; R</td></tr>
<tr><td>VarDosage14; O</td><td>VarDosage15; O</td><td>VarDosage16; C</td></tr>
<tr><td>VarDosage17; R</td><td>VarDosage18; C</td><td>VarDosage19; R</td></tr>
<tr><td>VarDosage20; C</td><td>VarDosage21; C</td><td>VarDosage22; C</td></tr>
<tr><td>VarDosage23; C</td><td>VarDosage24; C</td><td>VarDosage25; C</td></tr>
<tr><td>VarDosage26; R</td><td>VarDosage39; M</td><td>MM_ConfProc2; M</td></tr>
<tr><td colspan="2">Test purpose</td><td colspan="3">Check that:
Variable Dosage Medication Dispensed Numeric Object contains the attributes specified for Standard Configuration (0x1C22 or 0x1C23)</td></tr>
<tr><td colspan="2">Applicability</td><td colspan="3">C_AG_OXP_168 AND (C_AG_AM_003 OR C_AG_AM_004) AND C_AG_OXP_000</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. Check that the field Dev-Config-Id is set to 0x1C22 OR 0x1C23. If it is not, the PHG responds with an "unsupported-config" and waits for a new configuration. Repeat this step until a Dev-config-Id equal to 0x1C22 or 0x1C23 is received.
5. Once the PHD under test sends a standard configuration, check the Variable Dosage Medication object.
6. The Variable Dosage Medication object contents shall be:
a. Mandatory attribute Handle
❑ attribute-id = MDC_ATTR_ID_HANDLE
❑ attribute-type = HANDLE
❑ attribute-value = 0x00 0x02
b. Mandatory attribute Type
❑ attribute-id = MDC_ATTR_ID_TYPE
❑ attribute-type = TYPE
❑ attribute-value = MDC_PART_PHD_AI, MDC_AI_MED_DISPENSED_VARIABLE
c. Mandatory attribute Metric-Spec-Small
❑ attribute-id = MDC_ATTR_METRIC_SPEC_SMALL
❑ attribute-type = MetricSpecSmall</td></tr>
</table>

	❑ 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 2 (mss-upd-aperiodic(2)) must be set. • Bit 3 (mss-msmt-aperiodic(3)) is set. • Bit 9 (mss-acc-agent-initiated(9)) is set. d. Mandatory attribute Unit-Code ❑ attribute-id = MDC_ATTR_UNIT_CODE ❑ attribute-type = OID-Type ❑ attribute-value.length = 2 bytes ❑ attribute-value = MDC_DIM_MILLI_L e. Mandatory attribute Attribute-Value-Map ❑ attribute-id = MDC_ATTR_ATTRIBUTE_VAL_MAP ❑ attribute-type = AttrValMap ❑ attribute-count = 2 ❑ attribute-value = (MDC_ATTR_TIME_STAMP_ABS ,8 MDC_ATTR_NU_VAL_OBS_SIMP,4) 7. Check that no other attributes are present in the initial configuration.
Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	

TP Id		TP/PLT/PHD/CLASS/AM/BV-006		
TP label		Variable Dosage Medication Dispensed Object for Extended Configuration		
Coverage	**Spec**	[ISO/IEEE 11073-10472]		
	Testable items	VarDosage27; M	VarDosage28; R	VarDosage29; R
		VarDosage30; O	VarDosage31; R	VarDosage32; R
		VarDosage33; R	VarDosage34; M	VarDosage35; R
		VarDosage36; R	VarDosage37; R	VarDosage38; R
Test purpose		Check that: Variable Dosage Medication Dispensed Numeric Object contains the attributes specified for Extended Configuration		
Applicability		C_AG_OXP_168 AND C_AG_OXP_181 AND C_AG_AM_006 AND C_AG_OXP_000		
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 the tested extended configuration. If it is not, the PHG responds with an "unsupported-config" and waits for a new configuration. Repeat this step until a Dev-config-Id equal to the extended configuration is received.
5. Once the PHD under test sends the tested configuration, check the Variable Dosage Medication object.
6. The Variable Dosage Medication object contents shall be:
   a. Mandatory attribute Type
      - ❑ attribute-id = MDC_ATTR_ID_TYPE
      - ❑ attribute-type = TYPE

      attribute-value = MDC_PART_PHD_AI, MDC_AI_MED_DISPENSED_VARIABLE
   b. IF Not Recommended attribute Supplemental-Types
      - ❑ attribute-id = MDC_ATTR_SPPLEMENTAL_TYPES
      - ❑ attribute-type = SupplementalTypeList
      - ❑ attribute-value.length = <variable>Sequence of TYPE (TYPE.length= 4 bytes)
      - ❑ attribute-value = <Not relevant for this test>
   c. IF Not recommended attribute Metric-Structure-Small is present
      - ❑ attribute-id = MDC_ATTR_METRIC_STRUCTURE_SMALL
      - ❑ attribute-type = MetricStructureSmall
      - ❑ attribute-length = 2 bytes
      - ❑ attribute-value = <Not relevant for this test>
   d. IF Optional attribute Measurement-Status is present
      - ❑ attribute-id = MDC_ATTR_MSMT_STAT
      - ❑ attribute-type = MeasurementStatus
      - ❑ attribute-value.length = 2 bytes
      - ❑ attribute-value = <Not relevant for this test>
   e. IF Not recommended attribute Metric-Id is present
      - ❑ attribute-id = MDC_ATTR_ID_PHYSIO
      - ❑ attribute-type = OID-Type(INT-U16)
      - ❑ attribute-value.length =2 bytes
      - ❑ attribute-value = <Not relevant for this test>
   f. IF Not Recommended attribute Metric-Id-List is present
      - ❑ attribute-id = MDC_ATTR_ID_PHYSIO_LIS
      - ❑ attribute-type = MetricIdList
      - ❑ attribute-value = <Not relevant for this test>
   g. IF Not recommended attribute Metric-Id-Partition is present
      - ❑ attribute-id = MDC_ATTR_METRIC_ID_PART
      - ❑ attribute-type = NomPartition(INT-U16)
      - ❑ attribute-value.length = 2 bytes
      - ❑ attribute-value = <Not relevant for this test>
   h. Mandatory recommended attribute Unit-Code
      - ❑ attribute-id = MDC_ATTR_UNIT_CODE
      - ❑ attribute-type = OID-Type(INT-U16)
      - ❑ attribute-value.length = 2 bytes
      - ❑ attribute-value = <Not relevant for this test>
   i. IF Not recommended attribute Source-Handle-Reference is present

	❑ attribute-id = MDC_ATTR_SOURCE_HANDLE_REF ❑ attribute-type = HANDLE(INT-U16) ❑ attribute-value.length = 2 bytes ❑ attribute-value = <Not relevant for this test> j. IF Not recommended attribute Relative-Time-Stamp ❑ attribute-id = MDC_ATTR_TIME_STAMP_REL ❑ attribute-type = RelativeTime (INT-U32) ❑ attribute-value.length =4 bytes ❑ attribute-value = <Not relevant for this test> k. IF Not recommended attribute Measure-Active-Period ❑ attribute-id = MDC_ATTR_TIME_PD_MSMT_ACTIVE ❑ attribute-type = FLOAT-Type (INT-U32) ❑ attribute-value.length = 4 bytes ❑ attribute-value = <Not relevant for this test> l. IF Not Recommended attribute Accuracy is present ❑ attribute-id = MDC_ATTR_NU_ACCUR_MSMT ❑ attribute-type = FLOAT-Type (INT-U32) ❑ attribute-value.length = 4 bytes ❑ attribute-value = <Not relevant for this test>
Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	

TP Id		TP/PLT/PHD/CLASS/AM/BV-007		
TP label		User Feedback Object for Standard Configuration (0x1C21 or 0x1C23)		
Coverage	**Spec**	[ISO/IEEE 11073-10472]		
	Testable items	UserFeedback2; M	UserFeedback3; M	UserFeedback4; R
		UserFeedback5; M	UserFeedback6; R	UserFeedback7; O
		UserFeedback8; R	UserFeedback9; M	UserFeedback10 ;R
		UserFeedback11 ;R	UserFeedback12 ;M	UserFeedback13 ;R
		UserFeedback14 ;O	UserFeedback15 ;O	UserFeedback16 ;C
		UserFeedback17 ;R	UserFeedback18 ;C	UserFeedback19 ;R
		UserFeedback20 ;C	UserFeedback21 ;C	UserFeedback22 ;C
		UserFeedback23 ;C	UserFeedback24 ;C	UserFeedback25 ;C
		UserFeedback26 ;R	UserFeedback38; M	MM_ConfProc2; M
Test purpose		Check that: User Feedback Numeric Object contains the attributes specified for Standard Configuration (0x1C21 or 0x1C23)		
Applicability		C_AG_OXP_168 AND (C_AG_AM_002 OR C_AG_AM_004) AND C_AG_OXP_000		

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 0x1C21 OR 0x1C23. If it is not, the PHG responds with an "unsupported-config" and waits for a new configuration. Repeat this step until a Dev-config-Id equal to 0x1C21 or 0x1C23 is received. 5. Once the PHD under test sends a standard configuration, check the User Feedback object: 6. The User Feedback object contents shall be: a. Mandatory attribute Handle ❑ attribute-id = MDC_ATTR_ID_HANDLE ❑ attribute-type = HANDLE ❑ attribute-value = 0x00 0x04 b. Mandatory attribute Type ❑ attribute-id = MDC_ATTR_ID_TYPE ❑ attribute-type = TYPE ❑ attribute-value = MDC_PART_PHD_AI, MDC_AI_MED_FEEDBACK c. Mandatory attribute Metric-Spec-Small ❑ attribute-id = MDC_ATTR_METRIC_SPEC_SMALL ❑ attribute-type = MetricSpecSmall ❑ 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 2 (mss-upd-aperiodic(2)) must be set. • Bit 3 (mss-msmt-aperiodic(3)) is set. • Bit 9 (mss-acc-agent-initiated(9)) is set. • Bit 12 (mss-cat-manual(12)) is set. d. Mandatory attribute Metric-Id-List is present ❑ attribute-id = MDC_ATTR_ID_PHYSIO_LIS ❑ attribute-type = MetricIdList ❑ attribute-value = MDC_AI_MED_UF_LOCATION, MDC_AI_MED_UF_RESPONSE e. Mandatory attribute Attribute-Value-Map ❑ attribute-id = MDC_ATTR_ATTRIBUTE_VAL_MAP ❑ attribute-type = AttrValMap ❑ attribute-count = 2 ❑ attribute-value = (MDC_ATTR_TIME_STAMP_ABS ,8 MDC_ATTR_NU_CMPD_VAL_OBS_BASIC,8) 7. Check that no other attributes are present in the initial configuration.
Pass/Fail criteria	All checked values are as specified in the test procedure.

Notes	

TP Id		TP/PLT/PHD/CLASS/AM/BV-007_A		
TP label		User Feedback Object format for Standard Configuration		
Coverage	**Spec**	[ISO/IEEE 11073-10472]		
	Testable items	UserFeedback39; M	UserFeedback23; C	
Test purpose		Check that: User Feedback measurement values are in the right order in event report.		
Applicability		C_AG_OXP_168 AND (C_AG_AM_002 OR C_AG_AM_004) AND C_AG_OXP_000		
Other PICS		C_AG_OXP_009, C_AG_OXP_014, 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. 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 0x1C21 OR 0x1C23. If it is not, the PHG responds with an "unsupported-config" and waits for a new configuration. Repeat this step until a Dev-config-Id equal to 0x1C21 or 0x1C23 is received. 5. Once the PHD under test sends the tested configuration, the simulated PHG sends a "roiv-cmip-get" to get all the attributes of the MDS, record the value of Date-and-Time. 6. IF C_AG_OXP_293: a. 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. b. 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 it issues the Set-Time action command. • IF C_AG_OXP_014 it issues the Set-Base-Offset-Time action command. ❑ Once its internal time setting operation is completed, the PHD responds to the PHG. 7. Once the PHD under test is in the Operating state, take a measurement and record the value of the measurement. 8. Wait until the PHD under test sends an Event Report to the simulated PHG, the relevant fields are: a. event-type = MDC_NOTI_SCAN_REPORT_FIXED b. ScanReportInfoFixed ❑ obj-handle = 4 ❑ Compound Object Count =2 ❑ obs-val-data.value = • Time Stamp (8 bytes) • Location (2 bytes) • Response (2 bytes)		
Pass/Fail criteria		• The received data must be coherent with that previously recorded.		

	• The Time Stamp must be coherent with that received in the MDS attribute. • The data must be received in this exact same order and the Compound value contains two fields, the first one that represents the "relative location" and the second one that is the user response (numeric form).
Notes	

TP Id		TP/PLT/PHD/CLASS/AM/BV-008		
TP label		User Feedback Object for Extended Configuration		
Coverage	**Spec**	[ISO/IEEE 11073-10472]		
	Testable items	UserFeedback27; M	UserFeedback28; R	UserFeedback29; R
		UserFeedback30; O	UserFeedback31; R	UserFeedback32; R
		UserFeedback33; R	UserFeedback34; R	UserFeedback35; R
		UserFeedback36; R	UserFeedback37; R	
Test purpose		Check that: User Feedback Numeric Object contains the attributes specified for Extended Configuration		
Applicability		C_AG_OXP_168 AND C_AG_OXP_181 AND C_AG_AM_007 AND C_AG_OXP_000		
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 the tested extended configuration. If it is not, the PHG responds with an "unsupported-config" and waits for a new configuration. Repeat this step until a Dev-config-Id equal to the extended configuration is received. 5. Once the PHD under test sends the tested configuration, check User Feedback object: 6. User Feedback Object contents shall be: a. Mandatory attribute Type ❑ attribute-id = MDC_ATTR_ID_TYPE ❑ attribute-type = TYPE ❑ attribute-value = MDC_PART_PHD_AI, MDC_AI_MED_FEEDBACK b. IF Not Recommended attribute Supplemental-Types ❑ attribute-id = MDC_ATTR_SPPLEMENTAL_TYPES ❑ attribute-type = SupplementalTypeList ❑ attribute-value.length = <variable>Sequence of TYPE (TYPE.length= 4 bytes) ❑ attribute-value = <Not relevant for this test> c. IF Not recommended attribute Metric-Structure-Small is present ❑ attribute-id = MDC_ATTR_METRIC_STRUCTURE_SMALL ❑ attribute-type = MetricStructureSmall ❑ attribute-length = 2 bytes ❑ attribute-value = <Not relevant for this test>		

	d. IF Optional attribute Measurement-Status is present ❑ attribute-id = MDC_ATTR_MSMT_STAT ❑ attribute-type = MeasurementStatus ❑ attribute-value.length = 2 bytes ❑ attribute-value = <Not relevant for this test> e. IF Not recommended attribute Metric-Id is present ❑ attribute-id = MDC_ATTR_ID_PHYSIO ❑ attribute-type = OID-Type(INT-U16) ❑ attribute-value.length =2 bytes ❑ attribute-value = <Not relevant for this test> f. IF Not recommended attribute Metric-Id-Partition is present ❑ attribute-id = MDC_ATTR_METRIC_ID_PART ❑ attribute-type = NomPartition(INT-U16) ❑ attribute-value.length = 2 bytes ❑ attribute-value = <Not relevant for this test> g. IF Not recommended attribute Unit-Code ❑ attribute-id = MDC_ATTR_UNIT_CODE ❑ attribute-type = OID-Type(INT-U16) ❑ attribute-value.length = 2 bytes ❑ attribute-value = <Not relevant for this test> h. IF Not recommended attribute Source-Handle-Reference is present ❑ attribute-id = MDC_ATTR_SOURCE_HANDLE_REF ❑ attribute-type = HANDLE(INT-U16) ❑ attribute-value.length = 2 bytes ❑ attribute-value = <Not relevant for this test> i. IF Not recommended attribute Relative-Time-Stamp ❑ attribute-id = MDC_ATTR_TIME_STAMP_REL ❑ attribute-type = RelativeTime (INT-U32) ❑ attribute-value.length =4 bytes ❑ attribute-value = <Not relevant for this test> j. IF Not recommended attribute Measure-Active-Period ❑ attribute-id = MDC_ATTR_TIME_PD_MSMT_ACTIVE ❑ attribute-type = FLOAT-Type (INT-U32) ❑ attribute-value.length = 4 bytes ❑ attribute-value = <Not relevant for this test> k. IF Not Recommended attribute Accuracy is present ❑ attribute-id = MDC_ATTR_NU_ACCUR_MSMT ❑ attribute-type = FLOAT-Type (INT-U32) ❑ attribute-value.length = 4 bytes ❑ attribute-value = <Not relevant for this test>
Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	

TP Id		TP/PLT/PHD/CLASS/AM/BV-009		
TP label		Status Reporter Object for Standard Configuration (0x1C21 or 0x1C23)		
Coverage	**Spec**	[ISO/IEEE 11073-10472]		
	Testable items	StatReporter2; M	StatReporter3; M	StatReporter4; R
		StatReporter5; M	StatReporter6; R	StatReporter7; O
		StatReporter8; R	StatReporter9; R	StatReporter10; R
		StatReporter11; R	StatReporter12; M	StatReporter13; R
		StatReporter14; O	StatReporter15; O	StatReporter16; C
		StatReporter17; R	StatReporter18; C	StatReporter19; R
		StatReporter20; R	StatReporter21; C	StatReporter22; C
		StatReporter23; C	StatReporter24; C	StatReporter25; C
		StatReporter26; R	StatReporter27; O	StatReporter44; M
		MM_ConfProc2; M		
Test purpose		Check that: Status Reporter Enumeration Object contains the attributes specified for Standard Configuration (0x1C21 or 0x1C23)		
Applicability		C_AG_OXP_168 AND (C_AG_AM_002 OR C_AG_AM_004) AND C_AG_OXP_000		
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 0x1C21 OR 0x1C23. If it is not, the PHG responds with an "unsupported-config" and waits for a new configuration. Repeat this step until a Dev-config-Id equal to 0x1C21 or 0x1C23 is received. 5. Once the PHD under test sends a standard configuration, check the Status Reporter object 6. The Status Reporter object contents shall be: a. Mandatory attribute Handle ❑ attribute-id = MDC_ATTR_ID_HANDLE ❑ attribute-type = HANDLE ❑ attribute-value = 0x00 0x03 b. Mandatory attribute Type ❑ attribute-id = MDC_ATTR_ID_TYPE ❑ attribute-type = TYPE ❑ attribute-value = MDC_PART_PHD_AI, MDC_AI_MED_STATUS c. Mandatory attribute Metric-Spec-Small ❑ attribute-id = MDC_ATTR_METRIC_SPEC_SMALL ❑ attribute-type = MetricSpecSmall (BITS-16)		

	❑ attribute-value ≠ 0x00 0x00 • Bit 0 (mss-avail-intermittent(0)) must be set. • 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)) is set. • Bit 9 (mss-acc-agent-initiated(9)) is set. d. Mandatory attribute Attribute-Value-Map ❑ attribute-id = MDC_ATTR_ATTRIBUTE_VAL_MAP ❑ attribute-type = AttrValMap ❑ attribute-count = 2 ❑ attribute-value = (MDC_ATTR_TIME_STAMP_ABS ,8 MDC_ATTR_ENUM_OBS_VAL_BASIC_BIT_STR,2) 7. Check that no other attributes are present in the initial configuration.
Pass/Fail criteria	All checked values are as specified in the test procedure.

TP Id		TP/PLT/PHD/CLASS/AM/BV-010		
TP label		Status Reporter Object for Extended Configuration		
Coverage	**Spec**	[ISO/IEEE 11073-10472]		
	Testable items	StatReporter28; M	StatReporter29; R	StatReporter30; R
		StatReporter31; O	StatReporter32; R	StatReporter33; R
		StatReporter34; R	StatReporter35; R	StatReporter36; R
		StatReporter37; R	StatReporter38; R	StatReporter39; R
		StatReporter40; R	StatReporter41; O	StatReporter42; O
		StatReporter43; M		
Test purpose		Check that: Status Reporter Enumeration Object contains the attributes specified for Extended Configuration		
Applicability		C_AG_OXP_168 AND C_AG_OXP_181 AND C_AG_AM_008 AND C_AG_OXP_000		
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 extended configuration. If it is not, the PHG responds with an "unsupported-config" and waits for a new configuration. Repeat this step until a Dev-config-Id equal to tested extended configuration is received. 5. Once the PHD under test sends the tested configuration, check the Status Reporter object. 6. The Status Reporter object contents shall be:		

	a. Mandatory attribute Type ❑ attribute-id = MDC_ATTR_ID_TYPE ❑ attribute-type = TYPE ❑ attribute-value = MDC_PART_PHD_AI, MDC_AI_MED_STATUS b. IF Not Recommended attribute Supplemental-Types ❑ attribute-id = MDC_ATTR_SPPLEMENTAL_TYPES ❑ attribute-type = SupplementalTypeList ❑ attribute-value.length = <variable>Sequence of TYPE (TYPE.length= 4 bytes) ❑ attribute-value = <Not relevant for this test> c. IF Not recommended attribute Metric-Structure-Small is present ❑ attribute-id = MDC_ATTR_METRIC_STRUCTURE_SMALL ❑ attribute-type = MetricStructureSmall ❑ attribute-length = 2 bytes ❑ attribute-value = <Not relevant for this test> d. IF Optional attribute Measurement-Status is present ❑ attribute-id = MDC_ATTR_MSMT_STAT ❑ attribute-type = MeasurementStatus ❑ attribute-value.length = 2 bytes ❑ attribute-value = <Not relevant for this test> e. IF Not recommended attribute Metric-Id is present ❑ attribute-id = MDC_ATTR_ID_PHYSIO ❑ attribute-type = OID-Type(INT-U16) ❑ attribute-value.length =2 bytes ❑ attribute-value = <Not relevant for this test> f. IF Not Recommended attribute Metric-Id-List is present ❑ attribute-id = MDC_ATTR_ID_PHYSIO_LIS ❑ attribute-type = MetricIdList ❑ attribute-value = <Not relevant for this test> g. IF Not recommended attribute Metric-Id-Partition is present ❑ attribute-id = MDC_ATTR_METRIC_ID_PART ❑ attribute-type = NomPartition(INT-U16) ❑ attribute-value.length = 2 bytes ❑ attribute-value = <Not relevant for this test> h. IF Not recommended attribute Unit-Code is present ❑ attribute-id = MDC_ATTR_UNIT_CODE ❑ attribute-type = OID-Type(INT-U16) ❑ attribute-value.length = 2 bytes ❑ attribute-value = <Not relevant for this test> i. IF Not recommended attribute Source-Handle-Reference is present ❑ attribute-id = MDC_ATTR_SOURCE_HANDLE_REF ❑ attribute-type = HANDLE(INT-U16) ❑ attribute-value.length = 2 bytes ❑ attribute-value = <Not relevant for this test> j. IF Not recommended attribute Relative-Time-Stamp is present

	❑ attribute-id = MDC_ATTR_TIME_STAMP_REL ❑ attribute-type = RelativeTime (INT-U32) ❑ attribute-value.length =4 bytes ❑ attribute-value = <Not relevant for this test> k. IF Not recommended attribute Measure-Active-Period is present ❑ attribute-id = MDC_ATTR_TIME_PD_MSMT_ACTIVE ❑ attribute-type = FLOAT-Type (INT-U32) ❑ attribute-value.length = 4 bytes ❑ attribute-value = <Not relevant for this test> l. IF Not recommended attribute Enum-Observed-Value-Simple-OID is present ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_SIM_OID ❑ attribute-type = OID-Type (INT-U16) ❑ attribute-value.length = 2 bytes ❑ attribute-value = <Not relevant for this test> m. IF Not recommended attribute Enum-Observed-Value-Partition is present ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_PART ❑ attribute-type = NomPartition (INT-U16) ❑ attribute-value-length=2 bytes ❑ attribute-value = <Not relevant for this test> n. IF Optional attribute Context-Key is present ❑ attribute-id = MDC_ATTR_CONTEXT_KEY ❑ attribute-type = OCTET STRING(Size(8)) ❑ attribute-value.length =10 bytes ❑ attribute-value = Check against PIXIT(I_AG_OXP_009)
Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	

TP Id		TP/PLT/PHD/CLASS/AM/BV-011		
TP label		Adherence Monitor PM-Store object		
Coverage	**Spec**	[ISO/IEEE 11073-10472]		
	Testable items	MM_PMStoreAttr1; M	MM_PMStoreAttr2; M	MM_PMStoreAttr3; M
		MM_PMStoreAttr4; M		
Test purpose		Check that: PM-Store object contains the specified attributes.		
Applicability		C_AG_OXP_168 AND C_AG_OXP_041 AND C_AG_OXP_000		
Other PICS				
Initial condition		The simulated PHG and the PHD under test are in the Operating state.		
Test procedure		1. The simulated PHG issues a "Remote Operation Invoke | Get" command with the handle set to the PM-Store and the attribute-id-list set to 0 to indicate all attributes. 2. The PHD response must contain:		

	a. Mandatory Storage-Capacity-Count is present ❑ attribute-id = MDC_ATTR_METRIC_STORE_CAPAC_CNT ❑ attribute-type = INT-U32 ❑ attribute-value.length = 4 bytes ❑ attribute-value = <Not relevant in this test> b. Mandatory Storage-Usage-Count is present ❑ attribute-id = MDC_ATTR_METRIC_STORE_USAGE_CNT ❑ attribute-type = INT-U32 ❑ attribute-value.length = 4 bytes ❑ attribute-value = <Not relevant in this test> c. Mandatory attribute PM-Store-Label ❑ attribute-id = MDC_ATTR_PM_STORE_LABEL_STRING ❑ attribute-type = OCTET STRING ❑ attribute-value.length <= 255 octets ❑ attribute-value = <Not relevant for this Test> d. 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>
Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	

TP Id		TP/PLT/PHD/CLASS/AM/BV-012		
TP label		Adherence Monitor Segment-Data-Event size		
Coverage	**Spec**	[ISO/IEEE 11073-10472]		
	Testable items	MM_PMStoreEvent3; M	MM_PMStoreEvent4; M	
Test purpose		Check that: Segment-Data-Event report size shall be no larger than 1024 octets. [AND] A PM-segment containing data in excess of this size shall transfer its data using multiple Segment-Data-Event reports as described in IEEE Std 11073-20601		
Applicability		C_AG_OXP_168 AND C_AG_OXP_041 AND C_AG_OXP_000		
Other PICS				
Initial condition		The simulated PHG and the PHD under test are in the Operating state.		
Test procedure		1. The simulated PHG issues a Get-Segment-Info with SegmSelection set to all-segments. 2. The simulated PHG sends a request for the PM-Segment Data to one of the PM-Segments that contains data: a. Data APDU ❑ Type = Invoke | Confirmed Action,		

	❑ HANDLE = obj-handle ❑ Action = MDC_ACT_SEG_TRIG_XFER ❑ TrigSegmDataXferReq = <Instance number of the selected PM-Segment that contains the data> 3. The PHD issues an action response: a. Data APDU ❑ Type = Invoke | Confirmed Action, ❑ HANDLE = obj-handle b. Action = MDC_ACT_SEG_TRIG_XFER ❑ TrigSegmDataXferRsp = <Same Instance number> | tsxr-succesful (0x00 0x00) 4. The PHD under test starts Data transfer: a. Data APDU ❑ Invoke | CfmEventReport ❑ Action = MDC_NOTI_SEGMENT_DATA ❑ SegmentDataEvent 5. The simulated PHG response to transferred data APDU's: a. Data APDU ❑ Type = Invoke | Confirmed Action,, ❑ HANDLE = obj-handle ❑ Action = MDC_NOTI_SEGMENT_DATA ❑ SegmentDataResult ❑ PHD under test repeats steps 3 and 4 until all the data is transferred
Pass/Fail criteria	The size of the Segment-Data-Event (MDC_NOTI_SEGMENT_DATA) cannot exceed 1024 octets.
Notes	

TP Id		TP/PLT/PHD/CLASS/AM/BV-013		
TP label		Adherence Monitor PM-Segment		
Coverage	**Spec**	[ISO/IEEE 11073-10472]		
	Testable items	MM_PStoreModel1; M	MM_PStoreModel2; M	MM_PMSegmAttr1; M
		MM_PMSegmAttr2; M	MM_PMSegmAttr3; M	MM_PMSegmAttr4; M
Test purpose		Check that: For every implemented medication monitor object there shall be at least one corresponding segment present if the PM-store is implemented [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 [AND] PM-Segment has the specified attributes		
Applicability		C_AG_OXP_168 AND C_AG_OXP_041 AND C_AG_OXP_000		
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-Segment-Info action for a PM-Store object with SegmSelection = all-segments to indicate the PM-Segments attributes of all available PM-Segments. 2. The PHD issues a "rors-cmip-confirmed-action" response with the PM-Segment attributes it supports: a. Mandatory attribute PM-Segment-Entry-Map ❑ attribute-id = MDC_ATTR_PM_SEG_MAP ❑ attribute-type = PmSegmentEntryMap ❑ attribute-value = SEQUENCE of ▪ segm-entry-header shall include one of the time formats. ▪ segm-entry-elem-list: Record this value b. Mandatory attribute Segment-Label is present ❑ attribute-id = MDC_ATTR_PM_SEG_LABEL_STRING ❑ attribute-type = OCTET STRING ❑ attribute-value.length = consistent with value ❑ attribute-value = <Not relevant for this test> c. Mandatory attribute Segment-Start-Abs-Time is present ❑ attribute-id = MDC_ATTR_TIME_START_SEG ❑ attribute-type = AbsoluteTime ❑ attribute-value.length = 8 bytes ❑ attribute-value = ▪ century = ▪ year ≤ 99 ▪ month ≤ 12 ▪ day ≤ 31 ▪ hour ≤ 24 ▪ minute ≤ 60 ▪ second ≤ 60 ▪ sec-fractions ≤ 100 d. Mandatory attribute Segment-End-Abs-Time is present ❑ attribute-id = MDC_ATTR_TIME_END_SEG ❑ attribute-type = AbsoluteTime ❑ attribute-value.length = 8 bytes ❑ attribute-value = ▪ century = ▪ year ≤ 99 ▪ month ≤ 12 ▪ day ≤ 31 ▪ hour ≤ 24 ▪ minute ≤ 60 ▪ second ≤ 60 ▪ sec-fractions ≤ 100 e. Mandatory attribute Segment-Usage-Count is present

	❑ attribute-id = MDC_ATTR_SEG_USAGE_CNT ❑ attribute-type = INT-U32 ❑ attribute-value.length = 4 bytes ❑ attribute-value = <Not relevant for this test> 3. Repeat step 1 and 2 for every PM-Store object
Pass/Fail criteria	All checked attributes are as specified in the test procedure. There is at least one segment for every implemented object.
Notes	

TP Id		TP/PLT/PHD/CLASS/AM/BV-014		
TP label		Association Adherence Monitor PHD		
Coverage	**Spec**	[ISO/IEEE 11073-10472]		
	Testable items	MM_AssocReq1; M	MM_AssocReq2 ; M	MM_AssocReq3 ; M
		MM_AssocReq4 ; M	MM_AssocReq5 ; M	MM_AssocReq6 ; M
		MM_AssocReq7 ; M	MM_AssocReq8 ; M	MM_AssocReq9 ; M
		MM_AssocReq10 ; M	MM_AssocReq11 ; M	MM_AssocReq12 ; M
		MM_MDSMethod4 ; M		
Test purpose		Check that: During the association procedure, Medication Monitor PHD sends the correct association request to the simulated PHG		
Applicability		C_AG_OXP_168 AND C_AG_OXP_000		
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 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=0x80 0x00 0x00 0x00

e. encoding rules
- ❑ field- type = EncodingRules
- ❑ field-length = 2 bytes
- ❑ field- value=
  - Bit 0 must be set (support MDER)
  - Bits 1 and 2 may be set
  - The rest of the 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
- ❑ field-value =
  - Bit 0 must not be set , only bit 1 or 2 may be set to 1.

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 the System Id attribute of the MDS object.

j. dev-config-id
- ❑ field- type = ConfigId(INT-U16)
- ❑ field-length = 2 bytes
- ❑ field- value =
  - <0x1C20 or 0x1C21 or 0x1C22 or 0x1C23> for standard configuration
  - <between 0x40 0x00 and 0x7F 0xFF > for extended configuration.

k. data-req-mode-flags (DataReqModeCapab)
- ❑ field- type = DataReqModeFlags
- ❑ field-length = 2 bytes
- ❑ If the PHD supports only Medication Monitor specialization →Only bit 15 is set (data-req-supp-init-agent(15))

l. data-req-init-agent-count (DataReqModeCapab)
- ❑ field- type = INT-U8
- ❑ field-length = 2 bytes

	❑ field.value = 0x01 m. data-req-init-manager-count (DataReqModeCapab) ❑ field- type = INT-U8 ❑ field-length = 2 bytes ❑ field.value = 0x00
Pass/Fail criteria	All checked attributes have proper values.
Notes	

TP Id		TP/PLT/PHD/CLASS/AM/BV-015		
TP label		Get Request Adherence Monitor PHD		
Coverage	**Spec**	[ISO/IEEE 11073-10472]		
	Testable items	MM_OperProc4; M		
Test purpose		Check that: It is not required for a medication monitor PHD to support this capability (Get MDS object using an Attribute-Id-List). If this capability is not implemented, the medication monitor PHD shall respond with a "Remote Operation Error Result" (roer) service message (see ISO/IEEE Std 11073-20601) with the error-value field set to no-such-action (9).		
Applicability		C_AG_OXP_168 AND C_AG_OXP_000		
Other PICS		C_AG_OXP_100		
Initial condition		The simulated PHG and the PHD under test are in the Operating state.		
Test procedure		1. The simulated PHG issues a "Remote Operation Invoke | Get" command with a. Obj-handle set to 0 (to request for MDS object) b. attribute-id-list.count=1 and a single AVA_Type MDC_ATTR_DEV_CONFIG_ID (0X0A 0X44) to retrieve the mandatory "Dev-Configuration-Id" attribute 2. The PHD under test responds with: • IF C_AG_OXP_100 THEN: with a "rors-cmip-get" service message which contains the "Dev-Configuration-Id" • ELSE: with a "roer" service message with error-value set to no-such-an-action (9)		
Pass/Fail criteria		In step 2 the PHD properly sends the requested attribute or the error (no-such-action) message.		
Notes				

TP Id		TP/PLT/PHD/CLASS/AM/BV-016		
TP label		Operating State. PHG to PHD Maximum APDU Size		
Coverage	**Spec**	[ISO/IEEE 11073-20601-2015A] and [ISO/IEEE 11073-20601-2016C]		
	Testable items	CommonCharac 3; M		
	Spec	[ISO/IEEE 11073-10472]		

	Testable items	MM_ComModel1; M	MM_ComModel2; M	
Test purpose		Check that: The total size of the response do not exceed of the maximum APDU size established by the specialization [AND] A medication monitor PHD implementing only this device specialization shall not transmit any APDU larger than Ntx and shall be capable of receiving any APDU up to a size of Nrx. For this standard, Ntx shall be 1024 octets and Nrx shall be 64 octets.		
Applicability		C_AG_OXP_000 AND C_AG_OXP_168		
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 a "Remote Operation Invoke | Get" command with: a. Obj-handle set to 0 (to request for an MDS object) b. attribute-id-list.count = 23 c. attribute-id-list: (MDC_ATTR_ID_MODEL, MDC_ATTR_SYS_ID, MDC_ATTR_DEV_CONFIG_ID) repeated 7 times followed by an additional MDC_ATTR_ID_MODEL and MDC_ATTR_SYS_ID 2. Check the response of the PHD. 3. The simulated PHG issues a "Remote Operation Invoke | Get" command with the handle set to 0 (to request for an 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 the PHD does not respond with a rors-cmip-get message, it responds with a roer message or rorj(resource-limitation) message, a WARNING will appear. • If the response is a get response, the total size of the response cannot exceed the sum of the APDU sizes of the supported specializations (limited to an absolute limit of 64512 octets): ▪ Pulse oximeter → 9216 octets ▪ Weighing scales → 896 octets ▪ Glucose meter → 5120 octets or 64512 octets if the PHD supports PM-Store ▪ Blood pressure → 896 octets ▪ Thermometer → 896 octets ▪ Independent activity hub → 5120 octets ▪ Cardiovascular → 64512 octets or 6624 octets if PHD under test only supports Step Counter Profile ▪ Strength → 64512 octets: ▪ Adherence monitor → 1024 octets ▪ Peak flow → 2030 octets ▪ Body composition analyser → 7730 octets ▪ Basic ECG/Simple ECG → 7168 octets or 64512 octets if the PHD supports PM-Store ▪ Basic ECG/Heart rate → 1280 octets or 64512 octets if the PHD supports PM-Store ▪ International normalized ratio → 896 octets or 64512 if the PHD supports PM-Store		

	• In the case where 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	

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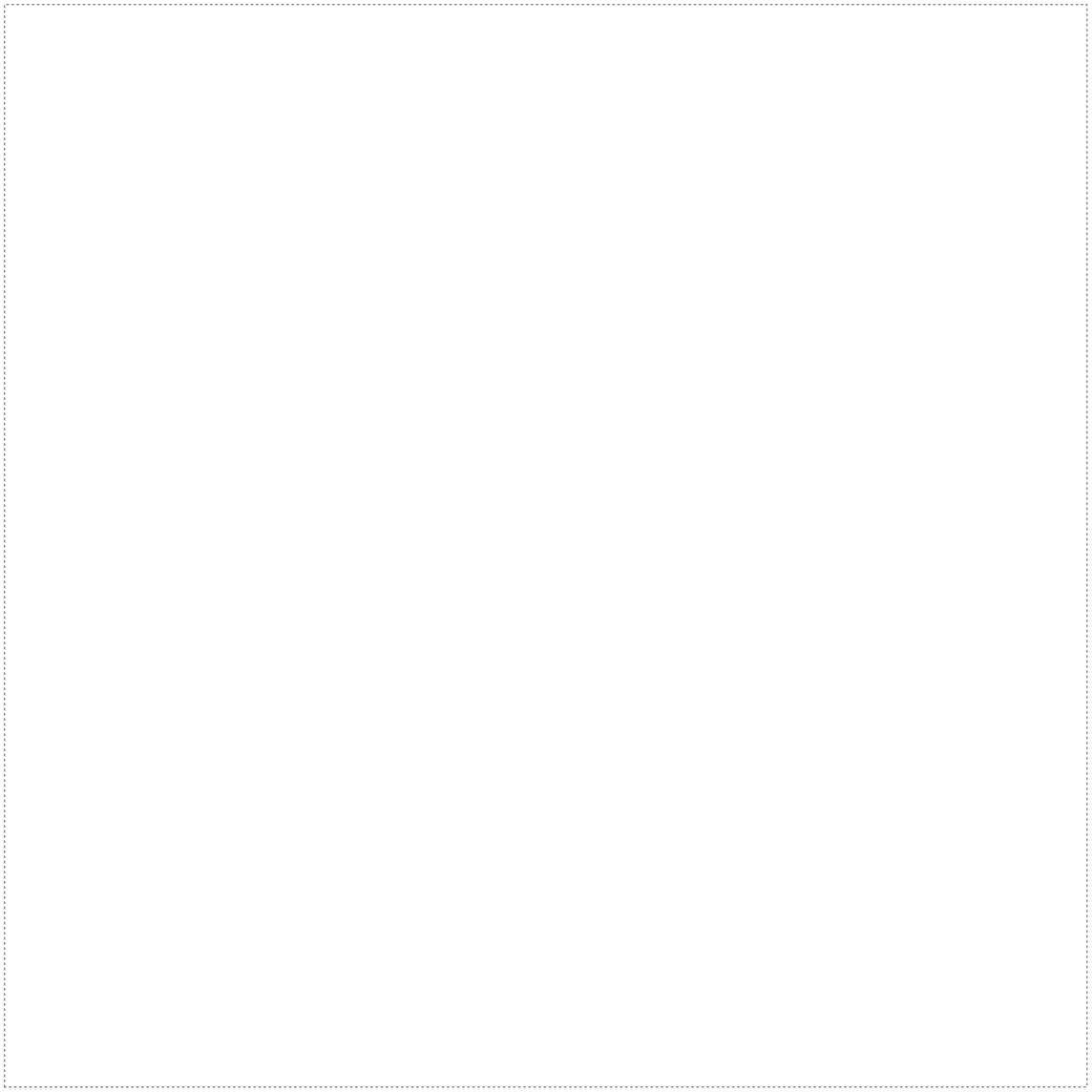

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