International Telecommunication Union

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

H.845.7

(04/2017)

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 5G: Strength fitness equipment

Recommendation ITU-T H.845.7

International Telecommunication Union

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Recommendation ITU-T H.845.7

Conformance of ITU-T H.810 personal health system: Personal Health Devices interface Part 5G: Strength fitness equipment

Summary

Recommendation ITU-T H.845.7 provides a test suite structure (TSS) and the test purposes (TP) for strength fitness equipment 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.845.7 is a transposition of Continua Test Tool DG2016, Test Suite Structure & Test Purposes, Personal Health Devices Interface; Part 5G: Device Specializations. Personal Health Device (Strength) (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.845.7	2015-01-13	16	11.1002/1000/12268
2.0	ITU-T H.845.7	2016-07-14	16	11.1002/1000/12944
3.0	ITU-T H.845.7	2017-04-13	16	11.1002/1000/13225

Keywords

Conformance testing, Continua Design Guidelines, e-health, IEEE 11073 device specialization, ITU-T H.810, personal area network, personal connected health devices, Personal Health Devices interface, strength fitness equipment, 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 5G: Device Specializations. Personal Health Device (Strength) (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_5G_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_5G_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_5G_v1.3.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_5G_v1.4.doc" as a baseline and it adds new features included in Documentation Enhancements: • "Other PICS" row added
1.5	2015-07-01	Initial release for Test Tool DG2015. This is the same version as "TSS&TP_DG2013_PLT_PART_5G_v1.4.doc" because the new features included in [ITU-T H.810 (2015)]/[b-CDG 2015] do not affect the test procedures specified in this document.
1.6	2016-09-20	Initial release for Test Tool DG2016. It uses "TSS&TP_DG2015_PLT_ PART_5G_v1.5.doc" as a baseline and it adds new features included in [ITU-T H.810 (2016)]/[b-CDG 2016]

Recommendation ITU-T H.845.7

Conformance of ITU-T H.810 personal health system: Personal Health Devices interface Part 5G: Strength fitness equipment

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 5G.

– 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 11073-10442] IEEE 11073-10442-2015, *Health informatics – Personal health device communication – Part 10442: Device specialization – Strength fitness equipment*.
https://www.iso.org/standard/66212.html
(Equivalent to the IEEE version:
http://standards.ieee.org/findstds/standard/11073-10442-2008.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

CDG	Continua Design Guidelines
CGM	Continuous Glucose Monitor
DIMLESS	Dimension-less
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 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 1.3.7 (shown in bold).

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

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

– Group 2: Personal Health Gateway (PHG)

- Group 2.1: Transport (TR)
  - Subgroup 2.1.1: Design guidelines: Common (DGC)
  - Subgroup 2.1.2: USB design guidelines (UDG)
  - Subgroup 2.1.3: Bluetooth design guidelines (BDG)
  - Subgroup 2.1.4: Cardiovascular design guidelines (CVDG)
  - Subgroup 2.1.5: Activity hub design guidelines (HUBDG)
  - Subgroup 2.1.6: ZigBee design guidelines (ZDG)
  - Subgroup 2.1.7: Bluetooth low energy design guidelines (BLEDG)
  - Subgroup 2.1.8: NFC design guidelines (NDG)
- Group 2.2: IEEE 20601 Optimized exchange protocol (OXP)
  - Subgroup 2.2.1: General (GEN)
  - Subgroup 2.2.2: PHD domain information model (DIM)
  - Subgroup 2.2.3: PHD service model (SER)
  - Subgroup 2.2.4: PHD communication model (COM)
- Group 2.3: Devices class specializations (CLASS)
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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)
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- 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.2 Subgroup 1.3.7: Strength (ST)

TP Id		TP/PLT/PHD/CLASS/ST/BV-000		
TP label		Get MDS Object for Strength fitness equipment specialization: Mandatory, Conditional and Optional Attributes		
Coverage	**Spec**	[ISO/IEEE 11073-10442]		
	Testable items	StrenMDSClassAttr 1; M	StrenMDSClassAttr 2; M	StrenMDSClassAttr 3; R
		StrenMDSClassAttr 4; R	StrenMDSClassAttr 5; R	StrenMDSClassAttr 6; M
Test purpose		Check that: The MDS Object contains the attributes specified for a Strength Fitness Personal Health Device (PHD)		
Applicability		C_AG_OXP_000 AND C_AG_OXP_175		
Other PICS				
Initial condition		The simulated Personal Health Gateway (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(INT-U16) ❑ attribute-value.length = 2 bytes ❑ 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). 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 = <variable> ❑ attribute-value =MDC_DEV_SPEC_PROFILE_HF_STRENGTH,1
Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	

TP Id		TP/PLT/PHD/CLASS/ST/BV-004_A		
TP label		MDS-Configuration. Check Objects		
Coverage	**Spec**	[ISO/IEEE 11073-10442]		
	Testable items	RepCountAttr 1; O	ResisAttr 1; O	RepAttr 1; O
		SetAttr 1; O	ExeposAtt 1; O	ExLateAttr 1; O
		ExGripAttr 1; O	ExMovAttr 1; O	trenMDSObjEven 1; M
Test purpose		Check that: MDS-Configuration-Event shall be sent in Confirmed Mode. Configuration report contains objects declared by the vendor.		
Applicability		C_AG_OXP_000 AND C_AG_OXP_175		
Other PICS		C_AG_OXP_010, C_AG_ST_012, C_AG_ST_030, C_AG_ST_050, C_AG_ST_090, C_AG_ST_113, C_AG_ST_131, C_AG_ST_153		
Initial condition		The simulated PHG and the PHD under test are in the Unassociated state.		
Test procedure		1. The PHD under test sends an AARQ message to the simulated PHG. 2. The simulated PHG issues an AARE message with 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 = <Between 0x40 0x00 and 0x7F 0xFF> h. obj-class (ConfigReport → ConfigObjectList (ConfigObject)) ❑ field- type = OID-Type ❑ field-length = INT-U16 ❑ field-value=Objects that will be cheked: ❑ Set Object shall be present. ❑ IF C_AG_ST_012 THEN Repetition numeric object is present, ELSE it is not present. ❑ IF C_AG_ST_030 THEN Resistance numeric object is present, ELSE it is not present. ❑ IF C_AG_ST_050 THEN Repetition numeric object is present, ELSE it is not present. ❑ IF C_AG_ST_090 THEN Exercise Position enumeration object is present, ELSE it is not present. ❑ IF C_AG_ST_113 THEN Exercise Laterality enumeration object is present, ELSE it is not present. ❑ IF C_AG_ST_131 THEN Exercise Grip enumeration object is present, ELSE it is not present. Movement enumeration object is present, ELSE it is not present.
Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	

TP Id		TP/PLT/PHD/CLASS/ST/BV-004_B		
TP label		Repetition Count Numeric Object attributes		
Coverage	**Spec**	[ISO/IEEE 11073-10442]		
	Testable	RepCountAttr 2; M	RepCountAttr 3; R	RepCountAttr 4; M

	items	RepCountAttr 5; R	RepCountAttr 6; M	RepCountAttr 7; R
		RepCountAttr 8; R	RepCountAttr 9; R	RepCountAttr 10; M
		RepCountAttr 11; M		
Test purpose		Check that: The Repetition Count Numeric object contains the attributes specified for Extended Configuration.		
Applicability		C_AG_OXP_000 AND C_AG_OXP_175 AND C_AG_ST_012		
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 PHD under test sends an AARQ message to the simulated PHG. 2. The simulated PHG issues an AARE message with result "accepted-unknown-config". 3. The PHD responds with a roiv-cmip-confirmed-event report message with an MDC_NOTI_CONFIG event to send its configuration to the PHG. 4. Record the handle of the Set object. 5. The Repetition Count object shall be: a. Mandatory attribute Type ❑ attribute-id = MDC_ATTR_ID_TYPE ❑ attribute-type = TYPE ❑ attribute-value = MDC_PART_PHD_HF (129) | MDC_HF_REP_COUNT (202) b. 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)) shall be set. • bit 1(mss-avail-stored-data(1)) shall be set. • bit 2 (mss-upd-aperiodic(2)) shall be set. • bit 3(mss-msmt-aperiodic(3)) shall be set • bit 9 (mss-acc-agent-initiated(9)) shall be set. • The other bits have to be 0. a. Mandatory attribute Source-Handle-Reference ❑ attribute-id = MDC_ATTR_SOURCE_HANDLE_REF ❑ attribute-type = HANDLE (INT-U16) ❑ attribute-value.length = 2 bytes ❑ attribute-value = Handle of the Set object to which this object is associated c. Not Recommended attribute Supplemental-Types ❑ attribute-id = MDC_ATTR_SUPPLEMENTAL_TYPES ❑ attribute-type = SupplementalTypeList ❑ attribute-value.length =Sequence of TYPE (TYPE.length= 4 bytes) d. Not Recommended attribute Metric-Structure-Small ❑ attribute-id = MDC_ATTR_METRIC_STRUCTURE_SMALL ❑ attribute-type = MetricStructureSmall ❑ attribute-value.length = <variable> (Sequence of (ms-struct.length =1byte(INT-		

	U8) + ms-comp-no =1byte(INT-U8))) e. Not Recommended attribute Compound-Simple-Nu-Observed-Value ❑ attribute-id = MDC_ATTR_NU_CMPD_VAL_OBS_SIMP ❑ attribute-type = SimpleNuObsValueCmp ❑ attribute-value.length =<variable> ((SimpleNuObsValueCmp ::= SEQUENCE OF SimpleNuObsValue ; SimpleNuObsValue::= FLOAT-Type) f. Not Recommended attribute Compound-Basic-Nu-Observed-Value ❑ attribute-id = MDC_ATTR_NU_CMPD_VAL_OBS_BASIC ❑ attribute-type = BasicNuObsValueCmp ❑ attribute-value.length = <variable> (SimpleNuObsValueCmp ::= SEQUENCE OF BasicNuObsValue ; BasicNuObsValue::= SFLOAT-Type) g. Not Recommended attribute Compound-Nu-Observed-Value ❑ attribute-id = MDC_ATTR_NU_CMPD_VAL_OBS ❑ attribute-type = NuObsValueCmp ❑ attribute-value.length =<variable> (NuObsValueCmp::= SEQUENCE OF NuObsValue) 6. 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. 7. Wait for the PHD under test and the simulated PHG to reach the Operating state. 8. Take a measurement in the PHD. 9. Wait until the PHG receives an event report.
Pass/Fail criteria	• All checked values are as specified in the test procedure. • In step 9, check that only non-negative values are used (for observed values of the Repetition Count object).
Notes	

TP Id		TP/PLT/PHD/CLASS/ST/BV-005		
TP label		Resistance Numeric Object attributes		
Coverage	**Spec**	[ISO/IEEE 11073-10442]		
	Testable items	ResisAttr 2; M	ResisAttr 3; R	ResisAttr 4; M
		ResisAttr 5; R	ResisAttr 6; M	ResisAttr 7; M
		ResisAttr 8; R	ResisAttr 9; R	ResisAttr 10; R
		ResisAttr 11; M	ResisAttr 12; M	ResisAttr 13; M

		ResisAttr 14; M		
Test purpose	Check that: The Resistance Numeric object contains the attributes specified for Extended Configuration.			
Applicability	C_AG_OXP_000 AND C_AG_OXP_175 AND C_AG_ST_030			
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 PHD under test sends an AARQ message to the simulated PHG. 2. The simulated PHG issues an AARE message with result "accepted-unknown-config". 3. The PHD responds with a roiv-cmip-confirmed-event report message with a MDC_NOTI_CONFIG event to send its configuration to the PHG. 4. Record the handle of the Set object 5. The Resistance object shall be: a. Mandatory attribute Type ❑ attribute-id = MDC_ATTR_ID_TYPE ❑ attribute-type = TYPE ❑ attribute-value = MDC_PART_PHD_HF (129) | MDC_HF_RESISTANCE (203) b. 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)) shall be set. • bit 1(mss-avail-stored-data(1)) shall be set. • bit 2 (mss-updt-aperiodic(2)) shall be set. • bit 3(mss-msmt-aperiodic(3)) shall be set • bit 9 (mss-acc-agent-initiated(9)) shall be set. • The other bits have to be 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= • If the resistance is measured in weight → attribute-value= MDC_DIM_X_G or MDC_DIM_LB • If the resistance is measured in an indexed value → attribute-value = MDC_DIM_DIMLESS d. Mandatory attribute Source-Handle-Reference ❑ attribute-id = MDC_ATTR_SOURCE_HANDLE_REF ❑ attribute-type = HANDLE (INT-U16) ❑ attribute-value.length = 2 bytes ❑ attribute-value = Handle of the Set object to which this object is associated. e. Optional attribute Unit-Label-String ❑ attribute-id = MDC_ATTR_ID_LABEL_STRING ❑ attribute-type = OCTET STRING			

	❑ attribute-value.length = <variable> ❑ attribute-value= If the resistance is measured in an indexed value → Label-string may provide additional information. f. Not Recommended attribute Supplemental-Types ❑ attribute-id = MDC_ATTR_SUPPLEMENTAL_TYPES ❑ attribute-type = SupplementalTypeList ❑ attribute-value.lenght= <variable> (Sequence of TYPE (TYPE.length= 4 bytes)) g. Not Recommended attribute Metric-Structure-Small ❑ attribute-id = MDC_ATTR_METRIC_STRUCTURE_SMALL ❑ attribute-type = MetricStructureSmall ❑ attribute-value.length = <variable> (Sequence of (ms-struct.length =1byte(INT-U8) + ms-comp-no =1byte(INT-U8))) h. Not Recommended attribute Compound-Simple-Nu-Observed-Value ❑ attribute-id = MDC_ATTR_NU_CMPD_VAL_OBS_SIMP ❑ attribute-type = SimpleNuObsValueCmp ❑ attribute-value.length = <variable> (SimpleNuObsValueCmp ::= SEQUENCE OF SimpleNuObsValue ; SimpleNuObsValue::= FLOAT-Type) i. Not Recommended attribute Compound-Basic-Nu-Observed-Value ❑ attribute-id = MDC_ATTR_NU_CMPD_VAL_OBS_BASIC ❑ attribute-type = BasicNuObsValueCmp ❑ attribute-value.length = <variable> (SimpleNuObsValueCmp ::= SEQUENCE OF BasicNuObsValue ; BasicNuObsValue::= SFLOAT-Type) j. Not Recommended attribute Compound-Nu-Observed-Value ❑ attribute-id = MDC_ATTR_NU_CMPD_VAL_OBS_SIMP ❑ attribute-type = NuObsValueCmp ❑ attribute-value.length = <variable> (NuObsValueCmp::= SEQUENCE OF NuObsValue) 6. 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. 7. Wait for the PHD under test and the simulated PHG to reach the Operating state. 8. Take a measurement in the PHD. 9. Wait until the PHG receives an event report.
Pass/Fail criteria	• All checked values are as specified in the test procedure. • In step 9, check that only non-negative values are used (for observed values of the Resistance object).
Notes	

<table>
<tr><td colspan="2">TP Id</td><td colspan="3">TP/PLT/PHD/CLASS/ST/BV-006</td></tr>
<tr><td colspan="2">TP label</td><td colspan="3">Repetition Numeric Object attributes</td></tr>
<tr><td rowspan="5">Coverage</td><td>Spec</td><td colspan="3">[ISO/IEEE 11073-10442]</td></tr>
<tr><td rowspan="4">Testable items</td><td>RepAttr 2; M</td><td>RepAttr 3; R</td><td>RepAttr 4; M</td></tr>
<tr><td>RepAttr 5; R</td><td>RepAttr 6; M</td><td>RepAttr 7; M</td></tr>
<tr><td>RepAttr 8; R</td><td>RepAttr 9; R</td><td>RepAttr 10; R</td></tr>
<tr><td>RepAttr 11; M</td><td>RepAttr 13; M</td><td></td></tr>
<tr><td colspan="2">Test purpose</td><td colspan="3">Check that:
The Repetition Numeric 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_175 AND C_AG_ST_050</td></tr>
<tr><td colspan="2">Other PICS</td><td colspan="3">C_AG_OXP_009, C_AG_OXP_014, C_AG_OXP_293</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 PHD under test sends an AARQ message to the simulated PHG.
2. The simulated PHG issues an AARE message with result "accepted-unknown-config".
3. The PHD responds with a roiv-cmip-confirmed-event report message with a MDC_NOTI_CONFIG event to send its configuration to the PHG.
4. Record the handle of the Set object.
5. The Repetition object shall be:
a. Mandatory attribute Type
❑ attribute-id = MDC_ATTR_ID_TYPE
❑ attribute-type = TYPE
❑ attribute-value = MDC_PART_PHD_HF (129) | MDC_HF_REPETITION (201)
b. 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)) shall be set.
• bit 1(mss-avail-stored-data(1)) shall be set.
• bit 2 (mss-upd-aperiodic(2)) shall be set.
• bit 3(mss-msmt-aperiodic(3)) shall be set
• bit 9 (mss-acc-agent-initiated(9)) shall be set.
• The other bits have to be 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_X_M or MDC_DIM_X_INCH
d. Mandatory attribute Source-Handle-Reference
❑ attribute-id = MDC_ATTR_SOURCE_HANDLE_REF</td></tr>
</table>

	❑ attribute-type = HANDLE (INT-U16) ❑ attribute-value.length = 2 bytes ❑ attribute-value = Handle of the Set object to which this object is associated. Tested later e. Not Recommended attribute Supplemental-Types ❑ attribute-id = MDC_ATTR_SUPPLEMENTAL_TYPES ❑ attribute-type = SupplementalTypeList ❑ attribute-value.length = <variable> (Sequence of TYPE (TYPE.length= 4 bytes)) f. Not Recommended attribute Metric-Structure-Small ❑ attribute-id = MDC_ATTR_METRIC_STRUCTURE_SMALL ❑ attribute-type = MetricStructureSmall ❑ attribute-value.length = <variable> (Sequence of (ms-struct.length =1byte(INT-U8) + ms-comp-no =1byte(INT-U8))) g. Not Recommended attribute Compound-Simple-Nu-Observed-Value ❑ attribute-id = MDC_ATTR_NU_CMPD_VAL_OBS_SIMP ❑ attribute-type = SimpleNuObsValueCmp ❑ attribute-value.length =<variable> (SimpleNuObsValueCmp ::= SEQUENCE OF SimpleNuObsValue ; SimpleNuObsValue::= FLOAT-Type) h. Not Recommended attribute Compound-Basic-Nu-Observed-Value ❑ attribute-id = MDC_ATTR_NU_CMPD_VAL_OBS_BASIC ❑ attribute-type = BasicNuObsValueCmp ❑ attribute-value.length = <variable> SimpleNuObsValueCmp ::= SEQUENCE OF BasicNuObsValue ; BasicNuObsValue::= SFLOAT-Type) i. Not recommended attribute Compound-Nu-Observed-Value ❑ attribute-id = MDC_ATTR_NU_CMPD_VAL_OBS_SIMP ❑ attribute-type = NuObsValueCmp ❑ attribute-value.length = <variable> (NuObsValueCmp::= SEQUENCE OF NuObsValue) 6. 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. 7. Wait for the PHD under test and the simulated PHG to reach the Operating state. 8. Take a measurement in the PHD. 9. Wait until the PHG receives an event report.
Pass/Fail criteria	• All checked values are as specified in the test procedure. • In step 9, check that only non-negative values are used (for observed values of the Repetition object).

Notes	

TP Id		TP/PLT/PHD/CLASS/ST/BV-007		
TP label		Repetition Count Numeric Object and Set object attributes		
Coverage	**Spec**	[ISO/IEEE 11073-10442]		
	Testable items	RepCountAttr 12; M		
Test purpose		Check that: This object shall use the same timestamp attribute and value as the associated Set object.		
Applicability		C_AG_OXP_000 AND C_AG_OXP_175 AND C_AG_ST_012		
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 PHD under test sends an AARQ message to the simulated PHG. 2. The simulated PHG issues an AARE message with result "accepted-unknown-config". 3. The PHD under test sends its configuration to the simulated PHG. 4. 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. 5. Record the handle and Attribute-Value-Map of the Set object and the Repetition Count object that is associated to it. 6. Take a measurement. 7. Wait for the simulated PHG to receive it.		
Pass/Fail criteria		• In step 7 if the Repetition Count measurement contains a timestamp it shall be the same (attribute and value) as that for the Set object.		
Notes				

TP Id		TP/PLT/PHD/CLASS/ST/BV-008		
TP label		Resistance Numeric Object and Set object attributes		
Coverage	**Spec**	[IEEE11073-10442]		
	Testable items	ResisAttr 15; M		

Test purpose	Check that: This object shall use the same timestamp attribute and value as the associated Set object.
Applicability	C_AG_OXP_000 AND C_AG_OXP_175 AND C_AG_ST_030
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 PHD under test sends an AARQ message to the simulated PHG. 2. The simulated PHG issues an AARE message with result "accepted-unknown-config". 3. The PHD under test sends its configuration to the simulated PHG. 4. 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. 5. Record the handle and the Attribute-Value-Map of the Set object and the Resistance object that is associated to it. 6. Take a measurement. 7. Wait for the simulated PHG to receive it.
Pass/Fail criteria	• In step 7 if the Resistance measurement contains a timestamp it shall be the same (attribute and value) as that for the Set object.
Notes	

TP Id		TP/PLT/PHD/CLASS/ST/BV-009		
TP label		Repetition Numeric Object and Set object attributes		
Coverage	**Spec**	[ISO/IEEE 11073-10442]		
	Testable items	RepAttr 14; M		
Test purpose		Check that: This object shall use the same timestamp attribute and value as the associated Set object.		
Applicability		C_AG_OXP_000 AND C_AG_OXP_175 AND C_AG_ST_050		
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 PHD under test sends an AARQ message to the simulated PHG. 2. The simulated PHG issues an AARE message with result "accepted-unknown-config". 3. The PHD under test sends its configuration to the simulated PHG.		

	4. 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. 5. Record the handle and Attribute-Value-Map of the Set object and the Repetition Numeric Object that is associated to it. 6. Take a measurement. 7. Wait for the simulated PHG to receive it.
Pass/Fail criteria	• In step 7 if the Repetition measurement contains a timestamp it shall be the same (attribute) as that for the Set object.
Notes	

TP Id		TP/PLT/PHD/CLASS/ST/BV-011		
TP label		Repetition Object observed values		
Coverage	**Spec**	[ISO/IEEE 11073-10442]		
	Testable items	RepAttr 15; M	RepAttr 16; M	
Test purpose		Check that: If the related Set object has a Measure-Active-Period defined, the timestamp for this object shall fall within the time range defined by the associated Set object's timestamp attribute and lasts for the Measure-Active-Period defined by the related Set object's Measure-Active-Period attribute. [AND] If the Repetition object specifies a Measure-Active-Period, the time period defined by the Repetition object shall fall completely within the time range defined by the associated Set object.		
Applicability		C_AG_OXP_000 AND C_AG_OXP_175 AND C_AG_ST_050		
Other PICS				
Initial condition		The simulated PHG and the PHD under test are in the Operating state.		
Test procedure		1. Take a measurement with the PHD under test. 2. Wait for the simulated PHG to receive it. Record the Time-Stamp and the Measure-Active-Period of the Set object and of the Repetition object.		
Pass/Fail criteria		• The Time-Stamp of the Repetition measurement shall fall between the time range defined by the Time-Stamp and the Measure-Active-Period of the Set measurement. • The Measure-Active-Period of the Repetition measurement shall be within the boundaries of the Set one.		

Notes	

TP Id		TP/PLT/PHD/CLASS/ST/BV-012		
TP label		Set Enumeration Object attributes		
Coverage	**Spec**	[ISO/IEEE 11073-10442]		
	Testable items	SetAttr 2; M	SetAttr 3; R	SetAttr 4; M
		SetAttr 5; R	SetAttr 6; R	SetAttr 7; M
		SetAttr 8; R	SetAttr 9; R	SetAttr 10; R
		SetAttr 11; R	SetAttr 12; M	
Test purpose		Check that: The Set Enumeration object contains the attributes specified for Extended Configuration.		
Applicability		C_AG_OXP_000 AND C_AG_OXP_175		
Other PICS		C_AG_ST_156		
Initial condition		The simulated PHG and the PHD under test are in the Unassociated state.		
Test procedure		1. The PHD under test sends an AARQ message to the simulated PHG. 2. The simulated PHG issues an AARE message with result "accepted-unknown-config". 3. The PHD under test sends its configuration to the simulated PHG. 4. The Set object shall be: a. Mandatory Type ❑ attribute-id = MDC_ATTR_ID_TYPE ❑ attribute-type = TYPE ❑ attribute-value.length = <variable>(Sequence of partition (NomPartition (INT-U16)) and code (OID-Type))) ❑ attribute-value = MDC_PART_PHD_HF | MDC_HF_SET b. Not Recommended attribute Supplemental-Types ❑ attribute-id = MDC_ATTR_SUPPLEMENTAL_TYPES ❑ attribute-type = SupplementalTypeList ❑ attribute-value.length = <variable> (Sequence of TYPE (TYPE.length= 4 bytes → partition NomPartition (INT-U16) and code (OID-Type))) 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)) shall be set • bit 1 is set(mss-avail-stored-data(1)) shall be set • bit 2 is set(mss-updt-aperiodic(2)) shall be set, • bit 3 is set(mss-msmt-aperiodic(3)) shall be set • bit 9 is set(mss-acc-agent-initiated(9)) shall be set • The other bits have to be 0. d. Not Recommended attribute Metric-Structure-Small		

	❑ attribute-id = MDC_ATTR_METRIC_STRUCTURE_SMALL ❑ attribute-type = MetricStructureSmall ❑ attribute-value.length = <variable>(Sequence of (ms-struct.length =1byte(INT-U8) + ms-comp-no =1byte(INT-U8))) e. Not Recommended attribute Source-Handle-Reference ❑ attribute-id = MDC_ATTR_SOURCE_HANDLE_REF ❑ attribute-type = HANDLE (INT-U16) ❑ attribute-value.length = 2 bytes f. Conditional attribute Measure-Active-Period ❑ attribute-id = MDC_ATTR_TIME_PD_MSMT_ACTIVE ❑ attribute-type = FLOAT-Type (INT-U32) ❑ attribute-value.length = 4 bytes g. Mandatory attribute Enum-Observed-Value-Simple-OID ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_SIMP_OID ❑ attribute-type = OID-Type (INT-U16) ❑ attribute-value.length = 2 bytes ❑ attribute-value = MDC_MUSC_* (See Annex C of [b-ISO/IEEE 11073-10408]) h. Not Recommended attribute Enum-Observed-Value-Simple-Bit-Str ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_SIMP_BIT_STR ❑ attribute-type = BITS-32 ❑ attribute-value.length = 4 bytes i. Not Recommended attribute Enum-Observed-Value-Basic-Bit-Str ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_BASIC_BIT_STR ❑ attribute-type = BITS-16 ❑ attribute-value.length = 2bytes j. Not Recommended attribute Enum-Observed-Value-Simple-Str ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_SIM_STR ❑ attribute-type = EnumPrintableString ❑ attribute-value.length = <variable> k. Not Recommended attribute Enum-Observed-Value ❑ attribute-id= MDC_ATTR_VAL_ENUM_OBS ❑ attribute-type = EnumObsValue ❑ attribute-value.length = <variable> l. Mandatory attribute Enum-Observed-Value-Partition ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_PART ❑ attribute-type = NomPartition (INT-U16) ❑ 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/ST/BV-013
TP label	Exercise Position Enumeration Object attributes

<table>
<tr><td rowspan="5">Coverage</td><td>Spec</td><td colspan="3">[ISO/IEEE 11073-10442]</td></tr>
<tr><td rowspan="4">Testable items</td><td>ExeposAtt 2; M</td><td>ExeposAtt 3; R</td><td>ExeposAtt 4; M</td></tr>
<tr><td>ExeposAtt 5; R</td><td>ExeposAtt 6; M</td><td>ExeposAtt 7; M</td></tr>
<tr><td>ExeposAtt 8; R</td><td>ExeposAtt 9; R</td><td>ExeposAtt 10; R</td></tr>
<tr><td>ExeposAtt 11; R</td><td>ExeposAtt 12; R</td><td>ExeposAtt 15; M</td></tr>
<tr><td colspan="2">Test purpose</td><td colspan="3">Check that:
The Exercise Position Enumeration 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_175 AND C_AG_ST_090</td></tr>
<tr><td colspan="2">Other PICS</td><td colspan="3">C_AG_ST_156</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 PHD under test sends an AARQ message to the simulated PHG.
2. The simulated PHG issues an AARE message with result "accepted-unknown-config".
3. The PHD under test sends its configuration to the simulated PHG.
4. The Exercise Position object shall be:
a. Mandatory Type
❑ attribute-id = MDC_ATTR_ID_TYPE
❑ attribute-type = TYPE
❑ attribute-value.length = <variable> (Sequence of partition (NomPartition (INT-U16)) and code (OID-Type)))
❑ attribute-value= MDC_PART_PHD_HF | MDC_HF_EXERCISE_POSITION
b. Not recommended attribute Supplemental-Types
❑ attribute-id = MDC_ATTR_SUPPLEMENTAL_TYPES
❑ attribute-type = SupplementalTypeList
❑ attribute-value.length = <variable> (Sequence of TYPE (TYPE.length= 4 bytes → partition NomPartition (INT-U16) and code (OID-Type)))
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)) shall be set
• bit 1 is set(mss-avail-stored-data(1)) shall be set
• bit 2 is set(mss-updt-aperiodic(2)) shall be set
• bit 3 is set(mss-msmt-aperiodic(3)) shall be set
• bit 9 is set(mss-acc-agent-initiated(9)) shall be set
• The other bits have to be 0.
d. Not Recommended attribute Metric-Structure-Small
❑ attribute-id = MDC_ATTR_METRIC_STRUCTURE_SMALL
❑ attribute-type = MetricStructureSmall
❑ attribute-value.length = <variable> (Sequence of (ms-struct.length =1byte(INT-U8) + ms-comp-no =1byte(INT-U8)))
e. Mandatory attribute Source-Handle-Reference</td></tr>
</table>

	❑ attribute-id = MDC_ATTR_SOURCE_HANDLE_REF ❑ attribute-type = HANDLE(INT-U16) ❑ attribute-value.length = 2 bytes ❑ attribute-value = Handle of the Set object to which this object is associated f. Mandatory attribute Enum-Observed-Value-Simple-OID ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_SIMP_OID ❑ attribute-type = OID-Type (INT-U16) ❑ attribute-value.length = 2 bytes ❑ attribute-value = MDC_HF_POSITION_* (See Annex C of [b-ISO/IEEE 11073-10408]) g. Not Recommended attribute Enum-Observed-Value-Simple-Bit-Str ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_SIMP_BIT_STR ❑ attribute-type = BITS-32 ❑ attribute-value.length = 4 bytes h. Not Recommended attribute Enum-Observed-Value-Basic-Bit-Str ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_BASIC_BIT_STR ❑ attribute-type = BITS-16 ❑ attribute-value.length = 2 bytes i. Not Recommended attribute Enum-Observed-Value-Simple-Str ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_SIM_STR ❑ attribute-type = EnumPrintableString ❑ attribute-value.length = <variable> j. Not Recommended attribute Enum-Observed-Value ❑ attribute-id= MDC_ATTR_VAL_ENUM_OBS ❑ attribute-type = EnumObsValue ❑ attribute-value.length = <variable> k. Not Recommended attribute Enum-Observed-Value-Partition ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_PART ❑ attribute-type = NomPartition (INT-U16) ❑ 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/ST/BV-014		
TP label		Exercise Position Object and Set object attributes		
Coverage	**Spec**	[ISO/IEEE 11073-10442]		
	Testable items	ExeposAtt 14; M		
Test purpose		Check that: The timestamp attribute used for an Exercise Position object instance shall be the same as that which is used for the Set object instance to which it is related		
Applicability		C_AG_OXP_000 AND C_AG_OXP_175 AND C_AG_ST_090		

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 PHD under test sends an AARQ message to the simulated PHG. 2. The simulated PHG issues an AARE message with the result "accepted-unknown-config". 3. The PHD under test sends its configuration to the simulated PHG. 4. 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. 5. Record the handle and Attribute-Value-Mpa of the Set object and the Exercise Position object that is associated to it. 6. Take a measurement. 7. Wait for the simulated PHG to receive it.
Pass/Fail criteria	• In step 7 if the Exercise Position measurement contains a timestamp it shall be the same (attribute and value) as that for the Set object.
Notes	

TP Id		TP/PLT/PHD/CLASS/ST/BV-015		
TP label		Exercise Laterality enumeration Object attributes		
Coverage	**Spec**	[ISO/IEEE 11073-10442]		
	Testable items	ExLateAttr 2; M	ExLateAttr 3; R	ExLateAttr 4; M
		ExLateAttr 5; R	ExLateAttr 6; M	ExLateAttr 7; M
		ExLateAttr 8; R	ExLateAttr 9; R	ExLateAttr 10; R
		ExLateAttr 11; R	ExLateAttr 12; R	ExLateAttr 14; M
Test purpose		Check that: The Exercise Laterality Enumeration object contains the attributes specified for Extended Configuration.		
Applicability		C_AG_OXP_000 AND C_AG_OXP_175 AND C_AG_ST_113		
Other PICS		C_AG_ST_156		
Initial condition		The simulated PHG and the PHD under test are in the Unassociated state.		
Test procedure		1. The PHD under test sends an AARQ message to the simulated PHG. 2. The simulated PHG issues an AARE message with the result "accepted-unknown-		

config".

3. The PHD under test sends its configuration to the simulated PHG.
4. The Exercise Laterality object shall be:
   a. Mandatory Type
      - ❑ attribute-id = MDC_ATTR_ID_TYPE
      - ❑ attribute-type = TYPE
      - ❑ attribute-value.length = <variable> (Sequence of partition (NomPartition (INT-U16)) and code (OID-Type)))
      - ❑ attribute-value= MDC_PART_PHD_HF | MDC_HF_EXERCISE_LATERALITY
   b. Not recommended attribute Supplemental-Types
      - ❑ attribute-id = MDC_ATTR_SUPPLEMENTAL_TYPES
      - ❑ attribute-type = SupplementalTypeList
      - ❑ attribute-value.length = <variable> (Sequence of TYPE (TYPE.length= 4 bytes → partition NomPartition (INT-U16) and code (OID-Type)))
   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)) shall be set
        - bit 1 is set (mss-avail-stored-data(1)) shall be set
        - bit 2 is set (mss-updt-aperiodic(2)) shall be set
        - bit 3 is set (mss-msmt-aperiodic(3)) shall be set
        - bit 9 is set (mss-acc-agent-initiated(9)) shall be set
        - The other bits have to be 0.
   d. Not Recommended attribute Metric-Structure-Small
      - ❑ attribute-id = MDC_ATTR_METRIC_STRUCTURE_SMALL
      - ❑ attribute-type = MetricStructureSmall
      - ❑ attribute-value.length = <variable> (Sequence of (ms-struct.length =1byte(INT-U8) + ms-comp-no =1byte(INT-U8)))
   e. Mandatory attribute Source-Handle-Reference
      - ❑ attribute-id = MDC_ATTR_SOURCE_HANDLE_REF
      - ❑ attribute-type = HANDLE (INT-U16)
      - ❑ attribute-value.length = 2 bytes
      - ❑ attribute-value = Handle of the Set object to which this object is associated
   f. Mandatory attribute Enum-Observed-Value-Simple-OID
      - ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_SIMP_OID
      - ❑ attribute-type = OID-Type (INT-U16)
      - ❑ attribute-value.length = 2 bytes
      - ❑ attribute-value = MDC_HF_LATERALITY_* (See Annex C of [b-ISO/IEEE 11073-10408])
   g. Not Recommended attribute Enum-Observed-Value-Simple-Bit-Str
      - ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_SIMP_BIT_STR
      - ❑ attribute-type = BITS-32
      - ❑ attribute-value.length = 4 bytes
   h. Not Recommended attribute Enum-Observed-Value-Basic-Bit-Str
      - ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_BASIC_BIT_STR

	❑ attribute-type = BITS-16 ❑ attribute-value.length = 2 bytes i. Not Recommended attribute Enum-Observed-Value-Simple-Str ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_SIM_STR ❑ attribute-type = EnumPrintableString ❑ attribute-value.length = <variable> j. Not Recommended attribute Enum-Observed-Value ❑ attribute-id= MDC_ATTR_VAL_ENUM_OBS ❑ attribute-type = EnumObsValue ❑ attribute-value.length = <variable> k. Not Recommended attribute Enum-Observed-Value-Partition ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_PART ❑ attribute-type = NomPartition (INT-U16) ❑ 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/ST/BV-016		
TP label		Exercise Laterality Object and Set object attributes		
Coverage	**Spec**	[ISO/IEEE 11073-10442]		
	Testable items	ExLateAttr 13; M		
Test purpose		Check that: This object's timestamp shall be equal to the timestamp of the associated Set Object		
Applicability		C_AG_OXP_000 AND C_AG_OXP_175 AND C_AG_ST_113		
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 PHD under test sends an AARQ message to the simulated PHG. 2. The simulated PHG issues an AARE message with the result "accepted-unknown-config". 3. The PHD under test sends its configuration to the simulated PHG. 4. 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. 5. Record the handle and the Attribute-Value-Map of the Set object and the Exercise Laterality object that is associated to it. 6. Take a measurement 7. Wait for the simulated PHG to receive it.
Pass/Fail criteria	• In step 7 if the Exercise Laterality measurement contains a timestamp it shall be the same (attribute and value) as that for the Set object.
Notes	

TP Id		TP/PLT/PHD/CLASS/ST/BV-017		
TP label		Exercise Grip enumeration Object attributes		
Coverage	**Spec**	[ISO/IEEE 11073-10442]		
	Testable items	ExGripAttr 2; M	ExGripAttr 3; R	ExGripAttr 4; M
		ExGripAttr 5; R	ExGripAttr 6; M	ExGripAttr 7; M
		ExGripAttr 8; R	ExGripAttr 9; R	ExGripAttr 10; R
		ExGripAttr 11; R	ExGripAttr 12; R	ExGripAttr 15; M
Test purpose		Check that: The Exercise Grip Enumeration object contains the attributes specified for Extended Configuration.		
Applicability		C_AG_OXP_000 AND C_AG_OXP_175 AND C_AG_ST_131		
Other PICS		C_AG_ST_156		
Initial condition		The simulated PHG and the PHD under test are in the Unassociated state.		
Test procedure		1. The PHD under test sends an AARQ message to the simulated PHG. 2. The simulated PHG issues an AARE message with the result "accepted-unknown-config". 3. The PHD under test sends its configuration to the simulated PHG. 4. The Exercise Grip object shall be: a. Mandatory Type ❑ attribute-id = MDC_ATTR_ID_TYPE ❑ attribute-type = TYPE ❑ attribute-value.length = <variable> (Sequence of partition (NomPartition (INT-U16)) and code (OID-Type))) ❑ attribute-value= MDC_PART_PHD_HF | MDC_HF_EXERCISE_GRIP b. Not Recommended attribute Supplemental-Types ❑ attribute-id = MDC_ATTR_SUPPLEMENTAL_TYPES ❑ attribute-type = SupplementalTypeList ❑ attribute-value.length =<variable> (Sequence of TYPE (TYPE.length= 4 bytes → partition NomPartition (INT-U16) and code (OID-Type))) 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)) shall be set
  - bit 1 is set (mss-avail-stored-data(1)) shall be set
  - bit 2 is set (mss-updt-aperiodic(2)) shall be set
  - bit 3 is set (mss-msmt-aperiodic(3)) shall be set
  - bit 9 is set(mss-acc-agent-initiated(9)) shall be set
  - The other bits have to be 0.

d. Not Recommended attribute Metric-Structure-Small
- ❑ attribute-id = MDC_ATTR_METRIC_STRUCTURE_SMALL
- ❑ attribute-type = MetricStructureSmall
- ❑ attribute-value.length = <variable> (Sequence of (ms-struct.length =1byte(INT-U8) + ms-comp-no =1byte(INT-U8)))

e. Mandatory attribute Source-Handle-Reference
- ❑ attribute-id = MDC_ATTR_SOURCE_HANDLE_REF
- ❑ attribute-type = HANDLE (INT-U16)
- ❑ attribute-value.length = 2 bytes
- ❑ attribute-value = Handle of the Set object to which this object is associated.

f. Mandatory attribute Enum-Observed-Value-Simple-OID
- ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_SIM_OID
- ❑ attribute-type = OID-Type (INT-U16)
- ❑ attribute-value.length = 2 bytes
- ❑ attribute-value = MDC_HF_GRIP_* (See Annex C of [b-ISO/IEEE 11073-10408])

g. Not Recommended attribute Enum-Observed-Value-Simple-Bit-Str
- ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_SIMP_BIT_STR
- ❑ attribute-type = BITS-32
- ❑ attribute-value.length = 4 bytes

h. Not Recommended attribute Enum-Observed-Value-Basic-Bit-Str
- ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_BASIC_BIT_STR
- ❑ attribute-type = BITS-16
- ❑ attribute-value.length = 2 bytes

i. Not Recommended attribute Enum-Observed-Value-Simple-Str
- ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_SIMP_STR
- ❑ attribute-type = EnumPrintableString
- ❑ attribute-value.length =

j. Not Recommended attribute Enum-Observed-Value
- ❑ attribute-id= MDC_ATTR_VAL_ENUM_OBS
- ❑ attribute-type = EnumObsValue
- ❑ attribute-value.length =

k. Not Recommended attribute Enum-Observed-Value-Partition
- ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_PART
- ❑ attribute-type = NomPartition(INT-U16)
- ❑ 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/ST/BV-018		
TP label		Exercise Grip Object and Set object attributes		
Coverage	**Spec**	[ISO/IEEE 11073-10442]		
	Testable items	ExGripAttr 14; M		
Test purpose		Check that: The timestamp attribute used for an Exercise Grip object instance shall be the same as that which is used for the Set object instance to which it is related		
Applicability		C_AG_OXP_000 AND C_AG_OXP_175 AND C_AG_ST_131		
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 PHD under test sends an AARQ message to the simulated PHG. 2. The simulated PHG issues an AARE message with result "accepted-unknown-config". 3. The PHD under test sends its configuration to the simulated PHG. 4. 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. 5. Record the handle and Attribute-Value-Map of the Set object and the Exercise Grip object that is associated to it. 6. Take a measurement. 7. Wait for the simulated PHG to receive it.		
Pass/Fail criteria		• In step 7 if the Exercise Grip measurement contains a timestamp it shall be the same (attribute and value) as that for the Set object.		
Notes				

TP Id		TP/PLT/PHD/CLASS/ST/BV-019
TP label		Exercise Movement enumeration Object attributes
Coverage	**Spec**	[ISO/IEEE 11073-10442]

	Testable items	ExMovAttr 2; M	ExMovAttr 3; R	ExMovAttr 4; M
		ExMovAttr 5; R	ExMovAttr 6; M	ExMovAttr 7; M
		ExMovAttr 8; R	ExMovAttr 9; R	ExMovAttr 10; R
		ExMovAttr 11; R	ExMovAttr 12; R	ExMovAttr 15; M
Test purpose		Check that: The Exercise Movement Enumeration object contains the attributes specified for Extended Configuration.		
Applicability		C_AG_OXP_000 AND C_AG_OXP_175 AND C_AG_ST_153		
Other PICS		C_AG_ST_156		
Initial condition		The simulated PHG and the PHD under test are in the Unassociated state.		
Test procedure		1. The PHD under test sends an AARQ message to the simulated PHG. 2. The simulated PHG issues an AARE message with the result "accepted-unknown-config". 3. The PHD under test sends its configuration to the simulated PHG. 4. The Exercise Movement object shall be: a. Mandatory Type ❑ attribute-id = MDC_ATTR_ID_TYPE ❑ attribute-type = TYPE ❑ attribute-value.length = <variable> (Sequence of partition (NomPartition (INT-U16)) and code (OID-Type))) ❑ attribute-value= MDC_PART_PHD_HF | MDC_HF_EXERCISE_MOVEMENT b. 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 → partition NomPartition (INT-U16) and code (OID-Type))) 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)) shall be set • bit 1 (mss-avail-stored-data(1)) shall be set • bit 2 (mss-updt-aperiodic(2)) shall be set • bit 3 (mss-msmt-aperiodic(3)) shall be set • bit 9 (mss-acc-agent-initiated(9)) shall be set • The other bits have to be 0. d. Not Recommended attribute Metric-Structure-Small ❑ attribute-id = MDC_ATTR_METRIC_STRUCTURE_SMALL ❑ attribute-type = MetricStructureSmall ❑ attribute-value.length = <variable> (Sequence of (ms-struct.length =1byte(INT-U8) + ms-comp-no = 1 byte(INT-U8))) e. Mandatory attribute Source-Handle-Reference		

	❑ attribute-id = MDC_ATTR_SOURCE_HANDLE_REF ❑ attribute-type = HANDLE (INT-U16) ❑ attribute-value.length = 2 bytes ❑ attribute-value = Handle of the Set object to which this object is associated f. Mandatory attribute Enum-Observed-Value-Simple-OID ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_SIMP_OID ❑ attribute-type = OID-Type (INT-U16) ❑ attribute-value.length = 2 bytes ❑ attribute-value = MDC_HF_MOVEMENT_* (See Annex C of [b-ISO/IEEE 11073-10408]) g. Not Recommended attribute Enum-Observed-Value-Simple-Bit-Str ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_SIMP_BIT_STR ❑ attribute-type = BITS-32 ❑ attribute-value.length = 4 bytes h. Not Recommended attribute Enum-Observed-Value-Basic-Bit-Str ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_BASIC_BIT_STR ❑ attribute-type = BITS-16 ❑ attribute-value.length = 2 bytes i. Not Recommended attribute Enum-Observed-Value-Simple-Str ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_SIM_STR ❑ attribute-type = EnumPrintableString ❑ attribute-value.length = j. Not Recommended attribute Enum-Observed-Value ❑ attribute-id= MDC_ATTR_VAL_ENUM_OBS ❑ attribute-type = EnumObsValue ❑ attribute-value.length = k. Not Recommended attribute Enum-Observed-Value-Partition ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_PART ❑ attribute-type = NomPartition(INT-U16) ❑ 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/ST/BV-020		
TP label		Exercise Movement Object and Set object attributes		
Coverage	**Spec**	[ISO/IEEE 11073-10442]		
	Testable items	ExMovAttr 14; M		
Test purpose		Check that: The timestamp attribute used for an Exercise Movement object instance shall be the same as that which is used for the Set object instance to which it is associated		
Applicability		C_AG_OXP_000 AND C_AG_OXP_175 AND C_AG_ST_153		

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 PHD under test sends an AARQ message to the simulated PHG. 2. The simulated PHG issues an AARE message with the result "accepted-unknown-config". 3. The PHD under test sends its configuration to the simulated PHG. 4. 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. 5. Record the handle and the Attribute-Value-Map of the Set object and the Exercise Movement that is associated to it. 6. Take a measurement. 7. Wait for the simulated PHG to receive it.
Pass/Fail criteria	• In step 7 if the Exercise Movement measurement contains a timestamp it shall be the same (attribute and value) as that for the Set object.
Notes	

TP Id		TP/PLT/PHD/CLASS/ST/BV-021		
TP label		Association Request		
Coverage	**Spec**	[ISO/IEEE 11073-10442]		
	Testable items	StrenAssocReq 1; M	StrenAssocReq 2; M	StrenAssocReq 3; M
		StrenAssocReq 4; M	StrenAssocReq 5; M	StrenAssocReq 6; M
		StrenAssocReq 7; M	StrenAssocReq 8; M	StrenAssocReq 9; M
		StrenAssocReq 10; O	StrenAssocReq 11; M	StrenAssocReq 12; C
		StrenAssocReq 13; C		
Test purpose		Check that: The association procedure data exchange is correct.		
Applicability		C_AG_OXP_000 AND C_AG_OXP_175		
Other PICS		C_AG_OXP_017		
Initial condition		The simulated PHG and the PHD under test are in the Unassociated state.		
Test procedure		1. The PHD under test sends an AARQ message to the simulated PHG.		

	2. The expected fields 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-version = 0x80 0x00 0x00 0x00 (asassoc-version1(0) set) indicates that version 1 of the association protocol is supported. c. Data-proto-id ❑ field- type = DataProtoId ❑ field-length = INT-U16 ❑ field- value = 0x50 0x79 (20601) ❑ data-proto-id = 20601 indicates exchange protocol follows this standard, and data-proto-info shall contain PhdAssociationInformation. d. Protocol-Version ❑ field- type = Protocol Version ❑ field-length = BITS-32 ❑ field- value = 0x80 0x00 0x00 0x00 ❑ This value shows that version 1 of the data exchange protocol is supported (assoc-version1(0)=1 e. Encoding-Rules ❑ field- type = EncodingRules ❑ field-length = BITS-16 ❑ field- value = depends on the encoding rules supported/selected. ❑ mder(0) always is set (MDER always is supported) and xer(1) or/and per(2) may be set (optional). f. Nomenclature-Version ❑ field- type = NomenclatureVersion ❑ field-length = BITS-32 ❑ 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 = BITS-32 ❑ If the PHD has no Test Association capabilities: field- value= 0x00 0x00 0x00 0x00 ❑ If the PHD has tested capabilities that can be used within the Test Association: field- value= 0x40 0x00 0x00 0x00 ❑ If the PHD has tested capabilities that can be used within the Test Association and requires that the PHG establish a Test Association: field- value= 0x60 0x00 0x00 0x00 h. System-Type ❑ field- type = SystemType ❑ field-length = BITS-32

	❑ field- value = 0x00 0x80 0x00 0x00 (sys-type-agent) i. System-id ❑ field- type = OCTET STRING ❑ field-length = 0x00 0x0A ❑ field- value = < Check with PIXITs > j. Dev-config-id ❑ field- type = ConfigId ❑ field-length = INT-U16 ❑ field- value = <between 0x40 0x00 and 0x7F 0xFF> k. Data-req-mode-flags (DataReqModeCapab) ❑ field- type = DataReqModeFlags ❑ field-length = BITS-16 ❑ If the PHD implements only this Device Specialization: field- value = 0x00 0x01 – Agent-initiated data request/flows l. Data-req-init-agent-count (DataReqModeCapab) ❑ field- type = INT-U8 ❑ field-length = INT-U8 ❑ If the PHD implements only this Device Specialization: field- value = 0x01 m. Data-req-init-manager-count (DataReqModeCapab) ❑ field- type = INT-U8 ❑ field-length = INT-U8 ❑ If the PHD implements only this Device Specialization: field- value = 0x00
Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	

TP Id		TP/PLT/PHD/CLASS/ST/BV-022		
TP label		Config Changes Service. Resistance Contextual Attribute.		
Coverage	**Spec**	[ISO/IEEE 11073-10442]		
	Testable items	NumObj 1; M		
	Spec	[b-ITU-T H.810 (2015)]		
	Testable items	Communication 8; M		
Test purpose		Check that: Whenever a contextual attribute changes, the PHD shall report these changes to the PHG using an MDS object event prior to reporting any of the dependent values.		
Applicability		C_AG_OXP_000 AND C_AG_OXP_175 AND C_AG_ST_030 AND C_AG_ST_154		
Other PICS				
Initial condition		The simulated PHG and the PHD under test are in the Operating state.		
Test procedure		1. If the attribute that is going to be changed is reported in a Fixed format event report, take some measurements with the PHD under test.		

	2. Make a change to the contextual attribute Unit-Code for Resistance object (grams to pounds, pounds to grams, grams or pounds to DIMLESS, or DIMLESS to grams or pounds). 3. The PHD shall send an MDS event report indicating the new contextual attribute value. 4. Take some more measurements. 5. Wait for the PHG to receive new event reports from the PHD, which report the measurements from step 4.
Pass/Fail criteria	• The PHD sends an MDS event report to inform about the contextual attribute that has been changed. • Data has changed accordingly to a new contextual attribute.
Notes	

TP Id		TP/PLT/PHD/CLASS/ST/BV-023		
TP label		Config Changes Service. Repetition Contextual Attribute.		
Coverage	**Spec**	[ISO/IEEE 11073-10442]		
	Testable items	NumObj 1; M		
	Spec	[b-CDG 2010]		
	Testable items	Communication 8; M		
Test purpose		Check that: Whenever a contextual attribute changes, the PHD shall report these changes to the PHG using an MDS object event prior to reporting any of the dependent values.		
Applicability		C_AG_OXP_000 AND C_AG_OXP_175 AND C_AG_ST_050 AND C_AG_ST_155		
Other PICS				
Initial condition		The simulated PHG and the PHD under test are in the Operating state.		
Test procedure		1. If the attribute that is going to be changed is reported in a Fixed format event report, take some measurements with the PHD under test. 2. Make a change to the contextual attribute Unit-Code for Repetition object (meters to inches or inches to meters.) 3. The PHD shall send an MDS event report indicating the new contextual attribute value. 4. Take some more measurements. 5. Wait for the PHG to receive new event reports from the PHD, which report the measurements from step 4.		
Pass/Fail criteria		• The PHD sends an MDS event report to inform about the contextual attribute that has been changed. • Data has changed accordingly to new contextual attribute.		
Notes				

TP Id	TP/PLT/PHD/CLASS/ST/BV-024
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		
Test purpose		Check that: The total size of the response do not exceed of the maximum APDU size established by the specialization		
Applicability		C_AG_OXP_000 AND C_AG_OXP_175		
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 MDS object) b. attribute-id-list.count = 4087 c. attribute-id-list: (MDC_ATTR_ID_MODEL, MDC_ATTR_SYS_ID, MDC_ATTR_DEV_CONFIG_ID) repeated 1362 times followed by an additional MDC_ATTR_ID_MODEL 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. o 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 the 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 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 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				

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Printed in Switzerland
Geneva, 2017