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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 5K: Peak expiratory flow monitor

Recommendation ITU-T H.845.11

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Recommendation ITU-T H.845.11

Conformance of ITU-T H.810 personal health system: Personal Health Devices interface Part 5K: Peak expiratory flow monitor

Summary

Recommendation ITU-T H.845.11 provides a test suite structure (TSS) and the test purposes (TP) for peak expiratory flow 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.845.11 is a transposition of Continua Test Tool DG2016, Test Suite Structure & Test Purposes, Personal Health Devices Interface; Part 5K: Device Specializations. Personal Health Device (Peak expiratory flow 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.845.11	2015-01-13	16	11.1002/1000/12271
2.0	ITU-T H.845.11	2016-07-14	16	11.1002/1000/12948
3.0	ITU-T H.845.11	2017-04-13	16	11.1002/1000/13228

Keywords

Conformance testing, Continua Design Guidelines, e-health, IEEE 11073 device specialization, ITU-T H.810, peak expiratory flow 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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Electronic attachment: This Recommendation includes an electronic attachment with the protocol implementation conformance statements (PICS) and the protocol implementation extra information for testing (PIXIT) required for the implementation of Annex A.

Introduction

This Recommendation is the transposition of Continua Test Tool DG2016, Test Suite Structure & Test Purposes, Personal Health Devices Interface; Part 5K: Device Specializations. Personal Health Device (Peak expiratory flow 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_5K_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_5K_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_5K_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_5K_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_5K_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.
1.6	2016-09-20	Initial release for Test Tool DG2016. It uses "TSS&TP_DG2015_ PLT_PART_5K_v1.5.doc" as a baseline and adds new features included in [ITU-T H.810 (2016)]/[b-CDG 2016]

Recommendation ITU-T H.845.11

Conformance of ITU-T H.810 personal health system: Personal Health Devices interface Part 5K: Peak expiratory flow 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 5K.

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

[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 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 11073-10421] ISO/IEEE 11073-10421-2010, *Health informatics – Personal health device communication – Part 10421: Device specialization – Peak expiatory flow monitor (peak flow)*. https://www.iso.org/standard/61056.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

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

PCO Point of Control and Observation

PCT Protocol Conformance Testing

PHD Personal Health Device

PHDC Personal Healthcare Device Class

PHG Personal Health Gateway

PICS Protocol Implementation Conformance Statement

PIXIT Protocol Implementation extra Information for Testing

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 1.3.11 (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)
    - Subgroup 2.3.1: Weighing scales (WEG)
    - Subgroup 2.3.2: Glucose meter (GL)
    - Subgroup 2.3.3: Pulse oximeter (PO)
    - Subgroup 2.3.4: Blood pressure monitor (BPM)
    - Subgroup 2.3.5: Thermometer (TH)
    - Subgroup 2.3.6: Cardiovascular (CV)
    - Subgroup 2.3.7: Strength (ST)
    - Subgroup 2.3.8: Activity hub (HUB)
    - Subgroup 2.3.9: Adherence monitor (AM)
    - Subgroup 2.3.10: Insulin pump (IP)
    - Subgroup 2.3.11: Peak flow (PF)
    - Subgroup 2.3.12: Body composition analyser (BCA)
    - Subgroup 2.3.13: Basic electrocardiograph (ECG)
    - Subgroup 2.3.14: International normalized ratio (INR)
    - Subgroup 2.3.15: Sleep apnoea breathing therapy equipment (SABTE)
    - Subgroup 2.3.16: Continuous glucose monitor (CGM)
  - Group 2.4: Personal health device transcoding whitepaper (PHDTW)
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    - Subgroup 2.4.5: Whitepaper glucose meter requirements (GL)
    - Subgroup 2.4.6: Whitepaper weight scale requirements (WS)
    - Subgroup 2.4.7: Whitepaper pulse oximeter requirements (PLX)
    - Subgroup 2.4.8: Whitepaper continuous glucose monitoring requirements (CGM)

7 Electronic attachment

The protocol implementation conformance statements (PICS) and the protocol implementation extra information for testing (PIXIT) required for the implementation of this Annex 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 1.3.11: Peak expiratory flow monitor (PF)

<table>
<tr><td colspan="2">TP Id</td><td colspan="3">TP/PLT/PHD/CLASS/PF/BV-000</td></tr>
<tr><td colspan="2">TP label</td><td colspan="3">Get MDS Object for peak expiratory flow monitor specialization: Mandatory, Conditional and Optional Attributes</td></tr>
<tr><td rowspan="4">Coverage</td><td>Spec</td><td colspan="3">[ISO/IEEE 11073-10421]</td></tr>
<tr><td rowspan="3">Testable items</td><td>PF_MDSAttr1; C</td><td>PF_MDSAttr2; M</td><td>PF_MDSAttr3; M</td></tr>
<tr><td>PF_MDSAttr4; M</td><td>PF_MDSAttr5; O</td><td>PF_MDSAttr6; M</td></tr>
<tr><td>PF_GETServ1; M</td><td>PF_GETServ3; M</td><td>PF_OperProc2; M</td></tr>
<tr><td colspan="2">Test purpose</td><td colspan="3">Check that:
The PHD supports a Get command that requests all attributes
[AND]
The MDS Object contains the attributes specified for a peak expiratory flow monitor PHD.</td></tr>
<tr><td colspan="2">Applicability</td><td colspan="3">C_AG_OXP_170 AND C_AG_OXP_000</td></tr>
<tr><td colspan="2">Other PICS</td><td colspan="3">C_AG_OXP_181</td></tr>
<tr><td colspan="2">Initial condition</td><td colspan="3">The simulated PHG and the PHD under test are in the Operating state.</td></tr>
<tr><td colspan="2">Test procedure</td><td colspan="3">1. The simulated PHG issues 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 under test 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. Conditional attribute System-Type shall not be present.
❑ attribute-id = MDC_ATTR_SYS_TYPE
❑ attribute-type = TYPE
❑ attribute-value.length = 4 bytes
❑ attribute-value =<not relevant >
b. 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_PEFM, 1
c. Mandatory attribute System-model
❑ attribute-id = MDC_ATTR_ID_MODEL
❑ attribute-type = SystemModel
❑ attribute-value.length =<variable>
❑ attribute-value ={Manufacturer, Model}
d. Mandatory attribute Dev-Configuration-Id
❑ attribute-id = MDC_ATTR_DEV_CONFIG_ID
❑ attribute-type = ConfigId
❑ attribute-value.length = 2 bytes
❑ attribute-value =</td></tr>
</table>

	– IF NOT C_AG_OXP_181 then attribute-value = 0x08 0x34 – ELSE attribute-value = < between 0x4000 and 0x7FFF> e. Optional 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.
Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	

TP Id		TP/PLT/PHD/CLASS/PF/BV-001		
TP label		MDS Configuration objects events for peak expiratory flow monitor PHD		
Coverage	**Spec**	[ISO/IEEE 11073-10421]		
	Testable items	PF_MDSEvent1; M	PF_GenNumObj1; O	PEF1; M
		PersBest1; M	FEV1S1;M	FEV6S1; O
		ReadStatus1;M	PF_ExtRules2; M	PF_ConfProc1;M
Test purpose		Check that: A peak expiratory flow monitor PHD 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_170 AND C_AG_OXP_000		
Other PICS		C_AG_OXP_010, C_AG_OXP_181, C_AG_PF_ 001		
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 NOT C_AG_OXP_181 then attribute-value = 0x08 0x34 – ELSE 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 = – Three simple numeric objects for PEF, Personal Best and FEV1 shall be present. – One enumeration object, Reading status shall be present. – IF NOT C_AG_OXP_181 and C_AG_PF_ 001 FEV6 shall be present ELSE FEV6 shall not be present.
Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	

TP Id		TP/PLT/PHD/CLASS/PF/BV-002		
TP label		MDS objects events Peak expiratory flow monitor		
Coverage	**Spec**	[ISO/IEEE 11073-10421]		
	Testable	PF_MDSEvent3; M	PF_MDSEvent4; M	PF_MDSEven5; M

	items	PF_MDSEvent6; M	PF_EventRepServ1; M	PF_EventRepServ2; M
		PF_EventRepServ3; O	PF_OperProc4; M	PF_OperProc8; M
		PF_OperProc9; O		
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] Event reports shall be used in confirmed mode. [AND] Agent-initiated mode shall be supported for measurement data transmission. [AND] A peak expiratory flow monitor PHD may support only single-person event reports [AND] A peak expiratory flow monitor PHD with standard configuration shall use the fixed format data update messages method for transmitting measurement data [AND] A peak expiratory flow monitor PHD with extended configuration may use either fixed or variable format data update messages for transmitting measurement data.		
Applicability		C_AG_OXP_170 AND C_AG_OXP_000 AND (C_AG_OXP_182 OR C_AG_OXP_183 OR C_AG_OXP_184 OR C_AG_OXP_189)		
Other PICS		C_AG_OXP_009, C_AG_OXP_014, C_AG_OXP_181, 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 under test 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 tested configuration is received. 5. Record the PHD configuration. 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. Take Measurements for every supported object in the PHD under test. 8. Wait to receive every event report and check: ❑ 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 one of the following Data APDU and that it is confirmed. • For Standard Configuration (NOT C_AG_OXP_181): An MDS Event Report is sent by the PHD under test to report measurements for every object: ❑ MDC_NOTI_SCAN_REPORT_FIXED ❑ MDC_NOTI_SCAN_REPORT_MP_FIXED • For Extended Configuration, an MDS Event Report is sent by the PHD under test 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
Notes	

TP Id		TP/PLT/PHD/CLASS/PF/BV-003		
TP label		PEF Object for Standard Configuration (0x0834)		
Coverage	**Spec**	[ISO/IEEE 11073-10421]		
	Testable items	PEF2; M	PEF3; M	PEF4; R
		PEF5; M	PEF6; R	PEF7; R
		PEF8; R	PEF9; R	PEF10; R
		PEF11; M	PEF12; M	PEF13; R
		PEF14; O	PEF15; O	PEF16; M
		PEF17; C	PEF18; C	PEF19; R
		PEF20; C	PEF21; R	PEF22; R
		PEF23; R	PEF24; R	PEF25; R
		PEF26; R	PEF45; M	PF_ConfProc2; M
Test purpose		Check that: PEF Numeric Object contains the attributes specified for Standard Configuration (0x0834)		
Applicability		C_AG_OXP_170 AND (NOT C_AG_OXP_181) 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 0x0834. 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 0x0834 is received. 5. Once the PHD under test sends a standard configuration, check the PEF object. 6. The PEF 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_SCADA, MDC_FLOW_AWAY_EXP_FORCED_PEAK c. Mandatory attribute Metric-Spec-Small ❑ attribute-id = MDC_ATTR_METRIC_SPEC_SMALL ❑ attribute-type = MetricSpecSmall ❑ attribute-value.length = 2 bytes ❑ attribute-value = 0xD0 0x40 • Bit 0 (mss-avail-intermittent(0)) is set. • Bit 1 (mss-avail-stored-data(1)) is 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_X_L_PER_MIN e. Mandatory attribute Attribute-Value-Map ❑ attribute-id = MDC_ATTR_ATTRIBUTE_VAL_MAP ❑ attribute-type = AttrValMap ❑ attribute-count = 2 ❑ attribute-value = (MDC_ATTR_NU_ VAL_OBS_SIMP,4 MDC_ATTR_TIME_STAMP_ABS, 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/PF/BV-004
TP label	PEF Object for Extended Configuration

<table>
<tr><td rowspan="7">Coverage</td><td>Spec</td><td colspan="3">[ISO/IEEE 11073-10421]</td></tr>
<tr><td rowspan="6">Testable items</td><td>PEF27; M</td><td>PEF28; R</td><td>PEF29; M</td></tr>
<tr><td>PEF30; R</td><td>PEF31; R</td><td>PEF32; R</td></tr>
<tr><td>PEF33; R</td><td>PEF34; R</td><td>PEF35; M</td></tr>
<tr><td>PEF37; R</td><td>PEF38; R</td><td>PEF39; R</td></tr>
<tr><td>PEF40; R</td><td>PEF41; R</td><td>PEF42; R</td></tr>
<tr><td>PEF43; R</td><td>PEF44; R</td><td></td></tr>
<tr><td colspan="2">Test purpose</td><td colspan="3">Check that:
PEF Numeric Object contains the attributes specified for Extended Configuration</td></tr>
<tr><td colspan="2">Applicability</td><td colspan="3">C_AG_OXP_170 AND C_AG_OXP_181 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 under test 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 PEF object.
6. The PEF object contents shall be:
a. Mandatory attribute Type
❑ attribute-id = MDC_ATTR_ID_TYPE
❑ attribute-type = TYPE
❑ attribute-value = MDC_PART_SCADA, MDC_FLOW_AWAY_EXP_FORCED_PEAK
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. Mandatory attribute Metric-Spec-Small
❑ attribute-id = MDC_ATTR_METRIC_SPEC_SMALL
❑ attribute-type = MetricSpecSmall
❑ attribute-value.length = 2 bytes
❑ attribute-value =0xD0 0x40
• Bit 0 (mss-avail-intermittent(0)) is set.
• Bit 1 (mss-avail-stored-data(1)) is set.
• Bit 3 (mss-msmt-aperiodic(3)) is set.
• Bit 9 (mss-acc-agent-initiated(9)) is set.</td></tr>
</table>

	d. 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> e. IF Not recommended 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> f. 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> g. 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> h. 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> i. Mandatory attribute Unit-Code ❑ attribute-id = MDC_ATTR_UNIT_CODE ❑ attribute-type = OID-Type ❑ attribute-value.length = 2 bytes ❑ attribute-value = MDC_DIM_X_L_PER_MIN j. 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> 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 Compound-Simple-Nu-Observed-Value is present ❑ attribute-id = MDC_ATTR_NU_CMPD_VAL_OBS_SIMP ❑ attribute-type = SimpleNuObsValueCmp ❑ attribute-value.length =<variable> ❑ attribute-value = <Not relevant for this test>

	m. IF Not recommended attribute Basic-Nu-Observed-Value is present ❑ attribute-id = MDC_ATTR_NU_VAL_OBS_BASIC ❑ attribute-type = BasicNuObsValue ❑ attribute-value.length = 2bytes ❑ attribute-value = <Not relevant for this test> n. IF Not recommended attribute Compound-Basic-Nu-Observed-Value is present ❑ attribute-id = MDC_ATTR_NU_CMPD_VAL_OBS_BASIC ❑ attribute-type = BasicNuObsValueCmp ❑ attribute-value.length = <variable> ❑ attribute-value = <Not relevant for this test> o. IF Not recommended attribute Nu-Observed-Value is present ❑ attribute-id = MDC_ATTR_NU_VAL_OBS ❑ attribute-type = NuObsValue ❑ attribute-value.length = 10bytes ❑ attribute-value = <Not relevant for this test> p. Not recommended attribute Compound-Nu-Observed-Value ❑ attribute-id = MDC_ATTR_NU_CMPD_VAL_OBS_SIMP ❑ attribute-type = NuObsValueCmp ❑ attribute-value.length = <variable> ❑ attribute-value = <Not relevant for this test> q. 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/PF/BV-005		
TP label		Personal Best Object for Standard Configuration (0x0834)		
Coverage	**Spec**	[ISO/IEEE 11073-10421]		
	Testable items	PersBest2; M	PersBest3; M	PersBest4; R
		PersBest5; M	PersBest6; R	PersBest7; R
		PersBest8; R	PersBest9; R	PersBest10; R
		PersBest11; M	PersBest12; M	PersBest13; R
		PersBest14; O	PersBest15; O	PersBest16; C
		PersBest17; R	PersBest18; C	PersBest19; R
		PersBest20; C	PersBest21; R	PersBest22; R

		PersBest23; R	PersBest24; R	PersBest25; R
		PersBest26; R	PersBest40; M	PF_ConfProc2; M
Test purpose		Check that: Personal Best Numeric Object contains the attributes specified for Standard Configuration (0x0834)		
Applicability		C_AG_OXP_170 AND (NOT C_AG_OXP_181) 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 0x0834. 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 0x0834 is received. 5. Once the PHD under test sends a standard configuration, check the Personal Best object. 6. The Personal Best 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_SCADA, MDC_FLOW_AWAY_EXP_FORCED_PEAK_PB c. Mandatory attribute Metric-Spec-Small ❑ attribute-id = MDC_ATTR_METRIC_SPEC_SMALL ❑ attribute-type = MetricSpecSmall ❑ attribute-value.length = 2 bytes ❑ attribute-value =0xC0 0x44 • Bit 0 (mss-avail-intermittent(0)) is set. • Bit 1 (mss-avail-stored-data(1)) is set. • Bit 9 (mss-acc-agent-initiated(9)) is set. • Bit 13 (mss-cat-setting (13)) 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_X_L_PER_MIN e. Mandatory attribute Attribute-Value-Map ❑ attribute-id = MDC_ATTR_ATTRIBUTE_VAL_MAP ❑ attribute-type = AttrValMap		

	❑ attribute-count = 2 ❑ attribute-value = (MDC_ATTR_NU_ VAL_OBS_SIMP,4 MDC_ATTR_TIME_STAMP_ABS, 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/PF/BV-006		
TP label		Personal Best Object for Extended Configuration		
Coverage	**Spec**	[ISO/IEEE 11073-10421]		
	Testable items	PersBest27; M	PersBest28; R	PersBest29; M
		PersBest30; R	PersBest31; R	PersBest32; R
		PersBest33; R	PersBest34; R	PersBest35; M
		PersBest37; R	PersBest38; R	PersBest39; R
Test purpose		Check that: Personal Best Numeric Object contains the attributes specified for Extended Configuration		
Applicability		C_AG_OXP_170 AND C_AG_OXP_181 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 Personal Best object. 6. The Personal Best object contents shall be: a. Mandatory attribute Type ❑ attribute-id = MDC_ATTR_ID_TYPE ❑ attribute-type = TYPE attribute-value = MDC_PART_SCADA, MDC_FLOW_AWAY_EXP_FORCED_PEAK_PB 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. Mandatory attribute Metric-Spec-Small
   - ❑ attribute-id = MDC_ATTR_METRIC_SPEC_SMALL
   - ❑ attribute-type = MetricSpecSmall
   - ❑ attribute-value.length = 2 bytes
   - ❑ attribute-value =0xC0 0x44
     - Bit 0 (mss-avail-intermittent(0)) is set.
     - Bit 1 (mss-avail-stored-data(1)) is set.
     - Bit 9 (mss-acc-agent-initiated(9)) is set.
     - Bit 13 (mss-cat-setting (13)) is set.

d. 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>

e. IF Not recommended 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>

f. 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>

g. 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>

h. 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>

i. Mandatory recommended 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_L_PER_MIN

j. 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>

	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/PF/BV-007		
TP label		FEV1 for Standard Configuration (0x0834)		
Coverage	**Spec**	[ISO/IEEE 11073-10421]		
	Testable items	FEV1S2; M	FEV1S3; M	FEV1S4; R
		FEV1S5; M	FEV1S6; R	FEV1S7; R
		FEV1S8; R	FEV1S9; R	FEV1S10; R
		FEV1S11; M	FEV1S12; M	FEV1S13; R
		FEV1S14; O	FEV1S15; O	FEV1S16; C
		FEV1S17; C	FEV1S18; C	FEV1S19; R
		FEV1S20; C	FEV1S21; R	FEV1S22; R
		FEV1S23; R	FEV1S24; R	FEV1S25; R
		FEV1S26; R	FEV1S45; M	PF_ConfProc2; M
Test purpose		Check that: FEV1 Numeric Object contains the attributes specified for Standard Configuration (0x0834)		
Applicability		C_AG_OXP_170 AND (NOT C_AG_OXP_181) 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 0x0834. 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 0x0834 is received. 5. Once the PHD under test sends a standard configuration, check the FEV1 object.		

	6. The FEV1 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_SCADA | MDC_VOL_AWAY_EXP_FORCED_1S c. Mandatory attribute Metric-Spec-Small ❑ attribute-id = MDC_ATTR_METRIC_SPEC_SMALL ❑ attribute-type = MetricSpecSmall ❑ attribute-value.length = 2 bytes ❑ attribute-value =0xD0 0x40 • Bit 0 (mss-avail-intermittent(0)) is set. • Bit 1 (mss-avail-stored-data(1)) is set. • Bit 3 (mss-msmt-aperiodic(3)) is set. • Bit 9 (mss-acc-agent-initiated(9)) is set. d. Mandatory recommended 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_L e. Mandatory attribute Attribute-Value-Map ❑ attribute-id = MDC_ATTR_ATTRIBUTE_VAL_MAP ❑ attribute-type = AttrValMap ❑ attribute-count = 2 ❑ attribute-value = (MDC_ATTR_NU_ VAL_OBS_SIMP,4 MDC_ATTR_TIME_STAMP_ABS, 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/PF/BV-008		
TP label		FEV1 Object for Extended Configuration		
Coverage	**Spec**	[ISO/IEEE 11073-10421]		
	Testable items	FEV1S27; M	FEV1S28; R	FEV1S29; R
		FEV1S30; M	FEV1S31; R	FEV1S32; R
		FEV1S33; R	FEV1S34; R	FEV1S35; M
		FEV1S37; R	FEV1S38; R	FEV1S39; R

		FEV1S40; R	FEV1S41; R	FEV1S42; R
		FEV1S43; R	FEV1S44; R	
Test purpose		Check that: FEV1 Numeric Object contains the attributes specified for Extended Configuration		
Applicability		C_AG_OXP_170 AND C_AG_OXP_181 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. 5. Once the PHD under test sends the tested configuration, check the FEV1 object. 6. The FEV1 object contents shall be: a. Mandatory attribute Type ❑ attribute-id = MDC_ATTR_ID_TYPE ❑ attribute-type = TYPE ❑ attribute-value = MDC_PART_SCADA | MDC_VOL_AWAY_EXP_FORCED_1S 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. Mandatory attribute Metric-Spec-Small ❑ attribute-id = MDC_ATTR_METRIC_SPEC_SMALL ❑ attribute-type = MetricSpecSmall ❑ attribute-value.length = 2 bytes ❑ attribute-value =0xD0 0x40 • Bit 0 (mss-avail-intermittent(0)) is set. • Bit 1 (mss-avail-stored-data(1)) is set. • Bit 3 (mss-msmt-aperiodic(3)) is set. • Bit 9 (mss-acc-agent-initiated(9)) is set. d. 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> e. IF Not recommended 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> f. 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> g. 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> h. 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> i. Mandatory attribute Unit-Code ❑ attribute-id = MDC_ATTR_UNIT_CODE ❑ attribute-type = OID-Type ❑ attribute-value.length = 2 bytes ❑ attribute-value = MDC_DIM_X_L j. 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> 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 Compound-Simple-Nu-Observed-Value is present ❑ attribute-id = MDC_ATTR_NU_CMPD_VAL_OBS_SIMP ❑ attribute-type = SimpleNuObsValueCmp ❑ attribute-value.length =<variable> ❑ attribute-value = <Not relevant for this test> m. IF Not recommended attribute Basic-Nu-Observed-Value is present ❑ attribute-id = MDC_ATTR_NU_VAL_OBS_BASIC ❑ attribute-type = BasicNuObsValue ❑ attribute-value.length = 2bytes ❑ attribute-value = <Not relevant for this test> n. IF Not recommended attribute Compound-Basic-Nu-Observed-Value is present ❑ attribute-id = MDC_ATTR_NU_CMPD_VAL_OBS_BASIC ❑ attribute-type = BasicNuObsValueCmp ❑ attribute-value.length = <variable>

	❑ attribute-value = <Not relevant for this test> o. IF Not recommended attribute Nu-Observed-Value is present ❑ attribute-id = MDC_ATTR_NU_VAL_OBS ❑ attribute-type = NuObsValue ❑ attribute-value.length = 10bytes ❑ attribute-value = <Not relevant for this test> p. Not recommended attribute Compound-Nu-Observed-Value ❑ attribute-id = MDC_ATTR_NU_CMPD_VAL_OBS_SIMP ❑ attribute-type = NuObsValueCmp ❑ attribute-value.length = <variable> ❑ attribute-value = <Not relevant for this test> q. 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/PF/BV-009		
TP label		FEV6 Object for Extended Configuration		
Coverage	**Spec**	[ISO/IEEE 11073-10421]		
	Testable items	FEV6S2; M	FEV6S3; R	FEV6S4; R
		FEV6S5; M	FEV6S6; R	FEV6S7; R
		FEV6S8; R	FEV6S9; R	FEV6S10; M
		FEV6S12; R	FEV6S14; R	FEV6S15; R
		FEV6S16; R	FEV6S17; R	FEV6S18; R
		FEV6S19; R	FEV6S20; R	
Test purpose		Check that: FEV6 Numeric Object contains the attributes specified for Extended Configuration		
Applicability		C_AG_OXP_170 AND C_AG_OXP_181 AND C_AG_PF_001 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 FEV6 object. 6. The FEV6 object contents shall be: a. Mandatory attribute Type ❑ attribute-id = MDC_ATTR_ID_TYPE ❑ attribute-type = TYPE ❑ attribute-value = MDC_PART_SCADA | MDC_VOL_AWAY_EXP_FORCED_6S 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. Mandatory attribute Metric-Spec-Small ❑ attribute-id = MDC_ATTR_METRIC_SPEC_SMALL ❑ attribute-type = MetricSpecSmall ❑ attribute-value.length = 2 bytes ❑ attribute-value =0xD0 0x40 • Bit 0 (mss-avail-intermittent(0)) is set. • Bit 1 (mss-avail-stored-data(1)) is set. • Bit 3 (mss-msmt-aperiodic(3)) is set. • Bit 9 (mss-acc-agent-initiated(9)) is set. d. 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> e. IF Not recommended 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> f. 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> g. 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> h. 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> i. Mandatory attribute Unit-Code ❑ attribute-id = MDC_ATTR_UNIT_CODE ❑ attribute-type = OID-Type ❑ attribute-value.length = 2 bytes ❑ attribute-value = MDC_DIM_X_L j. 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> 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 Compound-Simple-Nu-Observed-Value is present ❑ attribute-id = MDC_ATTR_NU_CMPD_VAL_OBS_SIMP ❑ attribute-type = SimpleNuObsValueCmp ❑ attribute-value.length =<variable> ❑ attribute-value = <Not relevant for this test> m. IF Not recommended attribute Basic-Nu-Observed-Value is present ❑ attribute-id = MDC_ATTR_NU_VAL_OBS_BASIC ❑ attribute-type = BasicNuObsValue ❑ attribute-value.length = 2bytes ❑ attribute-value = <Not relevant for this test> n. IF Not recommended attribute Compound-Basic-Nu-Observed-Value is present ❑ attribute-id = MDC_ATTR_NU_CMPD_VAL_OBS_BASIC ❑ attribute-type = BasicNuObsValueCmp ❑ attribute-value.length = <variable> ❑ attribute-value = <Not relevant for this test> o. IF Not recommended attribute Nu-Observed-Value is present ❑ attribute-id = MDC_ATTR_NU_VAL_OBS ❑ attribute-type = NuObsValue ❑ attribute-value.length = 10bytes ❑ attribute-value = <Not relevant for this test> p. Not recommended attribute Compound-Nu-Observed-Value ❑ attribute-id = MDC_ATTR_NU_CMPD_VAL_OBS_SIMP ❑ attribute-type = NuObsValueCmp ❑ attribute-value.length = <variable> ❑ attribute-value = <Not relevant for this test> q. 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/PF/BV-010		
TP label		Reading status Object for Standard Configuration (0x0834)		
Coverage	**Spec**	[ISO/IEEE 11073-10421]		
	Testable items	ReadStatus2; M	ReadStatus3; M	ReadStatus4; R
		ReadStatus5; M	ReadStatus6; R	ReadStatus7; R
		ReadStatus8; R	ReadStatus9; R	ReadStatus10; R
		ReadStatus11; R	ReadStatus12; M	ReadStatus13; R
		ReadStatus14; O	ReadStatus15; O	ReadStatus16; C
		ReadStatus17; R	ReadStatus18; C	ReadStatus19; O
		ReadStatus20; R	ReadStatus21; M	ReadStatus22; R
		ReadStatus23; R	ReadStatus24; R	ReadStatus41; M
		PF_ConfProc2; M		
Test purpose		Check that: Reading status Enumeration Object contains the attributes specified for Standard Configuration (0x0834)		
Applicability		C_AG_OXP_170 AND (NOT C_AG_OXP_181) 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 0x0834. 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 0x0834is received. 5. Once the PHD under test sends a standard configuration, check the Reading status object. 6. The Reading status object contents shall be: a. Mandatory attribute Handle ❑ attribute-id = MDC_ATTR_ID_HANDLE ❑ attribute-type = HANDLE ❑ attribute-value = 0x00 0x05 b. Mandatory attribute Type ❑ attribute-id = MDC_ATTR_ID_TYPE		

	❑ attribute-type = TYPE ❑ attribute-value = MDC_PART_PHD_DM, MDC_PEF_READING_STATUS c. Mandatory attribute Metric-Spec-Small ❑ attribute-id = MDC_ATTR_METRIC_SPEC_SMALL ❑ attribute-type = MetricSpecSmall (BITS-16) ❑ attribute-value =0xD0 0x40 • Bit 0 (mss-avail-intermittent(0)) is set. • Bit 1 (mss-avail-stored-data(1)) is 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_ENUM_VAL_OBS_BASIC_BIT_STRING, 2 MDC_ATTR_TIME_STAMP_ABS, 8) 7. Check that no other attributes are present in the initial configuration. 8. 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. 9. Take a measurement with the PHD. 10. Wait for the PHD to send an event report and check: a. Mandatory attribute Enum-Observed-Value-Basic-Bit-Str ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_SIM_OID ❑ attribute-type = OID-Type ❑ attribute-value.length = 2 bytes ❑ attribute-value= One of the following bits may be active: • pefm-read-stat-post-medication(0) • pefm-read-stat-cough(1) • pefm-read-stat-short-effort(2) • pefm-read-stat-long-time-to-peak(3) • The rest of the bits must not be set
Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	

<table>
<tr><td colspan="2">TP Id</td><td colspan="3">TP/PLT/PHD/CLASS/PF/BV-011</td></tr>
<tr><td colspan="2">TP label</td><td colspan="3">Reading status Object for Extended Configuration</td></tr>
<tr><td rowspan="7">Coverage</td><td>Spec</td><td colspan="3">[ISO/IEEE 11073-10421]</td></tr>
<tr><td rowspan="6">Testable items</td><td>ReadStatus25; M</td><td>ReadStatus26; R</td><td>ReadStatus27; R</td></tr>
<tr><td>ReadStatus28; M</td><td>ReadStatus29; R</td><td>ReadStatus30; R</td></tr>
<tr><td>ReadStatus31; R</td><td>ReadStatus32; R</td><td>ReadStatus33; R</td></tr>
<tr><td>ReadStatus34; R</td><td>ReadStatus35; O</td><td>ReadStatus36; R</td></tr>
<tr><td>ReadStatus37; M</td><td>ReadStatus38; R</td><td>ReadStatus39; R</td></tr>
<tr><td>ReadStatus40; R</td><td>ReadStatus41; M</td><td></td></tr>
<tr><td colspan="2">Test purpose</td><td colspan="3">Check that:
Reading status Enumeration Object contains the attributes specified for Extended Configuration</td></tr>
<tr><td colspan="2">Applicability</td><td colspan="3">C_AG_OXP_170 AND C_AG_OXP_181 AND C_AG_OXP_000</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 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 Reading status object.
6. The Reading status object contents shall be:
a. Mandatory attribute Type
❑ attribute-id = MDC_ATTR_ID_TYPE
❑ attribute-type = TYPE
❑ attribute-value = MDC_PART_PHD_DM, MDC_PEF_READING_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. Mandatory attribute Metric-Spec-Small
❑ attribute-id = MDC_ATTR_METRIC_SPEC_SMALL
❑ attribute-type = MetricSpecSmall (BITS-16)
❑ attribute-value =0xD0 0x40
• Bit 0 (mss-avail-intermittent(0)) is set.
• Bit 1 (mss-avail-stored-data(1)) is set.
• Bit 3 (mss-msmt-aperiodic(3)) is set.</td></tr>
</table>

	• Bit 9 (mss-acc-agent-initiated(9)) is set. d. 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> e. IF Not recommended 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> f. 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 Optional 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> k. IF Not Recommended attribute Enum-Observed-Value-Simple-Bit-Str is present ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_SIM_BIT_STR ❑ attribute-type = BITS-32 ❑ attribute-value.length = BITS-32

	❑ attribute-value= <Not relevant for this test> l. Mandatory attribute Enum-Observed-Value-Basic-Bit-Str is present ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_BASIC_BIT_STR ❑ attribute-type = BITS-16 ❑ attribute-value.length = 2 bytes ❑ attribute-value = One of the following bits may be active: • pefm-read-stat-post-medication(0) • pefm-read-stat-cough(1) • pefm-read-stat-short-effort(2) • pefm-read-stat-long-time-to-peak(3) • The rest of the bits must not be set m. IF Not Recommended attribute Enum-Observed-Value-Simple-Str is present ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_SIM_STR ❑ attribute-type = EnumPrintableString ❑ attribute-value.length = <variable> ❑ attribute-value = <Not relevant for this test> n. IF Not Recommended attribute Enum-Observed-Value is present ❑ attribute-id= MDC_ATTR_VAL_ENUM_OBS ❑ attribute-type = EnumObsValue ❑ attribute-value.length = <variable> ❑ attribute-value = <Not relevant for this test> o. 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> 7. 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. 8. Take a measurement with the PHD 9. Wait for the PHD to send an event report and check: a. Mandatory attribute Enum-Observed-Value-Basic-Bit-Str ❑ attribute-id= MDC_ATTR_ENUM_OBS_VAL_BASIC_BIT_STR ❑ attribute-type = OID-Type ❑ attribute-value.length = 2 bytes ❑ attribute-value= One of the following bits may be active:

	• pefm-read-stat-post-medication(0) • pefm-read-stat-cough(1) • pefm-read-stat-short-effort(2) • pefm-read-stat-long-time-to-peak(3) • The rest of the bits must not be set
Pass/Fail criteria	All checked values are as specified in the test procedure.
Notes	

TP Id		TP/PLT/PHD/CLASS/PF/BV-012		
TP label		Association Peak expiratory flow monitor PHD		
Coverage	**Spec**	[ISO/IEEE 11073-10421]		
	Testable items	PF_AssocReq1; M	PF_AssocReq2; M	PF_AssocReq3; M
		PF_AssocReq4; M	PF_AssocReq5; M	PF_AssocReq6; M
		PF_AssocReq7; M	PF_AssocReq8; M	PF_AssocReq9; M
		PF_AssocReq10; M	PF_AssocReq11; M	PF_AssocReq12; M
		PF_MDSMethod4; M		
Test purpose		Check that: During the association procedure, Peak expiratory flow monitor PHD sends the correct association request to the simulated PHG		
Applicability		C_AG_OXP_170 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 no 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 and the received value will be compared with the value defined in PIXIT I_AG_OXP_001 and I_AG_OXP_002.

j. dev-config-id
- ❑ field- type = ConfigId(INT-U16)
- ❑ field-length = 2 bytes
- ❑ field- value =
  - <0x0834> 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 PHD supports only Peak expiratory flow monitor specialization → 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/PF/BV-013		
TP label		Set Time Peak expiratory flow monitor PHD		
Coverage	**Spec**	[ISO/IEEE 11073-10421]		
	Testable items	PF_MDSMethod2; C		
Test purpose		Check that: If the PHD supports the Absolute-Time-Stamp attribute, this method (Set Time) shall be implemented		
Applicability		C_AG_OXP_170 AND C_AG_OXP_000 AND C_AG_OXP_009		
Other PICS				
Initial condition		The simulated PHG and the PHD under test are in the Operating state.		
Test procedure		1. The simulated PHG sends a SET action: ❑ CHOICE = SetTimeInvoke ❑ action-type = MDC_ACT_SET_TIME ❑ the action-info-args are SetTimeInvoke ▪ date-time = <century, year ≤ 99 month ≤ 12 day ≤ 31 hour ≤ 24 minute ≤ 60 s ≤ 60 sec-fractions ≤ 100> ▪ accuracy = 0 2. The PHD under test response shall be a rors-cmip-confirmed-action: ❑ action-type = MDC_ACT_SET_TIME ❑ action-info-args shall be empty.		
Pass/Fail criteria		All checked values are as specified in the test procedure.		
Notes				

TP Id		TP/PLT/PHD/CLASS/PF/BV-014		
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 11073-10421]		

	Testable items	PF_ComModel1;M	PF_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 PHD according to this definition shall be capable of receiving an APDU up to the size of at least Nrx. For this standard it is Nrx = 224 octets		
Applicability		C_AG_OXP_000 AND C_AG_OXP_170		
Other PICS		C_AG_OXP_041, C_AG_OXP_100		
Initial condition		The simulated PHG and the PHD are in the Operating state.		
Test procedure		1. The simulated PHG issues "Remote Operation Invoke | Get" command with: a. Obj-handle set to 0 (to request for MDS object) b. attribute-id-list.count = 103 c. attribute-id-list: (MDC_ATTR_ID_MODEL, MDC_ATTR_SYS_ID, MDC_ATTR_DEV_CONFIG_ID) repeated 34 times followed by an 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. ☐ 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 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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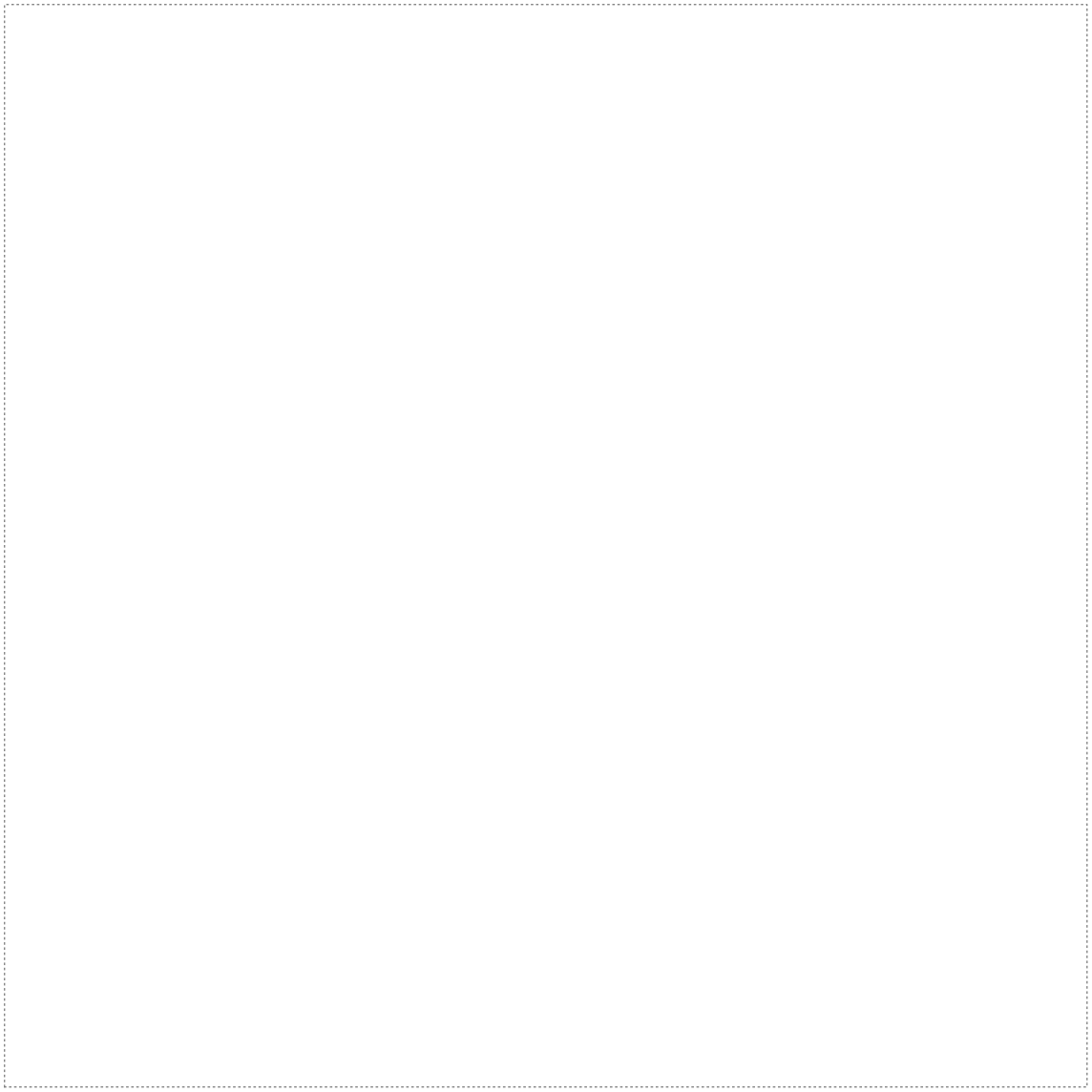

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