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SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

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Conformance of ITU-T H.810 personal health system: Personal Health Devices interface Part 7: Continua Design Guidelines for Bluetooth Low Energy: Personal Health Devices

Recommendation ITU-T H.847

International Telecommunication Union

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Recommendation ITU-T H.847

Conformance of ITU-T H.810 personal health system: Personal Health Devices interface Part 7: Continua Design Guidelines for Bluetooth Low Energy: Personal Health Devices

Summary

Recommendation ITU-T H.847 provides a test suite structure (TSS) and the test purposes (TP) for personal health devices using Bluetooth Low Energy transport 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.847 is a transposition of Continua Test Tool DG2016, Test Suite Structure & Test Purposes, Personal Health Devices Interface; Part 7: Continua Design Guidelines. Personal Health Device BLE (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.847	2015-01-13	16	11.1002/1000/12276
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Keywords

Bluetooth Low Energy (BLE), conformance testing, Continua Design Guidelines, e-health, ITU-T H.810, 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.

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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 7: Continua Design Guidelines. Personal Health Device BLE (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
1.0	2012-10-05	Initial release for Test Tool DG2011.
1.1	2013-05-24	Initial release for Test Tool DG2012. This uses "TSS&TP_DG2011_LP-PAN_PART_7_v1.0.doc" as a baseline and adds new features included in [b-CDG 2012]: • BPM and HR profiles
1.2	2014-01-24	Initial release for Test Tool DG2013. This uses "TSS&TP_DG2012 PAN-LAN-TAN Interface PART_7_v1.1.doc" as a baseline and adds new features included in [b-ITU-T H.810 (2013)]/[b-CDG 2013]: • Adds glucose meter BLE • Adds BLE SSP support • Adds NFC new transport • Adds INR device specialization
1.3	2014-04-24	TM Lite & Doc Enhancements (Test Tool v4.0 Maintenance Release 1). It uses "TSS&TP_DG2013_LP-PAN_PART_7_v1.2.doc" as a baseline and adds new features included in Documentation Enhancements: • "Other PICS" row has been added
1.4	2015-07-01	Initial release for Test Tool DG2015. It uses "TSS&TP_DG2013_LP-PAN_PART_7_v1.3.doc" as a baseline and adds new features included in [b-ITU-T H.810 (2015)]/[b-CDG 2015]: • Adds WS/BCA BLE device specialization • Adds SABTE IEEE device specialization
1.5	2016-01-26	First maintenance release for Test Tool DG2015. It uses "TSS&TP_DG2015_LP-PAN_PART_7_v1.4.doc" as a baseline and adds some updates according to the maintenance 2015 activity.
1.6	2016-09-20	Initial release for Test Tool DG2016. It uses "TSS&TP_DG2016_LP-PAN_PART_7_v1.5.doc" as a baseline and adds new features included in [ITU-T H.810 (2016)]/[b-CDG 2016]: • Adds PLX BLE device specialization • Adds CGM BLE device specialization

Recommendation ITU-T H.847

Conformance of ITU-T H.810 personal health system: Personal Health Devices interface Part 7: Continua Design Guidelines for Bluetooth Low Energy: Personal Health Devices

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 7.

– 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
  - 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*.

[Bluetooth PHDT v1.6] Bluetooth SIG, *Personal Health Devices Transcoding White Paper, v1.6*. https://www.bluetooth.org/DocMan/handlers/DownloadDoc.ashx?doc_id=310657

[ISO/IEEE 11073-10404] ISO/IEEE 11073-10404:2010, *Health informatics – Personal health device communication – Part 10404: Device specialization – Pulse oximeter*. https://www.iso.org/standard/54572.html

[ISO/IEEE 11073-10406] ISO/IEEE 11073-10406-2012, *Health informatics – Personal health device communication – Part 10406: Device specialization – Basic electrocardiograph (ECG) (1- to 3-lead ECG)*. https://www.iso.org/standard/61876.html

[ISO/IEEE 11073-10407] ISO/IEEE 11073-10407:2010, *Health informatics – Personal health device communication – Part 10407: Device specialization – Blood pressure monitor, version 1.0*. https://www.iso.org/standard/54573.html

[ISO/IEEE 11073-10408] ISO/IEEE 11073-10408:2010, *Health informatics – Personal health device communication – Part 10408: Device specialization – Thermometer*. https://www.iso.org/standard/54310.html

[ISO/IEEE 11073-10415] ISO/IEEE 11073-10415:2010, *Health informatics – Personal health device communication – Part 10415: Device specialization – Weighing scale*. https://www.iso.org/standard/54310.html

[ISO/IEEE 11073-10417] ISO/IEEE 11073-10417:2014, *Health informatics – Personal health device communication – Part 10417: Device specialization – Glucose meter*. https://www.iso.org/standard/61896.html

[ISO/IEEE 11073-10418C] ISO/IEEE 11073-10418-2014, *Health informatics – Personal health device communication – Part 10418: Device specialization – International Normalized Ratio (INR) monitor*, including ISO/IEEE 11073-10418:2014/Cor 1:2016. https://www.iso.org/standard/61897.html with https://www.iso.org/standard/70740.html

[ISO/IEEE 11073-10419] ISO/IEEE 11073-10419:2016, *Health informatics - Personal health device communication – Part 10419: Device specialization – Insulin pump*.
https://www.iso.org/standard/69528.html

[ISO/IEEE 11073-10420] ISO/IEEE 11073-10420-2012, *Health informatics – Personal health device communication – Part 10420: Device specialization – Body composition analyzer*.
https://www.iso.org/standard/61055.html

[ISO/IEEE 11073-10421] ISO/IEEE 11073-10421:2012, *Health informatics – Personal health device communication – Part 10421: Device specialization – Peak expiratory flow monitor (peak flow).*
https://www.iso.org/standard/61056.html

[ISO/IEEE 11073-10424] ISO/IEEE 11073-10424:2016, *Health informatics – Personal health device communication – Part 10424: Device specialization – Sleep apnoea breathing therapy equipment (SABTE)*.
https://www.iso.org/standard/68906.html
NOTE – Equivalent to IEEE 11073-10424-2014, Health informatics – Personal health device communication – Part 10424: Device Specialization – Sleep Apnoea Breathing Therapy Equipment (SABTE).
http://dx.doi.org/10.1109/IEEESTD.2014.6911927

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

[ISO/IEEE 11073-10441] ISO/IEEE 11073-10441-2015, *Health informatics – Personal Health Device Communication – Part 10441: Device Specialization – Cardiovascular Fitness and Activity Monitor*, (Revision of IEEE Std 11073-10441-2008).
https://www.iso.org/standard/64868.html

[ISO/IEEE 11073-10442] ISO/IEEE 11073-10442:2015, *Health informatics – Personal health device communication – Part 10442: Device specialization – Strength fitness equipment.*
http://standards.ieee.org/findstds/standard/11073-10442-2008.html

[ISO/IEEE 11073-10471] ISO/IEEE 11073-10471:2010, *Health informatics – Personal health device communication – Part 10471: Device specialization – Independent living activity hub.*
https://www.iso.org/standard/54328.html

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

[ISO/IEEE 11073-104xx] ISO/IEEE 11073-104xx series (in force), *Health informatics – Personal health device communication – Device specialization*.
NOTE – Shorthand is used to refer to the collection of device specialization standards that utilize [ISO/IEEE 11073-20601-2015A], where xx can be any number from 01 to 99, inclusive.

[ISO/IEEE 11073-20601-2015A] ISO/IEEE 11073-20601:2010, *Health informatics – Personal 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

None.

3.2 Terms defined in this Recommendation

None.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

ATS Abstract Test Suite
DUT Device Under Test
CDG Continua Design Guidelines
CGM Continuous Glucose Monitor
GUI Graphical User Interface
INR International Normalized Ratio
IUT Implementation Under Test
IP Insulin Pump
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

TCRL Test Case Reference List

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].	–

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

CDG release	Transposed as	Version	Description	Designation
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 1.1.9 (shown in bold).

– Group 1: Personal Health Device (PHD)
  - Group 1.1: Transport (TR)
    - Subgroup 1.1.1: Design guidelines: Common (DGC)
    - Subgroup 1.1.2: USB design guidelines (UDG)
    - Subgroup 1.1.3: Bluetooth design guidelines (BDG)
    - Subgroup 1.1.4: Pulse oximeter design guidelines (PODG)
    - Subgroup 1.1.5: Cardiovascular design guidelines (CVDG)
    - Subgroup 1.1.6: Activity hub design guidelines (HUBDG)
    - Subgroup 1.1.7: ZigBee design guidelines (ZDG)
    - Subgroup 1.1.8: Glucose meter design guidelines (GLDG)
    - **Subgroup 1.1.9: Bluetooth low energy design guidelines (BLEDG)**
    - Subgroup 1.1.10: Basic electrocardiograph design guidelines (ECGDG)
    - Subgroup 1.1.11: NFC design guidelines (NDG)

- Group 1.2: IEEE 20601 Optimized exchange protocol (OXP)
  - Subgroup 1.2.1: PHD domain information model (DIM)
  - Subgroup 1.2.2: PHD service model (SER)
  - Subgroup 1.2.3: PHD communication model (COM)
- Group 1.3: Devices class specializations (CLASS)
  - Subgroup 1.3.1: Weighing scales (WEG)
  - Subgroup 1.3.2: Glucose meter (GL)
  - Subgroup 1.3.3: Pulse oximeter (PO)
  - Subgroup 1.3.4: Blood pressure monitor (BPM)
  - Subgroup 1.3.5: Thermometer (TH)
  - Subgroup 1.3.6: Cardiovascular (CV)
  - Subgroup 1.3.7: Strength (ST)
  - Subgroup 1.3.8: Activity hub (HUB)
  - Subgroup 1.3.9: Adherence monitor (AM)
  - Subgroup 1.3.10: Insulin pump (IP)
  - Subgroup 1.3.11: Peak flow (PF)
  - Subgroup 1.3.12: Body composition analyser (BCA)
  - Subgroup 1.3.13: Basic electrocardiograph (ECG)
  - Subgroup 1.3.14: International normalized ratio (INR)
  - Subgroup 1.3.15: Sleep apnoea breathing therapy equipment (SABTE)
  - Subgroup 1.3.16: Continuous glucose monitor (CGM)
- Group 1.4: Personal health device transcoding whitepaper (PHDTW)
  - Subgroup 1.4.1: Whitepaper general requirements (GEN)
  - Subgroup 1.4.2: Whitepaper thermometer requirements (TH)
  - Subgroup 1.4.3: Whitepaper blood pressure requirements (BPM)
  - Subgroup 1.4.4: Whitepaper heart rate requirements (HR)
  - Subgroup 1.4.5: Whitepaper glucose meter requirements (GL)
  - Subgroup 1.4.6: Whitepaper weight scale requirements (WS)
  - Subgroup 1.4.7: Whitepaper pulse oximeter requirements (PLX)
  - Subgroup 1.4.8: Whitepaper continuous glucose monitoring requirements (CGM)

– Group 2: Personal Health Gateway (PHG)

- Group 2.1: Transport (TR)
  - Subgroup 2.1.1: Design guidelines: Common (DGC)
  - Subgroup 2.1.2: USB design guidelines (UDG)
  - Subgroup 2.1.3: Bluetooth design guidelines (BDG)
  - Subgroup 2.1.4: Cardiovascular design guidelines (CVDG)
  - Subgroup 2.1.5: Activity hub design guidelines (HUBDG)
  - Subgroup 2.1.6: ZigBee design guidelines (ZDG)
  - Subgroup 2.1.7: Bluetooth low energy design guidelines (BLEDG)
  - Subgroup 2.1.8: NFC design guidelines (NDG)
- Group 2.2: IEEE 20601 Optimized exchange protocol (OXP)

    - Subgroup 2.2.1: General (GEN)
    - Subgroup 2.2.2: PHD domain information model (DIM)
    - Subgroup 2.2.3: PHD service model (SER)
    - Subgroup 2.2.4: PHD communication model (COM)
- 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)
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    - 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 (BLE)
    - TAN: Touch area network (NFC)
    - PAN-LAN-TAN: 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).
- **TP label**: This is the title of the TP.
- **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 are 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 1.1.9: Bluetooth low energy design guidelines (BLEDG)

TP Id		TP/LP-PAN/PHD/TR/BLEDG/BI-000		
TP label		Abnormal cases management – Data exchange before pairing		
Coverage	**Spec**	[b-ITU-T H.810 (2015)]		
	Testable items	Discovery_Pairing BT LE 8; M		
Test purpose		Check that: BLE Personal Health Device (PHD) data (other than service discovery data or capability or service name from the advertising packet) shall not be exchanged with a BLE Personal Health Gateway (PHG) prior to pairing		
Applicability		C_AG_BLE_000		
Other PICS				
Initial condition		The PHD under test and the simulated PHG are in a Standby state and they have not been paired before.		
Test procedure		1. Reset the PHD under test to the default configuration and turn it on. 2. The simulated PHG initiates discovery, it finds the PHD under test, but it does not start the pairing process. 3. The simulated PHG waits until a 2-minute timeout expires. During this time, the PHD under test shall not exchange data (except the service discovery data or capability or service name from the advertising packet) with the simulated PHG.		
Pass/Fail criteria		In step 3, the PHD under test does not exchange data prior to pairing.		
Notes				

TP Id		TP/LP-PAN/PHD/TR/BLEDG/BV-000		
TP label		Discoverability mode service		
Coverage	**Spec**	[b-ITU-T H.810 (2015)]		
	Testable items	Discovery_Pairing BT LE 4; M	Discovery_Pairing BT LE 10; M	
Test purpose		Check that: BLE PHDs shall not be discoverable unless initiated by a user [AND] After a BLE PHD is successfully paired, it shall immediately (e.g. within 1 second) become undiscoverable until made discoverable again by the user.		
Applicability		C_AG_BLE_000		
Other PICS				
Initial condition		The PHD under test and the simulated PHG are in a Standby state and they have not been paired before.		
Test procedure		1. Turn on the PHD under test and configure it as a non- discoverable Bluetooth device. 2. The simulated PHG initiates a discovery process (Scanning state). Check if the simulated		

	PHG finds the PHD under test. 3. Turn on the PHD under test and configure it as a discoverable Bluetooth device (Advertising state). 4. The simulated PHG initiates again a discovery process (Scanning state), it discovers the PHD under test and it completes the pairing process with the PHD under test (Initiating state). 5. The simulated PHG initiates a new discovery process. Check if the PHD under test is discoverable or not.
Pass/Fail criteria	In step 2, the PHD under test shall not be discoverable. In step 5, the PHD under test shall not be discoverable.
Notes	

TP Id		TP/LP-PAN/PHD/TR/BLEDG/BV-001		
TP label		Maximum Discovery service duration		
Coverage	**Spec**	[b-ITU-T H.810 (2015)]		
	Testable items	Discovery_Pairing BT LE 9; R		
Test purpose		Check that: BLE PHD should have a documented maximum duration for discoverable mode whereby after the maximum time, the BLE PHD ceases to be discoverable until put back into that mode by the user		
Applicability		C_AG_BLE_000		
Other PICS				
Initial condition		The PHD under test and the simulated PHG support the same device specialization, they are in a Standby state and they have not been paired before.		
Test procedure		1. Turn on the PHD under test and configure it as a discoverable Bluetooth device (Advertising state). 2. The simulated PHG waits until Twait1 = Tdiscoverable – Tguard 3. The simulated PHG initiates a discovery process (Scanning state). Check that the simulated PHG finds the PHD under test. 4. The simulated PHG waits (from initial time = 0) until Twait2 = Tdiscoverable + Tguard 5. When Twait2 expires, the simulated PHG initiates a new discovery process. Check if the simulated PHG finds the PHD under test.		
Pass/Fail criteria		In step 3, the PHD under test is discoverable. In step 5, the PHD under test should not be discoverable. If it is discoverable, the test tool gives a warning message.		
Notes		Tdiscoverable is defined in PIXIT I_AG_BLEDG_006 Tguard = Tdiscoverable/2		

TP Id		TP/LP-PAN/PHD/TR/BLEDG/BV-002
TP label		Pairing service and delete pairing service
Coverage	**Spec**	[b-ITU-T H.810 (2015)]

	Testable items	Discovery_Pairing BT LE 7; M	Discovery_Pairing BT LE 5; R	Notify BT LE 1; R
Test purpose		Check that: BLE PHD shall support replacing its pairing [AND] BLE PHD should have a way to delete pairings [AND] If supported by the UI, BLE PHD should inform the user that pairing and authentication was successful		
Applicability		C_AG_BLE_000		
Other PICS		C_AG_BLEDG_001		
Initial condition		The PHD under test and the simulated PHG are in a Standby state and they have not been paired before.		
Test procedure		1. Turn on the PHD under test and configure it as a discoverable Bluetooth device (Advertising state). 2. The test tool simulated PHG initiates the discovery process (Scanning state), it discovers the PHD under test and it starts a pairing process with the PHD under test (Initiating state). 3. The simulated PHG initiates a Bluetooth connection with the PHD under test (Connection state). 4. Ask the operator to remove the paired devices in the PHD under test.		
Pass/Fail criteria		In step 2, the PHD finishes the pairing process successfully. In step 2, if PHD supports an UI that provides information about the Bluetooth connection (C_AG_BLEDG_001 = TRUE) and the PHD has not notified the pairing and authentication process, the test tool gives a warning message. In step 4, if the PHD cannot remove the paired devices, the test tool gives a warning message.		
Notes				

TP Id		TP/LP-PAN/PHD/TR/BLEDG/BV-003		
TP label		Storage pairing service		
Coverage	**Spec**	[b-ITU-T H.810 (2015)]		
	Testable items	Discovery_Pairing BT LE 11; M		
Test purpose		Check that: BLE PHDs should store pairing data from at least the most recently paired device such that the data is persistent (e.g. with loss of power, including removal of a battery)		
Applicability		C_AG_BLE_000		
Other PICS		C_AG_BLEDG_001		
Initial condition		The PHD under test and the simulated PHG are in a Standby state and they have not been paired before.		
Test procedure		1. Turn on the PHD under test and configure it as a discoverable Bluetooth device (Advertising state).		

	2. The simulated PHG initiates a discovery process (Scanning state), it finds the PHD under test and it establishes a pairing with the PHD under test (Initiating state). 3. Turn off the PHD under test by removing the batteries or unplugging the power supply. 4. Turn on the PHD under test again (Standby state). 5. The simulated PHG initiates a Bluetooth connection with the PHD under test (Connection state). Check if the pairing process is dispatched again.
Pass/Fail criteria	In step 5, the pairing process should not be dispatched again because both devices should have stored the pairing data from the previous pairing process. If the pairing process is dispatched again then the test tool gives a WARNING message.
Notes	

TP Id		TP/LP-PAN/PHD/TR/BLEDG/BV-004		
TP label		Supported service profiles		
Coverage	**Spec**	[b-ITU-T H.810 (2015)]		
	Testable items	Discovery_Pairing BT LE 14; M		
Test purpose		Check that: BLE PHD's Attribute database shall list all supported LE Services/Profiles claimed in Continua certification documentation		
Applicability		C_AG_BLE_000		
Other PICS		C_AG_BLEDG_001		
Initial condition		The PHD under test and the simulated PHG support the same device specialization, they are in a Standby state and they have not been paired before.		
Test procedure		1. Turn on the PHD under test and configure it as a discoverable Bluetooth device (Advertising state). 2. The simulated PHG initiates a discovery process (Scanning state), it finds the PHD under test. 3. The simulated PHG discovers all the primary services of the PHD under test. 4. The test tool checks the services UUID supported by the PHD under test: • IF the thermometer specialization is going to be certified (C_AG_BLE_001 = TRUE) THEN the health thermometer primary service (UUID 0x1809) shall be supported by the PHD under test. • IF the blood pressure specialization is going to be certified (C_AG_BLE_004 = TRUE) THEN the blood pressure primary service (UUID 0x1810) shall be supported by the PHD under test. • IF the heart rate specialization is going to be certified (C_AG_BLE_015 = TRUE) THEN the heart rate primary service (UUID 0x180D) shall be supported by the PHD under test. • IF the glucose meter specialization is going to be certified (C_AG_BLE_008 = TRUE) THEN the glucose primary service (UUID 0x1808) shall be supported by the PHD under test. • IF the weight scale specialization is going to be certified (C_AG_BLE_018 = TRUE) THEN Weight Scale Primary Service (UUID 0x181D) shall be supported by the PHD under test. a. IF the PHD supports Body Composition Service (C_AG_BLE_019 = TRUE) THEN Body Composition Secondary Service (UUID 0x181B) shall be supported by the PHD under test		

	• IF the pulse oximeter specialization is going to be certified (C_AG_BLE_032 = TRUE) THEN Pulse Oximeter Primary Service (UUID 0x1822) shall be supported by the PHD under test. • IF Continuous Glucose Monitoring specialization is going to be certified (C_AG_BLE_042 = TRUE) THEN CGM Primary Service (UUID 0x181F) shall be supported by the PHD under test.
Pass/Fail criteria	In step 4 the specializations claimed in the Continua certification shall match the services listed by the PHD under test.
Notes (to assist manual testing)	When performing Primary Services (0x2800) discovery (using "Discover All Primary Services" or "Discovery Primary Services by Service UUID" GATT sub-procedures) on the complete attribute handle range of the device, supported primary services UUID declarations shall be included in the response to the sub-procedure. This response to this sub-procedure will be composed of one or more ATT response packets that include one or more handle-value pairs (one for each Primary Service discovered in the specified range) in its attribute data. Each of this handle-value pairs is composed of: • Starting Attribute Handle (2 octets) • Ending Attribute Handle (2 octets) • Primary Service Declaration (2 octets), that will include the Short UUID of the supported Primary Service as seen in the Test Procedure. Additionally, if Weight Scale and Body Composition services are supported, the Body Composition Secondary Service UUID (0x181B) Service Declaration shall be returned when performing a "Find Included Services" GATT sub-procedure on the handle range that contains the Weight Scale Primary Service Declaration.

TP Id		TP/LP-PAN/PHD/TR/BLEDG/BV-005		
TP label		Authentication support service (Secure simple pairing support)		
Coverage	**Spec**	[b-ITU-T H.810 (2015)]		
	Testable items	Authentication BT LE 1; M		
Test purpose		Check that: Continua LP wireless PAN service components shall support at least one of the following Bluetooth 4.0 pairing methods depending on its I/O capabilities and the appropriate security for the service component device type: Just Works or Passkey Entry		
Applicability		C_AG_BLE_000		
Other PICS				
Initial condition		The PHD under test and the simulated PHG are in a Standby state and they have not been paired before.		
Test procedure		1. Check the PHD under test IO capabilities declared in PIXIT I_AG_BLEDG_002, the man in the middle (MITM) protection declared in PIXIT I_AG_BLEDG_003 and the association model declared in PIXIT I_AG_BLEDG_004 a. IF the PHD under test does not support MITM protection (PIXIT I_AG_BLEDG_003 = FALSE) THEN • IF the PHD under test supports the Just Works association model (PIXIT I_AG_BLEDG_004 = 0) THEN the test tool simulated PHG is configured with NoInputOutput capabilities and without man in the middle (MITM) support • IF the PHD under test supports the Passkey Entry association model (PIXIT I_AG_BLEDG_004 = 1) THEN the combination of IO capabilities, association model and MITM support declared by the PHD under test in PIXITs is not feasible and the test case ends by giving a FAIL verdict due to inconsistency		

	among the PHD under test SSP features declared in PIXITs b. IF the PHD under test supports MITM protection (PIXIT I_AG_ BLEDG _003 = TRUE) THEN • IF the PHD under test supports the Just Works association model (PIXIT I_AG_ BLEDG _004 = 0) THEN the combination of IO capabilities, association model and MITM support declared by the PHD under test in PIXITs is not feasible and the test case ends giving a FAIL verdict due to inconsistency among the PHD under test SSP features declared in PIXITs • IF the PHD under test supports the Passkey Entry association model (PIXIT I_AG_ BLEDG_004 = 1) and DisplayOnly capabilities (PIXIT I_AG_ BLEDG_002 = 0) THEN the test tool simulated PHG is configured with KeyboardOnly capabilities (see Note 1) and with MITM support • IF the PHD under test supports the Passkey Entry association model (PIXIT I_AG_ BLEDG _004 = 1) and DisplayYesNo capabilities (PIXIT I_AG_ BLEDG _002 = 1) THEN the test tool simulated PHG is configured with KeyboardOnly capabilities (see Note 1) and with MITM support • IF the PHD under test supports the Passkey Entry association model (PIXIT I_AG_ BLEDG _004 = 1) and KeyboardOnly capabilities (PIXIT I_AG_ BLEDG _002 = 2) THEN the test tool simulated PHG is configured with DisplayOnly capabilities (see Note 2) and with MITM support • IF the PHD under test supports the Passkey Entry association model (PIXIT I_AG_ BLEDG _004 = 1) and NoInputNoOutput capabilities (PIXIT I_AG_ BLEDG _002 = 4) THEN the combination of IO capabilities, association model and MITM support declared by the PHD under test in PIXITs is not feasible and the test case ends by giving a FAIL verdict due to inconsistency among the PHD under test SSP features declared in PIXITs • IF the PHD under test supports the Passkey Entry association model (PIXIT I_AG_ BLEDG _004 = 1) and KeyboardDisplay capabilities (PIXIT I_AG_ BLEDG _002 = 3) THEN the test tool simulated PHG is configured with DisplayOnly capabilities (see Note 2) and with MITM support 2. Turn on the PHD under test and configure it as a discoverable Bluetooth device (Advertising state). 3. The simulated PHG initiates a discovery process (Scanning state), it finds the PHD under test and it establishes a pairing with the PHD under test (Initiating state)
Pass/Fail criteria	In step 3, the pairing process is completed successfully.
Notes	Note 1 – "KeyboardOnly" and "KeyboardDisplay" are both OK. The test tool simulated PHG is configured with "KeyboardOnly". Note 2 – "DisplayOnly", "DisplayYesNo", "KeyboardOnly" and "KeyboardDisplay" are all OK. The test tool simulated PHG is configured with "DisplayOnly".

TP Id		TP/LP-PAN/PHD/TR/BLEDG/BV-006		
TP label		Continua DG Bluetooth LE attribute requirements - System Model		
Coverage	**Spec**	[b-ITU-T H.810 (2015)]		
	Testable items	OEM 1; M	OEM 2;M	
	Spec	[Bluetooth PHDT v1.6]		
	Testable items	Common MDS 2; M	String Conv 2; M	MDS Conv 1;M
Test purpose		Check that: BLE PHDs implement Manufacturer Name String characteristic [AND]		

	BLE PHDs shall set the Manufacturer Name String defined in the Bluetooth SIG Device Information Service to the device original manufacturer's name. If this capability is available, the Manufacturer Name String may be overwritten to the customer facing company's name by the customer facing company [AND] BLE PHDs implement Model Number String characteristic [AND] BLE PHDs shall set Model Number String defined in the Bluetooth SIG Device Information Service to the device original manufacturer's model number. The Model Number String field may be overwritten to the customer facing company's model by the customer facing company
Applicability	C_AG_BLE_000
Other PICS	
Initial condition	The PHD under test and the simulated PHG are in a Standby state.
Test procedure	1. Turn on the PHD under test and configure it as a discoverable Bluetooth device (Advertising state). 2. The simulated PHG initiates a discovery process (Scanning state), it discovers the PHD under test and it starts a pairing process with the PHD under test (Initiating state). 3. The simulated PHG initiates a Bluetooth connection with the PHD under test (Connection state). 4. The test tool checks if the PHD under test implements the model number string Bluetooth characteristic. 5. IF the PHD under test implements the model number string Bluetooth characteristic value THEN a. the simulated PHG reads the model number string Bluetooth characteristic value b. the PHD under test sends the model number string Bluetooth characteristic value 6. The test tool checks if the PHD under test implements manufacturer name string Bluetooth characteristic value. 7. IF the PHD under test implements the manufacturer name string Bluetooth characteristic value THEN a. the simulated PHG reads the manufacturer name string Bluetooth characteristic value b. the PHD under test sends the manufacturer name string Bluetooth characteristic value
Pass/Fail criteria	In step 4, the PHD under test implements the model number string Bluetooth characteristic value In step 5.b, the model number string Bluetooth characteristic value matches with value declared by the vendor in PIXIT I_AG_BLEDG_010 In step 6, the PHD under test implements the manufacturer name string Bluetooth characteristic value In step 5.b, the manufacturer name string Bluetooth characteristic value matches with the value declared by the vendor in PIXIT I_AG_BLEDG_009
Notes	

TP Id		TP/LP-PAN/PHD/TR/BLEDG/BV-007
TP label		Continua DG Bluetooth LE attribute requirements - System ID
Coverage	**Spec**	[b-ITU-T H.810 (2015)]

	Testable items	OEM 3; M	OEM 4;M	OEM 5; M
	Spec	[Bluetooth PHDT v1.6]		
	Testable items	Common MDS 3; M	MDS Conv 4; M	
Test purpose		Check that: BLE PHDs implement System ID characteristic [AND] The OUI part of the System ID field defined in the Bluetooth SIG Device Information Service in a BLE PHD shall remain unchanged from the value set by the original manufacturer [AND] The 40 bit manufacturer defined identifier in the System ID field defined in the Bluetooth SIG Device Information Service of a BLE PHD shall remain unchanged from the value set by the original manufacturer [AND] There shall not be multiple different System-Id values that identify the same BLE PHD		
Applicability		C_AG_BLE_000		
Other PICS				
Initial condition		The PHD under test and the simulated PHG are in a Standby state.		
Test procedure		1. Turn on the PHD under test and configure it as a discoverable Bluetooth device (Advertising state). 2. The simulated PHG initiates a discovery process (Scanning state), it discovers the PHD under test and it starts a pairing process with the PHD under test (Initiating state). 3. The simulated PHG initiates a Bluetooth connection with the PHD under test (Connection state). 4. The test tool checks if the PHD under test implements the system ID Bluetooth characteristic value. 5. IF the PHD under test implements the system ID Bluetooth characteristic value THEN a. the simulated PHG reads the system ID Bluetooth characteristic value b. the PHD under test sends the manufacturer name Bluetooth characteristic value c. Disconnect the PHD under test and connect it again (Standby state). d. the test tool simulated PHG connects the PHD under test (Connection state) and it reads the system ID Bluetooth characteristic e. the PHD under test sends the manufacturer name Bluetooth characteristic value		
Pass/Fail criteria		In step 4, the PHD implements the system ID Bluetooth characteristic value. In step 5.b, the system ID Bluetooth characteristic value matches with the value declared by the vendor in PIXITs I_AG_BLEDG_007 and I_AG_BLEDG_008. In step 5.e, the system ID Bluetooth characteristic value must be the same as the value displayed in step 5.b.		
Notes				

TP Id		TP/LP-PAN/PHD/TR/BLEDG/BV-008
TP label		Continua DG Bluetooth LE attribute requirements - Production Specification
Coverage	**Spec**	[b-ITU-T H.810 (2015)]

	Testable items	OEM 6; M	OEM 7; M	
	Spec	[Bluetooth PHDT v1.6]		
	Testable items	Common MDS 5; M	String Conv 2; M	MDS Conv 6; M
Test purpose		Check that: BLE PHDs implement Serial Number String and Firmware Revision String characteristics [AND] BLE PHDs shall set the Serial Number String defined in the Bluetooth SIG Device Information Service to the serial number of the device. [AND] BLE PHDs that provide a firmware identifier shall set the Firmware Revision String defined in the Bluetooth SIG Device Information Service to the firmware identifier of the device		
Applicability		C_AG_BLE_000		
Other PICS		C_AG_BLEDG_002		
Initial condition		The PHD under test and the simulated PHG are in a Standby state.		
Test procedure		1. Turn on the PHD under test and configure it as a discoverable Bluetooth device (Advertising state). 2. The simulated PHG initiates a discovery process (Scanning state), it discovers the PHD under test and it starts a pairing process with the PHD under test (Initiating state). 3. The simulated PHG initiates a Bluetooth connection with the PHD under test (Connection state). 4. The test tool checks if the PHD under test implements the serial number string Bluetooth characteristic value. 5. IF the PHD under test implements the serial number string Bluetooth characteristic value THEN a. the simulated PHG reads the serial number string Bluetooth characteristic value b. the PHD under test sends the serial number string Bluetooth characteristic value 6. The test tool checks if the PHD under test implements the firmware revision string Bluetooth characteristic value. 7. IF the PHD under test implements the firmware revision string Bluetooth characteristic value THEN a. the simulated PHG reads the firmware revision string Bluetooth characteristic value b. the PHD under test sends the firmware revision string Bluetooth characteristic value		
Pass/Fail criteria		In step 4, the PHD implements the serial number string characteristic value. In step 5.b, the serial number string Bluetooth characteristic value matches with the value declared by the vendor in PIXIT I_AG_BLEDG_011 In step 6, IF PICS C_AG_BLEDG_002 = TRUE THEN the PHD implements the firmware revision string Bluetooth characteristic value. In step 6, IF PICS C_AG_BLEDG_002 = FALSE THEN the PHD does not implement the firmware revision string Bluetooth characteristic value. In step 7.b, the firmware revision string Bluetooth characteristic value matches with the value declared by the vendor in PIXIT I_AG_BLEDG_012		
Notes				

<table>
<tr><td colspan="2">TP Id</td><td colspan="3">TP/LP-PAN/PHD/TR/BLEDG/BV-009</td></tr>
<tr><td colspan="2">TP label</td><td colspan="3">Continua DG Bluetooth LE attribute requirements - Reg-Cert-Data-List</td></tr>
<tr><td rowspan="4">Coverage</td><td>Spec</td><td colspan="3">[b-ITU-T H.810 (2015)]</td></tr>
<tr><td rowspan="2">Testable items</td><td>Cert_Reg 1; M</td><td>Cert_Reg 2; M</td><td>Cert_Reg 3; M</td></tr>
<tr><td>Cert_Reg 4; M</td><td>Cert_Reg 5; M</td><td>Cert_Reg 6; M</td></tr>
<tr><td>Spec</td><td colspan="3">[Bluetooth PHDT v1.6]</td></tr>
<tr><td>Testable items</td><td>Common MDS 14; M</td><td>Regulatory Conv 1; M</td><td></td></tr>
<tr><td colspan="2">Test purpose</td><td colspan="3">Check that:
BLE PHDs shall support and fill the IEEE 11073-20601 Regulatory Certification Data List characteristic defined in the Bluetooth SIG Device Information Service with an MDER encoded version of the IEEE 11073-20601 RegCertDataList data structure
[AND]
All Continua BLE PHDs shall report information on which Certified Device Classes exist on the device. This includes providing information to the BLE PHG component on the transport used (Bluetooth LE) as well as the Profile used
[AND]
All BLE PHDs shall report information on whether or not they are regulated. This is a single Boolean entitled unregulated-device, which is set to 1 if not regulated and 0 if regulated and contained as part of IEEE 11073-20601 Regulatory Certification Data List defined in the Bluetooth SIG Device Information Service</td></tr>
<tr><td colspan="2">Applicability</td><td colspan="3">C_AG_BLE_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 PHD under test and the simulated PHG are in a Standby state.</td></tr>
<tr><td colspan="2">Test procedure</td><td colspan="3">1. Turn on the PHD under test and configure it as a discoverable Bluetooth device.
2. The test tool simulated PHG initiates a discovery process, it discovers the PHD under test and it starts a pairing process with the PHD under test.
3. The test tool simulated PHG initiates a Bluetooth connection with the PHD under test.
4. The test tool checks the characteristics implemented by the PHD under test.
5. The test tool simulated PHG reads the Bluetooth equivalent characteristics "IEEE 11073-20601 Regulatory Certification Data List"
6. The PHD under test sends the "IEEE 11073-20601 Regulatory Certification Data List" Bluetooth equivalent characteristic value and the test tool checks its content:
❑ Element:
• auth-body-and-struc-type:
- auth-body: 02 (hex). auth-body-continua(2)
- auth-body-struc-type: 01 (hex). continua-version-struct(1)
• auth-body-data:
- major-IG-version: 05 (hex)
- minor-IG-version: 00 (hex)
- certified-devices: SEQUENCE {CertifiedDeviceClassEntry: MDC_DEV_SPEC_PROFILE_* - 4096 + TCode x 8192, and TCode=4 (Bluetooth LE)}
❑ Element:</td></tr>
</table>

	• auth-body-and-struc-type: - auth-body: 02 (hex). auth-body-continua(2) - auth-body-struc-type: 02 (hex). continua-reg-struct(2) • auth-body-data: - regulation-bit-field: 00 00 (hex). Regulated device OR 80 00 (hex). Unregulated device
Pass/Fail criteria	In step 4, the PHD implements the "IEEE 11073-20601 Regulatory Certification Data List" characteristic value. In step 6, check that the IEEE 11073-20601 Regulatory Certification Data List characteristic value is as described in the test procedure and: • IF the PHD under test supports the thermometer specialization (C_AG_BLE_001) THEN MDC_DEV_SPEC_PROFILE_* is MDC_DEV_SPEC_PROFILE_TEMP = 4104 and CertifiedDeviceClassEntry = 4104-4096+4*8192 = 32776 • IF the PHD under test supports the blood pressure specialization (C_AG_BLE_004) THEN MDC_DEV_SPEC_PROFILE_* is MDC_DEV_SPEC_PROFILE_BP = 4103 and CertifiedDeviceClassEntry = 4103-4096+4*8192 = 32775 • IF the PHD under test supports the heart rate specialization (C_AG_BLE_015) THEN MDC_DEV_SPEC_PROFILE_* is [MDC_DEV_SPEC_PROFILE_ECG = 4102 and MDC_DEV_SUB_SPEC_PROFILE_HR = 4237] and CertifiedDeviceClassEntry = [(4102-4096+4*8192 = 32774) and (4237-4096+4*8192 = 32909)] • IF the PHD under test supports the glucose specialization (C_AG_BLE_008) THEN MDC_DEV_SPEC_PROFILE_* is MDC_DEV_SPEC_PROFILE_GLUCOSE = 4113 and CertifiedDeviceClassEntry = 4113-4096+4*8192 = 32785] • IF the PHD under test supports Weight Scale specialization (C_AG_BLE_018 = TRUE and C_AG_BLE_019 = FALSE) THEN MDC_DEV_SPEC_PROFILE_* is MDC_DEV_SPEC_PROFILE_SCALE = 4111 and CertifiedDeviceClassEntry = 4111-4096+4*8192 = 32783 • IF the PHD under test supports Body Composition specialization (C_AG_BLE_018 = TRUE and C_AG_BLE_019 = TRUE) THEN MDC_DEV_SPEC_PROFILE_* is MDC_DEV_SPEC_PROFILE_BCA = 4116 and CertifiedDeviceClassEntry = 4116-4096+4*8192 = 32788 • IF the PHD under test supports Pulse Oximeter specialization (C_AG_BLE_032 = TRUE) THEN MDC_DEV_SPEC_PROFILE_* is MDC_DEV_SPEC_PROFILE_PULS_OXIM = 4100 and CertifiedDeviceClassEntry = 4100-4096+4*8192 = 32772 • IF the PHD under test supports Continuous Glucose Monitoring specialization (C_AG_BLE_042 = TRUE) THEN MDC_DEV_SPEC_PROFILE_* is MDC_DEV_SPEC_PROFILE_CGM = 4106 and CertifiedDeviceClassEntry = 4106-4096+4*8192 = 32778
Notes (to assist manual testing)	To read IEEE 11073-20601 Regulatory Certification Data List characteristic (0x2A2A), Master must discover the characteristic (using “Discover All Characteristics of a Service” or “Discover Characteristics by UUID” GATT sub-procedures on the handle range of the required Service), and then read its value (using “Read Characteristic Value” GATT sub-procedure). The response to the Read Request will be an ATT packet including Registration Certificate Data as the stored attribute type. Its value will be composed of the following elements: • Regulatory Certification Data List Count: 2 octets (0x0002) • Regulatory Certification Data List Length: 2 octets • Authorization body: 1 octet (0x02) • Authorization Body Structure Type: 1 octet (0x01) • Authorization Body Structure Length: 2 octets • Major IG Version: 1 octet (0x05) • Minor IG Version: 1 octet (0x01) • Certified Device Class List Count: 2 octets

	• Certified Device Class List Length: 2 octets • (1 or more) Certified Device Class Entry: 2 octets. ▪ If PHD under test supports Thermometer specialization: 0x8008 ▪ If PHD under test supports Blood Pressure specialization: 0x8007 ▪ If PHD under test supports Heart Rate specialization: 0x8006 (ECG specialization) AND 0x808D (Heart Rate profile) ▪ If PHD under test supports Glucose specialization: 0x8011 ▪ If PHD under test supports Weight Scale specialization: 0x800F ▪ If PHD under test supports Body Composition specialization: 0x8014 ▪ If PHD under test supports Pulse Oximeter specialization: 0x8004 • Continua Regulatory Structure: 2 octets (0x0202) • Continua Regulatory Structure Length: 2 octets (0x0002) • Regulation Bit Field Type: 2 octets (0x0000 or 0x8000)

TP Id		TP/LP-PAN/PHD/TR/BLEDG/BV-010		
TP label		Measurement time stamp and Date Time characteristic		
Coverage	**Spec**	[b-ITU-T H.810 (2015)]		
	Testable items	Date_Time 1; M		
	Spec	[Bluetooth PHDT v1.6]		
	Testable items	MDS Conv 9; M	HR Specific MDS 6; M	
Test purpose		Check that: If BLE PHD reports the Time Stamp in measurements then it should support the Current Time Service.		
Applicability		C_AG_BLE_000 AND (C_AG_BLE_001 OR C_AG_BLE_004 OR C_AG_BLE_008 OR C_AG_BLE_018 OR C_AG_BLE_032)		
Other PICS		C_AG_BLE_002, C_AG_BLE_003, C_AG_BLE_005, C_AG_BLE_019, C_AG_BLE_020, C_AG_BLE_025, C_AG_BLE_030, C_AG_BLE_035		
Initial condition		The PHD under test and the simulated PHG are in a Standby state.		
Test procedure		1. Turn on the PHD under test and configure it as a discoverable Bluetooth device (Advertising state). 2. The simulated PHG initiates a discovery process (Scanning state), it discovers the PHD under test and it starts a pairing process with the PHD under test (Initiating state). 3. The simulated PHG initiates a Bluetooth connection with the PHD under test (Connection state). 4. The PHD under test sends a measurement to the simulated PHG a. IF the PHD under test sends a thermometer measurement with a time stamp THEN: a.1 IF PICS C_AG_BLE_030 = TRUE, the test tool checks if the PHD under test supports Current Time Service a.2 IF PICS C_AG_BLE_002 = TRUE, Test Tool checks if the PHD under test implements Date Time characteristic inside the Thermometer service b. IF the PHD under test sends a blood pressure measurement with a time stamp THEN:		

	b.1 IF PICS C_AG_BLE_030 = TRUE, the test tool checks if the PHD under test supports Current Time Service b.2 IF PICS C_AG_BLE_002 = TRUE, Test Tool checks if the PHD under test implements Date Time characteristic inside the Blood Pressure service c. IF the PHD under test sends a glucose measurement with a Base Time THEN: c.1 IF PICS C_AG_BLE_030 = TRUE, the test tool checks if the PHD under test supports Current Time Service c.2 IF PICS C_AG_BLE_002 = TRUE, Test Tool checks if the PHD under test implements Date Time characteristic inside the Glucose service d. IF the PHD under test sends a Weight measurement with Time Stamp THEN Test Tool checks if the PHD under test supports Current Time Service e. IF the PHD under test sends a Body Composition measurement with Time Stamp THEN Test Tool checks if the PHD under test supports Current Time Service f. IF the PHD under test sends a Pulse Oximeter measurement with Time Stamp THEN Test Tool checks if the PHD under test supports Current Time Service
Pass/Fail criteria	In Step 4.a.1, the PHD supports Current Time Service and PICS C_AG_BLE_003 = TRUE In Step 4.a.2, the PHD implements Date Time characteristic inside the Thermometer service and PICS C_AG_BLE_003 = TRUE In Step 4.b.1, the PHD supports Current Time Service and PICS C_AG_BLE_004 = TRUE In Step 4.b.2, the PHD implements Date Time characteristic inside the Blood Pressure service and PICS C_AG_BLE_004 = TRUE In Step 4.c.1, the PHD supports Current Time Service In Step 4.c.2, the PHD implements Date Time characteristic inside the Glucose service In Step 4.d, the PHD supports Current Time Service and PICS C_AG_BLE_020 = TRUE In Step 4.e, the PHD supports Current Time Service and PICS C_AG_BLE_025 = TRUE In Step 4.f, the PHD supports Current Time Service and PICS C_AG_BLE_035 = TRUE
Notes (to assist manual testing)	Once enabled indications/notifications for the appropriate characteristic, the PHD under test will send the measurement. Check that a Timestamp field is present in the received measurement. If a Timestamp field is included check in services discovery that Current Time Service (0x1805) is present

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