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Second edition
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Health informatics — Device interoperability —

Part 10408: Personal health device communication — Device specialization — Thermometer

Informatique de santé — Interopérabilité des dispositifs —

Partie 10408: Communication entre dispositifs de santé personnels — Spécialisation des dispositifs — Thermomètre

Reference number
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Institute of Electrical and Electronics Engineers, Inc
3 Park Avenue, New York
NY 10016-5997, USA

Email: stds.ipr@ieee.org
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IEEE Std 11073-10408™-2019
(Revision of IEEE Std 11073-10408-2008)

Health informatics—Personal health device communication

Part 10408: Device specialization—Thermometer

Developed by the

IEEE 11073™ Standards Committee
of the
IEEE Engineering in Medicine and Biology Society

Approved 7 November 2019

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Abstract: Within the context of the ISO/IEEE 11073 family of standards for device communication, this standard establishes a normative definition of communication between personal telehealth thermometer devices and compute engines (e.g., cell phones, personal computers, personal health appliances, and set top boxes) in a manner that enables plug-and-play interoperability. It leverages appropriate portions of existing standards including ISO/IEEE 11073 terminology, information models, application profile standards, and transport standards. It specifies the use of specific term codes, formats, and behaviors in telehealth environments restricting optionality in base frameworks in favor of interoperability. This standard defines a common core of communication functionality for personal telehealth thermometer devices.

Keywords: IEEE 11073-10408™, medical device communication, personal health devices, thermometer

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Michael J. Kirwan, *Co-chair*

Karsten Aalders
Charles R. Abbruscato
Nabil Abujbara
Maher Abuzaid
James Agnew
Haidar Ahmad
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Serafin Arroyo
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Sunlee Bang
M. Jonathan Barkley
Gilberto Barrón
David Bean
John Bell
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Thomas Bluethner
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Julius Broma
Lyle G. Bullock, Jr.
Bernard Burg
Chris Burns
Anthony Butt
Jeremy Byford-Rew
Satya Calloji
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Carole C. Carey
Craig Carlson
Santiago Carot-Nemesio
Randy W. Carroll
Simon Carter
Seungchul Chae
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James Cheng
Peggy Chien
David Chiu
Jinyong Choi
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Saeed A. Choudhary
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John T. Collins
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Todd H. Cooper
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Allen Curtis
Ndifor Cyril Fru
Jesús Daniel Trigo
Eyal Dassau
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Sushil K. Deka
Ciro de la Vega
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Jim Dello Stritto
Matthew d'Entremont
Kent Dicks
Hyoungho Do
Alistair Donaldson
Xiaolian Duan
Brian Dubreuil
Sourav Dutta
Jakob Ehrensvard
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Robert Hall
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Nathaniel Hamming
Rickey L. Hampton
Sten Hanke
Aki Harma
Jordan Hartmann
Kai Hassing
Wolfgang Heck
Nathaniel Heintzman
Charles Henderson
Jun-Ho Her
Helen B. Hernandez
Takashi Hibino
Timothy L. Hirou
Allen Hobbs
Alex Holland
Arto Holopainen
Kris Holtzclaw
Xinyi Hong
Robert Hoy
Frank Hsu
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Sen-Der Huang
Ron Huby
David Hughes
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Ralph Kent
Laurie M. Kermes
Ikuo Keshi
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Introduction

This introduction is not part of IEEE Std 11073-10408-2019, Health informatics—Personal health device communication—Part 10408: Device specialization—Thermometer.

ISO/IEEE 11073 standards enable communication between medical devices and external computer systems. This document uses the optimized framework created in IEEE Std 11073-20601[a] and describes a specific, interoperable communication approach for thermometers. These standards align with and draw on the existing clinically focused standards to provide support for communication of data from clinical or personal health devices.

[a] Information on references can be found in Clause 2.

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Health informatics—Personal health device communication

Part 10408: Device specialization—Thermometer

1. Overview

1.1 Scope

Within the context of the ISO/IEEE 11073 family of standards for device communication, this standard establishes a normative definition of communication between personal telehealth thermometer devices and compute engines (e.g., cell phones, personal computers, personal health appliances, and set top boxes) in a manner that enables plug-and-play interoperability. It leverages appropriate portions of existing standards, including ISO/IEEE 11073 terminology, information models, application profile standards, and transport standards. It specifies the use of specific term codes, formats, and behaviors in telehealth environments restricting optionality in base frameworks in favor of interoperability. This standard defines a common core of communication functionality for personal telehealth thermometers.

1.2 Purpose

This standard addresses a need for an openly defined, independent standard for controlling information exchange to and from personal health devices and compute engines (e.g., cell phones, personal computers, personal health appliances, and set top boxes). Interoperability is the key to growing the potential market for these devices and to enabling people to be better informed participants in the management of their health.

1.3 Context

See IEEE Std 11073-20601™ for an overview of the environment within which this standard is written.[1]

This document, IEEE Std 11073-10408, defines the device specialization for the thermometer, being a specific agent type, and it provides a description of the device concepts, its capabilities, and its implementation according to this standard.

This standard is based on IEEE Std 11073-20601, which in turn draws information from both ISO/IEEE 11073-10201:2004 [B6] and ISO/IEEE 11073-20101:2004 [B7].[2] The medical device encoding rules (MDERs) used within this standard are fully described in IEEE Std 11073-20601.

[1] Information on normative references can be found in Clause 2.
[2] The numbers in brackets correspond to the numbers of the bibliography in Annex A.

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This standard defines specialized nomenclature codes that will be collected in future versions of IEEE Std 11073-10101. Between this standard, IEEE Std 11073-10101, IEEE Std 11073-20601, and IEEE Std 11073-104zz, all required nomenclature codes for implementation are documented. New codes may be defined in newer versions/revisions of each of these documents. In the case of a conflict, where one term code has been assigned to two separate semantic concepts with different RefIDs, in general the oldest definition that is in actual use should take precedence. The same policy applies when one RefID has two different code values assigned in different specifications. The resolution of such conflicts will be determined through joint action by the responsible working groups and other stakeholders, and any corrective action published as corrigenda.

NOTE—In this standard, the term *IEEE Std 11073-104zz* is used to refer to the collection of device specialization standards that utilize IEEE Std 11073-20601, where zz can be any number from 01 to 99, inclusive.[3]

1.4 Word usage

The word *shall* indicates mandatory requirements strictly to be followed in order to conform to the standard and from which no deviation is permitted (shall equals is required to).[4,5]

The word *should* indicates that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required (should equals is recommended that).

The word *may* is used to indicate a course of action permissible within the limits of the standard (may equals is permitted to).

The word *can* is used for statements of possibility and capability, whether material, physical, or causal (can equals is able to).

2. Normative references

The following referenced documents are indispensable for the application of this document (i.e., they must be understood and used, so that each referenced document is cited in text and its relationship to this document is explained). For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments or corrigenda) applies.

IEEE Std 11073-20601™, Health informatics—Personal health device communication—Part 20601: Application profile—Optimized Exchange Protocol.[6,7]

IEEE Std 11073-10101™, Health informatics—Point-of-care medical device communication—Part 10101: Nomenclature.

[3] Notes in text, tables, and figures are given for information only and do not contain requirements needed to implement the standard.
[4] The use of the word *must* is deprecated and cannot be used when stating mandatory requirements; *must* is used only to describe unavoidable situations.
[5] The use of *will* is deprecated and cannot be used when stating mandatory requirements; *will* is used only in statements of fact.
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3. Definitions, acronyms, and abbreviations

3.1 Definitions

For the purposes of this standard, the following terms and definitions apply. The *IEEE Standards Dictionary Online* should be referenced for terms not defined in this clause.[8]

agent: A node that collects and transmits personal health data to an associated manager.

body temperature: The measurement of the core body temperature of the person.

class: In object-oriented modeling, it describes the attributes, methods, and events that objects instantiated from the class utilize.

compute engine: *See:* **manager.**

device: A physical device implementing either an agent or a manager role.

extremity body temperature: The measurement of the temperature at the extremities of the body of the person, such as finger or toe.

handle: An unsigned 16-bit number that is locally unique and identifies one of the object instances within an agent.

manager: A node receiving data from one or more agent systems. Examples of managers include a cellular phone, health appliance, set top box, or a computer system.

obj-handle: *See:* **handle.**

object: A unit that represents some functionality or item in a device whose properties are described by attributes.

personal health device: A device used in personal health applications.

personal telehealth device: *See:* **personal health device.**

3.2 Acronyms and abbreviations

APDU	application protocol data unit
ASN.1	Abstract Syntax Notation One
DIM	domain information model
EUI-64	extended unique identifier (64 bits)
ICS	implementation conformance statement
MDC	medical device communication
MDER	medical device encoding rules
MDS	medical device system
MOC	managed object class
PDU	protocol data unit
PHD	personal health device
RT-SA	real-time sample array
VMO	virtual medical object
VMS	virtual medical system

[8] *IEEE Standards Dictionary Online* is available at http://dictionary.ieee.org.

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