

INTERNATIONAL STANDARD

ISO/IEEE 11073-10441

First edition
2015-03-01

Health informatics — Personal health device communication —

Part 10441: Device specialization — Cardiovascular fitness and activity monitor

Informatique de santé — Communication entre dispositifs de santé personnels —

Partie 10441: Spécialisation des dispositifs — Moniteur d'activité et de forme cardiovasculaire

get full document from standards.iteh.ai



Reference number
ISO/IEEE 11073-10441:2015(E)

© IEEE 2013

Sample Document

get full document from standards.iteh.ai



COPYRIGHT PROTECTED DOCUMENT

© IEEE 2013

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO or IEEE at the respective address below.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Institute of Electrical and Electronics Engineers, Inc.
3 Park Avenue, New York • NY 10016-5997, USA
E-mail stds.ipr@ieee.org
Web www.ieee.org

Published in Switzerland

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

IEEE Standards documents are developed within the IEEE Societies and the Standards Coordinating Committees of the IEEE Standards Association (IEEE-SA) Standards Board. The IEEE develops its standards through a consensus development process, approved by the American National Standards Institute, which brings together volunteers representing varied viewpoints and interests to achieve the final product. Volunteers are not necessarily members of the Institute and serve without compensation. While the IEEE administers the process and establishes rules to promote fairness in the consensus development process, the IEEE does not independently evaluate, test, or verify the accuracy of any of the information contained in its standards.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is called to the possibility that implementation of this standard may require the use of subject matter covered by patent rights. By publication of this standard, no position is taken with respect to the existence or validity of any patent rights in connection therewith. ISO/IEEE is not responsible for identifying essential patents or patent claims for which a license may be required, for conducting inquiries into the legal validity or scope of patents or patent claims or determining whether any licensing terms or conditions provided in connection with submission of a Letter of Assurance or a Patent Statement and Licensing Declaration Form, if any, or in any licensing agreements are reasonable or non-discriminatory. Users of this standard are expressly advised that determination of the validity of any patent rights, and the risk of infringement of such rights, is entirely their own responsibility. Further information may be obtained from ISO or the IEEE Standards Association.

ISO/IEEE 11073-10441 was prepared by the 11073 Committee of the Engineering in Medicine and Biology Society of the IEEE (as IEEE 11073-10441-2013). It was adopted by Technical Committee ISO/TC 215, *Health informatics*, in parallel with its approval by the ISO member bodies, under the “fast-track procedure” defined in the Partner Standards Development Organization cooperation agreement between ISO and IEEE. IEEE is responsible for the maintenance of this document with participation and input from ISO member bodies.

ISO/IEEE 11073 consists of the following parts, under the general title *Health informatics — Personal health device communication* (text in parentheses gives a variant of subtitle):

- *Part 00103: Overview*
- *Part 10101: (Point-of-care medical device communication) Nomenclature*
- *Part 10102: (Point-of-care medical device communication) Nomenclature — Annotated ECG*
- *Part 10103: (Point-of-care medical device communication) — Nomenclature — Implantable device, cardiac*
- *Part 10201: (Point-of-care medical device communication) Domain information model*
- *Part 10404: Device specialization — Pulse oximeter*

- *Part 10406: Device specialization — Basic electrocardiograph (ECG) (1- to 3-lead ECG)*
- *Part 10407: Device specialization — Blood pressure monitor*
- *Part 10408: Device specialization — Thermometer*
- *Part 10415: Device specialization — Weighing scale*
- *Part 10417: Device specialization — Glucose meter*
- *Part 10418: Device specialization — International Normalized Ratio (INR) monitor*
- *Part 10420: Device specialization — Body composition analyzer*
- *Part 10421: Device specialization — Peak expiratory flow monitor (peak flow)*
- *Part 10441: Device specialization — Cardiovascular fitness and activity monitor*
- *Part 10442: (Point-of-care medical device communication) Device specialization — Strength fitness equipment*
- *Part 10471: Device specialization — Independent living activity hub*
- *Part 10472: Device specialization — Medication monitor*
- *Part 20101: (Point-of-care medical device communication) Application profiles — Base standard*
- *Part 20601: Application profile — Optimized exchange protocol*
- *Part 30200: (Point-of-care medical device communication) Transport profile — Cable connected*
- *Part 30300: (Point-of-care medical device communication) Transport profile — Infrared wireless*
- *Part 30400: (Point-of-care medical device communication) Interface profile — Cabled Ethernet*
- *Part 90101: (Point-of-care medical device communication) Analytical instruments — Point-of-care test*
- *Part 91064: (Standard communication protocol) Computer-assisted electrocardiography*
- *Part 92001: (Medical waveform format) — Encoding rules*

Health Informatics—Personal health device communication

Part 10441: Device specialization— Cardiovascular fitness and activity monitor

Sample Document

IEEE Engineering in Medicine and Biology Society

Sponsored by the
IEEE 11073™ Standards Committee

IEEE
3 Park Avenue
New York, NY 10016-5997
USA

IEEE Std 11073-10441™-2013
(Revision of
IEEE Std 11073-10441-2008)

29 March 2013

Sample Document

get full document from standards.iteh.ai

Health informatics—Personal health device communication

Part 10441: Device specialization— Cardiovascular fitness and activity monitor

Sample Document

Sponsor

IEEE 11073™ Standards Committee

of the

IEEE Engineering in Medicine and Biology Society

Approved 6 February 2013

IEEE-SA Standards Board

Abstract: Within the context of the ISO/IEEE 11073 family of standards for device communication, a normative definition of communication between personal telehealth cardiovascular fitness and activity monitor devices and managers (e.g., cell phones, personal computers, personal health appliances, and set top boxes) is established in this standard in a manner that enables plug-and-play interoperability. Appropriate portions of existing standards are leveraged including ISO/IEEE 11073 terminology, information models, application profile standards, and transport standards. The use of specific term codes, formats, and behaviors in telehealth environments restricting optionality in base frameworks in favor of interoperability is specified. A common core of communication functionality for personal telehealth cardiovascular fitness and activity monitor devices is defined in this standard.

Keywords: activity monitor, cardiovascular fitness, IEEE 11073-10441™, medical device communication, personal health devices

Sample Document

get full document from standards.iteh.ai

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

Copyright © 2013 by The Institute of Electrical and Electronics Engineers, Inc.
All rights reserved. Published 29 March 2013. Printed in the United States of America.

IEEE is a registered trademark in the U.S. Patent & Trademark Office, owned by The Institute of Electrical and Electronics Engineers, Incorporated.

PDF: ISBN 978-0-7381-8267-4 **STD98161**
Print: ISBN 978-0-7381-8268-1 **STDPD98161**

IEEE prohibits discrimination, harassment, and bullying. For more information, visit <http://www.ieee.org/web/aboutus/whatis/policies/p9-26.html>.
No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, without the prior written permission of the publisher.

Notice and Disclaimer of Liability Concerning the Use of IEEE Documents: IEEE Standards documents are developed within the IEEE Societies and the Standards Coordinating Committees of the IEEE Standards Association (IEEE-SA) Standards Board. IEEE develops its standards through a consensus development process, approved by the American National Standards Institute, which brings together volunteers representing varied viewpoints and interests to achieve the final product. Volunteers are not necessarily members of the Institute and serve without compensation. While IEEE administers the process and establishes rules to promote fairness in the consensus development process, IEEE does not independently evaluate, test, or verify the accuracy of any of the information or the soundness of any judgments contained in its standards.

Use of an IEEE Standard is wholly voluntary. IEEE disclaims liability for any personal injury, property or other damage, of any nature whatsoever, whether special, indirect, consequential, or compensatory, directly or indirectly resulting from the publication, use of, or reliance upon any IEEE Standard document.

IEEE does not warrant or represent the accuracy or content of the material contained in its standards, and expressly disclaims any express or implied warranty, including any implied warranty of merchantability or fitness for a specific purpose, or that the use of the material contained in its standards is free from patent infringement. IEEE Standards documents are supplied "AS IS."

The existence of an IEEE Standard does not imply that there are no other ways to produce, test, measure, purchase, market, or provide other goods and services related to the scope of the IEEE standard. Furthermore, the viewpoint expressed at the time a standard is approved and issued is subject to change brought about through developments in the state of the art and comments received from users of the standard. Every IEEE standard is subjected to review at least every ten years. When a document is more than ten years old and has not undergone a revision process, it is reasonable to conclude that its contents, although still of some value, do not wholly reflect the present state of the art. Users are cautioned to check to determine that they have the latest edition of any IEEE standard.

In publishing and making its standards available, IEEE is not suggesting or rendering professional or other services for, or on behalf of, any person or entity. Nor is IEEE undertaking to perform any duty owed by any other person or entity to another. Any person utilizing any IEEE Standards document, should rely upon his or her own independent judgment in the exercise of reasonable care in any given circumstances or, as appropriate, seek the advice of a competent professional in determining the appropriateness of a given IEEE standard.

Translations: The IEEE consensus development process involves the review of documents in English only. In the event that an IEEE standard is translated, only the English version published by IEEE should be considered the approved IEEE standard.

Official Statements: A statement, written or oral, that is not processed in accordance with the IEEE-SA Standards Board Operations Manual shall not be considered the official position of IEEE or any of its committees and shall not be considered to be, nor be relied upon as, a formal position of IEEE. At lectures, symposia, seminars, or educational courses, an individual presenting information on IEEE standards shall make it clear that his or her views should be considered the personal views of that individual rather than the formal position of IEEE.

Comments on Standards: Comments for revision of IEEE Standards documents are welcome from any interested party, regardless of membership affiliation with IEEE. However, IEEE does not provide consulting information or advice pertaining to IEEE Standards documents. Suggestions for changes in documents should be in the form of a proposed change of text, together with appropriate supporting comments. Since IEEE standards represent a consensus of concerned interests, it is important to ensure that any responses to comments and questions also receive the concurrence of a balance of interests. For this reason, IEEE and the members of its societies and Standards Coordinating Committees are not able to provide an instant response to comments or questions except in those cases where the matter has previously been addressed. Any person who would like to participate in evaluating comments or revisions to an IEEE standard is welcome to join the relevant IEEE working group at <http://standards.ieee.org/develop/wg/>.

Comments on standards should be submitted to the following address:

Secretary, IEEE-SA Standards Board
445 Hoes Lane
Piscataway, NJ 08854-4141
USA

Photocopies: Authorization to photocopy portions of any individual standard for internal or personal use is granted by The Institute of Electrical and Electronics Engineers, Inc., provided that the appropriate fee is paid to Copyright Clearance Center. To arrange for payment of licensing fee, please contact Copyright Clearance Center, Customer Service, 222 Rosewood Drive, Danvers, MA 01923 USA; +1 978 750 8400. Permission to photocopy portions of any individual standard for educational classroom use can also be obtained through the Copyright Clearance Center.

Notice to users

Laws and regulations

Users of IEEE Standards documents should consult all applicable laws and regulations. Compliance with the provisions of any IEEE Standards document does not imply compliance to any applicable regulatory requirements. Implementers of the standard are responsible for observing or referring to the applicable regulatory requirements. IEEE does not, by the publication of its standards, intend to urge action that is not in compliance with applicable laws, and these documents may not be construed as doing so.

Copyrights

This document is copyrighted by the IEEE. It is made available for a wide variety of both public and private uses. These include both use, by reference, in laws and regulations, and use in private self-regulation, standardization, and the promotion of engineering practices and methods. By making this document available for use and adoption by public authorities and private users, the IEEE does not waive any rights in copyright to this document.

Updating of IEEE documents

Users of IEEE Standards documents should be aware that these documents may be superseded at any time by the issuance of new editions or may be amended from time to time through the issuance of amendments, corrigenda, or errata. An official IEEE document at any point in time consists of the current edition of the document together with any amendments, corrigenda, or errata then in effect. In order to determine whether a given document is the current edition and whether it has been amended through the issuance of amendments, corrigenda, or errata, visit the IEEE-SA Website at <http://standards.ieee.org/index.html> or contact the IEEE at the address listed previously. For more information about the IEEE Standards Association or the IEEE standards development process, visit IEEE-SA Website at <http://standards.ieee.org/index.html>.

Errata

Errata, if any, for this and all other standards can be accessed at the following URL: <http://standards.ieee.org/findstds/errata/index.html>. Users are encouraged to check this URL for errata periodically.

Patents

Attention is called to the possibility that implementation of this standard may require use of subject matter covered by patent rights. By publication of this standard, no position is taken by the IEEE with respect to the existence or validity of any patent rights in connection therewith. If a patent holder or patent applicant has filed a statement of assurance via an Accepted Letter of Assurance, then the statement is listed on the IEEE-SA Website at <http://standards.ieee.org/about/sasb/patcom/patents.html>. Letters of Assurance may indicate whether the Submitter is willing or unwilling to grant licenses under patent rights without compensation or under reasonable rates, with reasonable terms and conditions that are demonstrably free of any unfair discrimination to applicants desiring to obtain such licenses.

Essential Patent Claims may exist for which a Letter of Assurance has not been received. The IEEE is not responsible for identifying Essential Patent Claims for which a license may be required, for conducting inquiries into the legal validity or scope of Patents Claims, or determining whether any licensing terms or conditions provided in connection with submission of a Letter of Assurance, if any, or in any licensing agreements are reasonable or non-discriminatory. Users of this standard are expressly advised that determination of the validity of any patent rights, and the risk of infringement of such rights, is entirely their own responsibility. Further information may be obtained from the IEEE Standards Association.

Sample Document

get full document from standards.iteh.ai

Participants

At the time this standard was submitted to the IEEE-SA Standards Board for approval, the Personal Health Devices Working Group had the following membership:

Daidi Zhong, *Chair* **Michael J. Kirwan, *Chair***
Bernard Burg, *Vice Chair*

Charles R. Abbruscato
Nabil Abujbara
Maher Abuzaid
Manfred Aigner
Jorge Alberola
Karsten Alders
Murtaza Ali
Prasad Alva
Rolf Ambuehl
David Aparisi
Lawrence Arne
Serafin Arroyo
Muhammad Asim
Merat Bagha
Doug Baird
David Baker
Anindya Bakshi
Ananth Balasubramanian
Sunlee Bang
M. Jonathan. Barkley
Gilberto Barrón
David Bean
John Bell
Rudy Belliardi
Kathryn M. Bennett
Daniel Bernstein
George A. Bertos
Ola Björsne
Thomas Blackadar
Marc Blanchet
Thomas Bluethner
Douglas P. Bogia
Xavier Boniface
Shannon Boucousis
Kevin Braun
Julius Broma
Lyle G. Bullock, Jr.
Chris Burns
Anthony Butt
Jeremy Byford-Rew
Satya Calloji
Carole C. Carey
Santiago Carot-Nemesio
Randy W. Carroll
Seungchul Chae
Rahul Chauhan
James Cheng
Peggy Chien
Silviu Chiricescu
Chia-Chin Chong
Saeed A. Choudhary
Jinhan Chung

Malcolm Clarke
John A. Cogan
John T. Collins
Cory Condek
Todd H. Cooper
David Cornejo
Douglas Coup
Nigel Cox
Tomio Crosley
Allen Curtis
Jesús Daniel Trigo
Eyal Dassau
Russell Davis
Ed Day
Sushil K. Dekka
Pedro de-las-Heras-Quiros
Jim DelloStritto
Matthew d'Entremont
Kent Dicks
Hyoungcho Do
Xiaolian Duan
Brian Dubreuil
Jakob Ehrensvar
Fredrik Einberg
Roger M. Ellingson
Michihiro Enokida
Javier Escayola Calvo
Leonardo Estevez
Roger Feeley
Bosco T. Fernandes
Christoph Fischer
Morten Flintrup
Joseph W. Forler
Michael Fortner
Russell Foster
Eric Freudenthal
Matthias Frohner
Ken Fuchs
Jing Gao
Marcus Garbe
Gracinda García Lago
John Garguilo
Rick Geimer
Igor Gejdos
Ferenc Gerbovics
Nicolae Goga
Julian Goldman
Raul Gonzalez Gomez
Chris Gough
Channa Gowda
Niclas Granqvist
Charles Gropper

Amit Gupta
Jeff Guttmacher
Rasmus Haahr
Christian Habermann
Michael Hagerty
Jerry Hahn
Robert Hall
Nathaniel Hamming
Rickey L. Hampton
Sten Hanke
Kai Hassing
Marc Daniel Haunschild
Charles Henderson
Jun-Ho Her
Takashi Hibino
Timothy L. Hirou
Allen Hobbs
Alex Holland
Arto Holopainen
Robert Hoy
Frank Hsu
Anne Huang
Sen-Der Huang
Ron Huby
Robert D. Hughes
David Hughes
Jiyoung Huh
Hugh Hunter
Hitoshi Ikeda
Yutaka Ikeda
Philip O. Isaacson
Atsushi Ito
Praduman Jain
Danny Jochelson
Chris Johnson
Phaneeth Junga
Akiyoshi Kabe
Steve Kahle
Tomio Kamioka
Kei Kariya
Andy Kaschl
Junzo Kashiwara
Kohichi Kashiwagi
Ralph Kent
Laurie M. Kermes
Ikuo Keshi
Junhyung Kim
Min-Joon Kim
Minho Kim
Taekon Kim
Tetsuya Kimura
Alfred Kloos

Jeongmee Koh
 Jean-Marc Koller
 Patty Krantz
 Alexander Kraus
 Ramesh Krishna
 Falko Kuester
 Rafael Lajara
 Pierre Landau
 Jaechul Lee
 Kyong Ho Lee
 Rami Lee
 Sungkee Lee
 Woojae Lee
 Yonghee Lee
 Joe Lenart
 Kathryn A. Lesh
 Qiong Li
 Patrick Lichter
 Jisoon Lim
 Joon-Ho Lim
 John Lin
 Wei-Jung Lo
 Charles Lowe
 Don Ludolph
 Bob MacWilliams
 Sandra Martinez
 Miguel Martínez de Espronceda
 Cámara
 Peter Mayhew
 Jim McCain
 Richard McPartland
 Chris Mcvay
 László Meleg
 Ethan Metsger
 Jinsei Miyazaki
 Darr Moore
 Piotr Murawski
 Soundharya Nagasubramanian
 Jae-Wook Nah
 Alex Neefus
 Trong-Nghia Nguyen-Dobinsky
 Michael E. Nidd
 Tetsu Nishimura
 Jim Niswander
 Hiroaki Niwamoto
 Thomas Norgall
 Yoshiteru Nozoe
 Brett Olive
 Begonya Otal
 Charles Palmer
 Bud Panjwani

Carl Pantiskas
 Mikey Paradis
 Hanna Park
 Jong-Tae Park
 Myungeun Park
 Soojun Park
 Phillip E. Pash
 TongBi Pei
 Soren Petersen
 Peter Piction
 Jeff Price
 John Quinlan
 Arif Rahman
 Tanzilur Rahman
 Steve Ray
 Tim Reilly
 Barry Reinhold
 Brian Reinhold
 Melvin I. Reynolds
 John G. Rhoads
 Jeffrey S. Robbins
 Timothy Robertson
 David Rosales
 Bill Saltzstein
 Giovanna Sannino
 Jose A. Santos-Cadenas
 Stefan Sauermann
 John Sawyer
 Guillaume Schatz
 Alois Schloegl
 Paul S. Schluter
 Johannes Schmidt
 Lars Schmitt
 Mark G. Schnell
 Richard A. Schrenker
 Antonio Scorpiniti
 Jungmin Seo
 Kwang Seok Seo
 Riccardo Serafin
 Sid Shaw
 Frank Shen
 Min Shih
 Mazen Shihabi
 Krishna Shingala
 Redmond Shouldice
 Marjorie Skubic
 Robert Smith
 Ivan Soh
 Motoki Sone
 Emily Sopensky
 Rajagopalan Srinivasan

Andreas Staubert
 Nicholas Steblay
 Lars Steubesand
 John (Ivo) Stivorik
 Raymond A. Strickland
 Hermann Suominen
 Lee Surprenant
 Ravi Swami
 Ray Sweidan
 Kunihiko Takiuchi
 Francis Tam
 Haruyuyki Tatsumi
 John W. Thomas
 Brad Tipler
 Jonas Tirén
 James Tomcik
 Janet Traub
 Gary Tschautscher
 Masato Tsuchid
 Ken Tubman
 Yoshihiro Uchida
 Sunil Unadkat
 Philipp Urbauer
 Laura Vanzago
 Alpo Värri
 Dalimar Velez
 Naveen Verma
 Daniel von Büren
 Rudi Voon
 Isobel Walker
 David Wang
 Jerry P. Wang
 Yao Wang
 Yi Wang
 Steve Warren
 Fujio Watanabe
 Toru Watsuji
 Mike Weng
 Kathleen Wible
 Paul Williamson
 Jia-Rong Wu
 Will Wykeham
 Ariton Xhafa
 Ricky Yang
 Melanie Yeung
 Done-Sik Yoo
 Jason Zhang
 Zhiqiang Zhang
 Thomas Zhao
 Miha Zoubek
 Szymon Zysko

The following members of the balloting committee voted on this standard. Balloters may have voted for approval, disapproval, or abstention.

Arthur Astrin
Christopher Biernacki
Thomas Blackadar
Randy Carroll
Keith Chow
Malcolm Clarke
Sourav Dutta
Randall Groves
Kai Hassing
Werner Hoelzl

Noriyuki Ikeuchi
Atsushi Ito
Piotr Karocki
Michael J. Kirwan
William Lumpkins
Greg Luri
Michael S. Newman
Bansi Patel
Melvin I. Reynolds

Bartien Sayogo
Lars Schmitt
Gil Shultz
Kapil Sood
Raymond Strickland
Walter Struppler
Thomas Tullia
John Vergis
Oren Yuen
Daidi Zhong

When the IEEE-SA Standards Board approved this standard on 6 February 2013, it had the following membership:

Richard H. Hulett, *Chair*
Robert Grow, *Past Chair*
Konstantinos Karachalios, *Secretary*

Satish Aggarwal
Masayuki Ariyoshi
Peter Balma
William Bartley
Ted Burse
Clint Chaplin
Wael William Diab
Jean-Philippe Faure

Alexander Gelman
Paul Houzé
Jim Hughes
Young Kyun Kim
Joseph L. Koepfinger*
David J. Law
Thomas Lee
Hung Ling

Oleg Logvinov
Ted Olsen
Gary Robinson
Jon Walter Rosdahl
Mike Seavey
Yatin Trivedi
Phil Winston
Yu Yuan

*Member Emeritus

Also included are the following nonvoting IEEE-SA Standards Board liaisons:

Richard DeBlasio, *DOE Representative*
Michael Janezic, *NIST Representative*

Don Messina
IEEE Standards Program Manager, Document Development

Kathryn Bennett
IEEE Standards Program Manager, Technical Program Development

Introduction

This introduction is not part of IEEE Std 11073-10441-2013, IEEE Standard for Health informatics—Personal health device communication—Device specialization—Cardiovascular fitness and activity monitor.

ISO/IEEE 11073 standards enable communication between medical devices and external computer systems. This document uses the optimized framework created in IEEE Std 11073-20601aTM-2010^a and describes a specific, interoperable communication approach for cardiovascular fitness and activity monitors. These standards align with, and draw on, the existing clinically focused standards to provide easy management of data from either a clinical or a personal health device.

Sample Document

get full document from standards.iteh.ai

^a Information on references can be found in Clause 2.