ICS 11.040.55, 35.240.80 SLOVENSKÁ TECHNICKÁ NORMA August 2017

STN	**Zdravotnícka informatika Osobné komunikačné zdravotné zariadenie Časť 00103: Prehľad (ISO/IEEE 11073-00103: 2015)**	**STN EN ISO 11073-00103** 84 8037

Health informatics - Personal health device communication - Part 00103: Overview (ISO/IEEE 11073-00103:2015)

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 07/17

Obsahuje: EN ISO 11073-00103:2017, ISO/IEEE 11073-00103:2015

124916

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 11073-00103

February 2017

ICS 11.040.55; 35.240.80

English Version

Health informatics - Personal health device communication - Part 00103: Overview (ISO/IEEE 11073-00103:2015)

Informatique de santé - Communication entre dispositifs de santé personnels - Partie 00103: Aperçu général (ISO/IEEE 11073-00103:2015)

Medizinische Informatik - Kommunikation von Geräten für die persönliche Gesundheit- Teil 00103: Überblick (ISO/IEEE 11073-00103:2015)

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INTERNATIONAL STANDARD

ISO/IEEE 11073-00103

First edition
2015-03-01

Health informatics — Personal health device communication —

Part 00103: **Overview**

Informatique de santé — Communication entre dispositifs de santé personnels —

Partie 00103: Aperçu général

Reference number
ISO/IEEE 11073-00103:2015(E)

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

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— *Part 20101: (Point-of-care medical device communication) Application profiles — Base standard*

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— *Part 90101: (Point-of-care medical device communication) Analytical instruments — Point-of-care test*

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Health Informatics—Personal health device communication

Part 00103: Overview

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31 August 2012

IEEE Std 11073-00103™-2012

IEEE Std 1173-00103™-2012

Health informatics—Personal health device communication

Part 00103: Overview

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Approved 14 May 2012

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Abstract: Within the context of the ISO/IEEE 11073 family of standards for device communication, the landscape of transport-independent applications and information profiles for personal telehealth devices is described in this guide. Defined in these profiles are data exchange, data representation, and terminology for communication between personal telehealth devices and compute engines (e.g., health appliances, set top boxes, cell phones, and personal computers). A definition of personal telehealth devices as devices used for life activity, wellness monitoring, and/or health monitoring in domestic home, communal home, and/or mobile applications is provided in this guide. Use cases relevant to these scenarios and environments are also presented.

Keywords: IEEE 11073-00103, medical device communication, personal health devices

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

PDF: ISBN 978-0-7381-7280-4 STD97255
Print: ISBN 978-0-7381-7386-3 STDPD97255

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Introduction

This introduction is not part of IEEE Std 11073-00103-2012, Health informatics—Personal health device communication—Part 00103: Overview.

Within the context of the ISO/IEEE 11073 family of standards for device communication, this guide describes the landscape of transport-independent applications and information profiles for personal telehealth devices. These profiles define data exchange, data representation, and terminology for communication between personal telehealth devices and compute engines (e.g., health appliances, set top boxes, cell phones, and personal computers). The guide provides a definition of personal telehealth devices as devices used for life activity, wellness monitoring, and/or health monitoring in domestic home, communal home, and/or mobile applications. Use cases relevant to these scenarios and environments are also presented.

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Health informatics—Personal health device communication

Part 00103: Overview

1. Overview

1.1 Scope

Within the context of the ISO/IEEE 11073 family of standards for device communication, this guide describes the landscape of transport-independent applications and information profiles for personal telehealth devices. These profiles define data exchange, data representation, and terminology for communication between personal health devices and compute engines (e.g., health appliances, set top boxes, cell phones, and personal computers). The guide provides a definition of personal telehealth devices as devices used for life activity, wellness monitoring, and/or health monitoring in domestic home, communal home, and/or mobile applications as well as professional medical usage. Use cases relevant to these scenarios and environments are also presented.

1.2 Purpose

This guide sets a context for other personal telehealth standards in the ISO/IEEE 11073 framework of standards and describes the need for interoperability in personal telehealth environments. Interoperability is the key to growing the potential market for these devices and to enabling people to manage their own health independently.

1.3 The standards within 11073 standards applicable for the personal health devices (PHD) domain

The IEEE 11073 series of standards date back to the 1990s. It was initially intended for connecting point-of-care medical devices in professional healthcare provider organizations. Examples of these devices are vital signs monitors, blood pressure monitors, and other “medical” devices. Initially, medical devices were in most cases used in healthcare organizations by medical experts. However, the use of medical devices at home increased over time. Additionally, fitness and health devices reached the market. The intended use of these devices is generally not by clinicians directly, but derived data may have clinical significance. The term PHD evolved for medical devices as well as for health and fitness devices used out of professional healthcare organizations, by users at home. Today, PHDs are commonly sold together with consumer electronics products. They are used in home and mobile environments. Most devices provide digital displays and local storage of readings. Because of their small size and limited power supply, many devices have low computational limits. Users increasingly find it cumbersome to read data from displays and to enter it manually into online forms. Any manual interference adds to the probability of error. Communicating the recorded data is therefore gaining importance, with the additional advantage of avoiding media breaches. This development was also reflected in standardization work.

The following standards have been developed within the IEEE 11073 PHD standards series so far.

— ISO/IEEE 11073-20601:2010(E) [B48] and its amendment IEEE Std 11073-20601a:2010 [B36]: The Optimized Exchange Protocol defines the core elements: the domain information model, the service model, and the communication model.[1]

A further series of “device specialization” standards then tailor the broad toolkit provided in ISO/IEEE 11073-20601:2010(E) [B48] and IEEE Std 11073-20601a:2010 [B36] to specific usages to meet the needs to the device type being specialized. The following device specializations are currently available:

— ISO/IEEE 11073-10404:2010(E) [B43]
— IEEE Std 11073-10406™-2011 [B27]
— ISO/IEEE 11073-10407:2010(E) [B44]
— ISO/IEEE 11073-10408:2010(E) [B45]
— ISO/IEEE 11073-10415:2010(E) [B46]
— IEEE Std 11073-10417™-2011 [B28]
— IEEE Std 11073-10418™-2011 [B29]
— IEEE Std 11073-10420™-2010 [B30]
— IEEE Std 11073-10421™-2010 [B31]
— IEEE Std 11073-10441™-2008 [B32]
— IEEE Std 11073-10442™-2008 [B33]
— IEEE Std 11073-10471™-2008 [B34]
— IEEE Std 11073-10472™-2010 [B35]

Work is in progress to add further device specializations.

[1] The numbers in brackets correspond to those of the bibliography in Annex D.

An attempt has been made to ensure that the device specialization documents together with the base standard are self-contained and complete. For example, ISO/IEEE 11073-10101:2004(E) [B41] provides an extensive list of terms for coding data elements in the domain information model. For convenience of use, the terms are repeated where they are used, so that the reader does not need to consult ISO/IEEE 11073-10101:2004(E). Equally, key concepts such as the information and communication models are reproduced.

1.4 Audience

This overview is intended for readers who are interested in standardization for interoperability in the PHD field. It targets readers, engineers, and nonengineers who plan to provide and contribute to personal healthcare services, to use or buy devices, as well as those who are interested in the manifold steps that are necessary for planning and implementation.

This guide might also be used by information technology (IT) experts, who are seeking an introductory level entry point into the multi-part IEEE 11073 PHD series of standards, and need to quickly identify which content is intended for which purpose, and where the details are described. It also explains the more user-oriented aspects so that engineers may learn more about how users see things. That is the main focus of the “environmental overview.”

1.5 Document organization

Subsequent sections of this document are organized as follows.

- Clause 2 includes definitions, acronyms, and abbreviations. In general, these should be accessible by general technical and implementer audiences.
- Clause 3 describes user and device use characteristics in some detail, followed by a summary of device types; content is at a general technical level.
- Clause 4 is a “tutorial” of PHD technology, which is a set of structured models, generally following “top-down” organization, which are intended for technical audiences to gain a reasonably substantive understanding of standard architecture, although content should be accessible to general technical readers. It introduces the main technical concepts of the IEEE 11073 PHD standards.
- Clause 5 covers a number of topics concerning implementation, and along with Annex A through Annex C, is intended for in-depth technical understanding. It introduces how the IEEE 11073 PHD standards are used together with other specifications in implementation projects.
- Annex D is a detailed informative bibliography.

[2] The *IEEE Standards Dictionary Online* subscription is available at http://www.ieee.org/portal/innovate/products/standard/standards_dictionary.html.