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This second edition cancels and replaces the first edition (ISO/IEEE 11073-10442:2015), which has been technically revised.

The main changes are as follows:

— added support to Base-Offset-Time;

— updated normative references to refer to IEEE Std 11073-20601-2018;

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— updated the version of this device specialization;

— updated the association details based on new version;

— corrected the Type and Unit-Code in Table 5;

— removed the Unit-Code and Unit-labelstring from Enumeration objects;

— updated the wording in 6.3 regarding the Not Allowed and Observational;

— modified the binary examples, to be consistent with other 104xx specs;

— made IEEE Std 11073-10101 a normative reference;

— updated the wording at 1.3 and 4.1 regarding the precedence of nomenclature between 10101, 20601, 104xx, and this standard;

— updated the usage of nomenclature-version; tied it with the corresponding protocol-version;

— defined the continuous monitoring mode and set summary mode;

— defined the set-start-indicator.

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IEEE Std 11073-10442™-2023
(Revision of IEEE Std 11073-10442-2008)

Health Informatics—Device Interoperability

Part 10442: Personal Health Device Communication—Device Specialization—Strength Fitness Equipment

Developed by the

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

Approved 21 September 2023

IEEE SA Standards Board

Abstract: Within the context of the ISO/IEEE 11073 family of standards for device communication, a normative definition of the communication between personal strength fitness devices and managers (e.g., cell phones, personal computers, personal health appliances, and set top boxes) in a manner that enables plug-and-play interoperability is established in this standard. Appropriate portions of existing standards including ISO/IEEE 11073 terminology and information models are leveraged. 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 strength fitness devices is defined. In this context, strength fitness devices are being used broadly to cover strength fitness devices that measure musculo-skeletal strength-conditioning activities.

Keywords: IEEE 11073-10442™, medical device communication, personal health devices, strength fitness equipment

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Introduction

This introduction is not part of IEEE Std 11073-10442™-2023, IEEE Standard for Health Informatics—Device Interoperability—Part 10442: Personal Health Device Communication—Device Specialization—Strength Fitness Equipment.

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™ and describes a specific, interoperable communication approach for strength fitness equipment. 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.

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Health Informatics—Device Interoperability

Part 10442: Personal Health Device Communication—Device Specialization—Strength Fitness Equipment

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 the communication between personal strength fitness devices and managers (e.g., cell phones, personal computers [PCs], 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 and information models. 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 strength fitness devices. In this context, strength fitness devices are being used broadly to cover strength fitness devices that measure musculo-skeletal strength-conditioning activities.

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 managers (e.g., cell phones, PCs, personal health appliances, and set top boxes). Interoperability is the key to growing the potential market for these devices and to enable people to be better-informed participants in the management of their health.

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

This document defines the device specialization for the strength fitness device, 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/IEEE11073-10201 [B6][6] and ISO/IEEE 11073-20101 [B7]. The medical device encoding rules (MDER) used within this standard are fully described in IEEE Std 11073-20601.

This standard defines specialized nomenclature codes that will be collected in IEEE Std 11073-10101. Between this standard, IEEE Std 11073-10101, IEEE Std 11073-20601, and other IEEE Std 11073-104xx, all required nomenclature codes for implementation are documented. New codes may be

[6] The numbers in brackets correspond to those of the bibliography in Annex A.

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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 reference identifiers (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 workgroups and other stakeholders, and any corrective action will be published as corrigenda.

NOTE—In this standard, IEEE Std 11073-104xx is used to refer to the collection of device specialization standards that utilize IEEE Std 11073-20601, where xx can be any number from 01 to 99, inclusive.[7]

1.3 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*).[8, 9]

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 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 11073-10101, Health informatics—Point-of-care medical device communication—Part 10101: Nomenclature.[10, 11]

IEEE Std 11073-20601, Health informatics—Personal health device communication—Part 20601: Application profile—Optimized exchange protocol.

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

3.1 Definitions

For the purposes of this document, the following terms and definitions apply. The *IEEE Standards Dictionary Online* should be consulted for terms not defined in this clause.[12]

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

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

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

device: A term used to refer to a physical apparatus implementing either an agent or a manager role.

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. Some examples of managers include a cellular phone, health appliance, set top box, or a computer system.

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

object: In object-oriented modeling, a particular instantiation of a class. The instantiation realizes attributes, methods, and event from the class.

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	medical object class
OID	object identifier
PDU	protocol data unit

[12] *IEEE Standards Dictionary Online* is available at: http://dictionary.ieee.org. An IEEE Account is required for access to the dictionary, and one can be created at no charge on the dictionary sign-in page.

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