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Second edition
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Health informatics — Device interoperability —

Part 10471: Personal health device communication — Device specialization — Independent living activity hub

Informatique de santé — Interopérabilité des dispositifs —

Partie 10471: Communication entre dispositifs de santé personnels — Spécialisation des dispositifs — Concentrateur d'activités pour une vie autonome

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This second edition cancels and replaces the first edition (ISO/IEEE 11073-10471:2010), which has been technically revised.

The main changes are as follows:

— added current value sensors (temperature, humidity, utility usage);

— added humidity alert sensor;

— added support for location sensors;

— added support for Base-Offset-Time;

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- added new location identifiers;
- incorporated location identifiers from ZigBee Home Automation and Health Care profiles;
- added new appliance identifiers;
- changed from bit string to simple OIDs to report events;
- updated the example to simple OID;
- changed supplementary types to have upper 11 bits for location and lower 5 bits for number to support more codes within partition;
- updated the version of this device specialization;
- updated the association details based on new version;
- updated the wording in 6.3 regarding the Not Allowed and Observational;
- added systematic names;
- tamper detected flag made a general health status flag for all sensors;
- enumeration codes provided to other systems (ZigBee);
- location RefId discriminator changed from parentheses to underscore ((3)->_3);
- encounter object added.

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Abstract: Within the context of the ISO/IEEE 11073 family of standards for device communication, a normative definition of communication between personal telehealth independent living activity hub devices and compute engines (e.g., cell phones, personal computers, personal health appliances, 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, information models, application profile standards, and transport standards are leveraged. The use of specific term codes, formats, and behaviors in telehealth environments restricting optionality in base frameworks in favor of interoperability are specified. A common core of communication functionality for personal telehealth independent living activity hubs is defined in this standard.

Keywords: IEEE 11073-10471™, independent living activity hub, medical device communication, personal health devices

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Introduction

This introduction is not part of IEEE Std 11073-10471-2023, IEEE Standard for Health informatics—Device Interoperability—Part 10471: Personal health device communication—Device specialization—Independent living activity hub.

ISO/IEEE 11073 standards enable communication between medical devices and external computer systems. This document uses the optimized framework created in ISO/IEEE 11073:20601 and describes a specific, interoperable communication approach for the Independent Living Activity Hub of personal health devices. 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 (PHDs).

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Health Informatics—Device Interoperability—Part 10471: Personal Health Device Communication—Device Specialization—Independent Living Activity Hub

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 independent living activity hubs and managers (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 and information models. It specifies the use of specific term codes, formats, and behaviors in telehealth environments restricting ambiguity in base frameworks in favor of interoperability. This standard defines a common core of communication functionality for independent living activity hubs. In this context, independent living activity hubs are defined as devices that communicate with simple situation monitors (binary sensors), normalize information received from the simple environmental monitors, and provide this normalized information to one or more managers. This information can be examined, for example, to determine when a person's activities/behaviors have deviated significantly from what is normal for them such that relevant parties can be notified. Independent living activity hubs will normalize information from the following simple situation monitors (binary sensors) for the initial release of the proposed standard: fall sensor, motion sensor, door sensor, bed/chair occupancy sensor, light switch sensor, smoke sensor, (ambient) temperature threshold sensor, personal emergency response system (PERS), and enuresis sensor (bed-wetting).

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, 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 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*).[6,7]

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*).

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1.4 Context

See IEEE Std 11073-20601™ for an overview of the environment within which this standard is written.[8]

[6] The use of the word *must* is deprecated and cannot be used when stating mandatory requirements; *must* is used only to describe unavoidable situations.
[7] The use of *will* is deprecated and cannot be used when stating mandatory requirements; *will* is only used in statements of fact.
[8] Information on references can be found in Clause 2.

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This document, IEEE Std 11073-10471™, defines the device specialization for the independent living activity hub, being a specific agent type, and 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 IEEE Std 11073-10201™ [B5] and ISO/IEEE 11073:20101 [B9].[9] The medical device encoding rules (MDERs) used within this standard are fully described in IEEE Std 11073-20601.

This standard reproduces relevant portions of the nomenclature found in ISO/IEEE 11073:10101 [B8] and adds new nomenclature codes for the purposes of this standard. Between this standard and IEEE Std 11073-20601, all required nomenclature codes for implementation are documented.

The object classes and attributes in this standard are identified by nomenclature codes. Each code consists of a reference identifier (RefID) string and an integer code value. By using a consistent nomenclature, interoperability is enhanced as all implementations maintain the same semantic meaning for the numeric codes. This standard leverages the existing nomenclature codes in ISO/IEEE 11073:10101.

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 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 workgroups and other stakeholders and any corrective action published as corrigenda.

NOTE—In this standard, 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.[10]

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™-2019, Health informatics—Personal health device communication—Part 20601: Application profile—Optimized Exchange Protocol.[11,12]

ISO/IEEE 11073:10101-2020, Health informatics—Point-of-care medical device communication—Part 10101: Nomenclature.[13]

See Annex A for all informative material referenced by this standard.

3. Definitions, acronyms, and abbreviations

For the purposes of this standard, the following terms and definitions apply. *The IEEE Standard Dictionary Online* **Error! Reference source not found.** should be referenced for terms not defined in this clause.

3.1 Definitions

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

[9] The numbers in brackets correspond to those of the bibliography in Annex A.
[10] Notes in text, tables, and figures are given for information only and do not contain requirements needed to implement the standard.
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