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# Health informatics — Point-of-care medical device communication — Part 10101:

Nomenclature

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**Abstract:** Within the context of the ISO/IEEE 11073 family of standards for point-of-care (POC) medical device communication (MCD), this standard provides the nomenclature that supports both the domain information model and service model components of the standards family, as well as the semantic content exchanged with medical devices. The nomenclature is specialized for patient vital signs information representation and medical device informatics, with major areas including concepts for electrocardiograph (ECG), haemodynamics, respiration, blood gas, urine, fluid-related metrics, and neurology, as well as specialized units of measurement, general device events, alarms, and body sites. The standard defines both the architecture and major components of the nomenclature, along with extensive definitions for each conceptual area.

Keywords: codes, information model, medical device communication, nomenclature, ontology, patient, point-of-care, POC, semantics, service model, terminology **PREVIEW** 

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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.

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#### **IEEE Introduction**

This introduction is not part of ISO/IEEE 11073-10101:2004(E), Health informatics — Point-of-care medical device communication — Part 10101: Nomenclature.

ISO/IEEE 11073 standards enable communication between medical devices and external computer systems. They provide automatic and detailed electronic data capture of patient vital signs information and device operational data. The primary goals are to:

- Provide real-time plug-and-play interoperability for patient-connected medical devices
- Facilitate the efficient exchange of vital signs and medical device data, acquired at the point-of-care, in all health care environments

"Real-time" means that data from multiple devices can be retrieved, time correlated, and displayed or processed in fractions of a second. "Plug-and-play" means that all the clinician has to do is make the connection — the systems automatically detect, configure, and communicate without any other human interaction.

"Efficient exchange of medical device data" means that information that is captured at the point-of-care (e.g., patient vital signs data) can be archived, retrieved, and processed by many different types of applications without extensive software and equipment support, and without needless loss of information. The standards are especially targeted at acute and continuing care devices, such as patient monitors, ventilators, infusion pumps, ECG devices, etc. They comprise a family of standards that can be layered together to provide connectivity optimized for the specific devices being interfaced.

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#### Contents

| 1.           | Scope.                          |  | 1  |
|--------------|---------------------------------|--|----|
| 2.           | Conformance 1                   |  |    |
| 3.           | Normative references            |  |    |
| 4.           | Terms and definitions           |  |    |
| 5.           | Symbols (and abbreviated terms) |  |    |
| 6.           | Application                     |  | 4  |
| 7. Semantics |                                 | itics  | 4  |
|              | 7.1                             | Attribution  | 5  |
|              | 7.2                             | Coding   |    |
|              |                                 | 7.2.1 Context-sensitivity  | 6  |
|              |                                 | 7.2.2 Grouping   |    |
| 8.           | Syntax                          | ζ  | 7  |
|              | 0.1                             |  | _  |
|              | 8.1                             | TransferiTeh STANDARD PREVIEW  | 7  |
|              |                                 | <ul> <li>8.1.1 Types</li></ul>   | /  |
|              | 0.2                             | 8.1.2 Notation   | 8  |
|              | 8.2                             | 8.2.1 Attribution  |    |
|              |                                 |  |    |
|              |                                 | 8.2.2 https://station.ds.iteh.ai/catalog/standards/sist/f4149d20-38b2-426b-8e52- | 9  |
| 9.           | Extens                          | 26de1f88748a/iso-ieee-11073-10101-2004<br>sibility                               | 10 |
|              |                                 |  |    |
| 10.          | Versio                          | n exporting  | 10 |
| Annez        | x A (nor                        | mative) Nomenclature semantics   | 11 |
|              | A.1                             | Overview of nomenclature for vital signs—semantics                               | 11 |
|              |                                 | A.1.1 Introduction   |    |
|              | A.2                             | Code assignment to the MDIB elements   | 12 |
|              |                                 | A.2.1 Overview   | 12 |
|              |                                 | A.2.2 Basic rules  | 12 |
|              |                                 | A.2.3 Coding spaces  | 13 |
|              | A.3                             | Data dictionary and codes for object-oriented modeling elements (Block A)        | 18 |
|              |                                 | A.3.1 Introduction   |    |
|              |                                 | A.3.2 Object-oriented modeling elements: inventory tables                        |    |
|              | A.4                             | Data dictionary and codes for communication infrastructure (Block G)             |    |
|              |                                 | A.4.1 Communication infrastructure: inventory tables                             |    |
|              | A.5                             | Nomenclature, data dictionary, and codes for vital signs devices (Block A)       |    |
|              |                                 | A.5.1 Introduction   |    |
|              |                                 | A.5.2 Base concepts  |    |
|              |                                 | A.5.3 First set of differentiating criteria                                      |    |
|              |                                 | A.5.4 Second set of differentiating criteria                                     |    |
|              |                                 | A.5.5 Third set of differentiating criteria                                      | 49 |

|         |        | A.5.6     | Attributes   | 50  |
|---------|--------|-----------|--|-----|
|         |        | A.5.7     | Code table   | 50  |
|         | A.6    | Termino   | blogy and codes for units of measurement (Block B)                               |     |
|         |        | A.6.1     | Introduction   | 59  |
|         |        | A.6.2     | Orders of magnitude discriminator  |     |
|         |        | A.6.3     | Units outside of SI  |     |
|         |        | A.6.4     | Units of measurement   |     |
|         | A.7    |           | elature, data dictionary, and codes for metrics (measurements and                |     |
|         |        |           | ations) (Block C)  | 76  |
|         |        | A.7.1     | Nomenclature for ECG measurements  |     |
|         |        | A.7.2     | Nomenclature for ECG enumerations  |     |
|         |        | A.7.3     | Nomenclature, data dictionary, and codes for haemodynamic                        |     |
|         |        | 110,00    | monitoring measurements  | 102 |
|         |        | A.7.4     | Nomenclature, data dictionary, and codes for respiratory measurements            |     |
|         |        | A.7.5     | Nomenclature, data dictionary, and codes for common blood-gas, blood,            | 110 |
|         |        | 11.7.0    | urine, and other fluid chemistry measurements                                    | 150 |
|         |        | A.7.6     | Nomenclature, data dictionary, and codes for fluid output measurements           |     |
|         |        | A.7.7     | Nomenclature, data dictionary, and codes for pumps                               |     |
|         |        | A.7.8     | Nomenclature, data dictionary, and codes for pumps                               | 101 |
|         |        | A.7.0     | measurements   | 177 |
|         |        | A.7.9     | Nomenclature, data dictionary, and codes for neurophysiologic enumerations       |     |
|         |        |           | Nomenclature, data dictionary, and codes for heurophysiologic enumerations       |     |
|         |        |           |  |     |
|         | • •    |           | Nomenclature, data dictionary, and codes for miscellaneous measurements          |     |
|         | A.8    | A.8.1     | stature, data dictionary, and codes for body sites (Block D)<br>Introduction     | 228 |
|         |        |           |  |     |
|         |        | A.8.2     | Sites for neurophysiological signal monitoring: locations near peripheral nerves |     |
|         |        | A.8.3     | Sites for neurophysiological signal monitoring: locations near muscles           |     |
|         |        | A.8.4     | Sites for EEG-electrode placement on the head                                    | 287 |
|         |        | A.8.5     | Sites for EOG signal monitoring  | 294 |
|         |        | A.8.6     | Sites for general neurological monitoring measurements and drainage              | 299 |
|         |        | A.8.7     | Sites for cardiovascular measurements  | 301 |
|         |        | A.8.8     | Miscellaneous sites used in vital signs monitoring and measurement               |     |
|         |        | A.8.9     | Qualifiers of body site locations  |     |
|         | A.9    |           | elature, data dictionary, and codes for alerts (Block E)                         |     |
|         |        | A.9.1     | Introduction   |     |
|         |        | A.9.2     | Diagnostic pattern events  |     |
|         |        | A.9.3     | Device-related and environment-related events                                    |     |
|         | A.10   | Nomenc    | elature, data dictionary, and codes for external nomenclatures and messaging     |     |
|         |        |           | ls (Block F)   |     |
|         |        |           | Introduction   |     |
|         |        |           | Base concepts  |     |
|         |        | A.10.3    | First set of differentiating criteria  | 357 |
|         |        | A.10.4    | Second set of differentiating criteria   | 358 |
|         |        | A.10.5    | Third set of differentiating criteria  | 358 |
|         |        | A.10.6    | Code table   | 358 |
| Annex   | B (nor | native) N | Vomenclature syntax  | 363 |
| - minex |        |           |  | 200 |
|         | B.1    | General   |  | 363 |
|         |        | B.1.1     | Notation   | 363 |
|         |        | B.1.2     | Partition codes  | 363 |
|         |        | B.1.3     | Discriminator ranges   | 364 |
|         | B.2    | Object i  | nfrastructure  |     |
|         | B.3    |           | supervisory control and data acquisition (SCADA)                                 |     |

|       | B.4     | Events                       | 442 |
|-------|---------|------------------------------|-----|
|       | B.5     | Dimensions                   | 458 |
|       | B.6     | Virtual attributes           | 467 |
|       | B.7     | Parameter groups             | 467 |
|       | B.8     | Body Sites                   | 467 |
|       | B.9     | Communication infrastructure | 483 |
|       | B.10    | External nomenclature        | 486 |
|       |         |                              |     |
| Annex | C (info | rmative) Bibliography        | 489 |
|       |         |                              |     |

## iTeh STANDARD PREVIEW (standards.iteh.ai)

## Health informatics — Point-of-care medical device communication — Part 10101: Nomenclature

## 1. Scope iTeh STANDARD PREVIEW

The scope of this standard is nomenclature architecture for point-of-care (POC) medical device communication (MDC). It consists of three parts: the body of the standard, which defines the overall architecture of the organization and relationships among nomenclature components; normative Annex A and Annex B, which provide specifications of semantics and syntaxes; respectively; and informative Annex C, the bibliography. 26delf88748a/iso-ieee-11073-10101-2004

This standard is intended for use within the context of IEEE Std 1073,<sup>1</sup> which sets out the relationship between this and other documents in the POC MDC series.

#### 2. Conformance

There are no particular implementation conformance requirements defined in this standard, but some requirements for nomenclature representation are established in this standard to guide specification of semantics and syntax in other parts of the overall standard.

#### 3. Normative references

The following normative documents contain provisions that, through reference in this text, constitute provisions of ISO/IEEE 11073-10101. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on ISO/IEEE 11073-10101 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid international standards.

<sup>&</sup>lt;sup>1</sup>Information on references can be found in Clause 3.

CEN ENV 12611, Medical Informatics - Categorical structure of systems of concepts - Medical Devices.<sup>2</sup>

IEEE Std 1073<sup>™</sup>, IEEE Standard for Medical Device Communications—Overview and Framework.<sup>3</sup>

ISO/IEC 8824 (all parts), Information technology — Abstract Syntax Notation One (ASN.1).<sup>4</sup>

ISO/IEC 8825 (all parts), Information technology —ASN.1 encoding rules.

ISO/IEC 9596-1, Information technology — Open systems interconnection — Common Management Information Protocol — Part 1: Specification.

ISO/IEEE 11073-10201, Health informatics — Point-of-care medical device communication — Part 10201: Domain information model (referred to hereinafter as the "DIM").

ISO/IEEE 11073-20101, Health informatics — Point-of-care medical device communication — Part 20101: Application profiles – Base standard.

#### 4. Terms and definitions

For the purposes of this standard, the following terms and definitions apply. The Authoritative Dictionary of *IEEE Standards Terms*, Seventh Edition, [B10]<sup>5</sup> should be referenced for terms not defined in this clause.

4.1 corollary: a semantic and a syntactical representation that are correlated by a unique code. standards.iteh.ai

**4.2** -tuple: a component of a relation; e.g., a 2-tuple has two relational components.

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4.3 unique: nonredundant. https://standards.iteh.ai/catalog/standards/sist/f4149d20-38b2-426b-8e52-26de1f88748a/iso-ieee-11073-10101-2004

#### 5. Symbols (and abbreviated terms)

| API    | application program interface   |
|--------|---|
| ASN.1  | Abstract Syntax Notation One (ISO/IEC 8824)                                   |
| BAEP   | brainstem acoustic evoked potential   |
| BCC    | bedside communication controller  |
| BER    | basic encoding rules (ISO/IEC 8825-1).  |
| CMDISE | communication medical device information service element (CEN ENV 13735 [B5]) |
| CMIP   | Common Management Information Protocol (ISO/IEC 9596-1)                       |
| CMIP*  | Common Management Information Protocol using ISO/IEEE 11073 MDDL/<br>MDER     |
| CNS    | central nervous system  |

<sup>2</sup>CEN publications are available from the European Committee for Standardization (CEN), 36, rue de Stassart, B-1050 Brussels, Belgium (http://www.cenorm.be).

<sup>3</sup>IEEE publications are available from the Institute of Electrical and Electronics Engineers, Inc., 445 Hoes Lane, Piscataway, NJ 08854, USA (http://www.standards.ieee.org/).

<sup>4</sup>ISO/IEC documents can be obtained from the ISO office, 1 rue de Varembé, Case Postale 56, CH-1211, Genève 20, Switzerland/ Suisse (http://www.iso.ch/) and from the IEC office, 3 rue de Varembé, Case Postale 131, CH-1211, Genève 20, Switzerland/Suisse (http://www.iec.ch/). ISO/IEC publications are also available in the United States from the Sales Department, American National Standards Institute, 25 West 43rd Street, 4th Floor, New York, NY 10036, USA (http://www.ansi.org/).

<sup>5</sup>The numbers in brackets correspond to the numbers of the bibliography in Annex C.

| CSF               | cerebrospinal fluid  |
|-------------------|--|
| CVS               | cardiovascular system  |
| DCC               | device communication controller  |
| DIM               | domain information model, as defined in vital signs information representation (VITAL), interoperability of patient-connected medical devices (INTERMED), and medical device data language (MDDL) (ISO/IEEE 11073-10201 <sup>6</sup> ) |
| ECG               | electrocardiogram or electrocardiograph  |
| ECoG              | electrocochleograph  |
| EEG               | electroencephalogram or electroencephalograph  |
| EMG               | electromyogram or electromyograph  |
| EOG               | electrooculogram   |
| ERG               | electroretinogram or electroretinograph  |
| FEF               | file exchange format (CEN/TC251/PT-40 [B7])  |
| FFT               | fast Fourier transform   |
| FSM               | finite state machine   |
| HL7 <sup>®7</sup> | Health Level Seven   |
| ICU               | intensive care unit  |
| ID                | identifier   |
| INTERMED          | interoperability of patient-connected medical devices (CEN ENV 13735 [B5])   |
| LLAEP             | long latency acoustic evoked potential   |
| MDAP              | medical device application profile (The acronym <i>MDAP</i> may be substituted for the phrase <i>ISO/IEEE 11073-20000 family of standards.</i> ")  |
| MDC               | medical device communication.iteh.ai)  |
| MDDL              | medical device data language (The acronym <i>MDDL</i> may be substituted for the phrase <i>ISO/IEEE/I1073-110000 family/of standards.</i> ")   |
| MDER https:       | medical device encoding rules as defined in medical device application profile<br>(MDAP)6de1f88748a/iso-icee-11073-10101-2004  |
| MDIB              | medical data information base, as defined in ISO/IEEE 11073-10201  |
| MDS               | medical device system, an abstraction for a medical device (ISO/IEEE 11073-10201)  |
| MIB               | management information base  |
| MLAEP             | middle latency acoustic evoked potential   |
| NCS               | nerve conductens study   |
| NOS               | not otherwise specified  |
| 00                | object-oriented  |
| OID               | object identifier  |
| PCA               | patient-controlled analgesia   |
| PDU               | protocol data unit (also referred to as a <i>message</i> ; by convention, the term <i>PDUs</i> is used in text to indicate multiplicity)   |
| PFC               | physiological function code, which represents a physiological concept such as heart rate, blood pressure, etc.   |
| POC               | point of care or point-of-care   |
| SCADA             | supervisory control and data acquisition   |
| SCO               | service and control object   |

<sup>&</sup>lt;sup>6</sup>The DIM was originally defined in CEN ENV 13734 [B4] and CEN ENV 13735 [B5], which are now superseded by ISO/IEEE 11073-10201.

<sup>&</sup>lt;sup>7</sup>HL7 is a registered trademark of Health Level Seven, Inc. (www.hl7.org).