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**ISO/IEEE 11073-30400**

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# Health informatics — Point-of-care medical device communication —

## Part 30400: Interface profile — Cabled Ethernet

*Informatique de santé — Communication entre dispositifs médicaux sur le site des soins —*

*Partie 30400: Profil d'interface — Ethernet câblé*

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# Foreword

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ISO/IEEE 11073-30400 was prepared by the IEEE 11073 Standards Comittee of the IEEE Engineering in Medicine and Biology Society (as IEEE Std 11073-30400-2010). 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 10101: (Point-of-care medical device communication) Nomenclature*

— *Part 10201: (Point-of-care medical device communication) Domain information model*

— *Part 10404: Device specialization — Pulse oximeter*

— *Part 10407: Device specialization — Blood pressure monitor*

— *Part 10408: Device specialization — Thermometer*

— *Part 10415: Device specialization — Weighing scale*

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— *Part 10417: Device specialization — Glucose meter*

— *Part 10420: Device specialization — Body composition analyzer*

— *Part 10421: Device specialization — Peak expiratory flow monitor (peak flow)*

— *Part 10471: Device specialization — Independant 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*

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## Introduction

This introduction is not part of IEEE Std 11073-30400-2010, Health informatics—Point-of-Care medical device communication—Part 30400: Interface profile—Cabled Ethernet.

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 as follows:

— To provide real-time plug-and-play interoperability for patient-connected medical devices

— To facilitate the efficient exchange of vital signs and medical device data, acquired at the PoC, 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 between devices. The devices automatically detect, configure, and initiate communication 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, electrocardiogram (ECG) devices, and so on. They comprise a family of standards that can be layered together to provide connectivity optimized for the specific devices being interfaced.

This standard defines a communications interface profile. This profile is for a cable-connected, Ethernet-based local area network (LAN) for the interconnection of medical devices.

Specifically, this standard calls out layers 1 and 2 of the Open Systems Interconnection (OSI) reference model (physical and data link layers) communications services and protocols, as implemented in IEEE Std 802.3-2008,[a] that are appropriate for the medical communications environment. This standard is one part of the family of ISO/IEEE 11073 series of standards. It is compatible with the upper layer ISO/IEEE 11073 standards. It is expected that this standard will be combined, as appropriate, with other standards from the ISO/IEEE 11073 series.

The primary users of this standard are technical personnel who are creating or interfacing with a medical communications system. Familiarity with the ISO/IEEE 11073 family of standards is recommended. Familiarity with communications and networking technologies is also recommended.

[a] Information on references can be found in Clause 2.

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# Health informatics — Point-of-care medical device communication —

# Part 30400:
# Interface profile — Cabled Ethernet

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## 1 Overview

### 1.1 Scope

This document focuses on the application of the Ethernet family (IEEE Std 802.3™-2008[1]) of protocols for use in medical device communication. The scope is limited to referencing the appropriate Ethernet family specifications and to calling out any specific special needs or requirements of the ISO/IEEE 11073 environment, with a particular focus on easing interoperability and controlling costs.

### 1.2 Purpose

This standard defines a comprehensive set of protocols consistent with the ISO/IEEE 11073 and Ethernet family of protocols for common use by medical devices in networked operating contexts. By providing this standard, the ISO/IEEE 11073 design goal to provide real-time plug-and-play interoperability will be extended to a broad set of network interfaces.

[1] Information on references can be found in Clause 2.

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## 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.

ANSI/TIA/EIA 568-A-1995, Commercial Building Telecommunications Cabling Standard.[2]

IEEE Std 802.3™-2008, Standard for Information technology—Telecommunications and Information Exchange Between Systems—Local and Metropolitan Area Networks—Specific Requirements Part 3: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications.[3,4]

ISO/IEEE 11073-30200:2004, Health Informatics—Point-of-Care Medical Device Communication—Part 30200: Transport Profile—Cable Connected.[5]

## 3 Definitions, acronyms, and abbreviations

### 3.1 Definitions

For the purposes of this document, the following terms and definitions apply. *The IEEE Standards Dictionary: Glossary of Terms & Definitions* should be referenced for terms not defined in this clause.[6]

Note that numerous definitions from IEEE Std 802.3-2008 are used in this document. Those definitions will not be repeated here. For specific information, please refer to 1.4 of IEEE Std 802.3-2008.

**3.1.1 10BASE-T:** A type of Ethernet interface distinguished by its IEEE 802.3 physical layer specification for operation over two pairs of unshielded twisted-pair (UTP) cabling at a media access control (MAC) data rate of 10 Mb/s.

**3.1.2 100BASE-TX:** A type of Ethernet interface distinguished by its IEEE 802.3 physical layer specification for operation over two pairs of unshielded twisted-pair (UTP) cabling at a media access control (MAC) data rate of 100 Mb/s.

**3.1.3 1000BASE-T:** A type of Ethernet interface distinguished by its IEEE 802.3 physical layer specification for operation over four pairs of unshielded twisted-pair (UTP) cabling at a media access control (MAC) data rate of 1000 Mb/s.

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[2] ANSI publications are available from the Sales Department, American National Standards Institute, 25 West 43rd Street, 4th Floor, New York, NY 10036, USA (http://www.ansi.org/). TIA publications are available from the Telecommunications Industry Association, 2500 Wilson Boulevard, Suite 300, Arlington, VA 22201, USA (http://www.tiaonline.org). EIA publications are available from Global Engineering Documents, 15 Inverness Way East, Englewood, Colorado 80112, USA (http://global.ihs.com/).

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[6] *The IEEE Standards Dictionary: Glossary of Terms & Definitions* is available at http://shop.ieee.org/.



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**3.1.4 10GBASE-X:** A type of Ethernet interface distinguished by its IEEE 802.3 physical layer specification for operation over four pairs of unshielded twisted-pair (UTP) cabling at a media access control (MAC) data rate of 10 Gb/s.

**3.1.5 bedside communications controller (BCC):** A communications controller, which is typically located at a patient bedside, that serves to interface between one or more medical devices. The BCC may be embedded into local display, monitoring, or control equipment. Alternatively, it may be part of a communications router to a remote hospital host computer system.

**3.1.6 category 5 (Cat 5) balanced cable:** The designation applied to 100 Ω unshielded twisted-pair (UTP) cables and associated connecting hardware whose transmission characteristics are specified up to 100 MHz. (ANSI/TIA/EIA 568-A-1995). *See also*: **Class D cable**.

**3.1.7 category 5e (Cat 5e) balanced cable:** The designation applied to 100 Ω unshielded twisted-pair (UTP) cables and associated connecting hardware whose transmission characteristics are specified up to 100 MHz. This designation is an enhanced version of the Category 5 cable, which adds specifications for far end crosstalk. The Category 5e specification (ANSI/TIA/EIA 568-B.1-2001 [B11]) has deprecated the Category 5 specification. *See also*: **Class D cable**.

**3.1.8 Class D cable:** A category of cabling specified in ISO/IEC 11801-2002 [B9]. 100BASE-TX uses Class D as specified in the 1995 revision (corresponding to the ANSI/TIA/EIA 568-A specification for Category 5 cabling). 1000BASE-T uses Class D as specified in the 2001 revision (corresponding to the ANSI/TIA/EIA 568-A specification for Category 5e cabling).

**3.1.9 collision domain:** A single, half duplex mode Carrier Sense Multiple Access (CSMA)/Collision Detection (CD) network. If two or more media access control (MAC) sublayers are within the same collision domain and both transmit at the same time, a collision will occur. MAC sublayers separated by a repeater are in the same collision domain. MAC sublayers separated by a bridge are within different collision domains. (See IEEE Std 802.3-2008.)

**3.1.10 device communications controller (DCC):** A communications interface associated with a medical device. A DCC may support one or more physically distinct devices acting as a single network communications unit. Its purpose is to provide a point-to-point serial communication link to a bedside communications controller (BCC).

**3.1.11 downstream device:** A term used to differentiate the two ends of an Ethernet connection. The matching term (identifying the other end of the Ethernet connection) is “upstream device.”

**3.1.12 local area network (LAN):** A communications network to interconnect a variety of intelligent devices (e.g., personal computers, workstations, printers, and file storage devices) that can transmit data over a limited area, typically within a facility.

**3.1.13 management information base (MIB):** A type of database used to manage the devices in a communications network. It comprises a collection of objects in a (virtual) database used to manage entities in a network.

**3.1.14 management information base (MIB) aggregator:** A generic term for a device that combines multiple downstream MIB ports and multiplexes them on to one upstream MIB port.

**3.1.15 management information base (MIB) interface:** An informal name for the ISO/IEEE 11073-30200:2004.

**3.1.16 media access control (MAC):** The data link sublayer that is responsible for transferring data to and from the physical layer.

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**3.1.17 medical device communications (MDCs):** A general term used to describe the networking and connectivity standards that enable medical devices to communicate in interoperable ways.

**3.1.18 medical information bus (MIB):** An informal name for the ISO/IEEE 11073 family of standards. Now deprecated.

**3.1.19 octet:** A group of eight adjacent bits.

**3.1.20 Point of Care (PoC):** The area in which clinicians and patients are in close physical proximity and in which specific care, treatments, medical procedures, and/or monitoring are provided to the patient.

**3.1.21 registered jack (RJ)-45: (A)** AT&T Registered Jack designation for the eight-pin modular connectors that meet the requirements of IEC 60603-7:1996 [B5][7] and ISO/IEC 8877:1992 [B8]. **(B)** An eight-pin modular telephone plug.

NOTE 1—Also called a programmable connection, an RJ-45 plug is generally used on four-wire circuits, but it can be used on eight-wire circuits.[8]

NOTE 2—Definition (B) reflects colloquial usage. Standards referencing this term should point to the precise standardized connector specification.

**3.1.22 upstream device:** A term used to differentiate the two ends of an Ethernet connection. The matching term (identifying the other end of the Ethernet connection) is "downstream device."

## 3.2 Acronyms and abbreviations

Note that numerous acronyms and abbreviations from the IEEE Std 802.3-2008 are used in this document. Those acronyms and abbreviations will not be repeated here. For specific information, please refer to 1.5 of IEEE Std 802.3-2008.

| | |
|---|---|
| BCC | bedside communications controller |
| Cat 5 | Category 5 |
| Cat 5e | Category 5, enhanced |
| DCC | device communications controller |
| DTE | data terminal equipment |
| LAN | local area network |
| MAC | media access control |
| MDCs | medical device communications |
| MIB | management information block |
| PoC | Point of Care |
| PD | powered device |
| PSE | power sourcing equipment |
| RJ | registered jack |
| STP | shielded twisted pair |
| UTP | unshielded twisted pair |

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


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# 4 Clinical connectivity context

## 4.1 Clinical Point-of-Care deployment diagram

Figure 1 identifies for the purposes of this standard the cable-connected interface types specified by ISO/IEEE 11073-30200:2004 and this standard, the devices upon which those interface types are deployed, the interconnections between those devices, and the location within the PoC environment where these interfaces are deployed.

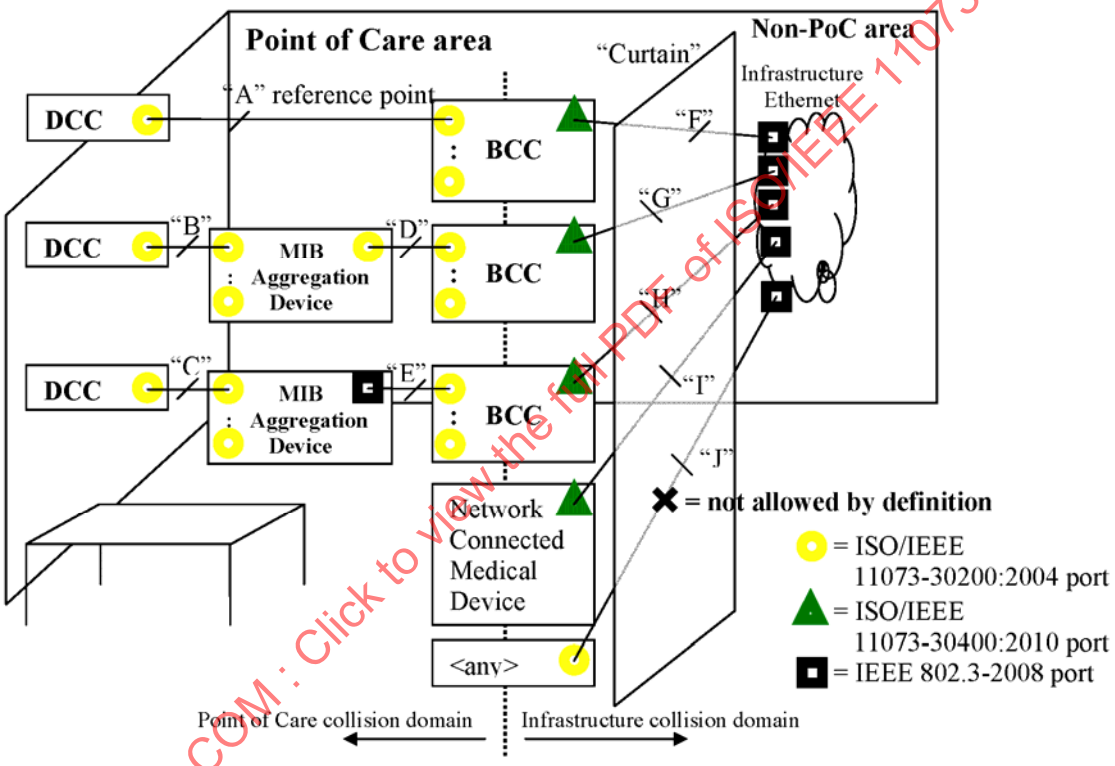


**Figure 1—Clinical PoC environment**

The interface reference points ("A" through "J") allow the different interface requirements in an overall clinical PoC environment to be appropriately considered and easily referenced. The reference points are described as follows:

- Reference points "A" through "D" between ISO/IEEE 11073-30200 ports.
- Not part of this standard. However, this is shown for completeness with respect to the ISO/IEEE 11073 interfaces deployed in the clinical PoC environment.
- Reference point "E" between ISO/IEEE 11073-30200 ports and IEEE 802.3 ports.
- Not part of this standard. However, this is shown for completeness with respect to the ISO/IEEE 11073 interfaces deployed in the clinical PoC environment. Compatibility is discussed in ISO/IEEE 11073-30200:2004.
- Reference points "F" through "I" between IEEE 11073-30400 ports and IEEE 802.3 ports.

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— These are the connectivity options in scope for this document.

— The BCC and the network connected medical device **shall** implement IEEE 802.3 Data Terminal Equipment (DTE) functionality.

— Reference point "J" between IEEE 802.3 ports and ISO/IEEE 11073-30200 ports.

— By definition, ISO/IEEE 11073-30200:2004 is for deployment in a clinical PoC environment. The "J" reference point is between a device in the PoC area and the networking infrastructure. Thus, reference point "J" is a specific example of nonadherence to the definition of PoC area.

## 4.2 Use of normative references

This standard makes normative reference to IEEE Std 802.3. The specific version of IEEE Std 802.3 that applies in this standard is specified in Clause 2. Although versions of IEEE Std 802.3 are intended to maintain backward compatibility, the user is recommended to undertake an evaluation of any version of IEEE Std 802.3 not specified in this standard before use of that version.

A device that adheres to this standard and thus to the relevant clauses of IEEE Std 802.3 shall not imply that the device conforms to electrical or performance characteristics of other standards or that it complies with regulatory issues.

## 4.3 High-level intent

This standard specifies the subset of the IEEE 802.3 specification that shall be allowed for use in a medical device communication environment. Specifically, it specifies the use of the IEEE 802.3 physical signaling interfaces utilizing unshielded twisted pair cabling.

— 10BASE-T (2 pairs required) **shall** use Class D-1995 (Category 5) or better unshielded twisted pair (UTP) cabling

— 100BASE-TX (2 pairs required) **shall** use Class D-1995 (Category 5) or better UTP cabling

— 1000BASE-T (4 pairs required) **shall** use Class D-2001 (Category 5e) or better UTP cabling

Shielded twisted pair (STP) cable **shall not** be used.

Further IEEE 802.3 functionality that is specified includes the following:

— Auto negotiation.

— Medium dependent interface crossover or MDI-X (the "X" representing "crossover"). It is also called Auto-MDI, Universal Cable Recognition, or Auto Sensing. This eliminates the need for crossover cables, obsoletes the uplink/normal ports and manual selector switches found on many older Ethernet hubs and switches, and vastly reduces installation errors, especially by nontechnical users.

— Power over Ethernet.

Beyond the supported Ethernet signaling and powering capabilities, there are also labeling, color coding, and related issues that are specific to the medical device communication environment.

NOTE 1—Although it is the intention of the IEEE 11073-30400 specification to support a UTP-based interface, it is not the intention to preclude any fiber deployment "elsewhere" in the networking infrastructure, nor is it the intention to include any language in the IEEE 11073-30400 specification that would limit any future ISO/IEEE 11073-3xxyy specification from covering a direct fiber optic interface.

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NOTE 2—Although it is the intention of the IEEE 11073-30400 specification to support 10, 100, and 1000BASE interfaces, it is not the intent to preclude any other IEEE 802.3 interfaces deployed "elsewhere" in the networking infrastructure, nor is it the intention to include any language in the IEEE 11073-30400 specification that would limit any future ISO/IEEE Std 11073-3xxyy specification from covering other IEEE 802.3 interfaces.

NOTE 3—Although it is the intention of the IEEE 11073-30400 specification to support a UTP-based interface, it is not the intent to preclude any backplane deployment "elsewhere" in the networking infrastructure, nor is it the intention to include any language in the IEEE 11073-30400 specification that would limit any future ISO/IEEE 11073-3xxyy specification from covering a backplane interface.

## 4.4 Mapping "PoC reference points" to "high-level intent"

To accommodate legacy and contemporary medical device communication devices within the IEEE 802.3 network infrastructure, this standard defines three groups with different IEEE 802.3 features. These are referred to as *Legacy*, *Standard*, and *Performance* feature groups.

The three feature groups are summarized and mapped to the clinical PoC environment in Table 1. The normative definition mapping all of the IEEE 802.3 features to each of the feature groups is contained in Clause 6.

Devices conformant with this standard shall implement either feature group *Legacy*, *Standard*, or *Performance* (see Table 1).

**Table 1—Mapping "PoC reference points" to "high-level intent"**

| Reference point: "interface end" | Applicability | Feature group name | IEEE 11073-30400 Ethernet feature group characteristics | | | |
|---|---|---|---|---|---|---|
| | | | Port type | Duplex | MDI-X | Power over Ethernet |
| F through I: "downstream" port | This feature group **may** be used. | *Legacy* | 10BASE-T 100BASE-TX Fixed | Fixed half | No | Yes |
| F through I: "downstream" port | This feature group **shall not** be used. | | 10BASE-T 100BASE-TX Fixed | Fixed full[a] | x | x |
| F through I: "downstream" port | One of these two feature groups **should** be used. | *Standard* | 10BASE-T 100BASE-TX auto negotiation | Half/full auto negotiation | Yes | Yes |
| | | *Performance* | 10BASE-T 100BASE-TX 1000BASE-T auto negotiation | Half/full auto negotiation | Yes | Yes |
| F through I: "upstream" port | One of these two feature groups **shall** be used. | *Standard* | 10BASE-T 100BASE-TX auto negotiation | Half/full auto negotiation | Yes | Yes |
| | | *Performance* | 10BASE-T 100BASE-TX 1000BASE-T auto negotiation | Half/full auto negotiation | Yes | Yes |

[a]In Ethernet, a duplex mismatch is a condition where two connected devices operate in different duplex modes. More specifically, one device operates in half duplex, whereas the other one operates in full duplex. Duplex mismatch may result from manually setting two connected network interfaces at different duplex modes. It will also result if one connected device performs autonegotiation while the other device is manually set to a full duplex mode. The implications of a duplex mismatch are an Ethernet interface that has extremely low to no effective throughput.

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### 4.5 Compliance with other standards

Devices that comply with this standard may also be required to comply with other domain- and device-specific standards that supersede the requirements of this standard and IEEE Std 802.3-2008 to which this standard refers with respect to issues including safety, reliability, and risk management. A user of this standard is expected to be familiar with all other such standards that apply and to comply with any higher specifications thus imposed. Typically, medical devices will comply with the IEC 60601-1:1999 [B1] base standards and its parts, such as IEC 60601-1-1:2000 [B3], with respect to electrical and mechanical safety and any device specific standard as might be defined in IEC 60601-1-2 Ed. 3.0 B:2007 [B4]. Subclause 4.1 of this standard provides a description of the context within which devices that comply with this standard function.

Devices that comply with this standard shall implement higher layers of network software as appropriate to the application. The requirements on performance of such applications and conformance are defined elsewhere and are outside the scope of this standard. Additionally, the network environment within which devices operate should be specified. Use of any medical equipment within a network environment shall be subject to risk assessment and risk management appropriate to the application and use and should adhere to standards such as ISO 14971:2007 [B7] and IEC 80001-1 [B6]. The requirements of such risk assessment and risk management and conformance are outside the scope of this standard.

## 5 Marking and cabling

### 5.1 Port marking

a) IEEE 11073-30400 ports on the BCC or other network connected medical equipment **shall** be marked with a forest green border surrounding the RJ-45 port (Figure 2).[9]

   For legacy devices, already in the field, being updated to this standard, it **shall** be acceptable to use other forest green shapes besides the "surround border." An acceptable example includes a forest green dot. The legacy marking **shall** be visible at 0.8 m (i.e., arms length) using normal clinical lighting levels.

b) Marking and labeling **shall not** involve a variant of these guidelines. Variations are reserved for future ISO/IEEE 11073 standards.

   Manufacturers **shall** be free to use specific port labeling indications (for example P0, P1, P2 or A, B, C, D) at their discretion.

[9] A color version of Figure 2 is located at the following URL: http://standards.ieee.org/downloads/11073/30400-2010/11073-30400-2010_Fig2.pdf.

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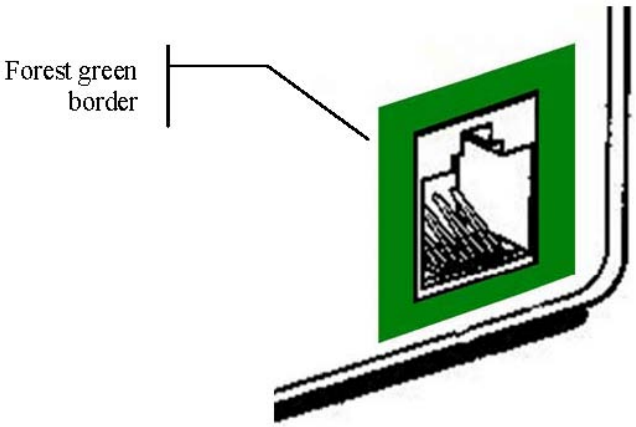


**Figure 2—Port marking**

## 5.2 Cable and connector marking

a) IEEE 11073-30400 cables **should** be colored forest green (Figure 3).[10]

b) IEEE 11073-30400 cables **should** have the cable grade printed on the cable jacket. For example, "Class D-2001 (Cat 5e)."

c) IEEE 11073-30400 cable connectors **should** either be:

   1) Colored all clear (the left of Figure 3)

   2) Colored partially clear and partially forest green (the right of Figure 3)

d) IEEE 11073-30400 cable connectors **may** be covered with a connector shroud. If a connector shroud is used, it **should** be colored forest green (Figure 3).

e) Marking and labeling **should not** involve a variant of these guidelines. Variations are reserved for future ISO/IEEE 11073 standards.

**or**

**Figure 3—Cable markings**

## 5.3 Cabling requirements

a) All IEEE 11073-30400 cables **should** utilize the Class D-2001 (Category 5e) or better UTP cabling.

[10] A color version of Figure 3 is located at the following URL: http://standards.ieee.org/downloads/11073/30400-2010/11073-30400-2010_Fig3.pdf.

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b) If Class D-2001 (Category 5e) or better UTP cabling is not used in all IEEE 11073-30400 situations, then for

1) 10BASE-T and 100BASE-TX deployments, IEEE 11073-30400 cables **shall** utilize the Class D-1995 (Category 5) or better UTP cabling.

2) 1000BASE-T deployments, IEEE 11073-30400 cables **shall** utilize the Class D-2001 (Category 5e) or better UTP cabling.

# 6 IEEE 11073-30400 feature group definition

## 6.1 Section-level summary

The three IEEE 11073-30400 feature groups are summarized and mapped to the five sections of IEEE Std 802.3-2008 in Table 2. The normative mapping of all IEEE 803.2 features to the IEEE 11073-30400 feature groups is contained in 6.2.

**Table 2—Section-level summary**

| Description | Applicability to IEEE 11073-30400 | | |
|---|---|---|---|
| | ***Legacy* feature group** | ***Standard* feature group** | ***Performance* feature group** |
| IEEE Std 802.3-2008: Section One: Ethernet MAC & 10 Mb/s interface | Partial (14 of 29 clauses) | Partial (14 of 29 clauses) | Partial (14 of 29 clauses) |
| IEEE Std 802.3-2008: Section Two: Ethernet 100 Mb/s interface | Partial (22 of 38 clauses) | Partial (29 of 38 clauses) | Partial (29 of 38 clauses) |
| IEEE Std 802.3-2008: Section Three: Ethernet 1000 Mb/s interface | No (0 of 19 clauses) | No (0 of 19 clauses) | Partial (8 of 19 clauses) |
| IEEE Std 802.3-2008: Section Four: Ethernet 10 Gb/s interface | Slight (1 of 17 clauses) | Slight (1 of 17 clauses) | Slight (1 of 17 clauses) |
| IEEE Std 802.3-2008: Section Five: Ethernet subscriber access interface | No (0 of 21 clauses) | No (0 of 21 clauses) | No (0 of 21 clauses) |

## 6.2 Clause/annex level mapping

The three IEEE 11073-30400 feature groups are normatively mapped to the clauses and annexes of IEEE Std 802.3-2008: Section One: Ethernet MAC & 10 Mb/s interface in Table 3.

Devices conformant with this standard **shall** implement either feature group *Legacy*, *Standard*, or *Performance*.

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**Table 3—Mapping for IEEE Std 802.3-2008: Section One: Ethernet MAC & 10 Mb/s interface**

| Clause/ annex | Clause title / applicability rationale | Applicability to IEEE 11073-30400 | | |
|---|---|---|---|---|
| | | ***Legacy*** **group: Partial (14 of 29)** | ***Standard*** **group: Partial (14 of 29)** | ***Performance*** **group: Partial (14 of 29)** |
| 1 | Introduction<br>Rationale: This clause includes content for all data rates and PHY types specified for use by IEEE Std 11073-30400-2010, including normative references, definitions, and acronyms. This general material provides IEEE 802.3 architecture, capability overview, and information necessary for understanding the applicable portions of that standard. Applicable references, definitions, and acronyms are distinguished by use in other applicable clauses. | Partial | Partial | Partial |
| 2 | Media access control (MAC) service specification<br>Rationale: The contents of this clause are applicable to any data rate or any IEEE 802.3 physical layer option used in IEEE Std 11073-30400-2010. | Yes | Yes | Yes |
| 3 | Media access control frame structure<br>Rationale: The contents of this clause are applicable to any data rate or any IEEE 802.3 physical layer option used in IEEE Std 11073-30400-2010. | Yes | Yes | Yes |
| 4 | Media access control<br>Rationale: The contents of this clause are applicable to any data rate or any IEEE 802.3 physical layer option used in IEEE Std 11073-30400-2010. | Yes | Yes | Yes |
| 5 | Layer Management<br>Rationale: Subclause 5.2.4 and its subclauses specify capabilities necessary for complete understanding of MAC operation and management capabilities and are thus applicable to any IEEE 802.3 physical layer option used in IEEE Std 11073-30400-2010.<br>NOTE—All parts of Clause 5, except for 5.2.4 and its subclauses, are deprecated by Clause 30. | Yes | Yes | Yes |
| 6 | Physical signaling (PLS) service specifications<br>Rationale: The contents of this clause are applicable to any data rate or any IEEE 802.3 physical layer option used in IEEE Std 11073-30400-2010. | Yes | Yes | Yes |
| 7 | PLS and Attachment unit interface (AUI) specifications<br>Rationale: The AUI physical layer option is not used in IEEE Std 11073-30400-2010. | No | No | No |

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**Table 3—Mapping for IEEE Std 802.3-2008: Section One: Ethernet MAC & 10 Mb/s interface (*continued*)**

| Clause/ annex | Clause title / applicability rationale | Applicability to IEEE 11073-30400 | | |
|---|---|---|---|---|
| | | ***Legacy*** **group: Partial (14 of 29)** | ***Standard*** **group: Partial (14 of 29)** | ***Performance*** **group: Partial (14 of 29)** |
| 8 | Medium Attachment Unit and baseband medium specifications, type 10BASE5<br>Rationale: The IEEE 802.3 coax (i.e., thicknet) 10BASE5 physical layer option is not used in IEEE Std 11073-30400-2010.<br>NOTE 1—This MAU is not recommended for new installations. Since September 2003, maintenance changes are no longer being considered for this clause. | No | No | No |
| 9 | Repeater unit for 10 Mb/s baseband networks<br>Rationale: IEEE 11073-30400 interfaces, implementing the DTE functionality of IEEE Std 802.3-2008, do not implement any repeater functionality. | No | No | No |
| 10 | Medium attachment unit and baseband medium specifications, type 10BASE2<br>Rationale: The IEEE 802.3 RG58 coax (i.e., thinnet) 10BASE2 physical layer option is not used in IEEE Std 11073-30400-2010. | No | No | No |
| 11 | Broadband medium attachment unit and broadband medium specifications, type 10BROAD36<br>Rationale: The IEEE 802.3 broadband cable 10BROAD36 physical layer option is not used in IEEE Std 11073-30400-2010.<br>NOTE 2—This MAU is not recommended for new installations. Since September 2003, maintenance changes are no longer being considered for this clause. | No | No | No |
| 12 | Physical signaling, medium attachment, and baseband medium specifications, type 1BASE5<br>Rationale: The IEEE 802.3 twisted pair 1BASE5 physical layer option is not used in IEEE Std 11073-30400-2010.<br>NOTE 3—This MAU is not recommended for new installations. Since September 2003, maintenance changes are no longer being considered for this clause. | No | No | No |
| 13 | System considerations for multisegment 10 Mb/s baseband networks<br>Rationale: IEEE 11073-30400 interfaces, implementing the DTE functionality of IEEE Std 802.3-2008, do not implement any repeater functionality and, thus, do not have multisegment issues to consider. | No | No | No |
| 14 | Twisted-pair medium attachment unit (MAU) and baseband medium, type 10BASE-T<br>Rationale: The contents of this clause are applicable to the use of the twisted pair 10BASE-T physical layer option used in IEEE Std 11073-30400-2010. | Yes | Yes | Yes |
| 15 | Fiber optic medium and common elements of medium attachment units and star, type 10BASE-F<br>Rationale: The IEEE 802.3 fiber optic 10BASE-F physical layer **option** is not used in IEEE Std 11073-30400-2010. | No | No | No |

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**Table 3—Mapping for IEEE Std 802.3-2008: Section One: Ethernet MAC & 10 Mb/s interface (*continued*)**

| Clause/ annex | Clause title / applicability rationale | Applicability to IEEE 11073-30400 | | |
|---|---|---|---|---|
| | | ***Legacy*** **group: Partial (14 of 29)** | ***Standard*** **group: Partial (14 of 29)** | ***Performance*** **group: Partial (14 of 29)** |
| 16 | Fiber optic passive star and medium attachment unit, type 10BASE-FP<br>Rationale: The IEEE 802.3 fiber optic physical layer option is not used in IEEE Std 11073-30400-2010. NOTE—This MAU is not recommended for new installations. Since September 2003, maintenance changes are no longer being considered for this clause. | No | No | No |
| 17 | Fiber optic medium attachment unit, type 10BASE-FB<br>Rationale: The IEEE 802.3 fiber optic 10BASE-FB physical layer option is not used in IEEE Std 11073-30400-2010. | No | No | No |
| 18 | Fiber optic medium attachment unit, type 10BASE-FL<br>Rationale: The IEEE 802.3 fiber optic 10BASE-FL physical layer option is not used in IEEE Std 11073-30400-2010. | No | No | No |
| 19 | Layer Management for 10 Mb/s baseband repeaters<br>Rationale: Clause 19 is deprecated by Clause 30. | No | No | No |
| 20 | Layer Management for 10 Mb/s baseband medium attachment units<br>Rationale: Clause 20 is deprecated by Clause 30. | No | No | No |
| Annex A | (informative) Bibliography<br>Rationale: The contents of this annex are applicable to any data rate or any IEEE 802.3 physical layer option used in IEEE Std 11073-30400-2010. | Yes | Yes | Yes |
| Annex B | (informative) System guidelines<br>Rationale: The contents of B.1, B.3, and B.4 are applicable to the 10BASE-T physical layer option used in IEEE Std 11073-30400-2010. The contents of B.2 and B.5 are not applicable to the 10BASE-T physical layer option used in IEEE Std 11073-30400-2010. | Partial | Partial | Partial |
| Annex C | (informative) State diagram, MAC sublayer<br>Rationale: This annex was deleted by IEEE Std 802.3x-1997 and IEEE Std 802.3y-1997. | No | No | No |
| Annex D | (informative) Application context, selected medium specifications<br>Rationale: The contents of D.1, D.5, and D.6 are applicable to the 10BASE-T physical layer option used in IEEE Std 11073-30400-2010. The contents of D.2, D.3, and D.4 are not applicable to the 10BASE-T physical layer option used in IEEE Std 11073-30400-2010. | Partial | Partial | Partial |
| Annex E | (informative) Receiver wavelength design considerations (FOIRL)<br>Rationale: The IEEE 802.3 fiber optic 10BASE-F physical layer option is not used in IEEE Std 11073-30400-2010. | No | No | No |

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**Table 3—Mapping for IEEE Std 802.3-2008: Section One: Ethernet MAC & 10 Mb/s interface (*continued*)**

| Clause/ annex | Clause title / applicability rationale | Applicability to IEEE 11073-30400 | | |
|---|---|---|---|---|
| | | ***Legacy*** **group: Partial (14 of 29)** | ***Standard*** **group: Partial (14 of 29)** | ***Performance*** **group: Partial (14 of 29)** |
| Annex F | (normative) Additional attributes required for systems<br>Rationale: IEEE Std 11073-30400-2010 does not implement any IEEE 802.3 repeater functionality. | No | No | No |
| Annex G | (normative) Additional material required for conformance testing<br>Rationale: As supporting information for the deprecated Clause 19, the contents of this annex are not applicable. | No | No | No |
| Annex H | (normative) GDMO specifications for CSMA/CD managed objects<br>Rationale: Subclauses H.1 through H.3 have been deprecated by Annex 30A, and H.4 has been deprecated by Annex 30B. | No | No | No |
| Annex 4A | (normative) Simplified full duplex media access control<br>*Legacy* feature group applicability: **No**.<br>Rationale: The contents of this annex are applicable when full duplex is the **only** supported mode of operation. In the case of the *Legacy* feature group, full duplex mode is not supported. Thus, this annex is not applicable to IEEE Std 11073-30400-2010.<br><br>*Standard and Performance* feature group applicability: **No**.<br>Rationale: The contents of this annex are applicable when full duplex is the **only** supported mode of operation. In the case of the *Standard* and *Performance* feature groups, both half and full duplex modes are supported. Thus, this annex is not applicable to IEEE Std 11073-30400-2010. | No | No | No |

The three IEEE 11073-30400 feature groups are normatively mapped to the clauses and annexes of IEEE Std 802.3-2008: Section Two: Ethernet 100 Mb/s interface in Table 4.

Devices conformant with this standard **shall** implement either feature group *Legacy*, *Standard*, or *Performance*.

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**Table 4—Mapping for IEEE Std 802.3-2008: Section Two: Ethernet 100 Mb/s interface**

| Clause/ annex | Clause title / applicability rationale | Applicability to IEEE 11073-30400 | | |
|---|---|---|---|---|
| | | *Legacy* group: Partial (22 of 29) | *Standard* group: Partial (29 of 38) | *Performance* group: Partial (29 of 38) |
| 21 | Introduction to 100 Mb/s baseband networks, type 100BASE-T<br>Rationale: The contents of this clause are applicable to the use of the twisted pair 100BASE-TX physical layer option used in IEEE Std 11073-30400-2010. | Yes | Yes | Yes |
| 22 | Reconciliation Sublayer (RS) and Media Independent Interface (MII)<br>Rationale: The contents of this clause are applicable to the use of either of the unshielded twisted pair 10BASE-T or 100BASE-TX physical layer options used in IEEE Std 11073-30400-2010.. | Yes | Yes | Yes |
| 23 | Physical Coding Sublayer (PCS), Physical Medium Attachment (PMA) sublayer and baseband medium, type 100BASE-T4<br>Rationale: The IEEE 802.3 Category 3, unshielded twisted pair, 100BASE-T4 physical layer option is not used in IEEE Std 11073-30400-2010.<br>NOTE—This PHY is not recommended for new installations. Since September 2003, maintenance changes are no longer being considered for this clause. | No | No | No |
| 24 | Physical Coding Sublayer (PCS) and Physical Medium Attachment (PMA) sublayer, type 100BASE-X<br>Rationale: The contents of this clause are applicable to the use of the unshielded twisted pair 100BASE-TX physical layer option used in IEEE Std 11073-30400-2010. | Yes | Yes | Yes |
| 25 | Physical Medium Dependent (PMD) sublayer and baseband medium, type 100BASE-TX<br>Rationale: The IEEE 802.3 Category 5, unshielded twisted pair 100BASE-TX physical layer option is used in IEEE Std 11073-30400-2010. | Yes | Yes | Yes |
| 26 | Physical Medium Dependent (PMD) sublayer and baseband medium, type 100BASE-FX<br>Rationale: The IEEE 802.3 fiber optic 100BASE-FX physical layer option is not used in IEEE Std 11073-30400-2010. | No | No | No |

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**Table 4—Mapping for IEEE Std 802.3-2008: Section Two: Ethernet 100 Mb/s interface (*continued*)**

| Clause/ annex | Clause title / applicability rationale | Applicability to IEEE 11073-30400 | | |
|---|---|---|---|---|
| | | ***Legacy*** **group: Partial (22 of 29)** | ***Standard*** **group: Partial (29 of 38)** | ***Performance*** **group: Partial (29 of 38)** |
| 27 | Repeater for 100 Mb/s baseband networks<br>Rationale: IEEE 11073-30400 interfaces, implementing the DTE functionality of IEEE Std 802.3-2008, do not implement any repeater functionality. | No | No | No |
| 28 | Physical Layer link signaling for 10 Mb/s, 100 Mb/s, and 1000 Mb/s Auto-Negotiation on twisted pair<br>*Legacy* feature group applicability: **No**.<br>Rationale: The *Legacy* feature group does not support Auto-Negotiation. Thus, this clause is not applicable.<br><br>*Standard and Performance* feature group applicability: **Yes**.<br>Rationale: The *Standard* and *Performance* feature groups do support auto-negotiation. Thus, this clause is applicable. | No | Yes | Yes |
| 29 | System considerations for multisegment 100BASE-T networks<br>Rationale: IEEE 11073-30400 interfaces, Implementing the DTE functionality of IEEE Std 802.3-2008, do not implement any repeater functionality and, thus, do not have multisegment issues to consider. | No | No | No |
| 30 | Management<br>Rationale: This clause specifies management capabilities for all Ethernet port types and features. Attributes and packages relevant to the supported interfaces of each feature group are applicable. This clause provides guidance to hardware implementers on management capabilities utilized by common management protocols (e.g., SNMP). | Partial | Partial | Partial |
| 31 | MAC Control<br>Rationale: The contents of this clause are applicable, if desired, to any data rate or any IEEE 802.3 physical layer option used in IEEE Std 11073-30400-2010. | Yes | Yes | Yes |
| 32 | Physical Coding Sublayer (PCS), Physical Medium Attachment (PMA) sublayer and baseband medium, type 100BASE-T2<br>Rationale: The IEEE 802.3 Category 3, unshielded twisted pair, 100BASE-T2 physical layer option is not used in IEEE Std 11073-30400-2010.<br>NOTE—This PHY is not recommended for new installations. Since September 2003, maintenance changes are no longer being considered for this clause. | No | No | No |
| 33 | Data Terminal Equipment (DTE) Power via Media Dependent Interface (MDI)<br>Rationale: As DTE, the IEEE 11073-30400 devices may, optionally, implement the powered device (PD) functionality of this clause. Furthermore, it is the responsibility of the networking infrastructure to, optionally, provide the power sourcing equipment (PSE) functionality of this clause. | Optional | Optional | Optional |

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**Table 4—Mapping for IEEE Std 802.3-2008: Section Two: Ethernet 100 Mb/s interface (*continued*)**

| Clause/ annex | Clause title / applicability rationale | Applicability to IEEE 11073-30400 | | |
|---|---|---|---|---|
| | | ***Legacy*** **group: Partial (22 of 29)** | ***Standard*** **group: Partial (29 of 38)** | ***Performance*** **group: Partial (29 of 38)** |
| Annex 22A | (informative) MII output delay, setup, and hold time budget<br>Rationale: The contents of this annex are applicable to any data rate or any IEEE 802.3 physical layer option used in IEEE Std 11073-30400-2010. | Yes | Yes | Yes |
| Annex 22B | (informative) MII driver ac characteristics<br>Rationale: The contents of this annex are applicable to any data rate or any IEEE 802.3 physical layer option used in IEEE Std 11073-30400-2010. | Yes | Yes | Yes |
| Annex 22C | (informative) Measurement techniques for MII signal timing characteristics<br>Rationale: The contents of this annex are applicable to any data rate or any IEEE 802.3 physical layer option used in IEEE Std 11073-30400-2010. | Yes | Yes | Yes |
| Annex 22D | (informative) Clause 22 access to Clause 45 MMD registers<br>Rationale: The contents of this annex are applicable to any data rate or any IEEE 802.3 physical layer option used in IEEE Std 11073-30400-2010. | Yes | Yes | Yes |
| Annex 23A | (normative) 6T codewords<br>Rationale: The IEEE 802.3 Category 3, unshielded twisted pair, 100BASE-T4 physical layer option is not used in IEEE Std 11073-30400-2010. | No | No | No |
| Annex 23B | (informative) Noise budget<br>Rationale: The IEEE 802.3 Category 3, unshielded twisted pair, 100BASE-T4 physical layer option is not used in IEEE Std 11073-30400-2010. | No | No | No |
| Annex 23C | (informative) Use of cabling systems with a nominal differential characteristic impedance of 120 Ω<br>Rationale: The IEEE 802.3 Category 3, unshielded twisted pair, 100BASE-T4 physical layer option is not used in IEEE Std 11073-30400-2010. | No | No | No |
| Annex 27A | (normative) Repeater delay consistency requirements<br>Rationale: IEEE Std 11073-30400-2010 does not implement any IEEE 802.3 repeater functionality. | No | No | No |

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**Table 4—Mapping for IEEE Std 802.3-2008: Section Two: Ethernet 100 Mb/s interface (*continued*)**

| Clause/ annex | Clause title / applicability rationale | Applicability to IEEE 11073-30400 | | |
|---|---|---|---|---|
| | | ***Legacy*** **group: Partial (22 of 29)** | ***Standard*** **group: Partial (29 of 38)** | ***Performance*** **group: Partial (29 of 38)** |
| Annex 28A | (normative) Selector Field definitions<br>*Legacy* feature group applicability: **No**.<br>Rationale: The *Legacy* feature group does not support the Ethernet Auto-Negotiation features. Thus, this annex, regarding the Selector Field, is not applicable.<br><br>*Standard and Performance* feature group applicability: **Yes**.<br>Rationale: The *Standard* and *Performance* feature groups do support the Ethernet Auto-Negotiation features. Thus, this annex, regarding Selector Field, is applicable. | No | Yes | Yes |
| Annex 28B | (normative) IEEE 802.3 Selector Base Page definition<br>*Legacy* feature group applicability: **No**.<br>Rationale: The *Legacy* feature group does not support the Ethernet Auto-Negotiation features. Thus this annex, regarding the Selector Base Page definition, is not applicable.<br><br>*Standard and Performance* feature group applicability: **Yes**.<br>Rationale: The *Standard* and *Performance* feature groups do support the Ethernet Auto-Negotiation features. Thus, this annex, regarding Selector Base Page definition, is applicable. | No | Yes | Yes |
| Annex 28C | (normative) Next Page Message Code Field definitions<br>*Legacy* feature group applicability: **No**.<br>Rationale: The *Legacy* feature group does not support the Ethernet Auto-Negotiation features. Thus, this annex, regarding the Next Page Message Code Field definition, is not applicable.<br><br>*Standard and Performance* feature group applicability: **Yes**.<br>Rationale: The *Standard* and *Performance* feature groups do support the Ethernet Auto-Negotiation features. Thus, this annex, regarding Next Page Message Code Field definition, is applicable. | No | Yes | Yes |
| Annex 28D | (normative) Description of extensions to Clause 28 and associated annexes<br>*Legacy* feature group applicability: **No**.<br>Rationale: The *Legacy* feature group does not support the Ethernet Auto-Negotiation features. Thus, this annex, regarding the extensions to Clause 28 and associated annexes, is not applicable.<br><br>*Standard and Performance* feature group applicability: **Yes**.<br>Rationale: The *Standard* and *Performance* feature groups do support the Ethernet Auto-Negotiation features. Thus, this annex, regarding the extensions to Clause 28 and associated annexes, is applicable. | No | Yes | Yes |

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**Table 4—Mapping for IEEE Std 802.3-2008: Section Two: Ethernet 100 Mb/s interface (*continued*)**

| Clause/\| annex | Clause title / applicability rationale | Applicability to IEEE 11073-30400 | | |
|---|---|---|---|---|
| | | ***Legacy* group: Partial (22 of 29)** | ***Standard* group: Partial (29 of 38)** | ***Performance* group: Partial (29 of 38)** |
| Annex 29A | (informative) DTE and repeater delay components<br>Rationale: This clause is supporting information for Clause 29 (which details multisegment considerations). Because IEEE Std 11073-30400-2010 only uses IEEE 802.3 DTE functionality, repeater functionality and multisegment considerations are not applicable. | No | No | No |
| Annex 29B | (informative) Recommended topology documentation<br>Rationale: IEEE Std 11073-30400-2010 is only concerned about DTE functionality. As such, this topology documentation, while applicable to the network on to which the IEEE 11073-30400 compliant equipment is deployed, it is not applicable to IEEE Std 11073-30400-2010. | No | No | No |
| Annex 30A | (normative) GDMO specification for IEEE 802.3 managed object classes<br>Rationale: The contents of this annex are applicable to any data rate or any IEEE 802.3 physical layer option used in IEEE Std 11073-30400-2010. | Yes | Yes | Yes |
| Annex 30B | (normative) GDMO and ASN.1 definitions for management<br>Rationale: The contents of this annex are applicable to any data rate or any IEEE 802.3 physical layer option used in IEEE Std 11073-30400-2010. | Yes | Yes | Yes |
| Annex 30C | (normative) SNMP MIB definitions for Link Aggregation<br>Rationale: The IEEE 802.3 link aggregation options (clause 43) are not used in IEEE Std 11073-30400-2010. | No | No | No |
| Annex 31A | (normative) MAC Control opcode assignments<br>*Legacy* feature group applicability: **No**.<br>Rationale: The *Legacy* feature group does not support the Ethernet full duplex features. Thus, this annex, regarding the MAC Control opcode assignments (the PAUSE opcode in particular), is not applicable.<br><br>*Standard and Performance* feature group applicability: **Partial**.<br>Rationale: The *Standard* and *Performance* feature groups do support the Ethernet full duplex features. Thus, this annex, regarding the MAC Control opcode assignments (the PAUSE opcode in particular), is applicable. | No | Partial | Partial |

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**Table 4—Mapping for IEEE Std 802.3-2008: Section Two: Ethernet 100 Mb/s interface (*continued*)**

| Clause/ annex | Clause title / applicability rationale | Applicability to IEEE 11073-30400 | | |
|---|---|---|---|---|
| | | ***Legacy* group: Partial (22 of 29)** | ***Standard* group: Partial (29 of 38)** | ***Performance* group: Partial (29 of 38)** |
| Annex 31B | (normative) MAC Control PAUSE operation<br>*Legacy* feature group applicability: **No**.<br>Rationale: The *Legacy* feature group does not support the Ethernet full duplex features. Thus, this annex, regarding the MAC Control PAUSE operation, is not applicable.<br><br>*Standard and Performance* feature group applicability: **Yes**.<br>Rationale: The *Standard* and *Performance* feature groups do support the Ethernet full duplex features. Thus this annex, regarding the MAC Control PAUSE operation, is applicable. | No | Yes | Yes |
| Annex 32A | (informative) Use of cabling systems with nominal differential characteristic impedance of 120 Ω or 150 Ω<br>Rationale: The IEEE 802.3Category 3, unshielded twisted pair, 100BASE-T2 physical layer option is not used in IEEE Std 11073-30400-2010. | No | No | No |
| Annex 33A | (informative) PSE detection of PDs<br>Rationale: The contents of this annex are applicable, if Clause 33 (Power over Ethernet functionality) is implemented, to any data rate or any IEEE 802.3 physical layer option used in IEEE Std 11073-30400-2010. | Yes | Yes | Yes |
| Annex 33B | (informative) Cabling guidelines<br>Rationale: The contents of this annex are applicable, if Clause 33 (Power over Ethernet functionality) is implemented, to any data rate or any IEEE 802.3 physical layer option used in IEEE Std 11073-30400-2010. | Yes | Yes | Yes |
| Annex 33C | (informative) Recommended test configurations and procedures<br>Rationale: The contents of this annex are applicable, if Clause 33 (Power over Ethernet functionality) is implemented, to any data rate or any IEEE 802.3 physical layer option used in IEEE Std 11073-30400-2010. | Yes | Yes | Yes |
| Annex 33D | (informative) PSE-PD stability<br>Rationale: The contents of this annex are applicable, if Clause 33 (Power over Ethernet functionality) is implemented, to any data rate or any IEEE 802.3 physical layer option used in IEEE Std 11073-30400-2010. | Yes | Yes | Yes |
| Annex 33E | (informative) Cabling resistance unbalance<br>Rationale: The contents of this annex are applicable, if Clause 33 (Power over Ethernet functionality) is implemented, to any data rate or any IEEE 802.3 physical layer option used in IEEE Std 11073-30400-2010. | Yes | Yes | Yes |

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The three IEEE 11073-30400 feature groups are summarized and mapped to the clauses and annexes of IEEE Std 802.3-2008: Section Three: Ethernet 1000 Mb/s interface in Table 5.

Devices conformant with this standard **shall** implement either feature group *Legacy*, *Standard*, or *Performance*.



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**Table 5—Mapping for IEEE Std 802.3-2008: Section Three: Ethernet 1000 Mb/s interface**

| Clause/ annex | Clause title / applicability rationale | Applicability to IEEE 11073-30400 | | |
|---|---|---|---|---|
| | | ***Legacy*** **group: No (0 of 19)** | ***Standard*** **group: No (0 of 19)** | ***Performance*** **group: Partial (8 of 19)** |
| 34 | Introduction to 1000 Mb/s baseband network<br>*Legacy and Standard* feature group applicability: **No**. Rationale: The *Legacy* and *Standard* feature groups do not support the 1000BASE-T interface. Thus, this clause is not applicable.<br><br>*Performance* feature group applicability: **Yes**. Rationale: The *Performance* feature group does support the 1000BASE-T interface. Thus, the contents of this clause are applicable to the use of the twisted pair 1000BASE-T physical layer option used in IEEE Std 11073-30400-2010. | No | No | Yes |
| 35 | Reconciliation Sublayer (RS) and Gigabit Media Independent Interface (GMII)<br>*Legacy and Standard* feature group applicability: **No**. Rationale: The *Legacy* and *Standard* feature groups do not support the 1000BASE-T interface. Thus, this clause is not applicable.<br><br>*Performance* feature group applicability: **Yes**. Rationale: The *Performance* feature group does support the 1000BASE-T interface. Thus, the contents of this clause are applicable to the use of the twisted pair 1000BASE-T physical layer option used in IEEE Std 11073-30400-2010. | No | No | Yes |
| 36 | Physical Coding Sublayer (PCS) and Physical Medium Attachment (PMA) sublayer, type 1000BASE-X<br>Rationale: The IEEE 802.3 1000 Mb/s fiber optic physical layer options are not used in IEEE Std 11073-30400-2010 | No | No | No |
| 37 | Auto-Negotiation function, type 1000BASE-X<br>Rationale: The IEEE 802.3 1000 Mb/s fiber optic physical layer options are not used in IEEE Std 11073-30400-2010. Thus, this clause is not applicable. | No | No | No |
| 38 | Physical Medium Dependent (PMD) sublayer and baseband medium, type 1000BASE-LX (Long Wavelength Laser) and 1000BASE-SX (Short Wavelength Laser)<br>Rationale: The IEEE 802.3 1000 Mb/s fiber optic physical layer options are not used in IEEE Std 11073-30400-2010. Thus, this clause is not applicable. | No | No | No |
| 39 | Physical Medium Dependent (PMD) sublayer and baseband medium, type 1000BASE-CX (short-haul copper)<br>Rationale: The IEEE 802.3 1000 Mb/s fiber optic physical layer options are not used in IEEE Std 11073-30400-2010. Thus, this clause is not applicable. | No | No | No |

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**Table 5—Mapping for IEEE Std 802.3-2008: Section Three: Ethernet 1000 Mb/s interface (*continued*)**

| Clause/\| annex | Clause title / applicability rationale | Applicability to IEEE 11073-30400 | | |
|---|---|---|---|---|
| | | ***Legacy*** **group: No (0 of 19)** | ***Standard*** **group: No (0 of 19)** | ***Performance*** **group: Partial (8 of 19)** |
| 40 | Physical Coding Sublayer (PCS), Physical Medium Attachment (PMA) sublayer and baseband medium, type 1000BASE-T<br>*Legacy and Standard* feature group applicability: **No**. Rationale: The *Legacy* and *Standard* feature groups do not support the 1000BASE-T interface. Thus, this clause is not applicable.<br><br>*Performance* feature group applicability: **Yes**. Rationale: The *Performance* feature group does support the 1000BASE-T interface. Thus, the contents of this clause are applicable to the use of the twisted pair 1000BASE-T physical layer option used in IEEE Std 11073-30400-2010. | No | No | Yes |
| 41 | Repeater for 1000 Mb/s baseband networks<br>*Legacy and Standard* feature group applicability: **No**. Rationale: The *Legacy* and *Standard* feature groups do not support the 1000BASE-T interface nor is any repeater functionality supports in IEEE Std 11073-30400-2010. Thus, this clause is not applicable.<br><br>*Performance* feature group applicability: **No**. Rationale: The *Performance* feature group does support the 1000BASE-T interface. However, IEEE Std 11073-30400-2010 does not support any repeater functionality. Thus, this clause is not applicable. | No | No | No |
| 42 | System considerations for multisegment 1000 Mb/s networks<br>*Legacy and Standard* feature group applicability: **No**. Rationale: The *Legacy* and *Standard* feature groups do not support the 1000BASE-T interface; no repeater functionality is supported in IEEE Std 11073-30400-2010. Thus, the multisegment considerations of this clause are not applicable.<br><br>*Performance* feature group applicability: **Yes**. Rationale: The *Performance* feature group does support the 1000BASE-T interface. However, IEEE Std 11073-30400-2010 does not support any repeater functionality. Thus, the multisegment considerations of this clause are not applicable. | No | No | No |
| 43 | Link Aggregation<br>Rationale: The link aggregation features of IEEE Std 802.3-2008 are not used in IEEE Std 11073-30400-2010. Thus, this clause is not applicable. | No | No | No |

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**Table 5—Mapping for IEEE Std 802.3-2008: Section Three: Ethernet 1000 Mb/s interface (*continued*)**

| Clause/\| annex | Clause title / applicability rationale | Applicability to IEEE 11073-30400 | | |
|---|---|---|---|---|
| | | ***Legacy* group: No (0 of 19)** | ***Standard* group: No (0 of 19)** | ***Performance* group: Partial (8 of 19)** |
| Annex 36A | (informative) Jitter test pattern.<br>Rationale: The IEEE 802.3 1000 Mb/s fiber optic physical layer options are not used in IEEE Std 11073-30400-2010. Thus, this annex is not applicable. | No | No | No |
| Annex 36B | (informative) 8B/10B transmission code running disparity calculation examples<br>Rationale: The IEEE 802.3 1000 Mb/s fiber optic physical layer options are not used in IEEE Std 11073-30400-2010. Thus, this annex is not applicable. | No | No | No |
| Annex 38A | (informative) Fiber launch conditions<br>Rationale: The IEEE 802.3 1000 Mb/s fiber optic physical layer options are not used in IEEE Std 11073-30400-2010. Thus, this annex is not applicable. | No | No | No |
| Annex 40A | (informative) Additional cabling design guidelines<br>*Legacy and Standard* feature group applicability: **No**.<br>Rationale: The *Legacy* and *Standard* feature groups do not support the 1000BASE-T interface. Thus, this annex is not applicable.<br><br>*Performance* feature group applicability: **Yes**.<br>Rationale: The *Performance* feature group does support the 1000BASE-T interface. Thus, the contents of this annex are applicable to the use of the twisted pair 1000BASE-T physical layer option used in IEEE Std 11073-30400-2010. | No | No | Yes |
| Annex 40B | (informative) Description of cable clamp<br>*Legacy and Standard* feature group applicability: **No**.<br>Rationale: The *Legacy* and *Standard* feature groups do not support the 1000BASE-T interface. Thus, this annex is not applicable.<br><br>*Performance* feature group applicability: **Yes**.<br>Rationale: The *Performance* feature group does support the 1000BASE-T interface. Thus, the contents of this annex are applicable to the use of the twisted pair 1000BASE-T physical layer option used in IEEE Std 11073-30400-2010. | No | No | Yes |
| Annex 40C | (informative) Add-on interface for additional Next Pages<br>*Legacy and Standard* feature group applicability: **No**.<br>Rationale: The *Legacy* and *Standard* feature groups do not support the 1000BASE-T interface. Thus, this annex is not applicable.<br><br>*Performance* feature group applicability: **Yes**.<br>Rationale: The *Performance* feature group does support the 1000BASE-T interface. Thus, the contents of this annex are applicable to the use of the twisted pair 1000BASE-T physical layer option used in IEEE Std 11073-30400-2010. | No | No | Yes |

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**Table 5—Mapping for IEEE Std 802.3-2008: Section Three: Ethernet 1000 Mb/s interface (*continued*)**

| Clause/\| annex | Clause title / applicability rationale | Applicability to IEEE 11073-30400 | | |
|---|---|---|---|---|
| | | ***Legacy* group: No (0 of 19)** | ***Standard* group: No (0 of 19)** | ***Performance* group: Partial (8 of 19)** |
| Annex 43A | (informative) Collection and Distribution functions<br>Rationale: The link aggregation features of IEEE 802.3 are not used in IEEE Std 11073-30400-2010. Thus, this annex is not applicable. | No | No | No |
| Annex 43B | (normative) Requirements for support of Slow Protocols<br>Rationale: The link aggregation features of IEEE Std 802.3 are not used in IEEE Std 11073-30400-2010. Thus, this annex is not applicable. | No | No | No |
| Annex 43C | (informative) LACP standby link selection and dynamic Key management<br>Rationale: The link aggregation features of IEEE Std 802.3-2008 are not used in IEEE Std 11073-30400-2010. Thus, this annex is not applicable. | No | No | No |

The three IEEE 11073-30400 feature groups are summarized and mapped to the clauses and annexes of IEEE Std 802.3-2008: Section four: Ethernet 10 Gb/s interface in Table 6.

Devices conformant with this standard **shall** implement either feature group *Legacy*, *Standard*, or *Performance*.

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**Table 6 —Mapping for IEEE Std 802.3-2008: Section Four: Ethernet 10 Gb/s interface**

| Clause/ annex | Clause title / applicability rationale | Applicability to IEEE 11073-30400 | | |
|---|---|---|---|---|
| | | *Legacy* group: Slight (1 of 19) | *Standard* group: Slight (1 of 17) | *Performance* group: Slight (1 of 17) |
| 44 | Introduction to 10 Gb/s baseband network<br>Rationale: The Ethernet 10 Gb/s interface is not a supported interface in IEEE Std 11073-30400-2010. | No | No | No |
| 45 | Management Data Input/Output (MDIO) Interface<br>Rationale: Portions of this clause (the "Clause 22 extensions") are applicable, if desired, to any of the IEEE 802.3 physical layer options used in IEEE Std 11073-30400-2010. | Partial | Partial | Partial |
| 46 | Reconciliation Sublayer (RS) and 10 Gigabit Media Independent Interface (XGMII)<br>Rationale: The Ethernet 10 Gb/s interface is not a supported interface in IEEE Std 11073-30400-2010. | No | No | No |
| 47 | XGMII Extender Sublayer (XGXS) and 10 Gigabit Attachment Unit Interface (XAUI)<br>Rationale: The Ethernet 10 Gb/s interface is not a supported interface in IEEE Std 11073-30400-2010. | No | No | No |
| 48 | Physical Coding Sublayer (PCS) and Physical Medium Attachment (PMA) sublayer, type 10GBASE-X<br>Rationale: The Ethernet 10 Gb/s interface is not a supported interface in IEEE Std 11073-30400-2010. | No | No | No |
| 49 | Physical Coding Sublayer (PCS) for 64B/66B, type 10GBASE-R<br>Rationale: The Ethernet 10 Gb/s interface is not a supported interface in IEEE Std 11073-30400-2010. | No | No | No |
| 50 | WAN Interface Sublayer (WIS), type 10GBASE-W<br>Rationale: The Ethernet 10 Gb/s interface is not a supported interface in IEEE Std 11073-30400-2010. | No | No | No |
| 51 | Physical Medium Attachment (PMA) sublayer, type Serial<br>Rationale: The Ethernet 10 Gb/s interface is not a supported interface in IEEE Std 11073-30400-2010. | No | No | No |
| 52 | Physical Medium Dependent (PMD) sublayer and baseband medium, type 10GBASE-S (Short Wavelength Serial), 10GBASE-L (Long Wavelength Serial), and 10GBASE-E (Extra Long Wavelength Serial)<br>Rationale: The Ethernet 10 Gb/s interface is not a supported interface in IEEE Std 11073-30400-2010. | No | No | No |
| 53 | Physical Medium Dependent (PMD) sublayer and baseband medium, type 10GBASE-LX4<br>Rationale: The Ethernet 10 Gb/s interface is not a supported interface in IEEE Std 11073-30400-2010. | No | No | No |

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**Table 6—Mapping for IEEE Std 802.3-2008: Section Four: Ethernet 10 Gb/s interface (*continued*)**

| Clause/\| annex | Clause title / applicability rationale | Applicability to IEEE 11073-30400 | | |
|---|---|---|---|---|
| | | ***Legacy*** **group: Slight (1 of 19)** | ***Standard*** **group: Slight (1 of 17)** | ***Performance*** **group: Slight (1 of 17)** |
| 54 | Physical Medium Dependent (PMD) sublayer and baseband medium, type 10GBASE-CX4<br>Rationale: The Ethernet 10 Gb/s interface is not a supported interface in IEEE Std 11073-30400-2010. | No | No | No |
| 55 | Clause 55 is reserved for future use<br>Rationale: The Ethernet 10 Gb/s interface is not a supported interface in IEEE Std 11073-30400-2010. | No | No | No |
| Annex 44A | (informative) Diagram of Data Flow<br>Rationale: The Ethernet 10 Gb/s interface is not a supported interface in IEEE Std 11073-30400-2010. | No | No | No |
| Annex 45A | (informative) Clause 45 MDIO electrical interface<br>Rationale: The Ethernet 10 Gb/s interface is not a supported interface in IEEE Std 11073-30400-2010. | No | No | No |
| Annex 48A | (informative) Jitter test patterns<br>Rationale: The Ethernet 10 Gb/s interface is not a supported interface in IEEE Std 11073-30400-2010. | No | No | No |
| Annex 48B | (informative) Jitter test methods<br>Rationale: The Ethernet 10 Gb/s interface is not a supported interface in IEEE Std 11073-30400-2010. | No | No | No |
| Annex 50A | (informative) Thresholds for Severely Errored Second calculations<br>Rationale: The Ethernet 10 Gb/s interface is not a supported interface in IEEE Std 11073-30400-2010. | No | No | No |
| Annex 55A | (normative) LDPC details<br>Rationale: The Ethernet 10 Gb/s interface is not a supported interface in IEEE Std 11073-30400-2010. | No | No | No |
| Annex 56A | (informative) Additional cabling design guidelines for 10GBASE-T<br>Rationale: The Ethernet 10 Gb/s interface is not a supported interface in IEEE Std 11073-30400-2010. | No | No | No |

The three IEEE 11073-30400 feature groups are summarized and mapped to the clauses and annexes of IEEE Std 802.3: Section five: Ethernet subscriber access interface in Table 7.

Devices conformant with this standard **shall** implement either feature group *Legacy*, *Standard*, or *Performance*.

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