SLOVENSKI STANDARD
SIST EN 29314-1:1997

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Information processing systems - Fibre Distributed Data Interface (FDDI) - Part 1: Token Ring Physical Layer Protocol (PHY) (ISO 9314-1:1989)

Information processing systems - Fibre Distributed Data Interface (FDDI) - Part 1: Token Ring Physical Layer Protocol (PHY) (ISO 9314-1:1989)

Informationsverarbeitungssysteme - Verteilte Datenschnittstelle mit Lichtwellenleitern (FFDI) - Teil 1: Protokoll für die Bitübertragungsschicht (PHY) (ISO 9314-1:1989)

Systemes de traitements de l'information - Interface de données distribuées sur fibre (FDDI) - Partie 1: Protocole de la couche physique de l'anneau a jeton (ISO 9314-1:1989)

Ta slovenski standard je istoveten z: EN 29314-1:1993

ICS:

35.100.10	Fizični sloj	Physical layer
35.200	Vmesniška in povezovalna oprema	Interface and interconnection equipment

SIST EN 29314-1:1997   **en**

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EUROPEAN STANDARD

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English version

Information processing systems - Fibre Distributed Data Interface (FDDI) - Part 1: Token Ring Physical Layer Protocol (PHY) (ISO 9314-1:1989)

Systèmes de traitement de l'information - Interface de données distribuées sur fibre (FDDI) - Partie 1: Protocole de la couche physique de l'anneau à jeton (ISO 9314-1:1989)

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REPUBLIKA SLOVENIJA
MINISTRSTVO ZA ZNANOST IN TEHNOLOGIJO
Urad RS za standardizacijo in meroslovje
LJUBLJANA
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PREVZET PO METODI RAZGLASITVE

-12- 1997

This European Standard was approved by CEN on 1993-10-20. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

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Foreword

On the proposal of the CEN Central Secretariat, the Technical Board decided to submit the International Standard:

"Information processing systems – Fibre Distributed Data Interface (FDDI) – Part 1: Token Ring Physical Layer Protocol (PHY) (ISO 9314-1:1989)"

to the formal vote.

The result of the formal vote was positive.

For the time being, this document exists only in English.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by April 1994, and conflicting national standards shall be withdrawn at the latest by April 1994.

In accordance with the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard:

Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

Endorsement notice

The text of the International Standard ISO 9314-1:1989 was approved by CEN as a European Standard without any modification.

INTERNATIONAL STANDARD

ISO
9314-1

First edition
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Information processing systems — Fibre Distributed Data Interface (FDDI) —

Part 1 :
Token Ring Physical Layer Protocol (PHY)

Systèmes de traitement de l'information — Interface de données distribuées sur fibre (FDDI) —

Partie 1 : Protocole de la couche physique de l'anneau à jeton

Reference number
ISO 9314-1 : 1989 (E)

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 9314-1 was prepared by Technical Committee ISO/TC 97, *Information processing systems*.

ISO 9314 consists of the following parts, under the general title *Information processing systems — Fibre Distributed Data Interface (FDDI)*:

— *Part 1: Token Ring Physical Layer Protocol (PHY)*

— *Part 2: Token Ring Media Access Control (MAC)*

— *Part 3: Token Ring Physical Layer, Medium Dependent (PMD)*

Introduction

This part of ISO 9314 on the FDDI physical layer protocol is intended for use in a high-performance multistation network. This protocol is designed to be effective at 100 Mbit/s using a Token ring architecture and fibre optics as the transmission medium over distances of several kilometers in extent.

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Information processing systems — Fibre Distributed Data Interface (FDDI) —

Part 1 :
Token Ring Physical Layer Protocol (PHY)

1 Scope

This part of ISO 9314 specifies the Physical Layer Protocol (PHY), the upper sublayer of the Physical Layer, for Fibre Distributed Data Interface (FDDI).

FDDI provides a high-bandwidth (100 Mbit/s), general-purpose interconnection among computers and peripheral equipment using fibre optics as the transmission medium. FDDI can be configured to support a sustained transfer rate of approximately 80 Mbit/s (10 Mbyte/s). It may not meet the response time requirements of all unbuffered high-speed devices. FDDI establishes connections among many stations distributed over distances of several kilometers in extent. Default values for FDDI were calculated on the basis of 1 000 physical links and a total fibre path length of 200 km (typically corresponding to 500 stations and 100 km of dual fibre cable).

FDDI consists of:

(a) A Physical Layer (PL), which is divided into two sublayers:

(1) A Physical Medium Dependent (PMD), which provides the digital baseband point-to-point communication between stations in the FDDI network. The PMD provides all services necessary to transport a suitably coded digital bit stream from station to station. The PMD defines and characterizes the fibre-optic drivers and receivers, medium-dependent code requirements, cables, connectors, power budgets, optical bypass provisions, and physical-hardware-related characteristics. It specifies the point of interconnectability for conforming FDDI attachments.

(2) A Physical Layer Protocol (PHY), which provides connection between the PMD and the Data Link Layer. PHY establishes clock synchronization with the upstream code-bit data stream and decodes this incoming code-bit stream into an equivalent symbol stream for use by the higher layers. PHY provides encoding and decoding between data and control indicator symbols and code bits, medium conditioning and initializing, the synchronization of incoming and outgoing code-bit clocks, and the delineation of octet boundaries as required for the transmission of information to or from higher layers. Information to be transmitted on the interface medium is encoded by the PHY into a grouped transmission code. The definition of PHY is contained in this part of ISO 9314.

(b) A Data Link Layer (DLL), which controls the accessing of the medium and the generation and verification of frame check sequences to ensure the proper delivery of valid data to the higher layers. DLL also concerns itself with the generation and recognition of device addresses and the peer-to-peer associations within the FDDI network. For the purpose of the PHY definition contained in this part of ISO 9314,

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references to DLL are made in terms of the Media Access Control (MAC) entity, which is the lowest sublayer of DLL.

(c) A Station Management (SMT)[1], which provides the control necessary at the station level to manage the processes under way in the various FDDI layers such that a station may work cooperatively on a ring. SMT provides services such as control of configuration management, fault isolation and recovery, and scheduling procedures.

The definition of PHY as contained in this part of ISO 9314 is designed to be as independent as possible from the actual physical medium.

ISO 9314 specifies the interfaces, functions, and operations necessary to ensure interoperability between conforming FDDI implementations. This part of ISO 9314 is a functional description. Conforming implementations may employ any design technique that does not violate interoperability.

2   Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 9314. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 9314 are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 9314-2: 1989, *Information processing systems – Fibre Distributed Data Interface (FDDI) – Part 2: Token Ring Media Access Control (MAC).*

ISO 9314-3: ----[2], *Information processing systems – Fibre Distributed Data Interface (FDDI) – Part 3: Token Ring Physical Layer, Medium Dependent (PMD).*

3   Definitions

For the purposes of this part of ISO 9314, the following definitions apply:

3.1 code bit: The smallest signalling element used by the Physical Layer for transmission on the medium.

3.2 code group: The specific sequence of five code bits representing a DLL symbol.

3.3 concentrator: A node on the FDDI ring, which in turn provides connections for additional conforming FDDI stations so that they may communicate with other attachments to the FDDI ring. A concentrator has two Physical Layer entities and may or may not have one or more Data Link Layer entities.

3.4 Connection Management (CMT): That portion of the Station Management (SMT) function that controls network insertion, removal, and connection of PHY and MAC entities within a station.

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[1] SMT will form the subject of a future part of ISO 9314.

[2] To be published.

2

3.5 entity: An active element within an Open System Interconnection (OSI) layer, or sublayer; or SMT, in a specific station.

3.6 fibre optics: A technology whereby signals are transmitted over an optical waveguide medium through the use of light-generating transmitters and light-detecting receivers.

3.7 frame: A Protocol Data Unit transmitted between cooperating MAC entities on a ring, consisting of a variable number of octets.

3.8 nonreturn to zero (NRZ): A technique in which a polarity level high, or low, represents a logical "1" (one), or "0" (zero).

3.9 nonreturn to zero invert on ones (NRZI): A technique in which a polarity transition represents a logical "1" (one). The absence of a polarity transition denotes a logical "0" (zero).

3.10 physical connection: The full-duplex physical layer association between adjacent PHY entities (in concentrators, repeaters, or stations) in an FDDI ring, i.e., a pair of Physical Links.

3.11 physical link: The simplex path (via PMD and attached medium) from the transmit function of one PHY entity to the receive function of an adjacent PHY entity (in concentrators, repeaters, or stations) in an FDDI ring.

3.12 primitive: An element of the services provided by one entity to another.

3.13 Protocol Data Unit (PDU): Information delivered as a unit between peer entities that may contain control information, address information and data (e.g., an Service Data Unit from a higher layer).

3.14 receive: The action of a station of accepting a frame, token, or control sequence from the medium.

3.15 repeat: The act of a station in receiving a code-bit stream (e.g., frame or token) from an upstream station and placing it on the medium to the next station. The station repeating the code-bit stream examines it and may copy it into a buffer and modify control indicators as appropriate.

3.16 ring: Two or more stations in which information is passed sequentially between active stations, each station in turn examining or copying the information, finally returning it to the originating station.

3.17 Service Data Unit (SDU): The unit of data transfer between a service user and a service provider.

3.18 services: The services provided by one entity to a higher entity or to SMT.

3.19 station: An addressable logical and physical node on a ring capable of transmitting, repeating, and receiving information.

3.20 Station Management (SMT): The entity within a station on the ring that monitors station activity and exercises overall appropriate control of station activity.

3.21 symbol: The smallest signalling element used by the Data Link Layer (DLL). The symbol set consists of 16 data symbols and 8 control symbols. Each symbol corresponds to a specific sequence of code bits (code group) to be transmitted by the Physical Layer.