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

Part 3: Physical Layer Medium Dependent (PMD)



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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) together form a system for worldwide standardization as a whole. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for approval before their acceptance as International Standards. They are approved in accordance with procedures requiring at least 75 % approval by the national bodies voting.

International Standard ISO/IEC 9314-3 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*.

ISO/IEC 9314-3 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)*

Annexes A to G are for information only.

Introduction

This part of ISO/IEC 9314 on the FDDI token ring physical layer, medium dependent 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 kilometres in extent.

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

Part 3: Physical Layer Medium Dependent (PMD)

1 Scope

This part of ISO/IEC 9314 specifies Physical Layer, Medium Dependent (PMD) requirements for the Fibre Distributed Data Interface (FDDI).

The FDDI provides a high-bandwidth (100 Mbit/s) general-purpose interconnection among computers and peripheral equipment using fibre optics as the transmission medium. The FDDI may 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. The FDDI establishes the connection among many FDDI nodes (stations) distributed over distances of several kilometres in extent. Default values for FDDI were calculated on the basis of 1 000 physical connections and a total fibre path length of 200 km.

The FDDI consists of

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

(1) A Physical Layer, Medium Dependent (PMD), which provides the digital baseband point-to-point communication between nodes in the FDDI network. PMD shall provide all services necessary to transport a suitably coded digital bit stream from node to node. PMD specifies the point of interconnection requirements for conforming FDDI stations and cable plants at both sides of the Media Interface Connector (MIC). PMD includes the following:

- The optical power budgets for cable plants using 62,5/125 μm fibre optic cables and optical bypass switches.
- The MIC receptacle mechanical mating requirements including the keying features.
- The 62,5/125 μm fibre optic cable requirements.
- The services provided by PMD to PHY and SMT.

(2) A Physical Layer Protocol (PHY), which provides connection between PMD and the Data Link Layer (DLL). 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.

(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 other 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 purposes of this part of ISO/IEC 9314, 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 node level to manage the processes underway in the various FDDI layers such that a node may work co-operatively on a ring. SMT provides services such as control of configuration management, fault isolation and recovery, and scheduling procedures.

This part of ISO/IEC 9314 is a supporting document to ISO/IEC 9314-1 which should be read in conjunction with it.

The SMT document should be consulted for information pertaining to supported FDDI node and network configurations.

ISO/IEC 9314 specifies the interfaces, functions, and operations necessary to insure interoperability between conforming FDDI implementations. This part of ISO/IEC 9314 is a functional description. Conforming implementations may employ any design technique which 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/IEC 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/IEC 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 9314-1: 1989, *Information processing systems - Fibre Distributed Data Interface (FDDI) - Part 1: Token Ring Physical Layer Protocol (PHY)*.

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

¹⁾ SMT will form the subject of a future part of ISO/IEC 9314.