# INTERNATIONAL STANDARD

# ISO/IEC 9314-25

First edition
1998-10

## Information technology –
## Fibre Distributed Data Interface (FDDI) –
## Part 25:
## Abstract Test Suite for FDDI – Station Management Conformance Testing (SMT-ATS)



Reference number
ISO/IEC 9314-25:1998(E)

PRICE CODE XC

*For price, see current catalogue*

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# FOREWORD

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. 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 voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

International Standard ISO/IEC 9314-25 was prepared by Joint Technical Committee ISO/IEC JTC 1 *Information technology*, Subcommittee SC 25, *Interconnection of information technology equipment.*

ISO/IEC 9314 consists of the following parts, under the general title *Information technology – Fibre Distributed Data Interface (FDDI):*

- *Part 1: Token Ring Physical Layer Protocol (PHY)*
- *Part 2: Token Ring Media Access Control (MAC)*
- *Part 3: Physical Layer Medium Dependent (PMD)*
- *Part 4: Single Mode Fibre Physical Layer Medium Dependent (SMF-PMD)*
- *Part 5: Hybrid Ring Control (HRC)*
- *Part 6: Station Management (SMT)*
- *Part 7: Physical Layer Protocol (PHY-2)*
- *Part 8: Media Access Control-2 (MAC-2)*
- *Part 9: Low-Cost Fibre – Physical Medium Dependent (LCF-PMD)*
- *Part 10: Token Ring Twisted Pair Physical layer Medium Dependent (TP-PMD)*
- *Part 13: Conformance Test Protocol Implementation Conformance Statement proforma (CT-PICS)*
- *Part 20: Physical Medium Dependent Conformance Testing (PMD-ATS)*
- *Part 21: Physical Layer Protocol Conformance Testing (PHY-ATS)*
- *Part 25: Abstract Test Suite for FDDI – Station Management Conformance Testing (SMT-ATS)*
- *Part 26: Media Access Control Conformance Testing (MAC-ATS)*

# INTRODUCTION

The International Organization for Standardization (ISO) has developed a standard to define the procedures required for Conformance Testing. These procedures are set forth in ISO 9646, Parts 1-7. Part 3 defines the language syntax to be used for writing Abstract Test Suites (ATS), that language is Tree and Tabular, Combined Notation (TTCN).

The Station Management (SMT) Abstract Test Suite (ATS) directly supports the FDDI Protocol Implementation Conformance Statement (PICS) Proforma and works in correlation with three other FDDI ATS standards.

This ATS for FDDI SMT provides the test procedures and test cases required to test the station management protocol described in the SMT standards. SMT specified the local portion of the system management application process for FDDI, including the control required for proper operation of an FDDI station in an FDDI ring. SMT provided services such as connection management, station insertion and removal, station initialization, configuration management, fault recovery, communication protocol for external authority, scheduling policies and the collection of statistics. SMT interact with PMD, PHY, and MAC for testing.

The three ATS standards when combined with SMT, that make up the complete Conformance Test for the FDDI Protocol are:

a) An ATS for FDDI Physical Medium Dependent (PMD) that provides a conformance test for FDDI PMD. PMD specifies the optical interface of FDDI stations. PMD is not a protocol standard and this ATS requires the measurement of physical quantities such as optical power, wavelength and signal jitter. The PMD ATS differs from the methodology of higher level protocol conformance tests written using the Tree and Tabular Combined Notation as specified by ISO 9643-3, because the TTCN notation does not provide a suitable vehicle for Physical Layer testing, where there is no concept of a protocol data unit and where physical quantities must be measured.

b) An ATS for the FDDI Physical Layer Protocol (PHY) that provides a conformance test for FDDI PHY. PHY specifies the upper sublayer of the Physical Layer for the FDDI, including the data encode/decode, framing and clocking, as well as the elasticity buffer, smoothing and repeat filter functions. FDDI PHY, however, does contain several state machines and implements a protocol at the level of FDDI code symbols. The only physical quantity that must be measured in this conformance test is frequency. The PHY ATS cannot use the TTCN notation. A unique notation is developed in the PHY ATS for specifying test patterns and expected results in terms of FDDI code symbol strings.

c) An ATS for FDDI Media Access Control (MAC) that provides a Conformance test for FDDI MAC. MAC specifies the lower sublayer of the Data Link Layer for FDDI. It specifies access to the medium, including addressing, data checking and data framing. MAC also specifies the receiver and transmitter state machines. Since MAC is a protocol that deals primarily with complete PDUs, the Tree and Tabular Combined Notation language specified in ISO 9643-3 is used to specify MAC protocol tests.

International Standard ISO/IEC 9314-25:1998, *Information technology - Fibre Distributed Data Interface (FDDI) - Station Management Conformance Testing (SMT-ATS)* was developed by ISO/IEC JTC 1/SC 25.

# INFORMATION TECHNOLOGY – FIBRE DISTRIBUTED DATA INTERFACE (FDDI) –

## Part 25: Abstract Test Suite for FDDI – Station Management Conformance Testing (SMT ATS)

## 1 Scope

This part of ISO/IEC 9314 contains the Abstract Test Suites for the Fiber Distributed Data Interface (FDDI) token ring Station Management (SMT) layer protocol. The SMT Protocol is extensive and very complex. In the development process, the protocol was broken into six separate areas. Those areas dealt with Physical Connection Management (PCM), Entity Coordination Management (ECM) Ring Management (RMT), Configuration Management (CMT), Frame Based Management (FBM) and Management Information Base (MIB).

This SMT ATS is divided along the same boundaries, with the exception that PCM and ECM are combined. Those two concepts are tested together. The formal description language used for Abstract Test Suite (ATS) development is Tree and Tabular Combined Notational (TTCN) and is defined in ISO 9646Framework. TTCN is intended for higher layer protocol testing and requires the use of discreet Protocol Data Units (PDUs). The TTCN notation is used in the test cases for RMT, FBM and MIB. It cannot be used for PCM, ECM and CFM. These three protocols use line states as the method of conveying information.

The TTCN (P) is similar in structure to TTCN but changes the paradigm from PDUs to line states. A description of the concept of TTCN (P) can be found in the beginning of section 6, PCM.

## 2 Normative references

The following normative documents 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 indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO/IEC 7498-1:1994, *Information technology – Open Systems Interconnection – Basic Reference Model: The Basic Model*

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

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

ISO/IEC 9314-3:1990, *Information processing systems – Fibre Distributed Data Interface (FDDI) – Part 3: Physical Layer Medium Dependent (PMD)*

ISO/IEC 9314-6:1998 *Information technology – Fibre Distributed Data Interface (FDDI) – Part 6: Station Management (SMT)*

ISO/IEC 9646 (all parts), *Information technology – Open Systems Interconnection – Conformance testing methodology and framework*

ISO/IEC 9646-1:1994, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 1: General concepts*

ISO/IEC 9646-2:1994, *Information technology – Open Systems Interconnection – Conformance testing methodology and framework – Part 2: Abstract test suite specification*