INTERNATIONAL STANDARD

ISO/IEC 8882-2

Third edition
2000-04-15

Information technology — Telecommunications and information exchange between systems — X.25 DTE conformance testing —

Part 2: Data link layer conformance test suite

Technologies de l'information — Télécommunications et échange d'information entre systèmes — Test de conformité X.25 DTE —

Partie 2: Suite d'essais de conformité pour la couche liaison de données

Reference number
ISO/IEC 8882-2:2000(E)

© ISO/IEC 2000

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS

Not for Resale

STD.ISO 8882-2-ENGL 2000 ■ 4851903 0832197 682 ■

INTERNATIONAL STANDARD

ISO/IEC 8882-3

Third edition
2000-04-15

Information technology — Telecommunications and information exchange between systems — X.25 DTE conformance testing —

Part 3: Packet layer conformance test suite

Technologies de l'information — Télécommunications et échange d'information entre systèmes — Test de conformité X.25 DTE —

Partie 3: Suite d'essais de conformité pour la couche paquet

Reference number
ISO/IEC 8882-3:2000(E)

© ISO/IEC 2000

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS

Not for Resale

STD.ISO 8882-2-ENGL 2000 ■ 4851903 0832198 519 ■

INTERNATIONAL STANDARD

ISO/IEC 8882-2

Third edition
2000-04-15

Information technology — Telecommunications and information exchange between systems — X.25 DTE conformance testing —

Part 2: Data link layer conformance test suite

Technologies de l'information — Télécommunications et échange d'information entre systèmes — Test de conformité X.25 DTE —

Partie 2: Suite d'essais de conformité pour la couche liaison de données

Reference number
ISO/IEC 8882-2:2000(E)

© ISO/IEC 2000

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS

Not for Resale

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

© ISO/IEC 2000

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 734 10 79
E-mail copyright@iso.ch
Web www.iso.ch

Printed in Switzerland

© ISO/IEC 2000 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

Contents

Page

1. SCOPE **1**

2. NORMATIVE REFERENCES **2**

3. DEFINITIONS AND ABBREVIATIONS **2**

3.1 REFERENCE MODEL DEFINITIONS 3
3.2 CONFORMANCE TESTING TERMS 3
3.3 X.25-DTE CONFORMANCE TESTING TERMS 4
3.4 ADDITIONAL DEFINITIONS 4
3.5 ABBREVIATIONS 4

4. TEST SUITE INFORMATION **4**

4.1 TEST SUITE STRUCTURE 4
4.2 DATA LINK LAYER TEST GROUPS AND SUBGROUPS 5
4.3. METHOD FOR CONFORMANCE TESTING 5
4.4 TEST CASE NOTATION 5
4.5 PREAMBLE 6
4.6 VERIFICATION SEQUENCE 6
4.7 IUT INITIATED ACTIONS 7
4.8 ACCEPTABLE UNEXPECTED IUT FRAMES 7
4.9 TRANSIENT STATES 7
4.10 UNREACHABLE STATES 7
4.11 DECLARATIONS 7
4.12 ENCODING AND ORDER OF BIT TRANSMISSION 7
4.13 PIXIT PROFORMA 8
4.14 CLASSIFICATION OF IUT 9

ANNEX A ABSTRACT TEST SUITE (ATS) **10**

A.1 THE TTCN GRAPHICAL FORM (TTCN.GR) 10
A.2 THE TTCN MACHINE PROCESSABLE FORM (TTCN.MP) 10

© ISO/IEC 2000 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS

Not for Resale

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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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.

Attention is drawn to the possibility that some of the elements of this part of ISO/IEC 8882-2 may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

International Standard ISO/IEC 8882-2 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 6, *Telecommunications and information exchange between systems*.

This third edition cancels and replaces the second edition (ISO/IEC 8882-2:1995), which has been technically revised.

ISO/IEC 8882 consists of the following parts, under the general title *Information technology — Telecommunications and information exchange between systems — X.25 DTE conformance testing*:

— *Part 1: General principles*

— *Part 2: Data link layer conformance test suite*

— *Part 3: Packet layer conformance test suite*

Annex A forms a normative part of this part of ISO/IEC 8882.

© ISO/IEC 2000 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

Introduction

This part of ISO/IEC 8882 presents the X.25-DTE Conformance Test Suite for Data Link Layer, described in Tree and Tabular Combined Notation (TTCN).

ISO/IEC 8882-1 explains the objectives and usage of this part of ISO/IEC 8882.

Clause 1 of this part of ISO/IEC 8882-2 is the scope which provides an objective basis for the applicability of the tests within this part of ISO/IEC 8882. Clauses 2 and 3 give the references, definitions and abbreviations used in this part of ISO/IEC 8882. Clause 4 contains information relating to procedures performed in conformance testing. The test suite structure is defined in terms of test groups and subgroups in Table 1. This clause also gives an overview of the test suite. Annex A provides information on the Abstract Test Suite for the X.25-DTE LAPB Data Link Layer protocol both in TTCN GR and TTCN MP format.

© ISO/IEC 2000 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS

Not for Resale

Information technology — Telecommunications and information exchange between systems — X.25 DTE conformance testing —

Part 2: Data link layer conformance test suite

1 Scope

This part of ISO/IEC 8882 defines an abstract test suite for testing the conformance of the Data Link Layer of an IUT with respect to ISO/IEC 7776 (1986, 1995) or the ITU-T Recommendation X.25 (1980, 1984, 1988, 1993).

Conformance of a Data Terminal Equipment (DTE) to the above ISO International Standard or ITU-T Recommendations is tested using a dedicated circuit between the tester and the DTE. It is noted that ITU-T Recommendations X.25 (1980), X.25 (1984), X.25 (1988) and X.25 (1993) are written from the perspective of a DCE and therefore do not always explicitly specify the DTE's operation. In such cases it is assumed that recommended operation of a DTE is included by implication because of the need to communicate with X.25 DCE's. This part of ISO/IEC 8882 excludes the testing of the LAP procedures given in the ITU-T Recommendations.

NOTE Test cases for extended mode operation (Modulo 128), multilink procedure and DTE-DTE operation as per ISO/IEC 7776 are for further study.

The tests in this part of ISO/IEC 8882 are designed for six possible interworking situations, shown in Figure 1. This part specifies tests for all six cases shown in Figure 1, but recognizes that not every test may apply to a particular DTE. A test selection procedure has to be performed to determine the applicability of a test to a particular DTE. Such selection will be based on the PICS and the PIXIT.

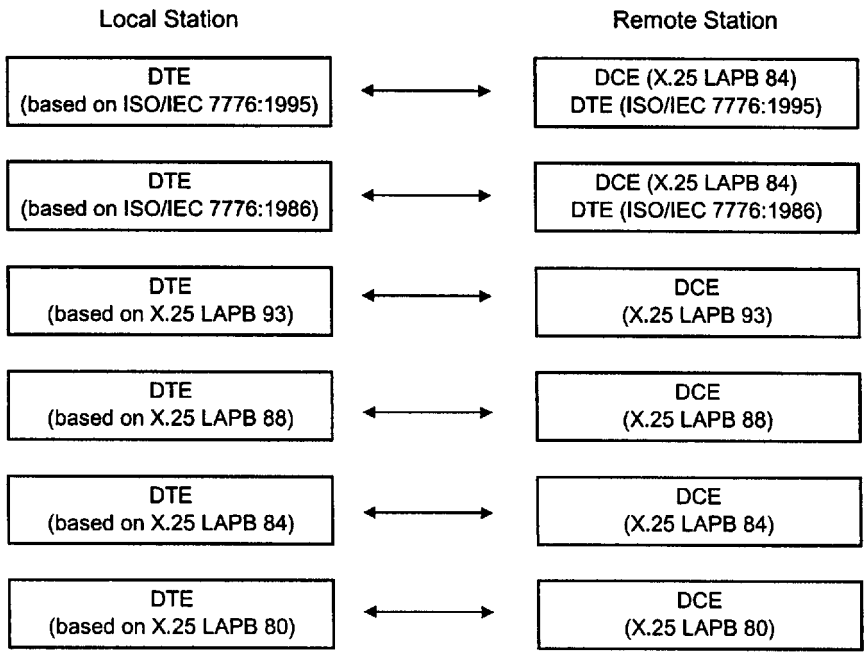


Figure 1 — Testing X.25-DTE/DCE and X.25-DTE/DTE Interworking

© ISO/IEC 2000 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

In the rest of this part of ISO/IEC 8882, the term "X.25 standards" means all four of ITU-T Recommendations X.25 (1980), X.25 (1984), X.25 (1988), X.25 (1993), and International Standards ISO/IEC 7776 (1995) and ISO/IEC 7776 (1986), unless stated otherwise.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 8882. 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 8882 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.* (See also ITU-T Recommendation X.200)

ISO/IEC 7776:1995, *Information technology — Telecommunications and information exchange between systems — High-level data link control procedures — Description of the X.25 LAPB-compatible DTE data link procedures.*

ISO/IEC 8824:1990, *Information technology — Open Systems Interconnection — Specification of Abstract Syntax Notation One (ASN.1).*

ISO/IEC 8882-1:1996, *Information technology — Telecommunications and information exchange between systems — X.25-DTE conformance testing — Part 1: General principles.*

ISO/IEC 9646-1:1994, *Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 1: General concepts.* (See also ITU-T Recommendation X.290)

ISO/IEC 9646-2:1994, *Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 2: Abstract Test Suite specification.* (See also ITU-T Recommendation X.291)

ISO/IEC 9646-3:1998, *Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 3: The Tree and Tabular Combined Notation (TTCN).*

ISO/IEC 9646-4:1994, *Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 4: Test realization.* (See also ITU-T Recommendation X.293)

ISO/IEC 9646-5:1994, *Information technology — Open Systems Interconnection — Conformance testing methodology and framework — Part 5: Requirements on test laboratories and clients for the conformance assessment process.* (See also ITU-T Recommendation X.294)

ITU-T Recommendations X.25 (1980), X.25 (1984), X.25 (1988), X.25 (1993), *Interface between Data Terminating Equipment (DTE) and Data Circuit-terminating Equipment (DCE) for terminals operating in the packet mode and connected to the public data networks by dedicated circuit.*

3 Terms, definitions and abbreviations

For the purposes of this part of ISO/IEC 8882, the terms and definitions given in 3.4 and in the following International Standards apply:

a) ISO/IEC 7498-1;

b) ISO/IEC 9646;

c) ISO/IEC 8882-1.

© ISO/IEC 2000 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS

Not for Resale

3.1 Reference model terms

The following terms defined in ISO/IEC 7498-1 are used:

a) (N)-protocol data unit (N-PDU). In the context of this part of ISO/IEC 8882-2. (N) is layer 2 and so N-PDU is abbreviated to PDU. A PDU in the Data Link Layer is also referred to as a "frame".

b) Data Link Layer

3.2 Conformance testing terms

The following terms are used from the Conformance Testing Methodology and Framework, International Standard ISO/IEC 9646:

a) Conformance Testing

b) Conformance Test Suite

c) Implementation Under Test (IUT)

d) Protocol Implementation Conformance Statement (PICS)

e) Protocol Implementation Extra Information for Testing (PIXIT)

f) Static Conformance Requirements (SCR)

g) Behavior Testing

h) Test Purpose

i) Tree and Tabular Combined Notation (TTCN)

j) Preamble

k) Test Body

l) Test Step

m) Test Event

n) Abstract Service Primitive (ASP)

o) Test Group

p) Abstract Test Suite (ATS)

q) Executable Test Suite (ETS)

r) Test Verdicts

s) Lower Tester

t) Upper Tester

u) Test Methods

v) Remote Single (layer) Test Method (RS method)

w) Valid Test Event

x) Invalid Test Event

y) Inopportune Test Event

z) Point of Control and Observation (PCO)

© ISO/IEC 2000 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS

Not for Resale

3.3 X.25-DTE conformance testing terms

This part of ISO/IEC 8882-2 makes use of the following terms defined in ISO/IEC 8882-1:

a) Improper PDU

b) Proper PDU

c) Test Case

d) Test Subgroup

e) Tester

3.4 Additional terms and definitions

This test suite uses test subgroups for proper, improper and inopportune frames to test the IUT behavior. These terms are defined below.

3.4.1
improper frame
frame that satisfies one or more of the following conditions:

a) it is not properly bounded by two flags;

b) it contains fewer than 32 bits between flags;

c) it contains a Frame Check Sequence (FCS) error;

d) it contains an invalid address field encoding;

e) it contains a command or response control field encoding that is undefined or not implemented in X.25-DTE LAPB Data Link Layer protocol as specified in ISO/IEC 7776;

f) it is an I frame exceeding the maximum established frame length;

g) it is an unnumbered or supervisory frame with an information field which is not permitted;

h) it is a frame with an invalid N(R)

3.4.2
inopportune frame
syntactically valid frame arriving at a time (DTE's state) when it should be considered irrelevant by the DTE. Syntactically valid frames are those that are allowed by the X.25 standards for a DTE using the LAPB procedure and are not covered by 3.4.1

3.4.3
proper frame
valid frame arriving at the correct DTE's state or phase and not covered by 3.4.1 or 3.4.2

3.5 Abbreviations

The abbreviation IUT is used in this part of ISO/IEC 8882-2 to refer to an X.25-DTE under test.

4 Test suite information

4.1 Test suite structure

The X.25-DTE Data Link Layer Conformance Test Suite structure is outlined in Table 1.

© ISO/IEC 2000 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

Table 1 — Data link layer test suite structure

Data Link Layer Test Groups	Test State Abbreviation	Test Group Name	Current State of IUT
DL1	DP	Disconnected phase	DISC received and UA or DM transmitted (see clause 4.10)
DL2	LD	Link Disconnection phase	DISC transmitted from any phase (see clause 4.11)
DL3	LS	Link Set-up phase	SABM transmitted from DP (see clause 4.11)
DL4	IT	Information Transfer phase	SABM received and UA transmitted, or SABM transmitted and UA received, while in DP or IT phase
DL5	FR	Frame Reject condition	FRMR transmitted from IT phase (see clause 4.10)
DL6	BY	IUT Busy condition	RNR transmitted from IT phase (see clause 4.10 and 4.11)
DL7	SR	Sent Reject condition	REJ transmitted from IT phase
DL8	SP	System Parameters and Error Recovery	See note below

NOTE Test Group DL8 tests the setting of the system parameters:

T1 - Retransmission timer
N2 - Maximum number of attempts by IUT to complete a transmission.

The setting of maximum established length and k (window size) are tested under test group DL4.

4.2 Data link layer test groups and subgroups

The first seven test groups shown in Table 1. called Data Link Layer Test Groups DL1 to DL7, are provided to test the interactive capability of the IUT in every phase. The test groups are further divided into three subgroups according to the definitions in 3.4. These are as follows:

- Subgroup 1 involves those test cases where the tester transmits a proper frame.
- Subgroup 2 involves those test cases where the tester transmits an improper frame.
- Subgroup 3 involves those test cases where the tester transmits an inopportune frame.

The eighth test group (DL8) is designed to test the operational correctness of the IUT system parameters listed in Table 1.

4.3 Method for conformance testing

The method for conformance testing shall be as defined in ISO/IEC 8882-1.

4.4 Test case notation

Annex A describes the abstract test suite using the Tree and Tabular Combined Notation (TTCN). This abstract test suite complies with ISO/IEC 9646-3 for TTCN.GR. The test realizer shall comply with the requirements of ISO/IEC 9646-4. In particular, these concern the realization of an Executable Test Suite (ETS) based on the Abstract Test Suite (ATS). Test laboratories running conformance test services for this abstract test suite shall comply with ISO/IEC 9646-5.

The tests described in this test suite may be performed in any order. Test cases are independent of one another. Most of the test cases consist of a preamble followed by a test body and ending with a verification sequence. The preamble consists of the initialization test steps described in test step group PREAMBLE. The verification sequences consists of the final test step described in test step group POSTAMBLE. In some instances in the test steps, all the possible parameter alternatives for PDUs are not verified, as they do not directly relate to the test purpose.

© ISO/IEC 2000 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale

The preambles shown in this part of ISO/IEC 8882 are examples of how, for different situations, the tester can get the IUT into the desired phase or state. These preambles are not meant to be either a mandatory or exhaustive set of acceptable initialization sequences for the IUT. Other possible preambles may be negotiated between the test laboratory and the client. Table 2 illustrates an abstract test case written in TTCN:

Table 2 — Test Step Dynamic Behavior

Test Step	: TTCN_EXAMPLE
NameGroup	: Example Test Case
Objective	: An example test step illustrating an abstract test case in TTCN
Default	:
Comments	:

Nr	Label	Behavior Description	Constraints Ref	Verdict	Comments
1		+ preamble_1 [IUT_TYPE = option_1]			1
2		+ preamble_n [IUT_TYPE = option_n]			2
3		+ test_body_part_1			
4		+ verification_1			
5		! PDU_X			5
6		? PDU_Y [IUT_TYPE = option_2			6
7		(VARIABLE := 1)			7
8		+ verification_2			
9		+ test_body_part_n			
10		+ verification_n			

Detailed Comments

1	The '+' symbol indicates the attachment of a TTCN tree.
2	Trees attached at the same level of indentation are alternatives.
5	Event line starting with '!' is a send event in TTCN.
6	Event line starting with '?' is a receive event in TTCN.
7	The operation ':=' is an assignment in TTCN.

4.5 Preamble

The preamble of a test case consists of the steps required to bring the IUT to the appropriate initial state or phase. There may be various alternative sequences of test steps which can be performed in order to initialize the IUT. The preamble may depend on the test method as well as specific IUT behavior that can be controlled or observed using that method. Therefore, preambles may be different for different IUTs. In order to properly initialize a test case an appropriate preamble has to be used for testing a particular IUT. An inconclusive verdict in the preamble may be the result either of protocol violation or of the fact that the preamble is unsuitable for that particular IUT. Test step group PREAMBLE gives examples of preambles to be used as a test initialization sequence. Other valid preambles that may be used are a matter of agreement between the test laboratory and its client.

4.6 Verification sequence

The conclusion of a test case is conducted in the test sequence called a verification sequence. In most cases the verification sequence depends on the final state in which the IUT is expected to be as a result of a test stimulus. A single test case may have more than one possible verification sequence depending on the actual IUT behavior. Also, like the preamble, the verification sequence may depend on the testing method used or may depend on the IUT. Test step group POSTAMBLE gives examples of verification sequences to be used as a test conclusion sequence. Other valid verification sequences that may be used are a matter of agreement between the test laboratory and its clients.

© ISO/IEC 2000 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS

Not for Resale

4.7 IUT initiated actions

The general principles, with respect to IUT initiated actions required by this test suite, are in accordance with ISO/IEC 8882-1. The ability of the IUT to perform these actions, and its ability to initiate the tests containing the actions, are determined by the information provided in the PIXIT.

4.8 Acceptable unexpected IUT frames

The test cases in this test suite indicate the frames from the IUT required to satisfy the test purpose. In some cases, particularly in the Information Transfer phase, unexpected frames may be received from the IUT which do not affect the final test verdict.

Acceptable unexpected frames are accepted by the tester without affecting the final test verdict. In the case of RNR, the tester shall suspend the test until the busy condition is cleared (see Table 3, item 7b).

In a controlled environment, DISC and SABM commands and DM responses sent by the IUT are not considered to be acceptable unexpected frames during information transfer tests.

4.9 Transient states

A transient state is an unstable state that may preclude satisfactory conduct of tests contained in test groups DL1, DL5 and DL6. To conduct tests in these clauses the IUT must be capable of:

- Being forced to establish a particular data link condition or phase as part of the test preamble, by using the LAPB procedures as defined in X.25 standards.
- Maintaining the established condition for a period of time sufficient for the tester to initiate and conduct the required test steps in an orderly and observable manner.
- Arriving at a prescribed, predictable condition or phase for the verification of the test, and maintaining that condition for a time sufficient to record the results from the verification sequence.

4.10 Unreachable states

An unreachable state is a state never entered by some IUTs. This may preclude satisfactory conduct of tests contained in test groups DL2, DL3 and DL6.

4.11 Declarations

Purpose of TTCN declarations is to describe the set of test events and all other attributes to be used in the test suite. For further information on TTCN declarations see ISO/IEC 9646-3.

For the X.25 Data Link Layer test suite, the declarations are based on Protocol Data Units (PDUs) defined in OSI Basic Reference Model [ISO/IEC 7498-1] are called "frames" in the X.25 standards. The PDUs are declared with a set of PDU parameters that may be assigned values for the purpose of testing. The PDU constraints are the list of values that the PDU parameters must take in a particular test event.

The improper PDUs are declared only for the purpose of use within ISO/IEC 8882. It is recognized that many variations are possible in an improper PDU, all of which may cause the same reaction from the IUT. It is not practical to exhaustively list all these variations. To preserve the flexibility of improper PDU encoding, ISO/IEC 8882 shows some typical examples.

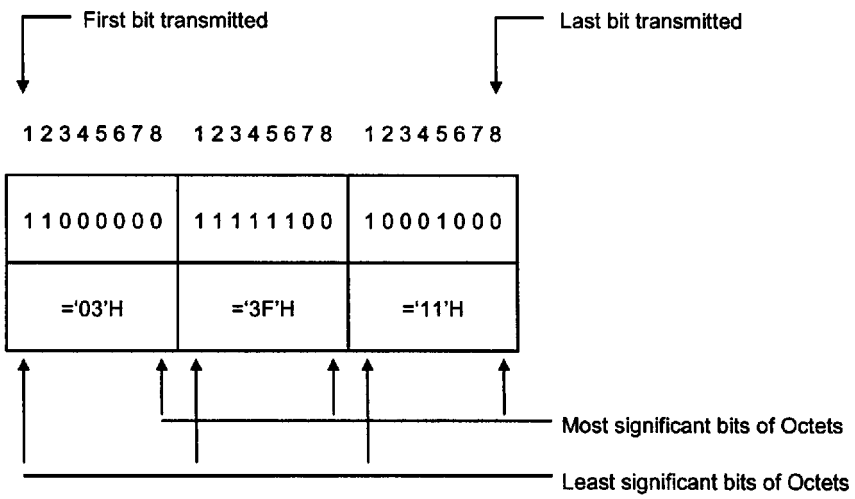
The FCS octets are not shown in the data type declarations in this test suite. These octets are to be generated for all PDU types except ABORT and FCS_ERROR.

4.12 Encoding and order of bit transmission

The encoding and order of bit transmission for the PDUs in the declarations above shall be as defined in the X.25 standards. The order of bit transmission for PDUs in the declarations for ABORT, HEX and FCS_ERROR is illustrated in the example shown in Figure 2.

© ISO/IEC 2000 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS
Not for Resale



NOTE This example does not show flags, FCS fields, and bits inserted for transparency.

Figure 2 — Example — Hex (String:='033F11'H)

4.13 PIXIT proforma

It is essential that the client provide the test laboratory with all the information (in addition to that given in the PICS) that will enable the appropriate test cases to be applied to the IUT. This information is provided in the Protocol Implementation eXtra Information for Testing (PIXIT). This PIXIT proforma is related to and dependent on the Protocol Implementation Conformance Statement (PICS) proforma which is being developed as an amendment to ISO/IEC 7776:1986 respectively Annex A of the ISO/IEC 7776:1995.

A mnemonic enclosed in parenthesis, e.g. (N2), indicates the test suite parameter that maps to this PIXIT question.

Table 3 — Protocol Implementation eXtra Information for Testing (PIXIT)

Item	General Information	Values
1	Classification of IUT, select one of ISO_7776_1986, ISO_7776_1995, X25_1980, X25_1984, X25_1988, X25_1993, if conformance is claimed to ISO/IEC 7776:1986, ISO/IEC 7776:1995, X.25 1980, X.25 1984 , X.25 1988 or X.25 1993 respectively. (IUT_TYPE)	Value:
2	The value of k used by IUT. (k)	Value:
3	The value of the maximum established length of the information field of the received I frames. (MEL) Note: MEL may be greater than the system parameter N1.	Value:
4	The value of N2 for IUT. (N2)	Value:
5	The value of T1 parameter, in milli-seconds, used by the IUT.	Value:
Md	Which MODULO base is used for these tests? (Md)	Value:
Item	**Procedural Information**	**Values**
6	IUT will initiate transmission of I frames on entering information transfer tests.	-- Yes -- No
6a	IUT acknowledges I frames immediately so that it can handle a full window of I frames within timer T1/2. (IUT_ACK)	-- Yes -- No
7a	IUT can be made to enter the busy condition when required for testing. (IUT_SEND_RNR)	-- Yes -- No
7a1	If yes to 7a, specify the time, in milli-seconds, the IUT will remain busy.	Value:
7b	Specify if IUT will send RNR after link set-up (e.g., this may correspond to a situation where RNR is used while higher level is being set up).	-- Yes -- No
7b1	If yes to 7b, enter the MAXIMUM time, in milli-seconds, the IUT will be in busy condition. (Tb)	Value:

© ISO/IEC 2000 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS

Not for Resale

Table 3 — Protocol Implementation eXtra Information for Testing (PIXIT) (*continued*)

8	IUT can be made to initiate link disconnection when required for testing. (IUT_SEND_DISC)	-- Yes -- No
8a	Is manual intervention required to initiate link disconnection when required for testing.	-- Yes -- No
8a1	If yes to 8a, specify the time, in milli-seconds.	Value:
9	State the time in milli-seconds the tester must wait before determining that the IUT will not respond to a tester stimulus. This value will be tester parameter Td. Note: Td > T1. (Td)	Value:
9a	State the time in milli-seconds before starting the preamble. This value will be tester parameter TSHORT.	Value:
10a	IUT can be made to set-up the link when required for testing. (IUT_SETUP_LINK)	-- Yes -- No
10a1	If yes to 10a, specify PICS item under "Link set-up (reset) procedure" to be used.	PICS item:
10b	IUT can request the tester to set-up the link when required. (TEST_DM)	-- Yes -- No
11	IUT can maintain the disconnected phase as a stable state for a period of time. (STABLE_DP)	-- Yes -- No
11a	If yes to 11, specify the time, in milli-seconds, IUT will remain in disconnected phase. During this time period the IUT will not unilaterally send a SABM, DISC, or DM frame.	Value:
12	The IUT can maintain the frame reject condition as a stable state for a period of time. (STABLE_FRMR)	-- Yes -- No
12a	If yes to 12, specify the time, in milli-seconds, IUT will remain in frame reject condition.	Value:
13a	Upon reaching the disconnected phase, will the IUT reply with DM response to all commands received, and not set up the data link until some operator action is taken. (DMRSP)	-- Yes -- No
13b	Upon reaching the disconnected phase, will the IUT not respond to any stimulus, and not set up the data link until some operator action is taken. (UNRSP)	-- Yes -- No
14	Where operator action is required (for implicit send events), specify the maximum time, in seconds, required for the operator to complete the requested action. (TOPERATOR)	Value:
Item	**I Frame Information**	**Values**
15	Specify in sequence contents of the information field that the tester is allowed to send to the IUT in information transfer phase. (UDAT) Note: Note that in some tests up to k + 1 frames are sent from the tester.	Frame 1:
15a		Frame 2:
15b		Frame 3:
15c		Frame 4:
15d		Frame 5:
15e		Frame 6:
15f		Frame 7:
15g		Frame 8:
16	Specify the i-field for an I frame that is to contain a too long information field. (ULON)	Value:

4.14 Classification of IUT

In this test suite the global variable "IUT_TYPE" is defined. This variable can assume values for ISO/IEC 7776:1986, ISO/IEC 7776:1995, or X.25 (1980), X.25 (1984), X.25 (1988), X.25 (1993). A Boolean expression is used to test this variable before a test event can apply to one specific standard. If this is not done, then that event applies to all six X.25 standards.

© ISO/IEC 2000 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS

Not for Resale

Annex A
(normative)

Abstract Test Suite (ATS)

This ATS has been produced using the Tree and Tabular Combined Notation (TTCN) according to ISO/IEC 9646-3.

The ATS was developed on a separate TTCN software tool and therefore the TTCN tables are not completely referenced in the table contents. The ATS itself contains a test suite overview part which provides additional information and references.

A.1 The TTCN Graphical Form (TTCN.GR)

The TTCN.GR representation of this ATS is contained in an Adobe Portable Document Format™ file (C029518E TTCN GR.pdf) which accompanies the present document.

A.2 The TTCN Machine Processable Form (TTCN.MP)

The TTCN.MP representation corresponding to this ATS is contained in an ASCII file (C029518E TTCN MP.mp) which accompanies the present document.

NOTE According to ISO/IEC 9646-3, in case of a conflict in interpretation of the operational semantics of TTCN.GR and TTCN.MP, the operational semantics of the TTCN.GR representation takes precedence.

© ISO/IEC 2000 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS

Not for Resale

ICS 35.100.30

Price based on 401 pages

© ISO/IEC 2000 – All rights reserved

Copyright International Organization for Standardization
Provided by IHS under license with ISO
No reproduction or networking permitted without license from IHS

Not for Resale