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 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

Contents

Page

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 8882-3 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 8882-3 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 8882-3:1995), 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.

Introduction

This part of ISO/IEC 8882 specifies a set of tests to evaluate Data Terminal Equipment (DTE) conformance to International Standards ISO 7776:1986, ISO 7776:1995 (X.25 LAPB) and/or ISO 8208:1987, ISO 8208:1990, ISO 8208:1995 (X.25 Packet Layer). ISO 7776 (1986,1995) and ISO 8208 (1987,1990, 1995) allow for a DTE to interface with a Data Circuit-Terminating Equipment (DCE) conforming to CCITT respectively ITU-T Recommendation X.25 or to another DTE conforming to ISO 7776 (1986,1995) and/or ISO 8208 (1987,1990, 1995) also allows for connection to Local Area Networks.

CCITT respectively ITU-T Recommendation 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 explicitly specify the DTE operation. However, recommended operation of DTEs is included by implication because of the need to communicate with X.25 DCEs. Tests within this part of ISO/IEC 8882 pertaining to X.25 1980, X.25 1984, X.25 1988 and X.25 1993 are based on the DTE operational characteristics implied by CCITT X.25 respectively ITU-T X.25.

This part of ISO/IEC 8882 presents the packet layer aspects for evaluating conformance to ISO 8208 (1987, 1990, 1995) and follows the procedures and guidelines defined in ISO/IEC 9646.

Where it is claimed that X.25 is used to provide the OSI Network Layer Service, the conformance tests as defined in this part of ISO/IEC 8882 can be used to verify the implementation of the necessary protocol elements.

The test suite is presented in an abstract form by means of the test case notation TTCN, as defined in ISO/IEC 9646-3. This is an abstract set of tests. Not every test applies to every public network or every type of DTE.

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

Part 3:
Packet layer conformance test suite

1 Scope

This part of ISO/IEC 8882 specifies a set of abstract tests for verifying that the implementation of X.25 protocols for use by Data Terminal Equipment (DTE), conforms to the requirements of International Standards that specify those protocols.

Testing of a DCE is not subject of this test suite. Testing of a DTE in DCE mode is covered in test group 28 of this test suite

a) specifies a PIXIT proforma;

b) describes the relationship of the PICS to the test suite,

c) describes the relationship of the PIXIT to the test suite,

d) specifies a set of abstract tests using TTCN Graphical notation.

This part of ISO/IEC 8882 defines the testing of a DTE operating at the packet layer designed to access a public or private packet-switched network conforming to CCITT respectively ITU-T Recommendation X.25 (1980, 1984, 1988, 1993) or another DTE conforming to ISO 8208. The specification of test cases in executable/machine processable TTCN is outside the scope of this part of ISO/IEC 8882.

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 8208:1987, *Information processing systems — Data communication — X.25 Packet Layer Protocol for Data Terminal Equipment.*

ISO/IEC 8208:1990, *Information technology — Data communication — X.25 Packet Layer Protocol for Data Terminal Equipment.*

ISO/IEC 8208:1995, *Information technology — Data communication — X.25 Packet Layer Protocol for Data Terminal Equipment.*

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 8886:1992, *Information technology — Telecommunications and information exchange between systems — Data link service definition for Open Systems Interconnection.*

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)

CCITT Recommendation X.25 (1980), X.25 (1984), and X.25 (1988), *Interface between Data Terminating Equipment (DTE) and Data Circuit-terminating Equipment (DCE) for terminals operating in the packet mode on the public data networks.*

ITU-T Recommendation 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 and definitions

3.1 Reference model terms

This part of ISO/IEC 8882 makes use of the following term defined in ISO 7498.

a) (N)-protocol-data-unit (N-PDU)

3.2 Conformance testing terms

This part of ISO/IEC 8882 makes use of the following terms defined in ISO/IEC 9646

a) Abstract Test Suite
b) Conforming System or Implementation
c) Conformance Test Suite
d) Conformance Testing
e) Executable Test Suite
f) Postamble
g) Preamble
h) Protocol Implementation Conformance Statement
i) Protocol Implementation eXtra Information for Testing
j) Test Group
k) Test Step
l) Test Suite

3.3 X.25 DTE conformance testing terms

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

a) Improper PDU
b) Inopportune PDU
c) Proper PDU
d) Test Subgroup
e) Test Selection
f) Tester
g) Transient States

3.4 Additional terms and definitions

For the purposes of this part of ISO/IEC 8882, the following terms and definitions apply.

3.4.1
proper packet
packet that is a proper PDU

3.4.2
improper packet
packet that is an improper PDU

3.4.3
inopportune packet
packet that is an inopportune PDU

4 Abbreviations

The following abbreviations are used in this part of ISO/IEC 8882.

ADX Address
ASP Abstract Service Primitive
ATS Abstract Test Suite
ETS Executable Test Suite
FAC Facility
IUT Implementation Under Test
LCI Logical Channel Identifier
LEN Length
PCO Point of Control and Observation
PDU Protocol Data Unit
PICS Protocol Implementation Conformance
PIXIT Protocol Implementation eXtra Information for Testing
PKT Packet
PLG Packet Layer Group
RX Receive
TST Tester
TX Transmit
UDF User Data Field

5 Conformance

The test realizer shall comply with the requirements of ISO/IEC 9646-4. In particular, these concern the realization of an ETS based on the ATS. Test laboratories running conformance test services for this abstract test suite shall comply with ISO/IEC 9646-5.

6 Test suite information

6.1 Packet layer test suite structure

The packet layer tests are grouped as shown in Table 1.

Table 1 — Packet layer test groups

Test Group #	Packet layer test groups	Test group #	Packet layer test groups
1	R1 - Packet Layer Ready	15	I2 - DTE Interrupt Sent
2	R2 - DTE Restart Request	16	J1 - DXE Interrupt Ready
3	R3 - DXE Restart Ind	17	J2 - DXE Interrupt Sent
4	P1 - Ready	18	F1 - DXE Receive Ready
5	P2 - DTE Call Request	19	F2 - DXE Receive Not Ready
6	P3 - DXE Incoming Call	20	G1 - Receive Ready
7	P4 - Data Transfer	21	G2 - DTE Receive Not Ready [a]
8	P5 - Call Collision	22	Data Transfer
9	P6 - DTE Clear Request	23	Timer Tests
10	P7 - DXE Clear Indication	24	Address
11	D1 - Flow Control Ready	25	Facility
12	D2 - DTE Reset Request	26	Registration
13	D3 - DXE Reset Ind	27	Multiple Logical Channel Asg
14	I1 - Interrupt Ready	28	DTE/DTE Tests

[a] This group has been deleted, but the number has been retained for consistency.

For each test group that tests a packet layer state (PLG1 through PLG28) the test cases specified are categorized into the following three subgroups.

- Subgroup 1 contains test cases in which the Tester transmits a proper test packet, these test cases are identified with a one hundred series test case identifier xx_1xx.
- Subgroup 2 contains test cases in which the Tester transmits an improper test packet, these test cases are identified with a two hundred series test case identifier xx_2xx.
- Subgroup 3 contains test cases in which the Tester transmits an inopportune test packet, these test cases are identified with a three hundred series test case identifier xx_3xx.

6.2 Packet layer initialization

In accordance with ISO 8208 (1987, 1990, 1995) the DTE must transmit a Restart Request whenever link layer initialization has completed. However, DTEs developed in conformance with the 1980, 1984, 1988, and 1993 versions of Recommendation X.25 are not required to send a Restart Request at this time. To accommodate both DTE implementations, the Tester initiates the restart procedure upon completion of link layer initialization.

The Tester will accept either a Restart Confirmation or a Restart Request as a valid response to its Restart Indication as shown below in example EG_001. Packet layer initialization always occurs once at the start of a test session. State initialization, on the other hand, is performed many times during a test session as part of each test case. Packet layer initialization will also occur as part of state initialization when the previously executed test case results in a Fail or Inconclusive verdict, or the previously executed test case is part of PLG 1, 2, 3, 26 or in test groups in which the Restart procedure is executed as part of state initialization (PLG 1, 2, 3 and 26).

The following are examples of initialization of ISO 8208 over ISO 7776 (LAPB). Any other examples of initialization sequences using other underlying protocols are not shown, but may be appropriate. For example, normal state initialization steps in state r1 (PLG 1) are as shown in Table 2.

For those DTEs which disconnect the link upon receipt of a Restart Indication (or transmittal of a Restart Request) the state initialization steps include link layer initialization as shown in Table 3.

Table 2 — Test Case Dynamic Behavior

Test Case Name: EG_001 **Group:** Example Test Step / Packet Layer Initialization **Purpose:** An example test step illustrating Packet Layer Initialization **Default:** **Comments:**					
Nr	**Label**	**Dynamic Behavior**	**Constraint Ref**	**Verdict**	**Comments**
1		! Restart_Indication START TD	STRT_DCE		1
2		? Restart_Confirmation CANCEL TD	STRTC		
3		? Restart_Request CANCEL TD	STRT_DTEA		
4		? TIMEOUT TD		FAIL	4
5		? OTHERWISE		FAIL	
Detailed Comments:		1. The Restart Indication is sent upon successful initialization of the Data Link Layer. 4. TD expired.			

Table 3 — Test Step Dynamic Behavior

Test Case Name : EG_002 **Group** : Example Test Step / Packet Layer Initialization / Link Layer Initialization **Objective** : An example test step Illustrating Packet Layer Initialization that includes Data Link Layer Initialization **Default** : **Comments** : a) L is the PCO at the Tester Packet Layer to Link Layer interface. : b) D is the PCO at the Link Layer to Physical Interface. : c) This example uses the Multi-Layer testing method, the Packet Layer Test Suite only uses the Remote Single-layer test method.					
Nr	**Label**	**Dynamic Behavior**	**Constraint Ref**	**Verdict**	**Comments**
1		EG_002 [L,D]			
2		L! Restart Indication START TD	STRT_DCE		
3		L? Restart Confirmation START TD	STRTC		
4		D? Disconnect CANCEL TD	DISC_1		4
5		+ LINK_INIT			
6		L? TIMEOUT TD			6
7		L? Restart_Request START TS	STRT_DTEA		
8		D? Disconnect CANCEL TD	DISC_1		
9		+ LINK_INIT			
10		L? TIMEOUT TD		FAIL	
11		L? TIMEOUT TD		FAIL	
12		L? OTHERWISE		FAIL	
13		LINK_INIT			
14		D! UA	UA_DCE		14
15		D? SABM	SABM1		15
16		D! UA	UA_DCE		14
17		L! Restart_Indication START TD	STRT_DCE		
18		L? Restart_Confirmation CANCEL TD	STRTC		
19		L? Restart_Request CANCEL TD	STRT_DTEA		
20		L? TIMEOUT TD		FAIL	
21		L? OTHERWISE CANCEL TD		FAIL	
Detailed Comments:		4 Wait for DISC 6 TD expired 14 Send UA 15 Wait for SABM			

6.3 DTE-initiated actions

DTE-initiated actions specified by the test suite are handled using the Implicit Send mechanism defined in ISO/IEC 9646-3. The ability of the IUT to perform these actions, and its ability to execute the tests containing the actions is determined by the information provided in the PIXIT and the PICS.

6.4 Timer definitions

This part of ISO/IEC 8882 defines the following timers:

TR the time required by the IUT to resume testing after completion of the Restart procedure. The duration is provided in PIXIT question 1.18a and contained in the test suite parameter TR_DELAY;

TC the time required by the IUT to testing after completion of the Clear procedure. The duration is provided in PIXIT question 1.18b and contained in the test suite parameter TC_DELAY;

TS the time required by the IUT to resume testing after completion of the Reset procedure The duration is provided in PIXIT question 1.18c and contained in the test suite parameter TS_DELAY;

TD the time the Tester waits before determining that the IUT will not respond to a Tester stimulus. For example, how long the Tester should wait before assuming that the IUT has either discarded or failed to respond to the stimulus. TD must be less than all other timers specific to ISO 8208, i.e. T20 through T28. The duration is calculated by the formula contained in the PIXIT question 1.23 (TD = 2 * TD_RESPONSE + MAX(TO_R3, TO_P3, TO_P7, TO_D3, TO_J2) and contained in the test suite parameter TD_WAIT_TIME;

TD_RESP the maximum time that the tester should wait for an immediate response from the IUT to a tester stimulus. The duration is provided in PIXIT question 1.20 and contained in TD RESPONSE;

TDEL is a tolerance used in testing timers T20 - T28 of the base standard. The duration is provided in PIXIT question 1.21 and contained in the test suite parameter TDELTA. The duration considers the round trip transit delay between the Tester and I UT, and the time necessary for an IUT to respond to a received packet or timer expiry;

TO_R3 is the minimum time that the IUT remains in state R3. The duration is provided in PIXIT question 1.22 and contained in TO_DELAY_R3_ MIN;

TO_P3 Is the minimum time that the IUT remains in state P3. The duration is provided in PIXIT question 1.22 and contained in TO_DELAY_P3_ MIN;

TO_P7 is the minimum time that the IUT remains in state P7. The duration is provided in PIXIT question 1.22 and contained in TO_DELAY_P7 MIN;

TO_D3 is the minimum time that the IUT remains in state D3. The duration is provided in PIXIT question 1.22 and contained in TO_DELAY_D3_ MIN;

TO_J2is the minimum time that the IUT remains in state J2. The duration is provided in PIXIT question 1.22 and retained in TO_DELAY_ J2_ MIN.

6.5 Cause codes and diagnostic codes

ISO 8208 (1987) requires the cause code to be 0 or 128 and the diagnostic code to be present in the Restart, Clear or Reset packet. Use of cause code 0 designates the use of standard diagnostic codes as specified in ISO 8208 (1987), Figure 14-B. Use of cause code 128 designates the use of DTE-specific diagnostic codes.

CCITT X.25 (1984) requires the cause code in the Restart, Clear, or Reset Request packets to be either 0 or a value in the range of 128 through 255. The diagnostic code field is not mandatory in the basic format of these request packets. However, when the extended format is used, the diagnostic code field shall be present.

CCITT X.25 (1980) requires the cause code field in the Restart, Clear, or Reset Request packet to be set to 0. The diagnostic code field is not mandatory in the request packets.

Any one of several diagnostic codes may be generated by the IUT, on a per test case basis, especially where multiple error conditions are present in the same packet. In such instances any one of the possible diagnostic codes shall be accepted.

The test cases allow for the use of multiple diagnostic codes by DTEs. In the case where the DTE implements specific diagnostic codes it is recommended that these codes be in accordance with Tables 31-36 in ISO/IEC 8208 (1987).

Although, as noted above, cause and diagnostic code fields are optional in some circumstances, the test suite requires these fields to be present. In practice, the great majority of implementations of the X.25 Packet Layer Protocol do not omit cause and diagnostic code fields, so the usefulness of the test suite is not significantly impaired by this limitation.

6.6 Facility fields

The definition of the field "facility" in Facility_Field as a SET does not permit repetitions of facilities within a facility field. In practice, implementations of the X.25 Packet Layer Protocol very rarely repeat facilities, and are unlikely to do so in a testing environment. The definition's limitation therefore does not significantly impair the usefulness of the test suite.

6.7 Data transfer states

A limited set of data transfer tests (PLG20 and PLG22) are included in this test suite to verify the IUT's ability to perform the following:

- send and/or receive valid data packets;
- manage window rotation;
- detect improper data packets and react accordingly;
- observe the remote busy condition.

In order to facilitate the exchange of data packets during these tests, the IUT provider shall specify the contents of the data packet user data field (UDF) for the Tester. The UDF values are supplied by the IUT provider in the PIXIT.

The following items should be considered when completing the PIXIT:

a) The UDF content in data packets received by the Tester will not be verified. Consequently, the information is not requested in the PIXIT.

   NOTE Receive-only IUTs are not expected to send data packets during data transfer tests.

b) The start of data transfer (i.e. Tester or IUT transmits first) is based on the response in the PIXIT.

c) Depending on the test being performed the full list of UDFs specified in the PIXIT may not be sent. Exchange of data packets containing UDFs specified in the list may terminate at any point. Subsequent tests will start with the entry in the UDF list that is specified in the PIXIT (i.e. first entry or next entry).

d) If UDF contents are specified in the PIXIT, they will be sent (in sequence) whenever a data packet must be sent, or in response to data packets received from the IUT.

   NOTE Q-bit, D-bit and M-bit settings in these data packets are based on information provided in the PIXIT. Receive Ready (RR) packets may also be sent by the Tester and the IUT.

e) It is also assumed that the IUT can send consecutive data packets as required for window rotation tests. The Tester will only send Receive Ready (RR) packets during these tests.

6.8 Other user data fields

When necessary, the content of user data fields in the Call setup, Clearing and Interrupt packets shall be provided to the Tester by the IUT provider in order to successfully execute the Packet Layer Test Suite. In this case the IUT requires the Tester to transmit user data fields in accordance with higher layer protocols which are operating above the packet layer.

6.9 Transient States

It is recognized that for those DTEs that process packets sequentially certain states are not observable. Specifically, the testing of the DTE during the DXE defined states (for example r3 - RESTART INDICATION, p3 - INCOMING CALL, p7 - CLEAR INDICATION and d3 - RESET INDICATION) may end up in the testing of some other states P1 - Packet Layer Ready, d4 - Data Transfer, d1 - Flow Control Ready). For example, to test the response to an error (r3) state the Tester would send a RESTART INDICATION immediately followed by the error packet. The Tester is expecting the DTE to discard the error packet, then send a RESTART REQUEST in response. However, the DTE generally responds immediately to the RESTART INDICATION with a RESTART CONFIRMATION and processes the next packet from the packet layer state r1. This test suite contains tests for these transient states only if they are observable. They are observable and testable if the minimum duration of the state is at least twice TD_RESPONSE.

6.10 Relationship of PICS to test suite

The Protocol Implementation Conformance Statement (PICS) defines the capabilities and options which have been implemented by the IUT, and also any features not implemented. The PICS shall be provided by the IUT, and its function is to ensure that the IUT implementation will be tested for conformance against only relevant requirements. The PICS proforma is defined in ISO/IEC 8208.

6.11 Relationship of PIXIT to test suite

The PIXIT consists of a list of questions developed to obtain the characteristics of the IUT which are necessary to successfully execute the conformance test suite.

6.12 Test case selection

Test case selection is performed using Boolean equations consisting of PICS and PIXIT parameters. Selection is performed at the test group level first then at the test case level.

6.13 PIXIT proforma

Information supplied by the IUT provider in Table 4 will be used to configure the Tester to execute the conformance test suite. Questions pertaining to function(s) not supported by the IUT should be ignored, since tests requiring the information will be eliminated from the conformance test suite by the PICS. It may be necessary to complete more than one PIXIT in order to represent the various configuration options of a specific IUT.

An uppercase mnemonic enclosed in parenthesis i.e. (IUT_TX) indicates the Test Suite Parameter that maps to this PIXIT question. Values supplied in the PIXIT will be directly mapped into the Test Suite via their associated Test Suite Parameter. Therefore all supplied values must be in valid TTCN notation. A field that may contain any valid value based on the protocol specification is indicated by use of a ? in the PIXIT answer. A field which may or may not be present is indicated by an * and a field which is never present is indicated by a -. Refer to the Test Suite Parameter table for the declared type (INTEGER, BITSTRING, HEXSTRING) of each test suite parameter.

Table 4 — Protocol Implementation eXtra Information for Testing (PIXIT) Proforma

Item	IUT Type	Values	Comments
1.1	Indicate the protocol to be tested by answering all of the following:		
1.1a	ISO 8208 1987 (ISO)	☐ Yes ☐ No	
1.1b	CCITT X.25 1980 (CCITT_80)	☐ Yes ☐ No	
1.1c	CCITT X.25 1984 (CCITT_84)	☐ Yes ☐ No	
1.1d	ISO 8208 1990 without extra functions and facilities added in ISO8208 1990(ISO)	☐ Yes ☐ No	
1.1e	ISO 8208 1995 without extra functions and facilities added in ISO8208 1995 or ISO 1990 (ISO)	☐ Yes ☐ No	
1.1f	CCITT X.25 1988 without extra functions and facilities added in CCITT X.25 1988 (CCITT_88) Implies (CCITT_84).	☐ Yes ☐ No	
1.1g	ITU-T X.25 1993 without extra functions and facilities added in CCITT X.25 1988 or ITU-T X.25 1993 (ITU_T_93) Implies (CCITT_84).	☐ Yes ☐ No	
1.2	State whether the IUT is capable of sending data and/or receiving data.		
1.2a	sending (IUT_TX)	☐ Yes ☐ No	
1.2b	receiving (IUT_RX)	☐ Yes ☐ No	
Item	**Logical Channel Configuration**	**Values**	**Comments**
1.3	Range of PVC Logical Channel identifier(s) (must be less than or equal to PICS item LCD).		
1.3a	Lowest PVC (LPV)	Value:	
1.3b	Highest PVC (HPV) .	Value:	
1.4	Range of SVC Logical Channel Identifier(s) (must be with the ranges specified in the PICS items LCD through LC6)		
1.4a.a	Lowest One-way incoming (LIC)	Value:	Note 1
1.4a.b	Highest One-way Incoming (HIC)	Value:	Note 1
1.4b.a	Lowest One-way outgoing (LOC)	Value:	Note 1
1.4b.b	Highest One-way outgoing (HOC)	Value:	Note 1
1.4c.a	Lowest Two-way (LTC)	Value:	Note 1
1.4c.b	Highest Two-way (HTC)	Value:	Note 1
1.5	Indicate a logical channel to be used by the Tester for Incoming Calls (to the IUT) or PVCs. (LCI_UNDER_TEST)	Value:	Note 9
1.6	Indicate a logical channel to be used for logical channel unassigned testing (LUC).	Value:	
1.7	How many Incoming virtual calls can be supported the same time using the information in PIXIT question 1.4 and PIXIT question 2.2a? (SIM_CALL_IN)	Value:	
1.8	How many Outgoing virtual calls can be supported at the same time using the Information in PIXIT question 1.4 and PIXIT question 2.3a? (SIM_CALL_OUT)	Value:	

Table 4 — Protocol Implementation eXtra Information for Testing (PIXIT) Proforma (*continued*)

Item	Flow Control Information	Values	Comments
1.9	Window sizes		
1.9a	Indicate the default window size to be used during test execution. This value Is used for both transmit and receive windows (must be in range of PICS Items V2s and V2r). (DEF_WIN_SZ)	Value:	
1.9b.a	Indicate a transmit nonstandard default window size to be used during test execution. (NS_DEF_WIN_SZ_TX)	Value:	
1.9b.b	Indicate a receive nonstandard default window size to be used during test execution. (NS_DEF_WIN_SZ _RX)	Value:	
1.9c	Provide the integer value of the nonstandard default-window size given in 1.9b above. (NS_DEF_WIN_SZ_NUM)	Value:	
1.10	Packet sizes		
1.10a	Indicate a transmit nonstandard default packet size to be used during test execution. (NS_DEF_PKT_SZ_TX)	Value:	
1.10b	Indicate a receive nonstandard default packet size to be used during test execution. (NS_DEF_PKT_SZ_RX)	Value:	
1.11	Indicate maximum flow control packet size. (MAX_PKT_SZ)	Value:	
1.12	Indicate the modulo to be used for testing. (SEQ_MODULO)	☐ 8 ☐ 128	
1.13	Does the IUT reinitialize at the Data Link Layer upon execution of an unexpected Restart procedure? (DISC_AT_DL)	☐ Yes ☐ No	
1.14	Does the IUT require a one for one exchange of Data packets when transmitting a window or more of data (REPLY_REQUIRED)	☐ Yes ☐ No	
1.15	Will the IUT send the first data packet? (FIRST_DATA _FROM _IUT)	☐ Yes ☐ No	
1.16	Will the IUT send more data packets than its send window size (MORE_DATA)	☐ Yes ☐ No	
1.17	Will the IUT send at feast three data packets more than its modulo size?	☐ Yes ☐ No	
Item	**Timer Information**	**Values**	**Comments**
1.18	State the time required by the IUT to resume testing after completion of the following procedures (in milli-seconds):		
1.18a	Restart (TR_DELAY)	Value:	Note 3
1.18b	Clear (TC_DELAY)	Value:	Note 3
1.18c	Reset (TS_DELAY)	Value:	Note 3
1.19	Enter the values used by the IUT for the following timers:		
1.19a	(T20)	Value:	Note 3
1.19b	(T21)	Value:	Note 3
1 19c	(T22)	Value:	Note 3
1.19d	(T23)	Value:	Note 3
1.19e	(T24)	Value:	Note 3
1.19f	(T25)	Value:	Note 3
1.19g	(T26)	Value:	Note 3
1.19h	(T27)	Value:	Note 3
1.19i	(T28)	Value:	Note 3
1.20	State the maximum time the tester should wait for an immediate response for the IUT to a tester stimulus, see clause 6.4. (TD_RESPONSE)	Value:	Note 3
1.21	State the delta value to be added to timers used by the Tester, see Clause 6.4. (TDELTA)	Value:	Note 3
1.22	For R3. P3, D3, P7, J2 give the minimum and time that the IUT remains in these states.		
122a	R3 (TO _DELAY_R3_MIN)	Value:	Note 3,7
1.22b	R3 (TO_DELAY_R3_MAX)	Value:	Note 3,7
1.22c	P3 (TO_DELAY_R3_MIN)	Value:	Note 3,7
1.22d	P3 (TO_DELAY_P3_MAX)	Value:	Note 3,7
1.22e	D3 (TO_DELAY_D3_MIN)	Value:	Note 3,7
1.22f	D3 (TO_DELAY_D3_MAX)	Value:	Note 3,7
1.22g	P7 (TO_DELAY_P7_MIN)	Value:	Note 3,7
1.22h	P7 (TO_DELAY_P7_MIN)	Value:	Note 3,7
1.22i	J2 (TO_DELAY_J2_MIN)	Value:	Note 3,7
1.22j	J2 (TO_DELAY_J2_MAX)	Value:	Note 3,7

Table 4 — Protocol Implementation eXtra Information for Testing (PIXIT) Proforma (*continued*)

1.23	The time that the tester will use in most cases when waiting for a response from the IUT should be a function of the following formula: TD_WAIT_TIME = 2*TD_RESPONSE + the maximum value of (TO_DELAY_R3_MAX, TO_DELAY_P3_MAX, TO_DELAY_D3_MAX, TO_DELAY_P7_MAX TO_DELAY_J2_MAX)	Value:	Note 3
Item	**CALL Information**	**Values**	**Comments**
2.0	Extended Addressing in effect, A-bit set in Call/Clear Packets (ABIT_ADDR)	Yes No	
2.1a	Is the Calling DTE address in an Incoming Call packet verified (CALLING_ VER)	Yes No	
2.1b	If 2.1a yes, indicate an unacceptable address and address length which can be sent by the Tester.		
2.1b.a	(TST_ADDR_INV)	Value:	
2.1b.b	(TST_ADDR_INVL)	Value:	
2.1c	Is the Called DTE address in an Incoming Call packet verified (CALLED_VER)	Yes No	
2.1d	If 2.1c is yes, indicate an unacceptable address and address length which can be sent by the Tester.		
2.1d.a	(IUT_ADDR_INV)	Value:	
2.1d.b	(IUT_ADDR_INVL)	Value:	
2.1e	Is the TOA/NPI address format supported? This PIXIT item is not used for ITU-T X.25/80, ITU-T X.25/84, ISO 8208:1987 and ISO 8208:1990	Yes No	
2.1f	If 2.1e is yes, indicate TOA/NPI addresses which can be sent by the tester		
2.1f.a	(IUT_ADDR_A1)	Value:	
2.1f.b	(TST_ADDR_A1)	Value:	
2.1f.c	(IUT_ADDR_A1L)	Value:	
2.1f.d	(TST_ADDR_A1L)	Value:	
2.2	For each of the following packets indicate the value of the field and its length expected by the IUT.		
2.2a	Incoming Call		
2.2a.a	Calling Address (TST_ADDR1)	Value:	
2.2a.b	Called Address (IUT_ADDR1)	Value:	
2.2a.c	Calling Address length (TST_ADDR1_L)	Value:	
2.2a.d	Called Address length (IUT_ADDR1_L)	Value:	
2.2b	Call Connected		
2.2b.a	Calling Address (TST_ADDR2)	Value:	
2.2b.b	Called Address (IUT_ADDR2)	Value:	
2.2b.c	Calling Address length (TST_ADDR2_L)	Value:	
2.2b.d	Called Address length (IUT_ADDR2_L)	Value:	
2.3	For each of the following packets indicate the value of the value of the field transmitted by the IUT.		
2.3a	Call Request		
2.3a.a	Calling Address (IUT_ADDR5)	Value:	
2.3a.b	Called Address (TST_ADDR5)	Value:	
2.3a.c	Calling Address length (IUT_ADDR5 L)	Value:	
2.3a.d	Called Address length (TST_ADDR5 L)	Value:	
2.3b	Call Accepted		
2.3b.a	Calling Address (IUT_ADDR6)	Value:	
2.3b.b	Called Address (TST_ADDR6)	Value:	
2.3b.c	Calling Address length (IUT_ADDR6_L)	Value:	
2.3b.d	Called Address length (TST_ADDR6 L)	Value:	
2.4	Specify a maximum length address supported by the IUT.		
2.4a	(IUT_ADDR_MAX)	Value:	
2.4b	(IUT_ADDR_MAXL)	Value:	
2.5	Indicate the address and facilities and lengths to be used in the ITU-T-Specific DTE facility for called and calling address extension.		
2.5a	The address and length for the Address Field contained in the Incoming Call packet only:		

Table 4 — Protocol Implementation eXtra Information for Testing (PIXIT) Proforma (*continued*)

2.5a.a	Calling Address to be used in the Address Extension Fac.(TST_AF)	Value:	
2.5a.b	Called Address to be used in the Address Extension Fac.(IUT_AF)	Value:	
2 5a.c	Calling Address length (TST_AF_L)	Value:	
2 5a.d	Called Address length (IUT_AF_L)	Value:	
Item	**Facilities Information**	**Values**	**Comments**
2.5b	The facility length and contents of the Address Extension Facility Parameter, including the use of address extension octet contained in the Incoming Call Packet only: Note: The F_NONX25 string of facilities: facility marker '000F"'H, facility code 'CB'H, called address length, and called address.	Value:	
2.5b.a	(F _NONX25)	Value:	
2.5b.b	(F _NON_X25_L)	Value:	
2.5c	The facility length and contents of the Address Extension Facility Parameter, including the use of address extension octet, contained in the Call Accept packet used in response to the Incoming Call packet: Note: The F_AE string of facilities include: facility marker '000F'H, facility code 'C9'H, called address length, and called address.	Value:	
2.5c.a	(F_AE)	Value:	
2.Sc b	(F _AE_L)	Value:	
2.6a	Is the fast select facility always used? (FAST_SELECT)	Yes No	
2.6b	Does the IUT require more than one facility to be present m an Incoming Call packet?	Yes No	Note 8
2.6c	Does the IUT transmit more than one facility in a Call Request packet?	Yes _ No	Note 8
2.6d	Provide a string of 110 octets of facility information to be sent to the IUT. (FACS_110)	Value:	Note 10
2.7	Provide the facilities, facility length and user data to be used in each of the following packets.		
2.7a	Incoming Call packet received by the IUT		
2.7a.a	(CALL_IND_F)	Value:	Note 10
2.7a.b	(CALL_IND_FL)	Value:	
2.7a.c	(CALL_IND_UD)	Value:	
2.7b	Call Request packet transmitted by the IUT		
2.7b.a	(CALL_REQ_F)	Value:	Note 10
2.7b.b	(CALL_REQ_FL)	Value:	
2.7b.c	(CALL_REQ_UD)	Value:	
2.7c	Call Connected packet received by the IUT		
2.7c.a	(CALL_CON F)	Value:	Note 10
2.7c.b	(CALL_CON FL)	Value:	
2.7c.c	(CALL_CON_UD)	Value:	
2.7d	Call Accept packet transmitted by the IUT		
2.7d.a	(CALL ACC F)	Value:	Note 10
2.7d.b	(CALL ACC FL)	Value:	
2.7d.c	(CALL ACC UD)	Value:	
2.7e	Clear Indication packet received by the IUT		
2.7e.a	(CLR)IND_F)	Value:	Note 10
2.7e.b	(CLR _IND_FL)	Value:	
2.7e.c	(CLR _IND_UD)	Value:	
2.7f	Clear Request packet transmitted by the IUT		
2.7f.a	(CLR_REQ_UD)	Value:	
2.7f.b	(CLR_REQ_FL)	Value:	
2.7f.c	(CLR_REQ_UD)	Value:	
2.7g	Clear Confirmation packet received by the IUT		
2.7g	Clear Confirmation packet received by the IUT		
2.7g.a	(CLC_RX_F)	Value:	Note 10
2.7g.b	(CLC_RX_FL)	Value:	
2.7h	Clear Confirmation packet transmitted by the IUT		
2.7h.a	{CLC_TX_F)	Value:	Note 10
2.7h.b	(CLC_TX_FL)	Value:	

Table 4 — Protocol Implementation eXtra Information for Testing (PIXIT) Proforma (*continued*)

2.8a	Provide a number to be used for Basic CUG (BCUG_NUM)	Value:	
2.8b	Provide a number to be used for extended CUG (ECUG_NUM)	Value:	
2.8c	Provide a number to be used for bilateral CUG (BICUG_NUM)	Value:	
2.9	Indicate the default throughput class.		
2.9a	(DEF_THRUPT_CALLED)	Value:	
2.9b	(DEF_THRUPT_CALLING)	Value:	
2.10	Indicate a throughput class that is different from the default throughput		
2.10a	(THRUPT_CALLING)	Value:	
2.10b	(THRUPT_CALLED)	Value:	
2.11	Indicate the Transit Delay value to be used.		
2.11a	First octet (TRNS_DELAY_1)	Value:	
2.11b	Second octet (TRNS_DELAY_2)	Value:	
2.12	Provide the Network User Identification facility length and facilities.		
2.12a	(F_NUI)	Value:	
2.12b	(F_NUI_ L)	Value:	
Item	**Data Packet Information**	**Values**	**Comments**
2.13	Specify the Q, D-Bit, and M-Bit settings and data contents of the first nine data packets which the IUT will receive (default settings for Q,D and M-bits are 0, a? in the entry indicates that any user data is acceptable). If possible at least one data packet should contain the full size of data.		
2.13a	First Data Packet		
2.13a.a	Q= (Q_UD_O)	Value:	
2.13a.b	D= (D_UD_O)	Value:	
2.13a.c	M= (M_UD_O)	Value:	
2.13a.d	User data field (UD_O)	Value:	
2.13b	Second Data Packet		
2.13b.a	Q= (Q_UD_1)	Value:	
2.13b.b	D= (D_UD_1)	Value:	
2.13b.c	M= (M_UD_1)	Value:	
2.13b.d	User data field (UD_1)	Value:	
2.13c	Third Data Packet		
2.13c.a	Q= (Q_UD_2)	Value:	
2.13c.b	D= (D_UD_2)	Value:	
2.13c.c	M = (M_UD_2)	Value:	
2.13c.d	User data field (UD_2)	Value:	
2.13d	Fourth Data Packet		
2.13d.a	Q= (Q_UD_3)	Value:	
2.13d.b	D= (D_UD_3)	Value:	
2.13d.c	M= (M_UD_3)	Value:	
2.13d.d	User data field (UD_3)	Value:	
2.13e	Fifth Data Packet		
2.13e.a	Q= (Q_UD_4)	Value:	
2.13e.b	D= (D_UD_4)	Value:	
2.13e.c	M= (M_UD_4)	Value:	
2.13e.d	User data field (UD_4)	Value:	
2.13f	Sixth Data Packet		
2.13f.a	Q= (Q_UD_5)	Value:	
2.13f.b	D= (D_UD_5)	Value:	
2.13f.c	M= (M_UD_5)	Value:	
2.13f.d	User data field (UD_5)	Value:	
2.13g	Seventh Data Packet		
2.13g.a	Q= (Q_UD_6)	Value:	
2.13g.b	D= (D UD_6)	Value:	
2.13g.c	M= (M_UD_6)	Value:	
2.13g.d	User data field (UD_6)	Value:	

Table 4 — Protocol Implementation eXtra Information for Testing (PIXIT) Proforma (*continued*)

2.13h	Eighth Data Packet		
2.13h.a	Q= (Q_UD_7)	Value:	
2.13h.b	D= (D_UD_7)	Value:	
2.13h.c	M= (M_UD_7)	Value:	
2.13h.d	User data field (UD_7)	Value:	
2.13i	Ninth Data Packet		
2.13i.a	Q= (Q_UD_U)	Value:	
2.13i.b	D= (D_UD_U)	Value:	
2.13i.c	M= (M_UD_U)	Value:	
2.13i.d	User data field (UD_U)	Value:	
2.13k	Contents of User data field for too long Data packet (UD_U_UD1)	Value:	
2.14	Specify a sequence of Data packets no greater than nine that contains a change of Q-bit value, where the change generates an error when received by the IUT, and data content that can be received by the IUT (default settings for D and M-bits is a 0, a ? in the entry indicates that any user data is acceptable).		
2.14a	First Data Packet		
2.14a.a	Q= (Q_UDQ_0)	Value:	
2.14a.b	D= (D_UDQ_0)	Value:	
2.14a.c	M= (M UDQ_0)	Value:	
2.14a.d	User data field (UDQ_0)	Value:	
2.14b	Second Data Packet		
2.14b.a	Q= (Q _UDQ_1)	Value:	
2.14b.b	D= (D_UDQ_1)	Value:	
2.14b.c	M = (M_UDQ_1)	Value:	
2.14b.d	User data field (UDQ_1)	Value:	
2.14c	Third Data Packet		
2.14c.a	Q= (Q_UDQ_2)	Value:	
2.14c.b	D= (D_UDQ_2)	Value:	
2.14c.c	M= (M_UDQ_2)	Value:	
2.14c.d	User data field (UDQ_2)	Value:	
2.14d	Fourth Data Packet		
2.14d.a	Q= (Q UDQ_3)	Value:	
2.14d.b	D= (D_UDQ_3)	Value:	
2.14d.c	M= (M_UDQ_3)	Value:	
2.14d.d	User data field (UDQ_3)	Value:	
2.14e	Fifth Data Packet		
2.14e.a	Q= (Q_UD4_4)	Value:	
2.14e.b	D= (D_UDQ_4)	Value:	
2.14e.c	M= (M_UDQ_4)	Value:	
2.14e.d	User data field (UDQ_4)	Value:	
2.14f	Sixth Data Packet		
2.14f.a	Q= (Q_UDQ_5)	Value:	
2.14f.b	D= (D_UDQ_5)	Value:	
2.14f.c	M = (M UDQ 5)	Value:	
2.14f.d	User data field (UDQ_5)	Value:	
2.14g	Seventh Data Packet		
2.14g.a	Q= (Q_UDQ_6)	Value:	
2.14g.b	D= (D_UDQ_6)	Value:	
2.14g.c	M = (M_UDQ_6)	Value:	
2.14g.d	User data field (UDQ_6)	Value:	
2.14h	Eighth Data Packet		
2.14h.a	Q= (Q_UDQ_7)	Value:	
2.14h.b	D= (D_UDQ_7)	Value:	
2.14h.c	M= (M_UDQ_7)	Value:	
2.14h.d	User data field (UDQ_7)	Value:	

Table 4 — Protocol Implementation eXtra Information for Testing (PIXIT) Proforma (*continued*)

2.14i	Ninth Data Packet		
2.14i.a	Q= (Q_UDQ_8)	Value:	
2.14i.b	D= (D_UDQ_8)	Value:	
2.14i.c	M = (M_UDQ_8)	Value:	
2.14i.d	User data field (UDQ_8)	Value:	
2.15	Specify a sequence of Data packets no greater than nine that contains a change of Q - bit value, where the change is acceptable to the IUT, and data content that can be received by the IUT (default settings for D and M-bits is 0, a ? in the entry indicates that any user data is acceptable).		
2.15a	First Data Packet		
2.15a.a	Q= (Q_UDQA_0)	Value:	
2.15a.b	D= (D_UDQA_0)	Value:	
2.15a.c	M = (M_UDQA_0)	Value:	
2.15a.d	User data field (UDQA_0)	Value:	
2.15b	Second Data Packet		
2.15b.a	Q= (Q_UDQA_1)	Value:	
2.15b.b	D= (D UDQA_1)	Value:	
2.15b.c	M = (M_UDQA_1)	Value:	
2.15b.d	User data field (UDQA_1)	Value:	
2.15c	Third Data Packet		
2.15c.a	Q= (Q_UDQA_2)	Value:	
2.15c.b	D= (D_UDQA_2)	Value:	
2.15c.c	M = (M_UDQA_2)	Value:	
2.15c.d	User data field (UDQA_2)	Value:	
2.15d	Fourth Data Packet;		
2.15d.a	Q= (Q_UDQA_3)	value:	
2.15d.b	D= (D_UDQA_3)	Value:	
2.15d.c	M= (M_UDQA_3)	Value:	
2.15d.d	User data field (DQA_3)	Value:	
2.15e	Fifth Data Packet		
2.15e.a	Q= (Q_UDQA_4)	Value:	
2.15e.b	D= (D_UDQA_4)	Value:	
2.15e.c	M= (M_UDQA_4)	Value:	
2.15e.d	User data field (UDQA_4)	Value:	
2.15f	Sixth Data Packet		
2.15f.a	Q= (Q_UDQA_5)	Value:	
2.15f.b	D= (D_UDQA_5)	Value:	
2.15f.c	M= (M_UDQA_5}	Value:	
2.15f.d	User data field (UDQA_5)	Value:	
2.15g	Seventh Data Packet		
2.15g.a	Q= (Q_UDQA_6)	Value:	
2.15g.b	D= (D_UDQA_6)	Value:	
2.15g.c	M= (M_UDQA_6)	Value:	
2.15g.d	User data field (UDQA_6)	Value:	
2.15h	Eighth Data Packet		
2.15h.a	Q= (Q_UDQA_7)	Value:	
2 17h.b	D = (D_UDQA_7)	Value	
2.15h.c	M= (M_UDQA_7)	Value:	
2.15h.d	User data field (UDQA_7)	Value:	
2.15i	Ninth Data Packet		
2.15i.a	Q= (Q_DQA_8)	Value:	
2.15i.b	D= (D_UDQA_8)	Value:	
2.15i.c	M = (M_UDQA_8)	Value:	
2.15i.d	User data field (UDQA 8)	Value:	

Table 4 — Protocol Implementation eXtra Information for Testing (PIXIT) Proforma (*continued*)

2.16	Specify a sequence of Data packets no greater than nine after which a packet with an empty data field may be processed by the IUT (default settings for Q, D and M- bits are 0, a ? In the entry indicates that any user data is acceptable.		
2.16a	First Data Packet		
2.16a.a	Q = (Q_UDE_0)	Value:	
2.16a.b	D= (D_UDE_0)	Value:	
2.16a.c	M= (M_UDE_0)	Value:	
2.16a.d	User data field (UDE_0)	Value:	
2.16b	Second Data Packet		
2.16b.a	Q = (Q_UDE_1)	Value:	
2.16b.b	D= (D_UDE_1)	Value:	
2.16b.c	M = (M_UDE_1)	Value:	
2.16b.d	User data field (UDE_1)	Value:	
2.16c	Third Data Packet		
2.16c.a	Q= (Q_UDE_2)	Value:	
2.16c.b	D= (D_UDE_2)	Value:	
2.16c.c	M= (M_UDE_2)	Value:	
2.16c.d	User data field (UDE_2)	Value:	
2.16d	Fourth Data Packet		
2.16d.a	Q = (Q_UDE_3)	Value:	
2.16d.b	D= (D_UDE_3)	Value:	
2.16d.c	M = (M_UDE_3)	Value:	
2.16d.d	User data field (UDE_3)	Value:	
2.16e	Fifth Data Packet		
2.16e.a	Q= (Q_UDE_4)	Value:	
2.16e.b	D= (D_UDE_4)	Value:	
2.16e.c	M= (M_UDE_4)	Value:	
2.16e.d	User data field (UDE_4)	Value:	
2.16f	Sixth Data Packet		
2.16f.a	Q= (Q_UDE_5)	Value:	
2.16f.b	D= (D_UDE_5)	Value:	
2.16f.c	M= (M_UDE_5)	Value:	
2.16f.d	User data field (UDE_5)	Value:	
2.16g	Seventh Data Packet		
2.16g.a	Q= (Q_UDE_6)	Value:	
2.16g.b	D= (D_UDE_6)	Value:	
2.16g.c	M= (M_UDE_6)	Value:	
2.16g.d	User data field (UDE_6)	Value:	
2.16h	Eighth Data Packet		
2.16h.a	Q= (Q_UDE_7)	Value:	
2.16h.b	D= (D_UDE_7)	Value:	
2.16h.c	M = (M_UDE_7)	Value:	
2.16h.d	User data field (UDE_7)	Value:	
2.16i	Ninth Data Packet		
2.16i.a	Q= (Q_UDE_8)	Value:	
2.16i.b	D= (D_UDE_8)	Value:	
2.16i.c	M= (M_UDE_8)	Value:	
2.16i.d	User data field (UDE_8)	Value:	
2.17	Specify a sequence of Data packets no greater than nine that contains a change of M-bit value and data content that can be received by the IUT (default setting for D and Q-bits are 0, a ? in the entry indicates that any user data is acceptable).		
2.17a	First Data Packet		
2.17a.a	Q = (Q_UDM_0)	Value:	
2.17a.b	D= (D_UDM_0)	Value:	
2.17a.c	M= (M_UDM_0)	Value:	

Table 4 — Protocol Implementation eXtra Information for Testing (PIXIT) Proforma (*continued*)

2.17a.d	User data field (UDM_0)	Value:	
2.17b	Second Data Packet		
2.17b.a	Q= (Q_UDM_1)	Value:	
2.17b.b	D= (D_UDM _1)	Value:	
2.17b.c	M= (M_UDM_1)	Value:	
2.17b.d	User data field (UDM_1)	Value:	
2.17c	Third Data Packet		
2.17c.a	Q= (Q_UDM_2)	Value:	
2.17c.b	D= (D_UDM_2)	Value:	
2.17c.c	M = (M_UDM_2)	Value:	
2.17c.d	User date field (UDM_2)	Value:	
2.17d	Fourth Data Packet		
2.17d.a	Q= (Q_UDM_3)	Value:	
2.17d.b	D= (D_UDM _3)	Value:	
2.17d.c	M = (M _UDM _3)	Value:	
2.17d.d	User data field (UDM_3)	Value:	
2.17e	Fifth Data Packet		
2.17e.a	Q = (Q_UDM_4)	Value:	
2.17e.b	D= (D_UDM _4)	Value:	
2.17e.c	M= (M_UDM_4)	Value:	
2.17e.d	User data field (UDM _4)	Value:	
2.17f	Sixth Data Packet		
2.17f.a	Q= (Q_UDM_5)	Value:	
2.17f.b	D= (D_UDM_5)	Value:	
2.17f.c	M= (M_UDM_5)	Value:	
2.17f.d	User data field (UDM_5)	Value:	
2.17g	Seventh Data Packet		
2.17g.a	Q= (Q_UDM_6)	Value:	
2.17g.b	D= (D_UDM_6)	Value:	
2.17g.c	M= (M_UDM_6)	Value:	
2.17g.d	User data field (UDM_6)	Value:	
2.17h	Eighth Data Packet		
2.17h.a	Q=(Q_UDM_7)	Value:	
2.17h.b	D= (D_UDM_7)	Value:	
2.17h.c	M= (M_UDM_7)	Value:	
2.17h.d	User data field (UDM _7)	Value:	
2.17.i	Ninth Data Packet		
2.17i.a	Q=(Q_UDM _8)	Value:	
2.17i.b	D=(D_UDM _8)	Value:	
2.17i.c	M=(M_UDM_8)	Value:	
2.17i.d	User data field (UDE_8)	Value:	
2.18	Specify a partially full data packet with M-bit set which would otherwise(M-bit = 0) be acceptable to the IUT.		
2.18a	Q=(Q_UDMP)	Value:	
2.18b	D=(D_UDMP)	Value:	
2.18c	M=(M_UDMP)	Value:	
2.18d	User data field (UDMP)	Value:	
2.19	Specify the user data to be carried where the Tester is required to send a specific number of data octets in order to test the IUT (a ? in the entry indicates that any user data is acceptable)		
2.19a	1 octet (UD1)	Value:	
2.19b	3 octets (UD3)	Value:	
2.19c	16 octets (UD16)	Value:	
2.19d	17 octets (UD17)	Value:	
2.19e	32 octets (UD32)	Value:	
2.19f	110 octets (UD110)	Value:	

Table 4 — Protocol Implementation eXtra Information for Testing (PIXIT) Proforma (*continued*)

2.19g	128 octets (UD129)	Value:	
2.19h	129 octets (UD129)	Value:	
2.19i	UDNS (UDNS)	Value:	Note 6
Item	**Miscellaneous Information**	**Values**	**Comments**
2.20	Provide Interrupt User Data (one octet for X.25 1980 and up to 32 octets for X.25 1984, X.25 1988, X.25 1993, ISO 8208 1987, ISO 8208 1990 and ISO 8208 1995) to be carried in the Interrupt Packet.		
2.20a	IUT transmits (Tester receives) (UD_I_IUT)	Value:	
2.20b	IUT receives (Tester transmits) (UD_I_TST)	Value:	
2.21	Registration Request/Confirmation Packets		Note 8
2.22	Implicit Sends		
2.22a	< IUTI CALL> Call Request	Yes No	
2.22b	<IUTIDATA> Data	Yes No	
2.22c	<IUTIINT>Interrupt	Yes No	
2.22d	< IUTI RESTART > Restart Confirm	Yes No	
2.22e	<IUTIRESTART> Restart	Yes No	
2.22f	<IUTIREG> Registration	Yes No	
2.22g	Where operator action is required for Implicit Send events, specify the maximum time required for the operator to complete the requested action (IMP_TO)	Value:	
Item	**Abstract Service Primitive Information**	**Values**	**Comments**
2.23	Does the IUT support abstract service primitives as defined in ISO/IEC 8886? (ASP_SUPP)	☐ Yes ☐ No	
	If 2.23 is yes, enter values for the following:		
2.23a	(DL_CALLED_ADDR_BT)	Value:	
2.23b	(DL_CALLED_ADDR_DEF)	Value:	
2.23c	(DL_CALLING_ADDR_BT)	Value:	
2.23d	(DL_CALLING_ADDR_DEF)	Value:	
2.23e	(DL_DLCNR_PS_BT)	Value:	
2.23f	(DL_DLCNR_PS_DEF)	Value:	
2.23g	(DL_DLCNC_PS_BT)	Value:	
2.23h	(DL_DLCNC_PS_DEF)	Value:	
2.23i	(DL_ORIGIN_BT)	Value:	
2.23j	(DL_ORIGIN_DEF)	Value:	
2.23k	(DL_QOS_BT)	Value:	
2.23l	(DL_QOS_DEF)	Value:	
2.23m	(DL_REASON_BT)	Value:	
2.23n	(DL_REASON_DEF)	Value:	
2.23o	(DL_RESP_ADDR_BT)	Value:	
2.23p	(DL_RESP_ADDR_BT)	Value:	

NOTES:

1. Specify a logical channel combination which will permit both Incoming Call and Call Request functions to be tested (preferably one two-way VC), if applicable.
2. Value should be indicated in hexadecimal
3. All times are to be given in seconds, except where noted.
4. The IUT will indicate here whether it accepts that the contents of this field could be different from what was expected. as a consequence of the use of the CLAMN facility.
5. UD_U is a universally repeatable data packet and will be used test cases where more than nine data packets are required to be transmitted by the tester. (see test case PL22_105 as an example).
6. A packet containing the number of octets to that of the Nonstandard Default packet size, see PIXIT 1.10.
7. When TO_DELAY_xx_MIN is not greater than or equal to twice the value of TD_RESPONSE (PIXIT 1.20) the applicable transient state is not testable.
8. All tests for facilities contained in PLG 25 and PLG 26 test for each facility independently where other facilities are not present. If a combination of facilities is required by the IUT, the facility test cases for those facilities will be deselected from PLG 25 and PLG 26.
9. If a value is not provided a logical channel will be assigned by selecting the lowest channel in the first available logical channel group chosen in the following order; Incoming, Two-way, PVC.
10. The facility information provided must be syntactically correct and acceptable to the IUT. The following maximum facility lengths are used: for X.25 (1993, 1988) and ISO/IEC 8208 (1990, 1995) the maximum facility length is 255 octets
    for X.25 (1984) and ISO/IEC 8208 (1987) the maximum facility length is 109 octets
    for X.25 (1980) the maximum facility length is 63 octets.

6.14 Acceptable unexpected responses

In some test cases particularly in the data transfer state (p4/dl) unexpected packets may be received from the IUT which do not affect the outcome of the test case. Such unexpected packets shall be accepted by the test system without consequence to the IUT.

Table 5 identifies those packets which the test system shall accept depending on the state of the interface as perceived by the IUT. Note that RESTART REQUEST, CLEAR REQUEST and RESET REQUEST which may be sent at any time by the IUT are not considered to be allowable unexpected response during data transfer tests. Also note that when the IUT is in state P1 where a Call Request may be sent at anytime an unsolicited Call Request is not considered to be an acceptable unexpected response. This is because it is highly unlikely for reasons of timing that the unsolicited Call Request would arrive at time when the tester would consider it as a correct response to a previousty issued implicit send request (IUT!CALL) see ISO/IEC 9646-5. Similarly a REJ packet requesting packet retransmission is not accepted as an allowable unexpected response.

The logical channel under test is derived from the PIXIT. All packets received on logical channels other than the one being tested shall be discarded by the tester, regardless of their syntactic validity. This does not apply to packets received on logical channel 0.

In a DTE/DTE environment where the IUT is acting as a DCE, diagnostic packets received by the Tester on logical channel 0 indicating timer timeouts shall be ignored.

Table 5 — Acceptable unexpected responses

Packet Received from the IUT (on LCN under test)	State of the interface as perceived by the IUT						
	d1	i1	i2	j1	f1	f2	g1
Data	x	x	x	x	x		x
INTERRUPT	x	x		x	x	x	x
RECEIVE READY	x	x	x	x	x	x	x
RECEIVE NOT READY	x	x	x	x	x	x	x

6.15 Implicit send

The use of the Implicit Send mechanism may be realized through either manual operator intervention or automated procedures. PIXIT question 2.22 lists the Implicit Sends used in this test suite.

6.16 Encoding and order of bit transmission

The encoding and the order of bit transmission for the PDUs in this ATS shall be as defined in the X.25 Standards.

6.17 Basic interconnection tests

A set of Basic Interconnection Tests (BITs) may be used to determine the interoperability between the Test Laboratory and the Implementation Under Test prior to running the full test suite, reference ISO/IEC 9646-1:1994, 6.1.2. When these BITs are used they shall be selected from the following list shown in Table 6. This selection is based on answers given in the PICS and PIXIT proformas and the corresponding test selection Boolean equations.

Table 6 — Basic Interconnection tests

Test case index	Test Purposes
P1_101	Verify the IUT accepts a Restart Indication in R1
P2_101	Verify the R2 to R1 transition via Restart Indication
P2_102	Verify the R2 to R1 transition via Restart Confirmation
P4_101	Verify the IUT accepts a valid Incoming Call received in state P1
P5_103	Verify the IUT accepts a Call Connected packet while in P2
P9_106	Verify the IUT accepts a valid Clear Confirmation received in state P6
P11_101	Verify the IUT accepts a Reset Indication received in state D1
P11_102	Verify the IUT can accept Data in state D1
P12_102	Verify the IUT is in state D1 after receiving a Reset Confirmation while in state D2

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 (C029517E 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 (C029517E 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.

ICS 35.100.30

Price based on 801 pages