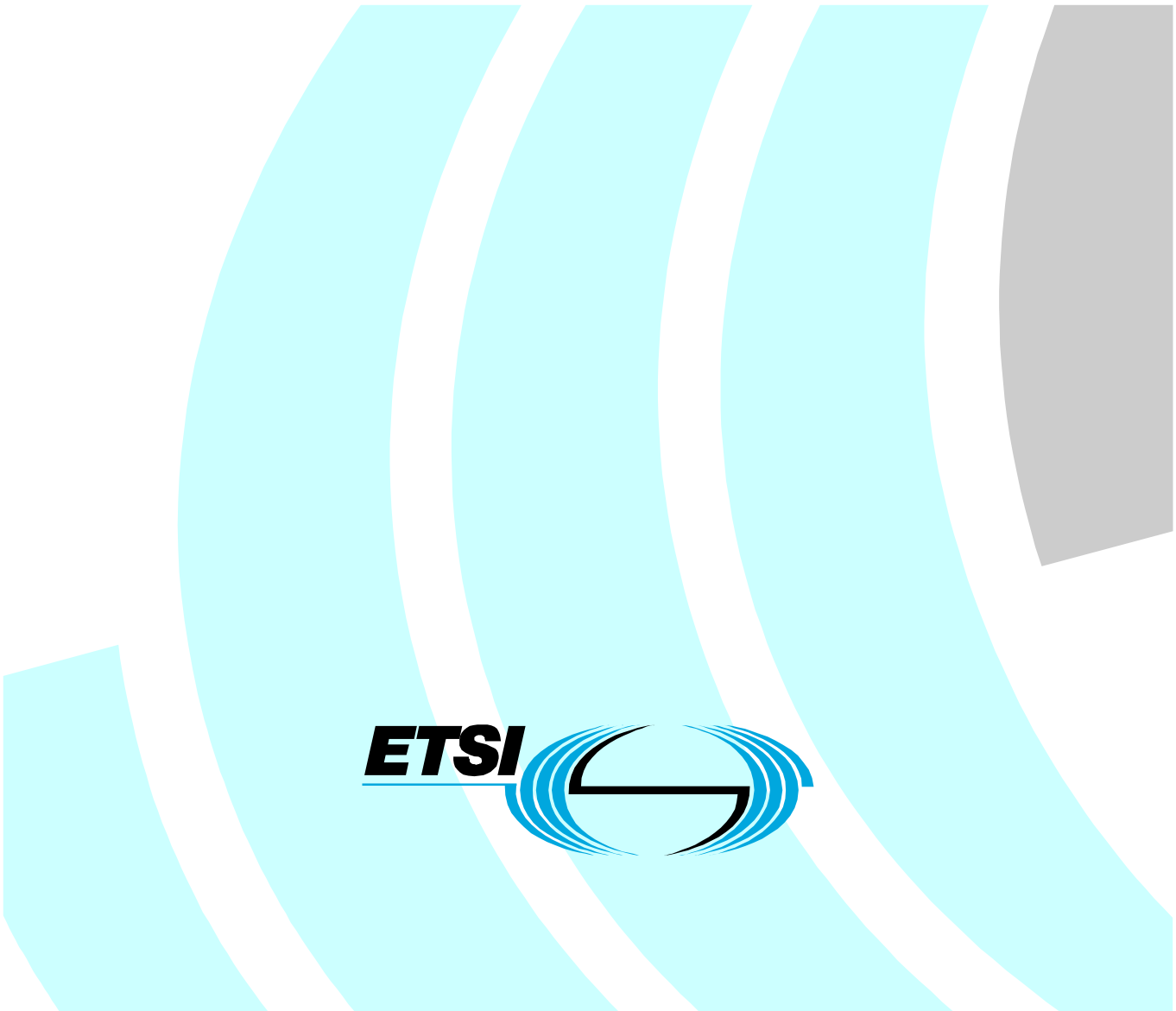
ETSI EN 300 052-4 V1.3.1 (2002-04)

European Standard (Telecommunications series)

Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Multi Subscriber Number (MSN) supplementary service; Part 4: Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the user



Reference
REN/SPAN-130270-4

Keywords
ATS, DSS1, ISDN, MSN, PIXIT, supplementary service, user

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Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Contents

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Services and Protocols for Advanced Networks (SPAN).

The present document is part 4 of a multi-part deliverable covering the Digital Subscriber Signalling System No. one (DSS1) protocol specification for the Integrated Services Digital Network (ISDN) Multiple Subscriber Number (MSN) supplementary service, as identified below:

Part 1: "Protocol specification";

Part 2: "Protocol Implementation Conformance Statement (PICS) proforma specification";

Part 3: "Test Suite Structure and Test Purposes (TSS&TP) specification for the user";

Part 4: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the user";

Part 5: "Test Suite Structure and Test Purposes (TSS&TP) specification for the network";

Part 6: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the network".

National transposition dates	
Date of adoption of this EN:	19 April 2002
Date of latest announcement of this EN (doa):	31 July 2002
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 January 2003
Date of withdrawal of any conflicting National Standard (dow):	31 January 2003

1 Scope

The present document specifies the Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma for the User side of the T reference point or coincident S and T reference point (as defined in ITU-T Recommendation I.411 [10]) of implementations conforming to the stage three standard for the Multiple Subscriber Number (MSN) supplementary service for the pan-European Integrated Services Digital Network (ISDN) by means of the Digital Subscriber Signalling System No. one (DSS1) protocol, EN 300 052-1 [2].

EN 300 052-3 [4] specifies the Test Suite Structure and Test Purposes (TSS&TP) related to this ATS and partial PIXIT proforma specification. Other parts specify the TSS&TP and the ATS and partial PIXIT proforma for the Network side of the T reference point or coincident S and T reference point of implementations conforming to EN 300 052-1 [2].

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

[1] ETSI EN 300 403-1: "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Signalling network layer for circuit-mode basic call control; Part 1: Protocol specification [ITU-T Recommendation Q.931 (1993), modified]".

[2] ETSI EN 300 052-1 (V1.2.4): "Integrated Services Digital Network (ISDN); Multiple Subscriber Number (MSN) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[3] ETSI EN 300 052-2 (V1.2.4): "Integrated Services Digital Network (ISDN); Multiple Subscriber Number (MSN) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 2: Protocol Implementation Conformance Statement (PICS) proforma specification".

[4] ETSI EN 300 052-3 (V1.2.4): "Integrated Services Digital Network (ISDN); Multiple Subscriber Number (MSN) supplementary service; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 3: Test Suite Structure and Test Purposes (TSS&TP) specification for the user".

[5] ISO/IEC 9646-1: "Information technology - Open Systems Interconnection - Conformance testing methodology and framework; Part 1: General concepts".

[6] ISO/IEC 9646-2: "Information technology - Open Systems Interconnection - Conformance Testing Methodology and Framework; Part 2: Abstract Test Suite specification".

[7] ISO/IEC 9646-3: "Information technology - Open Systems Interconnection - Conformance Testing Methodology and Framework; Part 3: The Tree and Tabular Combined Notation (TTCN)".

[8] ISO/IEC 9646-4: "Information technology - Open Systems Interconnection - Conformance Testing Methodology and Framework; Part 4: Test realization".

[9] ISO/IEC 9646-5: "Information technology - Open Systems Interconnection - Conformance Testing Methodology and Framework; Part 5: Requirements on test laboratories and clients for the conformance assessment process".

[10] ITU-T Recommendation I.411 (1993): "ISDN user-network interfaces - Reference configurations".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

Abstract Test Suite (ATS): See ISO/IEC 9646-1 [5].

Implementation Under Test (IUT): See ISO/IEC 9646-1 [5].

Lower Tester (LT): See ISO/IEC 9646-1 [5].

Point Of Control And Observation (PCO): See ISO/IEC 9646-1 [5].

Protocol Implementation Conformance Statement (PICS): See ISO/IEC 9646-1 [5].

PICS proforma: See ISO/IEC 9646-1 [5].

Protocol Implementation Extra Information For Testing (PIXIT): See ISO/IEC 9646-1 [5].

PIXIT proforma: See ISO/IEC 9646-1 [5].

System Under Test (SUT): See ISO/IEC 9646-1 [5].

Upper Tester (UT): See ISO/IEC 9646-1 [5].

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

ATM	Abstract Test Method
ATS	Abstract Test Suite
DSS1	Digital Subscriber Signalling No1
ExTS	Executable Test Suite
ISDN	Integrated Services Digital Network
IUT	Implementation Under Test
LT	Lower Tester
MOT	Means Of Testing
MSN	Multiple Subscriber Number
PCO	Point of Control and Observation
PCTR	Protocol Conformance Test Report
PDU	Protocol Data Unit
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
SUT	System Under Test
TCP	Test Co-ordination Procedures
TP	Test Purpose
TTCN	Tree and Tabular Combined Notation
UT	Upper Tester

4 Abstract Test Method (ATM)

The remote test method is applied for the MSN user ATS. The Point of Control and Observation (PCO) resides at the service access point between layers 2 and 3. This PCO is named "L" (for Lower). The L PCO is used to control and observe the behaviour of the Implementation Under Test (IUT) and test case verdicts are assigned depending on the behaviour observed at this PCO.

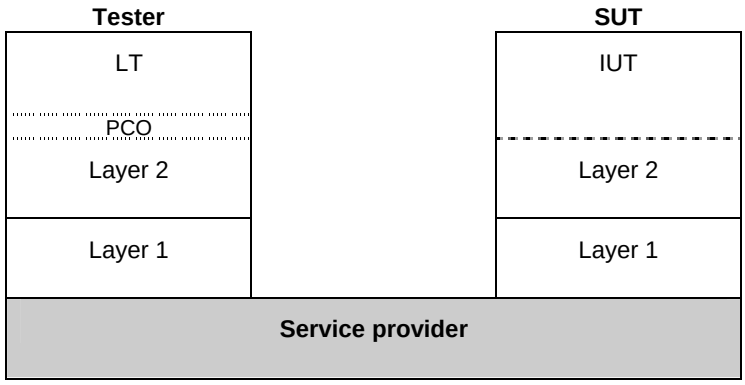

Figure 1: Remote test method

ISO/IEC 9646-2 [6] allows the informal expression of Test Co-ordination Procedures (TCP) between the System Under Test (SUT) upper layer(s) and the Lower Tester (LT). In the ATS contained in annex C, TCP is achieved by use of a second "informal" PCO, called "O" (for Operator). This PCO is used to specify control but not observation above the IUT and consequently, events at this PCO are never used to generate test case verdicts. The use of this O PCO is regarded as a preferred alternative to the use of the implicit send event, in that it allows the ATS to specify in a clear and meaningful way what actions are required to be performed on the IUT.

5 Untestable test purposes

There are no untestable test purposes associated with this ATS.

6 ATS conventions

This clause is structured similarly to the structure of a TTCN ATS. However, the names of the clauses are arranged in a way more suitable to the present document.

6.1 Version of TTCN used

The version of TTCN used is that defined in ISO/IEC 9646-3 [7].

7 ATS to TP map

The identifiers used for the TPs are reused as test case names. Thus there is a straightforward one-to-one mapping.

8 PCTR conformance

A test laboratory, when requested by a client to produce a PCTR, is required, as specified in ISO/IEC 9646-5 [9], to produce a PCTR conformant with the PCTR template given in annex B of ISO/IEC 9646-5 [9].

Furthermore, a test laboratory, offering testing for the ATS specification contained in annex C, when requested by a client to produce a PCTR, is required to produce a PCTR conformant with the PCTR proforma contained in annex A of the present document.

A PCTR which conforms to this PCTR proforma specification shall preserve the content and ordering of the clauses contained in annex A. Clause A.6 of the PCTR may contain additional columns. If included, these shall be placed to the right of the existing columns. Text in italics may be retained by the test laboratory.

9 PIXIT conformance

A test realizer, producing an executable test suite for the ATS specification contained in annex C, is required, as specified in ISO/IEC 9646-4 [8], to produce an augmented partial PIXIT proforma conformant with this partial PIXIT proforma specification.

An augmented partial PIXIT proforma which conforms to this partial PIXIT proforma specification shall, as a minimum, have contents which are technically equivalent to annex B. The augmented partial PIXIT proforma may contain additional questions that need to be answered in order to prepare the Means Of Testing (MOT) for a particular IUT.

A test laboratory, offering testing for the ATS specification contained in annex C, is required, as specified in ISO/IEC 9646-5 [9], to further augment the augmented partial PIXIT proforma to produce a PIXIT proforma conformant with this partial PIXIT proforma specification.

A PIXIT proforma which conforms to this partial PIXIT proforma specification shall, as a minimum, have contents which are technically equivalent to annex B. The PIXIT proforma may contain additional questions that need to be answered in order to prepare the test laboratory for a particular IUT.

10 ATS conformance

The test realizer, producing MOT and ExTS for this ATS specification, shall comply with the requirements of ISO/IEC 9646-4 [8]. In particular, these concern the realization of an ExTS based on each ATS. The test realizer shall provide a statement of conformance of the MOT to this ATS specification.

An ExTS which conforms to this ATS specification shall contain test groups and test cases which are technically equivalent to those contained in the ATS in annex C. All sequences of test events comprising an abstract test case shall be capable of being realized in the executable test case. Any further checking which the test system might be capable of performing is outside the scope of this ATS specification and shall not contribute to the verdict assignment for each test case.

Test laboratories running conformance test services using this ATS shall comply with ISO/IEC 9646-5 [9].

A test laboratory which claims to conform to this ATS specification shall use an MOT which conforms to this ATS.

Annex A (normative): Protocol Conformance Test Report (PCTR) proforma

A.1 Identification summary

A.1.1 Protocol conformance test report

PCTR number:	
PCTR date:	
Corresponding SCTR number:	
Corresponding SCTR date:	
Test laboratory identification:	
Test laboratory manager:	
Signature:	

A.1.2 IUT identification

Name:	
Version:	
Protocol specification:	EN 300 052-1
PICS:	
Previous PCTRs (if any):	

A.1.3 Testing environment

PIXIT reference number:	
ATS specification:	EN 300 052-4
Abstract test method:	Remote test method (see ISO/IEC 9646-2)
Means of testing identification:	
Dates of testing:	
Conformance log reference(s):	
Retention date for log reference(s):	

A.1.4 Limits and reservations

Additional information relevant to the technical contents or further use of the test report, or to the rights and obligations of the test laboratory and the client, may be given here. Such information may include restriction on the publication of the report.

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A.1.5 Comments

Additional comments may be given by either the client or the test laboratory on any of the contents of the PCTR, for example, to note disagreement between the two parties.

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A.2 IUT conformance status

This IUT has/has not been shown by conformance assessment to be non-conforming to the specified protocol specification.

Strike the appropriate words in this sentence. If the PICS for this IUT is consistent with the static conformance requirements (as specified in clause A.3 of the present document) and there are no "FAIL" verdicts to be recorded (in clause A.6) strike the words "has", otherwise strike the words "has not".

A.3 Static conformance summary

The PICS for this IUT is/is not consistent with the static conformance requirements in the specified protocol.

Strike the appropriate words in this sentence.

A.4 Dynamic conformance summary

The test campaign did/did not reveal errors in the IUT.

Strike the appropriate words in this sentence. If there are no "FAIL" verdicts to be recorded (in clause A.6 of the present document) strike the word "did", otherwise strike the words "did not".

Summary of the results of groups of tests:

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A.5 Static conformance review report

If clause A.3 indicates non-conformance, this clause itemizes the mismatches between the PICS and the static conformance requirements of the specified protocol specification.

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A.6 Test campaign report

ATS reference	Selected? (Y/N)	Run? (Y/N)	Verdict	Observations
MSN_U01_001				
MSN_U01_002				
MSN_U01_003				
MSN_U01_004				
MSN_U01_005				
MSN_U01_006				
MSN_U01_007				
MSN_U01_008				
MSN_U01_009				
MSN_U01_010				
MSN_U01_011				
MSN_U01_012				
MSN_U01_013				
MSN_U01_014				
MSN_U02_001				
MSN_U02_002				

A.7 Observations

Additional information relevant to the technical content of the PCTR are given here.

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Annex B (normative): Partial PIXIT proforma

B.1 Identification summary

PIXIT number:

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Test laboratory name:

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Date of issue:

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Issued to:

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B.2 Abstract test suite summary

Protocol specification:	EN 300 052-1
ATS specification:	EN 300 052-4
Abstract test method:	Remote test method (see ISO/IEC 9646-2)

B.3 Test laboratory

Test laboratory identification:

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Accreditation status of the test service:

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Accreditation reference:

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Test laboratory manager:

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Test laboratory contact:

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Means of testing:

.....

Test laboratory instructions for completion:

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B.4 Client (of the test laboratory)

Client identification:

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Client test manager:

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Client contact:

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Test facilities required:

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B.5 System Under Test (SUT)

Name:

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Version:

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SCS reference:

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Machine configuration:

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Operating system identification:

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IUT identification:

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PICS (all layers):

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Limitations of the SUT:

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Environmental conditions:

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B.6 Protocol information

B.6.1 Protocol identification

Specification reference: EN 300 052-1

Protocol version:

PICS reference:

NOTE: The PICS reference should reference a completed PICS which is conformant with the PICS proforma contained in EN 300 052-2.

B.6.2 IUT information

B.6.2.1 Parameters

Table B.1: Parameters

Item	Question	Supported? (Y/N)	Value
1.1	Does the IUT support MSN for basic access point-to-multipoint?		N/A
1.2	Does the IUT support MSN for basic access point-to-point?		N/A
1.3	Does the IUT support MSN for primary rate access?		N/A

B.6.2.2 Parameter values

Table B.2: Parameter values

Item	Description	Supported? (Y/N)	Value
2.1	Length of MSN number, MSN = least significant n digits of subscriber number		
2.2	Length of MSN number, MSN = national number		
2.3	Length of MSN number, MSN = international number		
2.4	Length of MSN number, MSN = subscriber number		
2.5	Length of MSN number with more digits than necessary, TON = unknown		
2.6	MSN digits, MSN = least significant n digits of subscriber number		
2.7	MSN digits, MSN = national number		
2.8	MSN digits, MSN = international number		
2.9	MSN digits, MSN = subscriber number		
2.10	MSN digits with more digits than necessary, TON = unknown		
2.11	Invalid DDI.MSN digits, MSN = national number		
2.12	Invalid DDI.MSN digits, MSN = international number		
2.13	Invalid DDI.MSN digits, MSN = subscriber number		
2.14	Invalid DDI.MSN digits, TON = unknown		

B.6.2.3 Procedural information

No items requiring response.

B.7 Basic call PIXIT items

B.7.1 Parameter values - information element codings

Table B.3: Codings of information elements

Item	Information element: provide, if possible, ...	Supported? (Y/N)	Value
BC1.1	a coding of a Bearer Capability information element, which the IUT is compatible with, for the purpose of accepting received SETUP messages and which may be used in SETUP messages to be transmitted		
BC1.2	a coding of a Low layer compatibility information element, which the IUT is compatible with, for the purpose of accepting received SETUP messages and which may be used in SETUP messages to be transmitted		
BC1.3	a coding of a High layer compatibility information element, which the IUT is compatible with, for the purpose of accepting received SETUP messages and which may be used in SETUP messages to be transmitted		
BC1.4	channel number		

B.7.2 Sending of message by IUT

Table B.4: Actions required to stimulate IUT to send messages

Item	Action: What actions, if possible, have to be taken to cause the IUT to send a ...	Supported? (Y/N)	Stimulus (action taken)
BC2.1	SETUP message		

Annex C (normative): Abstract Test Suite (ATS)

This ATS has been produced using the Tree and Tabular Combined Notation (TTCN) according to ISO/IEC 9646-3 [7].

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

C.1 The TTCN Graphical form (TTCN.GR)

C.1.1 ATS for basic access

The TTCN.GR representation of this ATS is contained in an Adobe Portable Document Format™ file (MSN_user_BA1.PDF contained in archive en_30005204v010301p0.zip) which accompanies the present document.

This ATS shall be used where the IUT claims to support MSN and basic access. It is specified for **point-to-multipoint** configuration. To re-configure for **point-to-point** operation it is necessary to make the following modification:

In the "Alias Definitions" table locate the expansion DL_UDAT_RQ and replace with DL_DAT_RQ.

C.1.2 ATS for primary rate access

The TTCN.GR representation of this ATS is contained in an Adobe Portable Document Format™ file (MSN_user_PA1.PDF contained in archive en_30005204v010301p0.zip) which accompanies the present document.

This ATS shall be used where the IUT claims to support MSN and primary rate access.

C.2 The TTCN Machine Processable form (TTCN.MP)

NOTE: According to ISO/IEC 9646-3 [7], 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.

C.2.1 ATS for basic access

The TTCN.MP representation corresponding to this ATS is contained in an ASCII file (MSN_user_BA1.MP contained in archive en_30005204v010301p0.zip) which accompanies the present document.

NOTE: Where an ETSI Abstract Test Suite (in TTCN) is published in both .GR and .MP format these two forms shall be considered equivalent. In the event that there appears to be syntactical or semantic differences between the two then the problem shall be resolved and the erroneous format (whichever it is) shall be corrected.

This ATS shall be used where the IUT claims to support MSN and basic access. It is specified for **point-to-multipoint** configuration. To re-configure for **point-to-point** operation it is necessary to make the following modification:

Replace the pattern "$ExpandedId DL_UDAT_RQ" with "$ExpandedId DL_DAT_RQ".

C.2.2 ATS for primary rate access

The TTCN.MP representation corresponding to this ATS is contained in an ASCII file (MSN_user_PA1.MP contained in archive en_30005204v010301p0.zip) which accompanies the present document.

This ATS shall be used where the IUT claims to support MSN and primary rate access.

Annex D (informative): Change record

D.1 Changes with respect to the previous ETS 300 052-4 and EN 300 052-4 v1.2.4

The following comments received in document 4DT174 (for the Plenary Meeting 11-2000) were analysed and included when needed. In addition, revisions including the update of the PIXIT tables and the removal of superfluous and out of date material from clause 6 and old appendix E were done.

- The type CAU has been modified. The type of the field cau_di OCTETSTRING[1 TO 28] has been replaced to OCTETSTRING[0 TO 28], because the diagnostic is optional. The type of the field cau_e3a BITSTRING[8] has also been replace by OCTETSTRING[0 TO 8], because this is an optional field.

- The test suite parameters INVALID_IPN1, INVALID_IPN2, INVALID_IPN3, INVALID_IPN4 have been created to receive invalid MSN.

- The test suite parameter PIC_FULL_CGPN_SETUP and PIC_PARTIAL_CGPN_SETUP have been created to indicate if the IUT support the presentation of the full ISDN MSN in the calling party information element of the SETUP PDU.

- The TSO MISMATCH_DIGIT has been deleted, the invalid MSN are indicated by the test suite parameters (see below). The TSO is not valid because the random procedure could generate valid MSNs instead of invalid ones.

- The test case selection expression SEL_SETUP_FULL_MSN and with the expression BXSET AND PIC_FULL_CGPN_SETUP has been created to select test cases MSN_U02_001 which is testing the sending of a SETUP message with a full MSN in the CGPN.

- The test case selection expression SEL_SETUP_PARTIAL_MSN and with the expression BXSET AND PIC_PARTIAL_CGPN_SETUP has been created to select test cases MSN_U02_001 which is testing the sending of a SETUP message with a partial MSN in the CGPN.

- In the constraint CAU2, the field cau_e3_eb and cau_e3_cs are missing. They have been added with the respective values '1'B and '000'B. Then the field cau_e3_loc is of type BITSTRING[4], so the value '10000010'B is too long, it has been replaced to '0010'B. The fields cau_e3a has been added with the value - (OMIT).

- In the constraint CAU4, the field cau_e3_eb and cau_e3_cs are missing. They have been added with the value?. The field cau_e3a has also been added with the value *

- The test cases MSN_U02_001 and MSN_U02_002 are selected with the test case selection expression SEL_SETUP_FULL_MSN and SEL_SETUP_PARTIAL_MSN respectively, because these two test cases are checking the MSN service on a per call basis.

D.2 Changes with respect to the previous ETS 300 052-4 V1.2.4 and ETS 300 052-4 edition 1

The following changes have been done:

- conversion to EN layout;

- replacement of references to ETS 300 102 with EN 300 403-1 [1];

- substitution of non-specific references to basic standards where the intention is to refer to the latest version.

Annex E (informative): Bibliography

ETSI ETS 300 102 (all parts): "Integrated Services Digital Network (ISDN); User-network interface layer 3".

History

Document history		
Edition 1	May 1997	Publication as ETS 300 052-4
V1.2.4	June 1998	Publication
V1.3.1	December 2001	One-step Approval Procedure OAP 20020419: 2001-12-19 to 2002-04-19
V1.3.1	April 2002	Publication