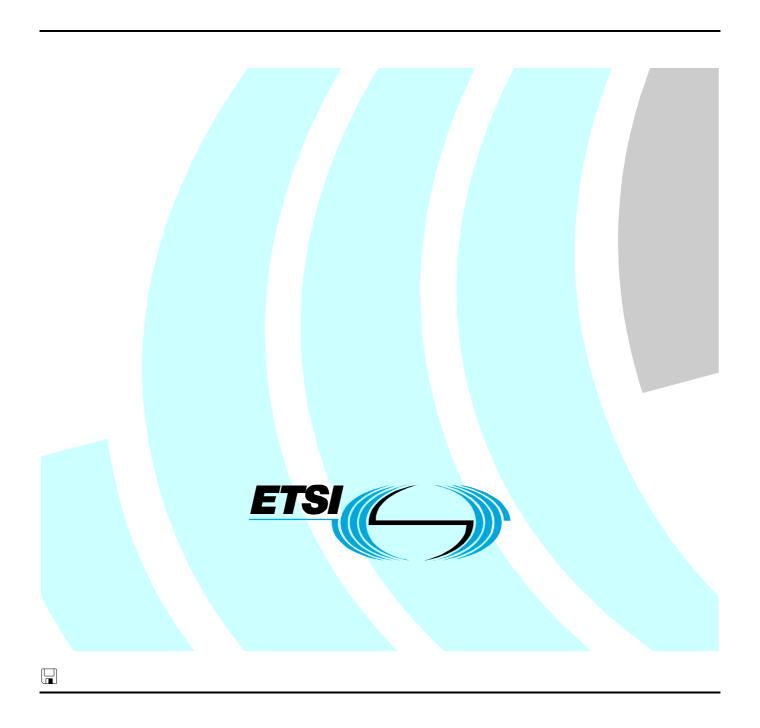# ETSI EN 301 002-6 V1.2.1 (2001-11)

European Standard (Telecommunications series)

Integrated Services Digital Network (ISDN);
Security tools (SET) procedures;
Digital Subscriber Signalling System No. one (DSS1) protocol;
Part 6: Abstract Test Suite (ATS) and partial Protocol
Implementation eXtra Information for Testing (PIXIT)
proforma specification for the network

ETSI

Reference

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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 6 of a multi-part deliverable covering the Digital Subscriber Signalling System No. one (DSS1) protocol specification for the Integrated Services Digital Network (ISDN) Security tools (SET) procedures, 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:	16 November 2001
Date of latest announcement of this EN (doa):	28 February 2002
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 August 2002
Date of withdrawal of any conflicting National Standard (dow):	31 August 2002

1 Scope

The present document specifies the Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma for the Network side of the T reference point or coincident S and T reference point of implementations conforming to the stage three standard for the Security Tools (SET) procedures for the pan-European Integrated Services Digital Network (ISDN) by means of the Digital Subscriber Signalling System No. one (DSS1) protocol, see EN 301 002-1 [1].

EN 301 002-5 [3] 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 User side of the T reference point or coincident S and T reference point of implementations conforming to EN 301 002-1 [1].

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, edition number, version number, etc.) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies.

[1]   ETSI EN 301 002-1 (V1.3.1): "Integrated Services Digital Network (ISDN); Security Tools (SET) procedures; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

[2]   ETSI EN 301 002-2 (V1.3.1): "Integrated Services Digital Network (ISDN); Security Tools (SET) procedures; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 2: Protocol Implementation Conformance Statement (PICS) proforma specification".

[3]   ETSI EN 301 002-5 (V1.2.1): "Integrated Services Digital Network (ISDN); Security Tools (SET) procedures; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 5: Test Suite Structure and Test Purposes (TSS&TP) specification for the network".

[4]   ETSI EN 300 196-1: "Integrated Services Digital Network (ISDN); Generic functional protocol for the support of supplementary services; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 1: Protocol specification".

NOTE: EN 301 002-1 [1] has an undated reference to EN 300 196-1 [4]. Some ASN.1 definitions from EN 300 196-1 [4] are referenced by EN 301 002-1 [1] and are reproduced in the TTCN ATSs in the present document. The version of these definitions used in the present document are based on those in EN 300 196-1 (V1.3.2). This has no impact on the testing of IUTs implemented according to earlier versions of EN 300 196-1.

[5]   ETSI EN 301 132 (V1.1.1): "Integrated Services Digital Network (ISDN); Security tools (SET) for use within telecommunication services".

[6]   ISO/IEC 9646-1 (1994): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 1: General concepts".

[7]   ISO/IEC 9646-2 (1994): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 2: Abstract Test Suite specification".

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

[9]   ISO/IEC 9646-4 (1994): "Information technology - Open Systems Interconnection - Conformance testing methodology and framework - Part 4: Test realization".

[10]   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".

[11]   ISO/IEC 8825-1: "Information technology - ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)". (See also ITU-T Recommendation X.690).

3   Definitions and abbreviations

3.1   Definitions

For the purposes of the present document, the terms and definitions given in ISO/IEC 9646-1 [6] apply.

3.2   Abbreviations

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

ATS	Abstract Test Suite
BER	Basic Encoding Rules
ETS	Executable Test Suite
IUT	Implementation Under Test
LT	Lower Tester
MOT	Means Of Testing
PCO	Point of Control and Observation
PCTR	Protocol Conformance Test Report
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation eXtra Information for Testing
SET	Security Tools
SUT	System Under Test
TP	Test Purpose
TTCN	Tree and Tabular Combined Notation

4   Abstract Test Method

The remote test method is applied for the SET network ATS.

A Point of Control and Observation (PCO) resides at the service access point between layers 2 and 3 in the test system. 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

5   Untestable test purposes

SET_N02_001 to SET_N02_005 and SET_N04_001 to SET_N04_004 are considered untestable because they can only be tested in the context of a particular supplementary service making use of SET.

6   ATS conventions

6.1   Version of TTCN used

The version of TTCN used is that defined in ISO/IEC 9646-3 [8].

6.2   Use of ASN.1

6.2.1   Situations where ASN.1 is used

ASN.1 has been used for three major reasons. First, types defined in ASN.1 can model problems that "pure" TTCN cannot. For instance, data structures modelling ordered or unordered sequences of data are preferably defined in ASN.1. Second, ASN.1 provides a better restriction mechanism for type definitions by using sub-type definitions. Third, it is necessary to use ASN.1 to reproduce the type definitions for remote operation components specified in the base standards in ASN.1.

The possibility to use TTCN and ASN.1 in combination is used, i.e. referring to an ASN.1 type from a TTCN type.

6.2.2   Specification of encoding rules

There is a variation in the encoding rules applied to ASN.1 types and constraints specified in this ATS and therefore a mechanism is needed to differentiate the encoding rules. However the mechanism specified in ISO/IEC 9646-3 [8] does not facilitate definition of the encoding rules as needed for this ATS. A solution is therefore used which is broadly in the spirit of ISO/IEC 9646-3 [8] in which comment fields have been used as a means of encoding rules.

For ASN.1 used in this ATS, two variations of encoding rules are used. One is the commonly known Basic Encoding Rules (BER) as specified in ISO/IEC 8825-1 [11]. In the second case the encoding is according to ISDN, i.e. the ASN.1 data types are a representation of structures contained within the ISDN specification (basic call, generic functional protocol or individual supplementary service). For example, if octets of an information element are specified in ASN.1 as a SEQUENCE then this should be encoded in an Executable Test Suite (ETS) as any other ISDN information element specified using tabular TTCN. This ISDN encoding variation is the default encoding rule for this ATS. This means that all ASN.1 constraint tables are encoded using ISDN (non-BER) encoding unless stated otherwise. BER encoding should never be applied to an ASN.1 constraint where BER encoding has not been specified. This encoding rule is sometimes named "Direct Encoding".

For BER encoding, an indication is given in the comments field of the table header. For this ATS such indications appear in the ASN.1 type constraint declaration tables only. In the first line of the table header comment field, the notation "ASN1_Encoding: *BER*" is used.

NOTE: Within BER, there are a number of variations for the encoding of lengths of fields. According to EN 300 196-1 [4], an IUT should be able to interpret all length forms within BER for received PDUs. When sending PDUs containing BER encoding, EN 300 196-1 [4] gives guidelines but makes no restrictions on the length forms within BER which an IUT may apply.

In this particular ATS all ASN.1 type constraints which are of type "Component" are to be encoded using BER.

Table 1: ASN.1 type constraint declaration showing use of encoding variation

ASN.1 Type Constraint Declaration	
Constraint Name:	ModifyPinInv1 (INV_ID: InvokeIdType; OLDPIN_NR: Pin; NEWPIN_NR: Pin; USER_NR: PartyNumber)
ASN.1 Type:	Component
Derivation Path:	
Comments:	ASN1_Encoding: BER
	SET ModifyPin Invoke component
Description	

```
modifyPin_Components
 modifyPin_InvokeComp
   { invokeID         ?,
     operation_value
         globalValue modifyPin,
       argument   {
              oldPin        OLDPIN_NR,
              newPin        NEWPIN_NR,
              servedUserNr  USER_NR
                }
   }
```

Detailed comments:

7   ATS to TP map

The identifiers used for the TPs are reused as test case names (see EN 301 002-5 [3]). 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 [10], to produce a PCTR conformant with the PCTR template given in annex B of ISO/IEC 9646-5 [10].

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 [9], 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 [10], 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 ETS for this ATS specification, shall comply with the requirements of ISO/IEC 9646-4 [9]. In particular, these concern the realization of an ETS based on each ATS. The test realizer shall provide a statement of conformance of the MOT to this ATS specification.

An ETS 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 [10].

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

11   Configurations required in testing

For some test cases it is necessary to configure the SUT in specific ways, this is described in table 2. Except as indicated in table 3 at least one service using a PIN shall be subscribed during testing.

Table 2: SUT configurations for specific test cases

Test cases	Special configuration	PIXIT reference
SET_N01_003	No telecommunication service using a PIN subscribed	2.3
SET_N03_001-2	MSN provided	2.1
SET_N03_003-4	MSN not provided	2.2

NOTE 1: The TCs listed in table 2 are de-selected if the PIXIT indicates the required configuration is not available.

NOTE 2: The PIN security tool becomes blocked during execution of SET_N01_004. It should be manually unblocked before any further test cases are executed.

NOTE 3: Test cases SET_N03_002 and SET_N03_004 involve automatic reinitialization of the PIN security tool after the PIN has become blocked. The time for this to occur is specified in EN 301 132 [5] to be at least 24 hours. If this time is adjustable in the SUT, testing would be facilitated by using a shorter period than that specified in EN 301 132 [5].

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

Notwithstanding the provisions of the copyright clause related to the text of the present document, ETSI grants that users of the present document may freely reproduce the PCTR proforma in this annex so that it can be used for its intended purposes and may further publish the completed PCTR.

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 301 002-1
PICS:	
Previous PCTRs (if any):	

A.1.3 Testing environment

PIXIT reference number:	
ATS specification:	EN 301 002-6
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
SET_N01_001				
SET_N01_002				
SET_N01_003				
SET_N01_004				
SET_N01_005				
SET_N01_006				
SET_N01_007				
SET_N01_008				
SET_N03_001				
SET_N03_002				
SET_N03_003				
SET_N03_004				

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

Notwithstanding the provisions of the copyright clause related to the text of the present document, ETSI grants that users of the present document may freely reproduce the partial PIXIT proforma in this annex so that it can be used for its intended purposes and may further publish the completed PIXIT.

B.1   Identification summary

PIXIT number:

....

Test laboratory name:

....

Date of issue:

....

Issued to:

....

B.2   Abstract test suite summary

Protocol specification: EN 301 002-1

ATS specification: EN 301 002-6

Abstract test method: Remote test method (see ISO/IEC 9646-2)

B.3   Test laboratory

Test laboratory identification:

....

Accreditation status of the test service:

....

Accreditation reference:

....

Test laboratory manager:

....

Test laboratory contact:

....

Means of testing:

....

Test laboratory instructions for completion:

....

B.4 Client (of the test laboratory)

Client identification:

....

Client test manager:

....

Client contact:

....

Test facilities required:

....

B.5 System Under Test (SUT)

Name:

....

Version:

....

SCS reference:

....

Machine configuration:

....

Operating system identification:

....

IUT identification:

....

PICS (all layers):

....

....

Limitations of the SUT:

....

Environmental conditions:

....

B.6   Protocol information

B.6.1   Protocol identification

Specification reference: EN 301 002-1

Protocol version:

PICS reference:

> NOTE: The PICS reference should reference a completed PICS which is conformant with the PICS proforma
> contained in EN 301 002-2.

B.6.2   IUT information

B.6.2.1   Parameter values

Table B.1: Parameter values

Item	Question	Supported? (Y/N)	Allowed values	Value
1.1	Does the IUT support basic access?		N/A	N/A
1.2	What length of Call Reference is used?		1, 2	

B.6.2.2   Configuration of IUT

Table B.2: Actions required to configure the IUT

Item	Action: What actions, if possible, have to be taken to configure the IUT …	Supported? (Y/N)	Stimulus (action taken)
2.1	to provide the MSN service.		
2.2	not to provide the MSN service.		
2.6	so that no telecommunication service using a PIN is subscribed.		

B.6.2.3 Timer values

Table B.3: Timer values

Item	Timer duration	Supported? (Y/N)	Allowed values	Value
3.2	T-REINITPIN duration in s? (duration taken for network to re-initialize PIN)		≥ 86 400 (24 hours) (see note 1)	
3.4	T-REGISTRATE duration in s? (Registration timer for the SET supplementary service)		(= 4)	
3.5	Wait for a message from the IUT (TWAIT). Duration in s (see note 2).		integer	
3.6	Wait for the IUT to respond to a stimulus sent by the tester (TAC). Duration in s (see note 2).		integer	
3.7	Control that the IUT does not respond to a stimulus sent by the tester (TNOAC). Duration in s (see note 2).		integer	
3.8	Wait for RESTART messages after establishment of the multiple frame operation (T_RESTART). Duration in s.		integer	
3.9	Does the IUT send RESTART messages after re-establishment of the multiple frame operation.		Boolean	N/A

NOTE 1: The minimum duration for this timer is specified as 24 hours in EN 301 132. For the purposes of testing a shorter duration may be used.

NOTE 2: The IUT provider may fill in a value range rather than a fixed value for the test management timers. During test execution the test laboratory will choose specific values for the timers dependant on the means of testing used. These specific values may be beyond the range given by the IUT provider, if this is necessary for achieving satisfactory test results.

B.6.2.4 Parameter values

Table B.4: Parameter values

Item	Question provide, if possible, ...	Supported? (Y/N)	Value
4.1	PIN 1 - valid at start of testing (see note).		
4.2	PIN 2 (see note).		
4.3	PIN 3 (see note).		
4.4	an invalid (i.e. wrong format) PIN value.		
4.5	a primitive PIN value.		
	.		
4.8	the PIN blocking limit.		
4.10	a valid served user number.		
4.11	an invalid served user number.		

NOTE: PINs 1, 2 and 3 should all be acceptable (i.e. not primitive and not having an unacceptable format). PIN 1 should be valid at the start of testing. Where test cases change the PIN they cycle through these three PIN values.

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 [8].

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.

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

The TTCN.GR representation of this ATS is contained in an Adobe Portable Document Format™ file (set_n02.pdf contained in archive en_30100206v010201p0.zip) which accompanies the present document.

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

The TTCN.MP representation corresponding to this ATS is contained in an ASCII file (set_n02.mp contained in archive en_30100206v010201p0.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.

Annex D (informative):
Bibliography

- ETSI ETS 300 196-2 (1996): "Integrated Services Digital Network (ISDN); Generic functional protocol for the support of supplementary services; Digital Subscriber Signalling System No. one (DSS1) protocol; Part 2: Protocol Implementation Conformance Statement (PICS) proforma specification".

- 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]".

- ETSI EN 301 082: "Integrated Services Digital Network (ISDN); Outgoing Call Barring-Fixed (OCB-F) supplementary service; Service description".

- ETSI EN 301 084: "Integrated Services Digital Network (ISDN); Outgoing Call Barring-User Controlled (OCB-UC) supplementary service; Service description".

- ETSI ETR 232: "Security Techniques Advisory Group (STAG); Glossary of security terminology".

History

Document history		
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