



**E**UROPEAN  
**T**ELECOMMUNICATION  
**S**TANDARD

**ETS 300 804-2**

February 1998

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Source: ECMA

Reference: DE/ECMA-00108-2

ICS: 33.020

**Key words:** ATS, circuit mode, layer 2, QSIG, PISN, PTN, testing

**Private Integrated Services Network (PISN);  
Inter-exchange signalling protocol;  
Circuit mode basic services;  
Data Link Layer (DLL);  
Part 2: Abstract Test Suite (ATS) specification**

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## Foreword

This European Telecommunication Standard (ETS) has been produced by the standardizing Information and Communication Systems Association (ECMA) on behalf of its members and those of the European Telecommunications Standards Institute (ETSI).

This ETS comprises two parts with the generic title "Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Circuit mode basic services; Data Link Layer (DLL)". The title of each part is listed below:

Part 1: "Test Suite Structure and Test Purposes (TSS & TPs)".

**Part 2: "Abstract Test Suite Specification (ATS)".**

Transposition dates	
Date of adoption of this ETS:	23 January 1998
Date of latest announcement of this ETS (doa):	31 May 1998
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	30 November 1998
Date of withdrawal of any conflicting National Standard (dow):	30 November 1998

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## 1 Scope

This European Telecommunication Standard (ETS) contains the Abstract Test Suite (ATS) specification for the Data Link Layer (DLL) of the Private Integrated Services Network (PISN), Inter-exchange signalling protocol.

The objective of the present document is to provide conformance tests which give a high probability of inter-operability of the Data Link Layer (DLL). The present document covers the procedures described in ETS 300 402-2 [1] annex ZA.

The ISO standard for the methodology of conformance testing (ISO/IEC 9646-1 [2], ISO/IEC 9646-2 [3] and ISO/IEC 9646-3 [4]) is used as basis for the test methodology.

The present document is applicable for use in symmetrical application between two Private Integrated Services Network eXchanges (PINXs) and is also applicable to equipment when used in certain scenarios that provide a continuous bit stream channel between two PINXs and will be referenced from the standards which specifies the scenarios concerned.

ATS specifications for the Network Layer (NL) are provided in other parts of the Private Integrated Services Network (PISN), Inter-exchange signalling protocol standards.

Annex A provides the Partial PIXIT proforma of this ETS.

Annex B provides the Protocol Conformance Test Report (PCTR) proforma of this ETS.

Annex C provides the Tree and Tabular Combined Notation (TTCN) part of this ETS.

## 2 Normative references

This ETS incorporates by dated and undated reference, provisions from other publications. These normative references are cited in the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments or revisions to of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] ETS 300 402-2 (1995): "User-network interface data link layer specification; Application of CCITT Recommendations Q.920 and Q.921".
- [2] ISO/IEC 9646-1: "Information Technology - OSI Conformance Testing Methodology and Framework, Part 1: General Concepts".
- [3] ISO/IEC 9646-2: "Information Technology - OSI Conformance Testing Methodology and Framework, Part 2: Abstract Test Suite Specification".
- [4] ISO/IEC 9646-3: "Information Technology - OSI Conformance Testing Methodology and Framework, Part 3: The Tree and Tabular Combined Notation".
- [5] ISO/IEC 9646-5: "Information Technology - OSI Conformance Testing Methodology and Framework, Part 5: Requirements on test laboratories and clients for the conformance assessment process".
- [6] ISO 7498: "Information Processing Systems - Open Systems Interconnection - Basic Reference model".
- [7] ETS 300 402-4 (1995): "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. one (DSS1) protocol; Data link layer; Part 2: General protocol specification [ITU-T Recommendation Q.921 (1993), modified]".

- [8] ETS 300 804-2 (1996): "Private Integrated Services Network (PISN); Inter-exchange signalling protocol; Circuit mode basic services; Data Link Layer (DLL); Part 2: Abstract Test".

### 3 Definitions and abbreviations

#### 3.1 ETS definitions:

For the purposes of this ETS, the following definitions apply:

**master:** The Data Link entity that provides the functionality of the "network" as described in ETS 300 402-2 [1] for a particular Data Link.

**slave:** The Data Link entity that provides the functionality of the "user" as described in ETS 300 402-2 [1] for a particular Data Link.

#### 3.2 ISO definitions:

For the purposes of this ETS, the following definitions apply:

<b>Abstract Test Suite (ATS):</b>	see ISO/IEC 9646-1 [2]
<b>Data Link Layer (DLL):</b>	see ISO 7498 [6]
<b>Implementation Under Test (IUT):</b>	see ISO/IEC 9646-1 [2]
<b>Lower Tester (LT):</b>	see ISO/IEC 9646-1 [2]
<b>Network Layer (NWK):</b>	see ISO 7498 [6]
<b>Physical Layer (PHL):</b>	see ISO 7498 [6]
<b>Protocol Implementation Conformance Statement PICS proforma:</b>	see ISO/IEC 9646-1 [2]
<b>PIXIT proforma:</b>	see ISO/IEC 9646-1 [2]
<b>Point of Control and Observation (PCO):</b>	see ISO/IEC 9646-1 [2]
<b>Protocol Implementation Conformance Statement (PICS):</b>	see ISO/IEC 9646-1 [2]
<b>Protocol Implementation eXtra Information for Testing (PIXIT):</b>	see ISO/IEC 9646-1 [2]
<b>System Under Test (SUT):</b>	see ISO/IEC 9646-1 [2]
<b>Upper Tester (UT):</b>	see ISO/IEC 9646-1 [2]

#### 3.3 Abbreviations

For the purposes of this ETS, the following abbreviations apply:

ASP	Abstract Service Primitive
ATM	Abstract Test Method
ATS	Abstract Test Suite
BI	Invalid Behaviour
BO	inOpportune Behaviour
BV	Valid Behaviour
C/R	Command/Response
DLL	Data Link Layer
ETS	Executable Test Suite
FCS	Field Code Sequence
FSM	Finite State Machine
GR	GRaphics extension
ISO	International Organization for Standardization
IUT	Implementation Under Test
LT	Lower Tester
MP	Machine Procedure
NL	Network Layer
PCO	Point of Control and Observation
PCTR	Protocol Conformance Test Report
PDU	Protocol Data Unit
PH	PHysical
PHL	PHysical Layer
PICS	Protocol Implementation Conformance Statements



PINX	Private Integrated Services Network eXchange
PISN	Private Integrated Services Network
PIXIT	Protocol Implementation eXtra Information for Testing
PSAP	PHL Service Access Point
SUT	System Under Test
TP	Test Purpose
TTCN	Tree and Tabular Combined Notation
UT	Upper Tester

## 4 Abstract Test Method (ATM)

This clause describes the ATM, which defines the abstract testing architecture applied in the ATS. The remote test method is the basic method used for DLL conformance testing. However, certain DLL Test Purposes (TPs) also need part of the NWK functions (e.g. I-frame transmission), consequently the embedded variant of the remote test method is used.

### 4.1 DLL protocol testing

The DLL implementations do not offer a direct access to the upper service boundary. The Remote test method is selected because any co-ordination procedures can only be expressed in an informal way.

**LT:** A Lower Tester (LT) is located in a remote DLL test system. It controls and observes the behaviours of the IUT.

**PCO:** The Point of Control and Observation (PCO) for DLL testing is located on the PHL Service Access Point (PSAP). All test events at the PCO are specified in terms of PH-Data Abstract Service Primitives (ASPs) and DLL Protocol Data Units (PDUs). A single PCO is defined for DLL testing.

**notional UT:** A notional Upper Tester (UT), i.e. the upper layer (NWK layer) of the System Under Test (SUT) is invoked to implement the functions of the upper tester (NWK functions) without any additional mechanism being installed.

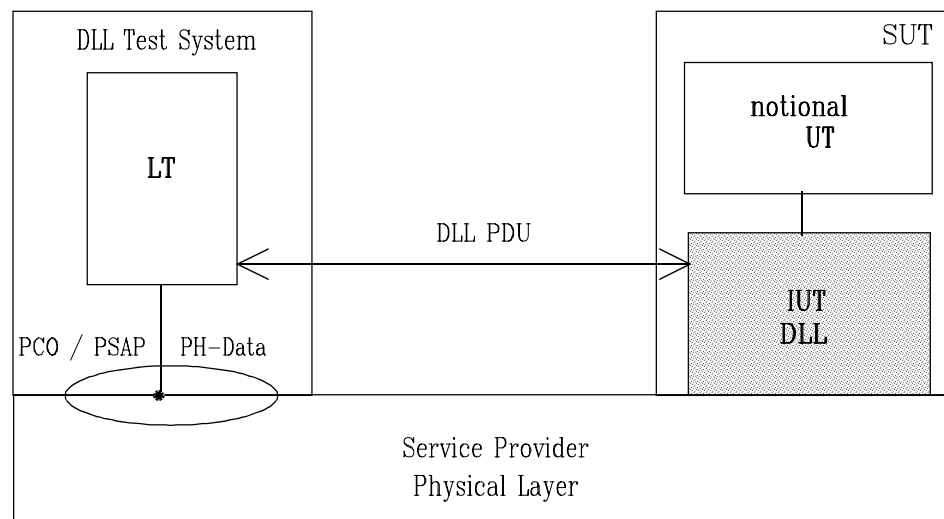


Figure 1: The Remote test method applied to the DLL testing

### 4.2 Execution of test cases

#### 4.2.1 Master-Slave testing

Regarding the DLL protocol, the interface is almost symmetrical. The naming and structure of the DLL ATS were developed for any side testing. To apply the DLL ATS for slave or master side testing, only the values of the Command/Response (C/R) field have to be reversed. To configure the ATS data for master side or slave side testing the TSPX\_MASTER parameter has to be set as described in table 1.

**Table 1: Master-Slave parameter**

	<b>Master</b>	<b>Slave</b>
TSPX_MASTER	TRUE	FALSE

**4.2.2 Handling of error indications**

During the execution of the DLL ATS many MDL-ERROR-IND primitives will be sent to the system management due to the invalid and inopportune test cases. It is up to the IUT supplier to take the necessary precautions to avoid any impact on the test result.

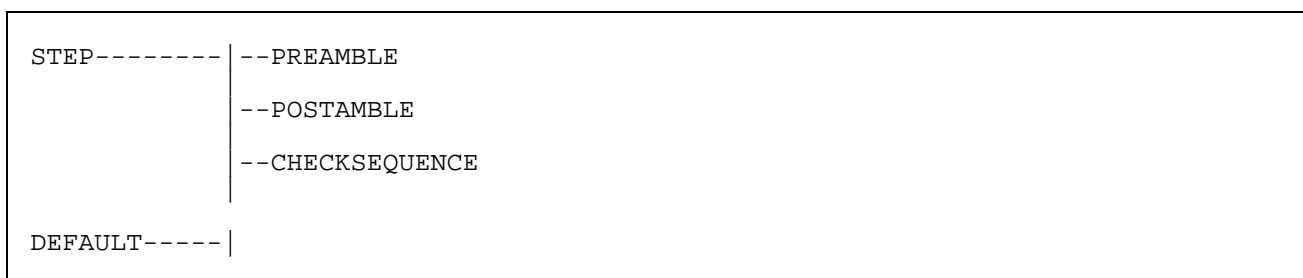
Some tests use NWK procedures to test DLL functions. It is not always possible to handle the NWK procedures properly. The effects of such faulty NWK messages and procedures are out of the scope of the DLL ATS. It is up to the IUT supplier to take the necessary precautions to avoid any impact on the test result.

**4.2.3 Test case execution sequence**

There is no restriction concerning the execution sequence of the DLL test cases, but to facilitate the analysis of the test results the execution sequence Valid Behaviour (BV), Inopportune Behaviour (BO), Invalid Behaviour (BI) should be applied.

**4.3 Test step and default step structure**

The common dynamic behaviour is described in test steps as shown in figure 2. These can be called from any test case.



**Figure 2: Test step and default structure**

**4.3.1 Preambles**

The preamble test group contains the preamble test steps needed for initialization of the IUT before testing a particular test purpose.

- PR40\_001 To bring the IUT into state 4.0.
- PR50\_001 To bring the IUT into state 5.0.
- PR51\_001 To bring the IUT into state 5.1.
- PR51\_002 To bring the IUT into state 5.1, with one I\_Frame in queue and V(S)=V(A).
- PR60\_001 To bring the IUT into state 6.0.
- PR70\_001 To bring the IUT into state 7.0.
- PR70\_002 To bring the IUT into state 7.0, with one I\_Frame exchange.
- PR70\_003 To bring the IUT into state 7.0, with V(S)=V(A) + 2.
- PR71\_001 To bring the IUT into state 7.1.
- PR74\_001 To bring the IUT into state 7.4.
- PR74\_002 To bring the IUT into state 7.4, with V(S)=V(A) + 2.
- PR74\_003 To bring the IUT into state 7.4, with DL\_DATA\_Request pending.
- PR75\_001 To bring the IUT into state 7.5.
- PR80\_001 To bring the IUT into state 8.0.
- PR80\_002 To bring the IUT into state 8.0, with V(S)=V(A) + 2.

PR81_001	To bring the IUT into state 8.1.
PR84_001	To bring the IUT into state 8.4.
PR84_002	To bring the IUT into state 8.4, with $V(S)=V(A) + 2$ .
PR85_001	To bring the IUT into state 8.5.

#### 4.3.2 Postambles

The postamble test group contains the postamble test steps needed for termination of the IUT to place it in the same state after testing each test purpose.

PO40_001	To place the IUT is in state 4.0 at the end of the test.
----------	--

#### 4.3.3 Check sequence

In tables D-1 to D-3 of ETS 300 402-2 [1], it is possible to identify the state of the IUT. The states 7.2, 7.3, 7.6, 7.7, 8.2, 8.3, 8.6, 8.7 are not checked as it is not possible to bring the IUT into these states. The states 5.0, 5.1, 5.2, 6.0 are not checked because they are transitional states between state 4.0 and state 7.0.

CS40_001	To check if the IUT is in state 4.0 at the end of the test.
CS70_001	To check if the IUT is in state 7.0 at the end of the test with RR/P exchange.
CS70_002	To check if the IUT is in state 7.0 at the end of the test with I/P=1 frame out of sequence.
CS71_001	To check if the IUT is in state 7.1 at the end of the test.
CS71_002	To check if the IUT is in state 7.1 at the end of the test.
CS74_001	To check if the IUT is in state 7.4 at the end of the test.
CS74_002	To check if the IUT is in state 7.4 at the end of the test.
CS75_002	To check if the IUT is in state 7.5 at the end of the test.
CS80_002	To check if the IUT is in state 8.0 at the end of the test.
CS81_002	To check if the IUT is in state 8.1 at the end of the test.
CS84_002	To check if the IUT is in state 8.4 at the end of the test.
CS85_002	To check if the IUT is in state 8.5 at the end of the test.

#### 4.3.4 Defaults

The default subclause describes the behaviour of the tester following the receipt of an unexpected event.

DFLT_001	Sub-tree for TEI-assigned, Awaiting Establishment, Awaiting Release states.
DFLT_002	Sub-tree for Multiple Frame Operation and Timer Recovery states.

### 4.4 Abstract Service Primitives (ASP) and Protocol Data Units (PDUs)

#### 4.4.1 Abstract Service Primitives (ASP)

Five ASPs are defined:

- PH\_DATA\_RQ
- PH\_DATA\_IN
- PH\_ACT\_RQ
- PH\_ACT\_IN
- PH\_DEACT\_IN

The PHysical (PH)-data frame is based on the frame structure described in ETS 300 402-2 [1], clause 2 (and subclauses) and in figure 1/Q.921. It contains the address field, the control field, the information field if necessary and the Field Code Sequence (FCS) field. The value of the FCS field is usually supplied by the physical layer of the tester, but for testing of some invalid behaviour it is necessary to change this value. The flag sequence is supplied by the physical layer of the tester.

#### 4.4.2 Protocol Data Units (PDUs)

The PDUs defined are based on the frame types described in ETS 300 402-2 [1], table 5/Q.921.

#### 4.5 Timers and counters of ATS

This clause describes the timers and counters used in the ATS. The "min" and "max" indications define that the timer value represents the minimum or maximum tolerance of a timer.

**Table 2: ATS Timers**

ATS timer name	ATS default timer value	Standard timer name	Reference to ETS
T200_min	950 ms	T200	ETS 300 402-2 [1]
T200_max	1050 ms		clause 5.9.1
T203_min	9500 ms	T203	ETS 300 402-2 [1]
T203_max	10500 ms		clause 5.9.8
ATS timer name	ATS default timer value	Comments	
T_AC	T200 value/5 ms	Watch dog timer if an ACTION from the IUT is expected.	
T_NOAC	T200 value x N200 s	Guard timer if NO ACTION shall appear.	
T_WAIT	30 s	Used by the tester for test synchronization with external procedure (maximum time for an IMPLICIT SEND execution)	
T_S4_max	6 s	Maximum time to send SABME for an IUT unstable in state S4.0.	
T_READ	30 s	Used in value and tolerance timer test	
T_NWK	PIXIT item	Maximum time for a response generated by NWK layer	

**Table 3: ATS Counters**

ATS counter name	ATS default counter value	Comments	Reference to ETS
N200	3	Corresponding counter variable: RC	ETS 300 402-2 [1], clause 5.9.2
N201	260	Maximum number of octets in an information field	ETS 300 402-2 [1], clause 5.9.3

#### 4.6 Test strategy

The ATS will rebuild the DLL functions. Therefore the test case variables N(S) and N(R) are implemented and used according to their functions described in ETS 300 402-2 [1].

The C/R bit of the address field is implemented as a return value of a test suite operation definition (i.e. external ATS function), to allow the test suite to be used for master testing as well as for slave testing.

Using the tables D-1 to D-3 of ETS 300 402-2 [1] and to attempt to cover a maximum of test events with an appropriate number of test cases the following selection criteria have been applied:

- the complete valid value ranges of the state variables V(S) and V(R) and the sequence numbers N(S) and N(R) are not covered;
- state transitions that are defined by the characters "\ " / " |", or that are empty are not covered.

### 5 ATS convention

This clause describes the conventions applied to define the ATS.

## 5.1 Test case naming convention

The identifier of the test cases is built according to the scheme in figure 3.

Identifier:	<b>TC&lt;s&gt;&lt;ss&gt;_&lt;nnn&gt;</b>		
<s>	= state	(4-8)	
<ss>	= sub-state	(0-7)	
<nnn>	= sequential number	(001-300)	BV, Valid Behaviour tests
		(301-600)	BO, Inopportune Behaviour tests
		(601-900)	BI, Invalid Behaviour tests

**Figure 3: Test case naming convention**

## 5.2 Test case and test purpose mapping

A test case is associated with a test purpose that has the same number, e.g.: TC74\_302 is associated with TP74-302. For TTCN syntactical reason, the character "-" in test purpose identifier is replaced by the character "\_" in test case identifier.

## 5.3 ATS declaration part

Complete names as defined in the standard are used for identifier names of declarations.

### 5.3.1 Test suite type definitions

The identifier names are written in uppercase.

### 5.3.2 Test suite operations definitions

The identifier names commence with test suite operations.

### 5.3.3 Test suite parameter declarations

The identifier names are written in uppercase and commences with test suite parameters.

### 5.3.4 Test case selection expression definitions

The identifier names are written in uppercase.

### 5.3.5 Test suite constant declarations

The identifier names commence with test suite constant. If the constant is representing a system parameter or value, only the system name is used, e.g. N200.

### 5.3.6 Test case variable declarations

The identifier names are written in uppercase.

### 5.3.7 Point of control and observation declarations

The identifier name for point of control and observation is PHL.

### 5.3.8 Timer declarations

The identifier names of Timers commence with T (e.g. T01). The names as defined in the present document are used.

### 5.3.9 ASP type definitions

The identifier names defined in the referenced standard are used, e.g.:

PH\_DATA\_Request;  
PH\_ACTIVATE\_Indication.

### 5.3.10 PDU Type Definitions

The identifier names are written with words separated with "\_". The first letter of each word is in uppercase and the other letters in lowercase. For generic PDU names (i.e. information, supervisory or unnumbered) only the first letter is used and written in uppercase, e.g.:

Empty\_I\_Frame;  
Invalid\_S\_Frame.

## 5.4 ATS constraint part

ASP constraint identifier names are written in both uppercase and lowercase. The identifier name is written as suitably as possible, e.g.:

Ph\_Act\_Rq for PH\_ACTIVATE\_Request;  
RR\_Cs for an RR command frame to be sent included in the ASP.

PDU constraint identifier names commence with PDU\_ and are written in uppercase.

Identifier names of declarations concerning the same subject have equivalent names in the ASP constraint and the PDU constraint, e.g.:

PDU identifier name: PDU\_RRC;  
ASP identifier name: RR\_Cs and RR\_Cr.

If formal parameter lists are used, the variable names are written in uppercase. The variable name is derived from the name of the element it is representing.

## 5.5 ATS dynamic behaviour part

### 5.5.1 Implementation strategies

All invalid events are handled in the default tree. The default tree should contain the error handling procedure for each specific event that is handled in the default tree.

All events that are defined as a conformance requirement by the TP, should cause a preliminary verdict PASS if the requirement is met.

All verdict assignments are labelled. According to ISO 9646-3 [4], annex E.2, labels should be written to the conformance log. This enables where the test failed to be identified. To allow an exact identification in which table the verdict was assigned, the following name convention is applied:

TC	Test Case;
CS	Check State test steps;
DF	DeFault;
PO	POstamble;
PR	PReamble;
TS	Test Step.

The labels of the same type are numbered sequentially if they are in the same test case, test step or default.

### 5.5.2 General conventions

If a test case is quite complicated and long, the test case is described in one main tree, several local trees and separate test steps. The name of the local tree is LTS\_ (Local Test Step) followed by an identifier name. The name of the separate test step is STP\_ followed by an identifier name, e.g.:

+LTS\_RR\_command;  
+STP\_RR\_command.

## Annex A (normative): Partial PIXIT proforma

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

The PIXIT Proforma is based on ISO/IEC 9646-5 [5]. Any additional information needed can be found in this international standard document.

### A.1 Identification summary

PIXIT Number:	
Test Laboratory Name:	
Date of Issue:	
Issued to:	

### A.2 Abstract Test Suite (ATS) summary

Protocol Specification:	ETS 300 402-2 [1] (annex ZA)
Protocol to be tested:	Data Link Layer (DLL)
ATS Specification:	ETS 300 804-2 [8] (annex C)
Abstract Test Method:	Remote test method, embedded variant

### A.3 Test laboratory

Test Laboratory Identification:	
Test Laboratory Manager:	
Means of Testing:	

### A.4 Client identification

Client Identification:	
Client Test manager:	
Test Facilities required:	

### A.5 SUT

Name:	
Version:	
SCS Number:	
Machine configuration:	
Operating System Identification:	
IUT Identification:	
Limitations of the SUT:	
Environmental Conditions:	

### A.6 Protocol layer information

#### A.6.1 Protocol identification

Name:	Data Link Layer (DLL)
Version:	
PICS References:	ETS 300 402-4 [7] (annex B)



**A.6.2 IUT information**

Item	Action	(ATS) Parameter Name	Value
1	Indicate the maximum number of outstanding I-frames.	TSPX_K	3 [ ] 7 [ ] Special arrangement { } value =
2	Is the IUT stable for at least 6 s in state S4.0?	TSPX_IUT_STA_S4	TRUE [ ] FALSE [ ]
3	Can the IUT be put in state S6.0 by operators command?	TSPX_IUT_S6	TRUE [ ] FALSE [ ]
4	Indicate the maximum time that the NWK layer has to respond with a RELEASE COMPLETE message to a RELEASE message sent by the tester.	TSPX_T_NWK	Unit: s
5	Is the IUT to be tested for Master or Slave side or both?	TSPX_MASTER	Master [ ] Slave [ ]

## Annex B (normative): Protocol Conformance Test Report (PCTR) for PINX-DLL

Notwithstanding the provisions of the copyright clause related to the text of this ETS, ETSI grants that users of this ETS 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.

The PCTR Proforma is based on ISO/IEC 9646-5 [5]. Any additional information needed can be found in this document.

### B.1 Identification summary

#### B.1.1 Protocol conformance test report

PCTR Number:	
PCTR Date:	
Corresponding SCTR Number:	
Corresponding SCTR Date:	
Test Laboratory Identification:	
Test Laboratory Manager:	
Signature:	

#### B.1.2 IUT identification

Name:	
Version:	
Protocol specification:	ETS 300 402-2 [1] (annex ZA)
PICS:	
Previous PCTR if any:	

#### B.1.3 Testing environment

PIXIT Number:	
ATS Specification:	ETS 300 804-2 [8] (annex C)
Abstract Test Method:	Remote test method, embedded variant
Means of Testing identification:	
Date of testing:	
Conformance Log reference(s):	
Retention Date for Log reference(s):	

#### B.1.4 Limits and reservation

*Additional information relevant to the technical contents or further use of the test report, or 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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**B.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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**B.2 IUT conformance status**

This IUT has or 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 3 in this report) and there are no "FAIL" verdicts to be recorded (in Clause 6) strike the words "has or". otherwise strike the words "or has not".*

**B.3 Static conformance summary**

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

*Strike the appropriate words in this sentence.*

**B.4 Dynamic conformance summary**

The test campaign did or 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 6 of this report) strike the words "did or" otherwise strike the words "or did not".*

*Summary of the results of groups of test:*

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**B.5 Static conformance review report**

*If Clause 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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**B.6 Test campaign report**

<b>ATS Reference</b>	<b>Selected?</b>	<b>Run?</b>	<b>Verdict</b>	<b>Observations (Reference to any observations made in clause 7)</b>
TC40_001	Yes/No	Yes/No		
TC40_001	Yes/No	Yes/No		
TC40_002	Yes/No	Yes/No		
TC40_003	Yes/No	Yes/No		
TC40_004	Yes/No	Yes/No		
TC50_001	Yes/No	Yes/No		
TC50_002	Yes/No	Yes/No		
TC50_003	Yes/No	Yes/No		
TC50_004	Yes/No	Yes/No		
TC50_005	Yes/No	Yes/No		
TC51_001	Yes/No	Yes/No		
TC51_002	Yes/No	Yes/No		
TC51_003	Yes/No	Yes/No		
TC51_004	Yes/No	Yes/No		
TC60_001	Yes/No	Yes/No		
TC60_002	Yes/No	Yes/No		
TC60_003	Yes/No	Yes/No		
TC60_005	Yes/No	Yes/No		
TC70_001	Yes/No	Yes/No		
TC70_002	Yes/No	Yes/No		
TC70_003	Yes/No	Yes/No		
TC70_004	Yes/No	Yes/No		
TC70_005	Yes/No	Yes/No		
TC70_006	Yes/No	Yes/No		
TC70_007	Yes/No	Yes/No		
TC70_008	Yes/No	Yes/No		
TC70_009	Yes/No	Yes/No		
TC70_010	Yes/No	Yes/No		
TC70_011	Yes/No	Yes/No		
TC70_012	Yes/No	Yes/No		
TC70_013	Yes/No	Yes/No		
TC70_014	Yes/No	Yes/No		
TC70_015	Yes/No	Yes/No		
TC70_016	Yes/No	Yes/No		
TC70_017	Yes/No	Yes/No		
TC70_018	Yes/No	Yes/No		
TC70_019	Yes/No	Yes/No		
TC70_020	Yes/No	Yes/No		
TC70_021	Yes/No	Yes/No		
TC70_022	Yes/No	Yes/No		
TC70_023	Yes/No	Yes/No		
TC70_024	Yes/No	Yes/No		
TC70_025	Yes/No	Yes/No		
TC70_026	Yes/No	Yes/No		
TC70_027	Yes/No	Yes/No		
TC70_028	Yes/No	Yes/No		
TC70_029	Yes/No	Yes/No		
TC70_030	Yes/No	Yes/No		
TC70_031	Yes/No	Yes/No		
TC71_001	Yes/No	Yes/No		
TC71_002	Yes/No	Yes/No		
TC74_001	Yes/No	Yes/No		
TC74_002	Yes/No	Yes/No		
TC74_003	Yes/No	Yes/No		

ATS Reference	Selected?	Run?	Verdict	Observations (Reference to any observations made in clause 7)
TC74_004	Yes/No	Yes/No		
TC74_005	Yes/No	Yes/No		
TC74_006	Yes/No	Yes/No		
TC74_007	Yes/No	Yes/No		
TC74_008	Yes/No	Yes/No		
TC74_009	Yes/No	Yes/No		
TC74_010	Yes/No	Yes/No		
TC74_011	Yes/No	Yes/No		
TC74_012	Yes/No	Yes/No		
TC74_013	Yes/No	Yes/No		
TC74_014	Yes/No	Yes/No		
TC74_015	Yes/No	Yes/No		
TC74_016	Yes/No	Yes/No		
TC74_017	Yes/No	Yes/No		
TC74_018	Yes/No	Yes/No		
TC74_019	Yes/No	Yes/No		
TC74_020	Yes/No	Yes/No		
TC74_021	Yes/No	Yes/No		
TC74_022	Yes/No	Yes/No		
TC74_023	Yes/No	Yes/No		
TC74_024	Yes/No	Yes/No		
TC74_025	Yes/No	Yes/No		
TC74_026	Yes/No	Yes/No		
TC75_001	Yes/No	Yes/No		
TC75_002	Yes/No	Yes/No		
TC80_001	Yes/No	Yes/No		
TC80_002	Yes/No	Yes/No		
TC80_003	Yes/No	Yes/No		
TC80_004	Yes/No	Yes/No		
TC80_005	Yes/No	Yes/No		
TC80_006	Yes/No	Yes/No		
TC80_007	Yes/No	Yes/No		
TC80_008	Yes/No	Yes/No		
TC80_009	Yes/No	Yes/No		
TC80_010	Yes/No	Yes/No		
TC80_011	Yes/No	Yes/No		
TC80_012	Yes/No	Yes/No		
TC80_013	Yes/No	Yes/No		
TC80_014	Yes/No	Yes/No		
TC80_015	Yes/No	Yes/No		
TC81_001	Yes/No	Yes/No		
TC81_002	Yes/No	Yes/No		
TC84_001	Yes/No	Yes/No		
TC84_002	Yes/No	Yes/No		
TC84_003	Yes/No	Yes/No		
TC84_004	Yes/No	Yes/No		
TC84_005	Yes/No	Yes/No		
TC84_006	Yes/No	Yes/No		
TC84_007	Yes/No	Yes/No		
TC84_008	Yes/No	Yes/No		
TC84_009	Yes/No	Yes/No		
TC84_010	Yes/No	Yes/No		
TC84_011	Yes/No	Yes/No		
TC84_012	Yes/No	Yes/No		
TC84_013	Yes/No	Yes/No		
TC84_014	Yes/No	Yes/No		
TC84_015	Yes/No	Yes/No		

ATS Reference	Selected?	Run?	Verdict	Observations (Reference to any observations made in clause 7)
TC84_016	Yes/No	Yes/No		
TC85_001	Yes/No	Yes/No		
TC85_002	Yes/No	Yes/No		
TC40_301	Yes/No	Yes/No		
TC40_302	Yes/No	Yes/No		
TC40_303	Yes/No	Yes/No		
TC40_304	Yes/No	Yes/No		
TC40_305	Yes/No	Yes/No		
TC40_306	Yes/No	Yes/No		
TC40_307	Yes/No	Yes/No		
TC40_308	Yes/No	Yes/No		
TC40_309	Yes/No	Yes/No		
TC40_310	Yes/No	Yes/No		
TC40_311	Yes/No	Yes/No		
TC40_312	Yes/No	Yes/No		
TC40_313	Yes/No	Yes/No		
TC40_314	Yes/No	Yes/No		
TC40_315	Yes/No	Yes/No		
TC40_316	Yes/No	Yes/No		
TC40_317	Yes/No	Yes/No		
TC40_318	Yes/No	Yes/No		
TC40_319	Yes/No	Yes/No		
TC40_320	Yes/No	Yes/No		
TC50_301	Yes/No	Yes/No		
TC50_302	Yes/No	Yes/No		
TC50_303	Yes/No	Yes/No		
TC50_304	Yes/No	Yes/No		
TC50_305	Yes/No	Yes/No		
TC50_306	Yes/No	Yes/No		
TC50_307	Yes/No	Yes/No		
TC50_308	Yes/No	Yes/No		
TC50_309	Yes/No	Yes/No		
TC50_310	Yes/No	Yes/No		
TC50_311	Yes/No	Yes/No		
TC50_312	Yes/No	Yes/No		
TC50_313	Yes/No	Yes/No		
TC50_314	Yes/No	Yes/No		
TC50_315	Yes/No	Yes/No		
TC50_316	Yes/No	Yes/No		
TC50_317	Yes/No	Yes/No		
TC50_318	Yes/No	Yes/No		
TC50_319	Yes/No	Yes/No		
TC50_320	Yes/No	Yes/No		
TC50_321	Yes/No	Yes/No		
TC60_301	Yes/No	Yes/No		
TC60_302	Yes/No	Yes/No		
TC60_303	Yes/No	Yes/No		
TC60_304	Yes/No	Yes/No		
TC60_305	Yes/No	Yes/No		
TC60_306	Yes/No	Yes/No		
TC60_307	Yes/No	Yes/No		
TC60_308	Yes/No	Yes/No		
TC60_309	Yes/No	Yes/No		
TC60_310	Yes/No	Yes/No		
TC60_311	Yes/No	Yes/No		
TC60_312	Yes/No	Yes/No		
TC60_313	Yes/No	Yes/No		

ATS Reference	Selected?	Run?	Verdict	Observations (Reference to any observations made in clause 7)
TC60_314	Yes/No	Yes/No		
TC60_315	Yes/No	Yes/No		
TC60_316	Yes/No	Yes/No		
TC60_317	Yes/No	Yes/No		
TC60_318	Yes/No	Yes/No		
TC60_319	Yes/No	Yes/No		
TC60_320	Yes/No	Yes/No		
TC60_321	Yes/No	Yes/No		
TC70_301	Yes/No	Yes/No		
TC70_302	Yes/No	Yes/No		
TC70_303	Yes/No	Yes/No		
TC70_304	Yes/No	Yes/No		
TC70_305	Yes/No	Yes/No		
TC70_306	Yes/No	Yes/No		
TC70_307	Yes/No	Yes/No		
TC70_308	Yes/No	Yes/No		
TC70_309	Yes/No	Yes/No		
TC70_310	Yes/No	Yes/No		
TC70_311	Yes/No	Yes/No		
TC70_312	Yes/No	Yes/No		
TC70_313	Yes/No	Yes/No		
TC70_314	Yes/No	Yes/No		
TC70_315	Yes/No	Yes/No		
TC70_316	Yes/No	Yes/No		
TC70_317	Yes/No	Yes/No		
TC70_318	Yes/No	Yes/No		
TC70_319	Yes/No	Yes/No		
TC70_320	Yes/No	Yes/No		
TC70_321	Yes/No	Yes/No		
TC70_322	Yes/No	Yes/No		
TC70_323	Yes/No	Yes/No		
TC70_324	Yes/No	Yes/No		
TC70_325	Yes/No	Yes/No		
TC70_326	Yes/No	Yes/No		
TC70_327	Yes/No	Yes/No		
TC70_328	Yes/No	Yes/No		
TC70_329	Yes/No	Yes/No		
TC70_330	Yes/No	Yes/No		
TC70_331	Yes/No	Yes/No		
TC70_332	Yes/No	Yes/No		
TC70_333	Yes/No	Yes/No		
TC70_334	Yes/No	Yes/No		
TC70_335	Yes/No	Yes/No		
TC71_301	Yes/No	Yes/No		
TC71_302	Yes/No	Yes/No		
TC74_301	Yes/No	Yes/No		
TC74_302	Yes/No	Yes/No		
TC74_303	Yes/No	Yes/No		
TC74_304	Yes/No	Yes/No		
TC74_305	Yes/No	Yes/No		
TC74_306	Yes/No	Yes/No		
TC74_307	Yes/No	Yes/No		
TC74_308	Yes/No	Yes/No		
TC74_309	Yes/No	Yes/No		
TC74_310	Yes/No	Yes/No		
TC74_311	Yes/No	Yes/No		
TC74_312	Yes/No	Yes/No		

ATS Reference	Selected?	Run?	Verdict	Observations (Reference to any observations made in clause 7)
TC74_313	Yes/No	Yes/No		
TC74_314	Yes/No	Yes/No		
TC74_315	Yes/No	Yes/No		
TC74_316	Yes/No	Yes/No		
TC74_317	Yes/No	Yes/No		
TC74_318	Yes/No	Yes/No		
TC74_319	Yes/No	Yes/No		
TC74_320	Yes/No	Yes/No		
TC74_321	Yes/No	Yes/No		
TC74_322	Yes/No	Yes/No		
TC74_323	Yes/No	Yes/No		
TC74_324	Yes/No	Yes/No		
TC74_325	Yes/No	Yes/No		
TC74_326	Yes/No	Yes/No		
TC74_327	Yes/No	Yes/No		
TC74_328	Yes/No	Yes/No		
TC74_329	Yes/No	Yes/No		
TC74_330	Yes/No	Yes/No		
TC74_331	Yes/No	Yes/No		
TC74_332	Yes/No	Yes/No		
TC74_333	Yes/No	Yes/No		
TC74_334	Yes/No	Yes/No		
TC75_301	Yes/No	Yes/No		
TC75_302	Yes/No	Yes/No		
TC80_301	Yes/No	Yes/No		
TC80_302	Yes/No	Yes/No		
TC80_303	Yes/No	Yes/No		
TC80_304	Yes/No	Yes/No		
TC80_305	Yes/No	Yes/No		
TC80_306	Yes/No	Yes/No		
TC80_307	Yes/No	Yes/No		
TC80_308	Yes/No	Yes/No		
TC80_309	Yes/No	Yes/No		
TC80_310	Yes/No	Yes/No		
TC80_311	Yes/No	Yes/No		
TC80_312	Yes/No	Yes/No		
TC80_313	Yes/No	Yes/No		
TC80_314	Yes/No	Yes/No		
TC80_315	Yes/No	Yes/No		
TC80_316	Yes/No	Yes/No		
TC80_317	Yes/No	Yes/No		
TC80_318	Yes/No	Yes/No		
TC80_319	Yes/No	Yes/No		
TC80_320	Yes/No	Yes/No		
TC80_321	Yes/No	Yes/No		
TC80_322	Yes/No	Yes/No		
TC80_323	Yes/No	Yes/No		
TC80_324	Yes/No	Yes/No		
TC80_325	Yes/No	Yes/No		
TC80_326	Yes/No	Yes/No		
TC80_327	Yes/No	Yes/No		
TC80_328	Yes/No	Yes/No		
TC80_329	Yes/No	Yes/No		
TC80_330	Yes/No	Yes/No		
TC81_301	Yes/No	Yes/No		
TC81_302	Yes/No	Yes/No		
TC84_301	Yes/No	Yes/No		



ATS Reference	Selected?	Run?	Verdict	Observations (Reference to any observations made in clause 7)
TC84_302	Yes/No	Yes/No		
TC84_303	Yes/No	Yes/No		
TC84_304	Yes/No	Yes/No		
TC84_305	Yes/No	Yes/No		
TC84_306	Yes/No	Yes/No		
TC84_307	Yes/No	Yes/No		
TC84_308	Yes/No	Yes/No		
TC84_309	Yes/No	Yes/No		
TC84_310	Yes/No	Yes/No		
TC84_311	Yes/No	Yes/No		
TC84_312	Yes/No	Yes/No		
TC84_313	Yes/No	Yes/No		
TC84_314	Yes/No	Yes/No		
TC84_315	Yes/No	Yes/No		
TC84_316	Yes/No	Yes/No		
TC84_317	Yes/No	Yes/No		
TC84_318	Yes/No	Yes/No		
TC84_319	Yes/No	Yes/No		
TC84_320	Yes/No	Yes/No		
TC84_321	Yes/No	Yes/No		
TC84_322	Yes/No	Yes/No		
TC84_323	Yes/No	Yes/No		
TC84_324	Yes/No	Yes/No		
TC84_325	Yes/No	Yes/No		
TC84_326	Yes/No	Yes/No		
TC84_327	Yes/No	Yes/No		
TC84_328	Yes/No	Yes/No		
TC84_329	Yes/No	Yes/No		
TC84_330	Yes/No	Yes/No		
TC85_301	Yes/No	Yes/No		
TC85_302	Yes/No	Yes/No		
TC40_601	Yes/No	Yes/No		
TC40_602	Yes/No	Yes/No		
TC40_603	Yes/No	Yes/No		
TC40_604	Yes/No	Yes/No		
TC40_605	Yes/No	Yes/No		
TC40_606	Yes/No	Yes/No		
TC40_607	Yes/No	Yes/No		
TC40_608	Yes/No	Yes/No		
TC40_609	Yes/No	Yes/No		
TC40_610	Yes/No	Yes/No		
TC40_611	Yes/No	Yes/No		
TC50_601	Yes/No	Yes/No		
TC50_602	Yes/No	Yes/No		
TC50_603	Yes/No	Yes/No		
TC50_604	Yes/No	Yes/No		
TC50_605	Yes/No	Yes/No		
TC50_606	Yes/No	Yes/No		
TC50_607	Yes/No	Yes/No		
TC50_608	Yes/No	Yes/No		
TC50_609	Yes/No	Yes/No		
TC60_601	Yes/No	Yes/No		
TC60_602	Yes/No	Yes/No		
TC60_603	Yes/No	Yes/No		
TC60_604	Yes/No	Yes/No		
TC60_605	Yes/No	Yes/No		
TC60_606	Yes/No	Yes/No		

ATS Reference	Selected?	Run?	Verdict	Observations (Reference to any observations made in clause 7)
TC60_607	Yes/No	Yes/No		
TC60_608	Yes/No	Yes/No		
TC60_609	Yes/No	Yes/No		
TC70_601	Yes/No	Yes/No		
TC70_602	Yes/No	Yes/No		
TC70_603	Yes/No	Yes/No		
TC70_604	Yes/No	Yes/No		
TC70_605	Yes/No	Yes/No		
TC70_606	Yes/No	Yes/No		
TC70_607	Yes/No	Yes/No		
TC70_608	Yes/No	Yes/No		
TC70_609	Yes/No	Yes/No		
TC70_610	Yes/No	Yes/No		
TC70_611	Yes/No	Yes/No		
TC70_612	Yes/No	Yes/No		
TC74_601	Yes/No	Yes/No		
TC74_602	Yes/No	Yes/No		
TC74_603	Yes/No	Yes/No		
TC74_604	Yes/No	Yes/No		
TC74_605	Yes/No	Yes/No		
TC74_606	Yes/No	Yes/No		
TC74_607	Yes/No	Yes/No		
TC74_608	Yes/No	Yes/No		
TC74_609	Yes/No	Yes/No		
TC74_610	Yes/No	Yes/No		
TC80_601	Yes/No	Yes/No		
TC80_602	Yes/No	Yes/No		
TC80_603	Yes/No	Yes/No		
TC80_604	Yes/No	Yes/No		
TC80_605	Yes/No	Yes/No		
TC80_606	Yes/No	Yes/No		
TC80_607	Yes/No	Yes/No		
TC80_608	Yes/No	Yes/No		
TC80_609	Yes/No	Yes/No		
TC80_610	Yes/No	Yes/No		
TC84_601	Yes/No	Yes/No		
TC84_602	Yes/No	Yes/No		
TC84_603	Yes/No	Yes/No		
TC84_604	Yes/No	Yes/No		
TC84_605	Yes/No	Yes/No		
TC84_606	Yes/No	Yes/No		
TC84_607	Yes/No	Yes/No		
TC84_608	Yes/No	Yes/No		
TC84_609	Yes/No	Yes/No		
TC84_610	Yes/No	Yes/No		

**B.7 Observations**

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

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## **Annex C (normative):      Abstract Test Suite (ATS) for PINX-DLL**

This ATS has been produced using the Tree and Tabular Combined Notation (TTCN) according to ISO/IEC 9646-3 [4].

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 a PDF file (PTNX\_DLL.PDF, see note 1) which accompanies this ETS.

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

The TTCN.MP representation corresponding to this ATS is contained in an ASCII file (PTNX\_DLL.MP, see note 1) which accompanies this ETS.

NOTE 1:    This file is located in an archive file name 8042\_E1.LZH. Other file formats are available on request.

NOTE 2:    According to ISO/IEC 9646-3 [4], 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.

## History

Document history	
July 1996	Public Enquiry PE 110: 1996-07-22 to 1996-11-15
November 1997	Vote V 9803: 1997-11-18 to 1998-01-16
February 1998	First Edition