



SLOVENSKI STANDARD

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Zasebno omrežje z integriranimi storitvami (PISN) - Medcentralni signalizacijski protokol - Osnovne storitve vodovnega načina - Podatkovna povezovalna plast (DLL) - 2. del: Abstraktni preskušalni niz (ATS) - Specifikacija

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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**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)".

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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:

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

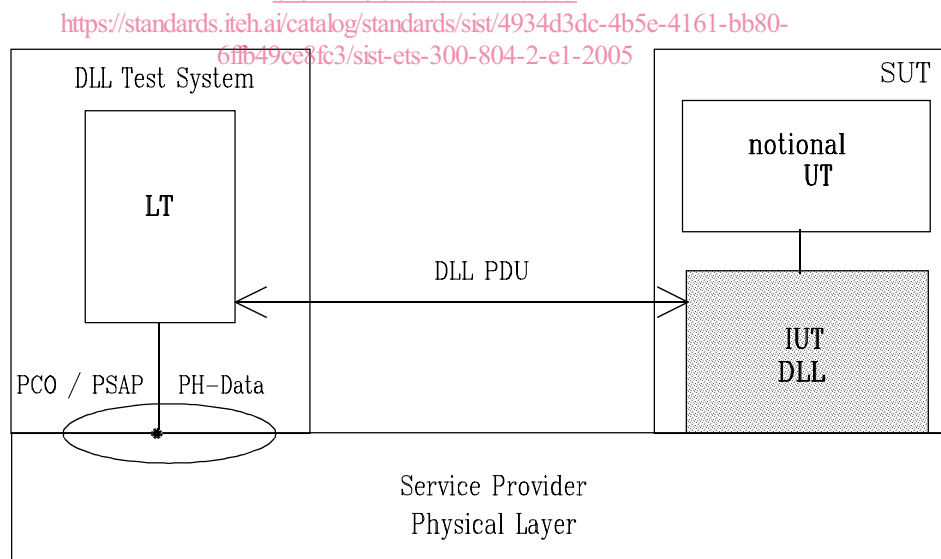


Figure 1: The Remote test method applied to the DLL testing

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

	Master	Slave
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.