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Digitalno omrežje z integriranimi storitvami (ISDN) – Osnovni vmesnik uporabnik-omrežje (UNI) – 5. del: Specifikacija za preskušanje skladnosti za vmesnik IB

Integrated Services Digital Network (ISDN); Basic User-Network Interface (UNI); Part 5: Conformance test specification for interface IB

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Foreword

This second edition European Telecommunication Standard (ETS) has been produced by the ETSI Technical Committee Transmission and Multiplexing (TM).

This ETS concerns the basic User Network Interface (UNI) for the Integrated Services Digital Network (ISDN) and consists of 7 parts as follows:

Part 1: "Layer 1 specification";

Part 2: "Implementation Conformance Statement (ICS) and Implementation eXtra Information for Testing (IXIT) specification for interface I_A";

Part 3: "Implementation Conformance Statement (ICS) and Implementation eXtra Information for Testing (IXIT) specification for interface I_B";

Part 4: "Conformance test specification for interface I_A";

Part 5: "Conformance test specification for interface I_B";

Part 6: "Abstract Test Suite (ATS) specification for interface I_A";

Part 7: "Abstract Test Suite (ATS) specification for interface I_B";

and is based on ITU-T Recommendation I.430 [1].

Transposition dates	
Date of adoption of this ETS:	18 September 1998
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1 Scope

This part 5 of ETS 300 012 provides the test principles for the requirements of this ETS used to determine the compliance of an Implementation Under Test (IUT) to this ETS.

It is outside the scope of this ETS to identify the specific tests required by an implementation where equipment has to meet attachment approval.

Detailed test equipment accuracy and the specification tolerance of the test devices is not a subject of this ETS. Where such details are provided then those test details are to be considered as being an "informative" addition to the test description.

Unless otherwise stated, conformance tests described in this ETS do not apply to the Auxiliary Power Supply (APS).

Ideal values for components and circuits are considered in the test principles.

2 Normative references

This ETS incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions 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] ITU-T Recommendation I.430 (1995): "Basic user-network interface; Layer 1 specification".

[2] ITU-T Recommendation I.411 (1993): "ISDN user-network interfaces; reference configurations".

[3] ETS 300 047-3 (1992): "Integrated Services Digital Network (ISDN); Basic access - safety and protection; Part 3: Interface I - protection".

[4] EN 60603-7 (1993): "Connectors for frequencies below 3 MHz for use with printed boards - Part 7: Detail specification for connectors, 8-way, including fixed and free connectors with common mating features; (IEC 603-7:1990) (S)".

[5] EN 28877 (1993): "Information technology; Telecommunications and information exchange between systems; Interface connector and contact assignments for ISDN Basic Access Interface located at reference point S and T; (ISO/IEC 8877: 1992)".

[6] CCITT Recommendation G.117 (1988): "Transmission aspects of unbalance about earth (definitions and methods)".

[7] ETS 300 102-1 (1990): "Integrated Services Digital Network (ISDN); User-network interface layer 3; Specifications for basic call control".

[8] ETS 300 012-1 (1998): "Integrated Services Digital Network (ISDN); Basic User Network Interface (UNI); Part 1: Layer 1 specification".

[9] ITU-T Recommendation X.200 (1994): "Information technology; Open Systems Interconnection; Basic reference model: The basic model".

[10] ITU-T Recommendation Q.512 (1995): "Digital exchange interfaces for subscriber access".

[11] CCITT Recommendation G.812 (1988): "Timing requirements at the outputs of slave clocks suitable for plesiochronous operation of international digital links".

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of this ETS the following definitions, together with those given in annex E of ITU-T Recommendation I.430 [1] and in ITU-T Recommendation I.411 [2] apply.

basic access: A user-network access arrangement that corresponds to the interface structure composed of two B-channels and one D-channel. The bit rate of the D-channel for this type of access is 16 kbit/s.

B-channel: This function provides for the bi-directional transmission of independent B-channel signals each having a bit rate of 64 kbit/s.

bearer service: A type of telecommunication service that provides the capability for the transmission of signals between UNI.

NOTE 1: The ISDN connection type used to support a bearer service may be identical to that used to support other types of telecommunication service.

connection management entity: An entity for the purpose of management of resources that have an impact on an individual data link connection.

D-channel: This function provides for bi-directional transmission of one D-channel signal at a bit rate of 16 kbit/s.

designated terminal: A terminal which is permitted to draw power from power source 1 under both normal and restricted power conditions.

frame alignment: This function provides information to enable the TE or NT to recover the time-division multiplexed channels.

Integrated Services Digital Network (ISDN): A network that provides or supports a range of different telecommunications services and provides digital connections between UNIs.

interface I_A: User side of the ISDN UNI for the basic access.

interface I_B: Network side of the ISDN UNI for the basic access.

IUT (Implementation Under Test): Interface point I_B i.e. NT2 or access connection element (see also ITU-T Recommendation I.430 [1], annex E, clause E.1 definition 109).

Network Termination (NT): An equipment providing interface I_B.

NOTE 2: This term is used in this ETS to indicate network-terminating aspects of NT1, NT2 and PS1 functional groups where these have an I_B interface.

Network Termination Type 1 (NT1): This functional group includes functions broadly equivalent to layer 1 (physical) of the Open Systems Interconnection (OSI) reference model. These functions are associated with the proper physical and electromagnetic termination of the network. NT1 functions are:

- line transmission termination;
- layer 1 maintenance functions and performance monitoring;
- timing;
- power transfer;
- layer 1 multiplexing;
- interface termination, including multidrop termination;
- employing layer 1 contention resolution.

Network Termination Type 2 (NT2): This functional group includes functions broadly equivalent to layer 1 and higher layers of the ITU-T Recommendation X.200 [9] reference model. Private Automatic Branch Exchanges (PABXs), Local Area Networks (LANs), and terminal controllers are examples of equipment or combinations of equipment that provide NT2 functions. NT2 functions include:

- layer 2 and 3 protocol handling;
- layer 2 and 3 multiplexing;
- switching;
- concentration;
- maintenance functions;
- interface termination and other layer 1 functions.

non-designated terminal: A terminal which is only permitted to draw power from power source 1 under normal power conditions.

normal power condition: The condition indicated by the normal polarity of the phantom voltage at the access leads, i.e. where the voltage of the transmit leads c and d on the TE is positive with respect to the voltage on the receive leads e and f.

Power Source 1 (PS1): Power source for the provision of remote power feeding of TE via a phantom circuit of the interface wires.

Rx (Receiver): Interface signal receiver of IUT or simulator.

restricted power condition: The condition indicated by the reversed polarity of the phantom voltage at the access leads, i.e. where the voltage of the receive leads e and f on the TE is positive with respect to the voltage on the transmit leads c and d.

simulator: Device generating the stimulus signal for the IUT and monitoring the signal transmitted by the IUT to test the characteristics of NT.

Terminal Adapter (TA): An equipment with interface I_A and one or more auxiliary interfaces that allow non-ISDN terminals to be served by an ISDN UNI (see also ITU-T Recommendation I.411 [2]).

Terminal Equipment (TE): An equipment with interface I_A and consisting of one or more functional blocks.

NOTE 3: This term is used in this ETS to indicate terminal-terminating aspects of TE1, TA and NT2 functional groups, where these have an I_A interface.

Terminal Equipment Type 1 (TE1): This functional group includes functions belonging to the functional group TE, and with an interface that complies with the ISDN UNI recommendation.

Tx (Transmitter): Interface signal transmitter of IUT or simulator.

3.2 Symbols

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

ONE	Binary "1"
ZERO	Binary "0"

3.3 Abbreviations

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

APS	Auxiliary Power Supply
dc	direct current
ETS	European Telecommunication Standard
I	Informative
I_A	Interface point A
I_B	Interface point B

ICS	Implementation Conformance Statement
ISDN	Integrated Services Digital Network
IUT	Implementation Under Test
IXIT	Implementation eXtra Information for Testing
LCL	Longitudinal Conversion Loss
N	Normative
N/R	Not Relevant
NT	Network Termination
ppm	parts per million
PS1	Power Source 1
Rx	Receive
Tx	Transmit
UI	Unit Interval (Layer 1)

4 Allocation of tests

4.1 Scope

Scope	Clause / subclause in ETS 300 012-1 [8]	Test defined in clause / subclause this ETS
Scope	1	N/R

4.2 References

Scope	Clause / subclause in ETS 300 012-1 [8]	Test defined in clause / subclause this ETS
References	2	N/R

4.3 Definitions, symbols and abbreviations

Definitions, symbols and abbreviations	Clause / subclause in ETS 300 012-1 [8]	Test defined in clause / subclause this ETS
Definitions, symbols and abbreviations	3	N/R
Definitions	3.1	N/R
General definitions	3.1.1	N/R
Interface	3.1.1.1	N/R
NT	3.1.1.2	N/R
TE	3.1.1.3	N/R
Definition of services	3.1.2	N/R
Services required from the physical medium	3.1.2.1	N/R
Services provided to layer 2	3.1.2.2	N/R
Transmission capability	3.1.2.2.1	N/R
Activation/deactivation	3.1.2.2.2	N/R
D-channel access	3.1.2.2.3	N/R
Maintenance	3.1.2.2.4	N/R
Status indication	3.1.2.2.5	N/R
Primitives between layer 1 and other entities	3.1.3	N/R
Modes of operation	3.1.4	N/R
Point-to-point operation	3.1.4.1	N/R
Point-to-multipoint operation	3.1.4.2	N/R
Definitions of states	3.1.5	N/R

TE states	3.1.5.1	N/R
State F1 (inactive)	3.1.5.1	N/R
State F2 (sensing)	3.1.5.1	N/R
State F3 (deactivated)	3.1.5.1	N/R
State F4 (awaiting signal)	3.1.5.1	N/R
State F5 (identifying input)	3.1.5.1	N/R
State F6 (synchronized)	3.1.5.1	N/R
State F7 (activated)	3.1.5.1	N/R
State F8 (lost framing)	3.1.5.1	N/R
NT states	3.1.5.2	N/R
State G1 (deactive)	3.1.5.2	6.3.1
State G2 (pending activation)	3.1.5.2	6.3.1
State G3 (active)	3.1.5.2	6.3.1
State G4 (pending deactivation)	3.1.5.2	6.3.1
Symbols	3.2	N/R
Abbreviations	3.3	N/R

4.4 Primitives associated with layer 1

Primitives associated with layer 1	Clause / subclause in ETS 300 012-1 [8]	Test defined in clause / subclause this ETS
Primitives associated with layer 1	4	N/R

4.5 Wiring configurations and location of interface points

Modes	Clause / subclause in ETS 300 012-1 [8]	Test defined in clause / subclause this ETS
Wiring configurations and location of interface points	5	N/R
General	5.1	N/R
Point-to-point configuration	5.1.1	N/R
Point-to-multipoint configuration	5.1.2	N/R
Location of the interfaces	5.1.3	N/R
Support of wiring configurations	5.2	N/R
Wiring polarity integrity	5.2.1	6.3.2.1.1
NT and TE associated wiring	5.2.2	N/R

4.6 Functional characteristics

Functions	Clause / subclause in ETS 300 012-1 [8]	Test defined in clause / subclause this ETS
Functional characteristics	6	N/R
Interface functions	6.1	N/R
B-channel	6.1.1	5.1
Bit timing	6.1.2	5.1.1
Octet timing	6.1.3	5.1.1
Frame alignment	6.1.4	6.4
D-channel	6.1.5	5.1.1
D-channel access procedure	6.1.6	6.2
Power feeding	6.1.7	8
Deactivation	6.1.8	6.3.3
Activation	6.1.9	6.3.3
Interchange circuits	6.2	5.2.1

Connected/disconnected indication	6.3	N/R
TEs powered across the interface	6.3.1	N/R
TEs not powered across the interface	6.3.2	N/R
Indication of connection status	6.3.3	N/R
Line code	6.4	5.1.1
Frame structure	6.5	5.1
Bit rate	6.5.1	5.1.1
Binary organization of the frame	6.5.2	N/R
TE to NT	6.5.2.1	N/R
NT to TE	6.5.2.2	5.1
Timing considerations	6.6	5.1.1

4.7 Interface procedures

D-channel access	Clause / subclause in ETS 300 012-1 [8]	Test defined in clause / subclause this ETS
Interface procedures	7	N/R
D-channel access procedure	7.1	N/R
Interframe (layer 2) time fill	7.1.1	6.1
D-echo channel	7.1.2	6.2
D-channel monitoring	7.1.3	N/R
Priority mechanism	7.1.4	N/R
Collision detection	7.1.5	N/R

Activation/deactivation	Clause / subclause in ETS 300 012-1 [8]	Test defined in clause / subclause this ETS
Activation/deactivation	7.2	N/R
Activate primitives	7.2.1	6.3
Deactivate primitives	7.2.2	6.3
Management primitives	7.2.3	6.3
Valid primitive sequences	7.2.4	N/R
Signals	7.3	5.1.1, 5.1.2
Activation/deactivation procedure for TEs	7.4	6.3.1
General TE procedures	7.4.1	N/R
Specification of the procedures	7.4.2	N/R
Activation/deactivation for NTs	7.5	6.3
Non-activating/non-deactivating NTs	7.5.1	6.3
Timer values	7.6	6.3.2.3
Activation times	7.7	N/R
TE activation times	7.7.1	N/R
NT activation times	7.7.2	6.3.2.1, 6.3.2.2
Deactivation times	7.8	6.3.2.2

Frame alignment	Clause / subclause in ETS 300 012-1 [8]	Test defined in clause / subclause this ETS
Frame alignment procedures	8	6.4
Frame alignment procedure in the direction NT to TE	8.1	N/R
Loss of frame alignment	8.1.1	N/R
Frame alignment	8.1.2	N/R
Frame alignment in the direction TE to NT	8.2	6.4
Loss of frame alignment	8.2.1	6.4
Frame alignment	8.2.2	6.4
Multi-framing	8.3	N/R
Idle channel code on the B-channels	8.4	N/R

4.8 Electrical characteristics

Functions	Clause / subclause in ETS 300 012-1 [8]	Test defined in clause / subclause this ETS
Electrical characteristics	9	N/R
Bit rate	9.1	7.1
Nominal rate	9.1.1	7.1.1, 7.1.2
Tolerance	9.1.2	7.1.1, 7.1.2
Jitter and bit-phase relationship between TE input and output	9.2	N/R
Test configurations	9.2.1	N/R
Timing extraction jitter	9.2.2	N/R
Total phase deviation input to output	9.2.3	N/R
NT jitter characteristics	9.3	7.2
Termination of the line	9.4	N/R
Transmitter output characteristics	9.5	N/R
Transmitter output impedance	9.5.1	N/R
NT transmitter output impedance	9.5.1.1	7.3
TE transmitter output impedance	9.5.1.2	N/R
Test load impedance	9.5.2	N/R
Pulse shape and amplitude (binary ZERO)	9.5.3	7.4
Pulse shape	9.5.3.1	7.4
Nominal pulse amplitude	9.5.3.2	7.4
Pulse unbalance	9.5.4	N/R
Pulse amplitude when transmitting a high density pattern	9.5.4.1	7.5.1
Pulse unbalance of an isolated couple of pulses	9.5.4.2	7.5.2
Voltage on other test loads (TE only)	9.5.5	N/R
400 Ω load	9.5.5.1	N/R
5,6 Ω load	9.5.5.2	N/R
Unbalance about earth	9.5.6	7.6
Longitudinal conversion loss	9.5.6.1	7.6
Output signal balance	9.5.6.2	N/R
Receiver input characteristics	9.6	N/R
Receiver input impedance	9.6.1	N/R
TE receiver input impedance	9.6.1.1	N/R
NT receiver input impedance	9.6.1.2	7.7.1
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TEs	9.6.2.1	N/R
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NTs for both point-to-point and short passive bus configurations (adaptive timing)	9.6.2.3	7.7.2
NTs for extended passive bus wiring configurations	9.6.2.4	7.7.2
NTs for point-to-point configurations only	9.6.2.5	7.7.2
NT receiver input delay characteristics	9.6.3	7.7.3
NT for short passive bus	9.6.3.1	7.7.3
NT for both point-to-point and passive bus	9.6.3.2	7.7.3
NT for extended passive bus	9.6.3.3	7.7.3
NT for point-to-point only	9.6.3.4	7.7.3
Unbalance about earth	9.6.4	7.7.4
Isolation from external voltages	9.7	N/R
Interconnecting media characteristics	9.8	N/R
Standard ISDN basis access TE cord	9.9	N/R