



**SLOVENSKI STANDARD**  
**SIST ETS 300 012-4 E2:2003**

**01-december-2003**

---

**Digitalno omrežje z integriranimi storitvami (ISDN) – Osnovni vmesnik uporabnik-omrežje (UNI) – 4. del: Specifikacija za preskušanje skladnosti za vmesnik IA**

Integrated Services Digital Network (ISDN); Basic User-Network Interface (UNI); Part 4: Conformance test specification for interface IA

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

Ta slovenski standard je istoveten z: **ETS 300 012-4 Edition 2**  
<https://standards.iteh.ai/catalog/standards/sist/1d70cc49-9710-40b9-ba1f-8fca7860a5f0/sist-ets-300-012-4-e2-2003>

---

**ICS:**

33.080

Digitalno omrežje z  
integriranimi storitvami  
(ISDN)

Integrated Services Digital  
Network (ISDN)

**SIST ETS 300 012-4 E2:2003**

**en**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST ETS 300 012-4 E2:2003](#)

<https://standards.iteh.ai/catalog/standards/sist/1d70ee49-97f0-40b9-ba1f-8fca7860a5f0/sist-ets-300-012-4-e2-2003>



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

**ETS 300 012-4**

October 1998

Second Edition

Source: TM

Reference: RE/TM-03038-4

ICS: 33.020

**Key words:** Basic, ISDN, layer 1, testing, transmission, UNI

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**  
**Integrated Services Digital Network (ISDN);**  
**Basic User Network Interface (UNI);**  
**Part 4: Conformance test specification for interface I<sub>A</sub>**

SIST ETS 300 012-4 E2:2003  
<https://standards.iteh.ai/catalog/standards/sist-ets-300-012-4-e2-2003>  
8fca7860a5f0/sist-ets-300-012-4-e2-2003

**ETSI**

European Telecommunications Standards Institute

**ETSI Secretariat**

**Postal address:** F-06921 Sophia Antipolis CEDEX - FRANCE

**Office address:** 650 Route des Lucioles - Sophia Antipolis - Valbonne - FRANCE

**Internet:** secretariat@etsi.fr - <http://www.etsi.fr> - <http://www.etsi.org>

Tel.: +33 4 92 94 42 00 - Fax: +33 4 93 65 47 16

**Copyright Notification:** No part may be reproduced except as authorized by written permission. The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 1998. All rights reserved.

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST ETS 300 012-4 E2:2003](https://standards.iteh.ai/catalog/standards/sist/1d70ee49-97f0-40b9-ba1f-8fca7860a5f0/sist-ets-300-012-4-e2-2003)

<https://standards.iteh.ai/catalog/standards/sist/1d70ee49-97f0-40b9-ba1f-8fca7860a5f0/sist-ets-300-012-4-e2-2003>

## Contents

Foreword .....	7
1 Scope .....	9
2 Normative References .....	9
3 Definitions, symbols and abbreviations .....	10
3.1 Definitions .....	10
3.2 Symbols .....	11
3.3 Abbreviations .....	11
4 Allocation of tests .....	12
4.1 Scope .....	12
4.2 References .....	12
4.3 Definitions, symbols and abbreviations .....	13
4.4 Primitives associated with layer 1 .....	13
4.5 Wiring configurations and location of interface points .....	14
4.6 Functional characteristics .....	14
4.7 Interface procedures .....	14
4.8 Electrical characteristics .....	16
4.9 Power feeding .....	17
4.10 Interface connector contact assignment .....	18
4.11 Annexes .....	19
5 Functional characteristic tests .....	19
5.1 Binary organization of frame .....	19
5.1.1 Test A .....	20
5.1.2 Test B .....	21
6 Interface procedure tests .....	21
6.1 D-channel access control procedure .....	21
6.1.1 Interframe (layer 2) time fill .....	22
6.1.2 D-echo channel response .....	22
6.2 Activation/deactivation .....	23
6.2.1 Activation/deactivation procedure .....	23
6.2.2 Timer for activation/deactivation .....	25
6.2.2.1 Timer for activation when receiving INFO 2 .....	25
6.2.2.1.1 Test A in state F3 .....	25
6.2.2.1.2 Test B in state F4 .....	25
6.2.2.2 Timer for activation when receiving INFO 4 .....	26
6.2.2.2.1 Test A in state F3 .....	26
6.2.2.2.2 Test B in state F4 .....	26
6.2.2.3 Timer for activation when receiving any signal .....	27
6.2.2.4 Value of the timer T3 .....	27
6.2.2.5 Timer for physical deactivation .....	27
6.2.2.5.1 Test A in state F6 .....	27
6.2.2.5.2 Test B in state F7 .....	28
6.2.2.6 Timer for complete deactivation .....	28
6.2.2.6.1 Test A in state F7 .....	28
6.2.2.6.2 Test B in state F8 .....	29
6.3 Frame alignment procedures .....	30
6.4 Multi-framing procedures .....	30
6.5 Idle channel code on the B-channels .....	31
7 Electrical characteristics tests .....	31
7.1 Frame rate when transmitting an INFO 1 .....	32
7.2 TE jitter characteristics .....	33
7.2.1 TE jitter measurement characteristics (test A) .....	33

	7.2.2	TE output phase deviation (test B) .....	34
7.3		TE transmitter output impedance .....	35
	7.3.1	Test A .....	35
	7.3.2	Test B .....	35
	7.3.3	Test C .....	36
	7.3.4	Test D .....	37
	7.3.5	Test E .....	37
7.4		Pulse shape and amplitude .....	38
7.5		Pulse unbalance .....	38
	7.5.1	Pulse amplitude .....	38
	7.5.2	Pulse unbalance of an isolated couple of pulses .....	39
7.6		Voltage on other test loads .....	40
	7.6.1	Test A .....	40
	7.6.2	Test B .....	41
7.7		Longitudinal conversion loss of transmitter output .....	41
7.8		Receiver input characteristics .....	42
	7.8.1	TE receiver input impedance .....	42
		7.8.1.1 Test A .....	42
		7.8.1.2 Test B .....	43
		7.8.1.3 Test C .....	43
		7.8.1.4 Test D .....	44
	7.8.2	Receiver sensitivity - noise and distortion immunity .....	44
	7.8.3	Unbalance about earth of receiver input .....	45
8		Power feeding .....	46
	8.1	Power source 1 phantom mode .....	46
		8.1.1 Normal power conditions .....	46
		8.1.1.1 Normal power provision (Test A) .....	46
		8.1.1.2 Normal power provision (Test B) .....	47
		8.1.1.3 Normal power provision (Test C) .....	48
		8.1.1.4 Normal power provision (Test D) .....	48
		8.1.1.5 Normal power provision (Test E) .....	49
	8.1.2	Restricted power conditions .....	50
		8.1.2.1 Restricted power provision (Test A) .....	50
		8.1.2.2 Restricted power provision (Test B) .....	50
		8.1.2.3 Restricted power provision (Test C) .....	51
		8.1.2.4 Restricted power provision (Test D) .....	52
		8.1.2.5 Restricted power provision (Test E) .....	52
		8.1.2.6 Restricted power provision (Test F) .....	53
	8.1.3	Current transient .....	54
	8.1.4	Limitation on power sink during transient conditions .....	55
		8.1.4.1 Current/time limitation for TE .....	55
		8.1.4.2 Current/time limitation for TE when connecting .....	56
		8.1.4.3 Behaviour of a TE using a connection detector .....	57
		8.1.4.4 Power start-up test .....	58
		8.1.4.4.1 Power start-up test after removal of short-circuit .....	58
		8.1.4.4.2 Power start-up test at low input voltage .....	59
		8.1.4.5 Protection against short-term interruptions .....	60
		8.1.4.5.1 Normal power .....	60
		8.1.4.5.2 Restricted power .....	61
		8.1.4.6 Behaviour at the switch-over .....	62
		8.1.4.6.1 Normal power .....	62
		8.1.4.6.2 Restricted power .....	62
		8.1.4.7 dc unbalance of TEs using power sink 1 .....	63
		8.1.4.8 Effect of current unbalance .....	64
	8.2	Power source 2 - optional third pair .....	65
	8.3	Galvanic isolation .....	66
		Annex A (normative): Connection cords and general testing requirements .....	67
		A.1 Connection cords .....	67

A.2 General testing requirements..... 67  
History..... 68

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST ETS 300 012-4 E2:2003](https://standards.iteh.ai/catalog/standards/sist/1d70ee49-97f0-40b9-ba1f-8fca7860a5f0/sist-ets-300-012-4-e2-2003)  
<https://standards.iteh.ai/catalog/standards/sist/1d70ee49-97f0-40b9-ba1f-8fca7860a5f0/sist-ets-300-012-4-e2-2003>

Blank page

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST ETS 300 012-4 E2:2003](https://standards.iteh.ai/catalog/standards/sist/1d70ee49-97f0-40b9-ba1f-8fca7860a5f0/sist-ets-300-012-4-e2-2003)

<https://standards.iteh.ai/catalog/standards/sist/1d70ee49-97f0-40b9-ba1f-8fca7860a5f0/sist-ets-300-012-4-e2-2003>



## 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<sub>A</sub>";
- Part 3: "Implementation Conformance Statement (ICS) and Implementation eXtra Information for Testing (IXIT) specification for interface I<sub>B</sub>";
- Part 4: "Conformance test specification for interface I<sub>A</sub>";**
- Part 5: "Conformance test specification for interface I<sub>B</sub>";
- Part 6: "Abstract Test Suite (ATS) specification for interface I<sub>A</sub>";
- Part 7: "Abstract Test Suite (ATS) specification for interface I<sub>B</sub>";

and is based on ITU-T Recommendation I.430 [7].

<b>Transposition dates</b>	
Date of adoption of this ETS:	18 September 1998
Date of latest announcement of this ETS (doa):	31 January 1999
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	31 July 1999
Date of withdrawal of any conflicting National Standard (dow):	31 July 1999

Blank page

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST ETS 300 012-4 E2:2003](https://standards.iteh.ai/catalog/standards/sist/1d70ee49-97f0-40b9-ba1f-8fca7860a5f0/sist-ets-300-012-4-e2-2003)

<https://standards.iteh.ai/catalog/standards/sist/1d70ee49-97f0-40b9-ba1f-8fca7860a5f0/sist-ets-300-012-4-e2-2003>

## 1 Scope

This part 4 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).

This ETS is applicable to interface I<sub>A</sub>. The field of applicability is reported at the beginning of each test.

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

Details concerning connection cords and general testing requirements can be found in annex A of this ETS.

## 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.

- (standards.iteh.ai)
- [1] CCITT Recommendation G.117 (1988): "Transmission aspects of unbalance about earth".  
<https://standards.iteh.ai/catalog/standards/sist/1d70ee49-97f0-40b9-ba1f-84d850a510/sist-300-012-4-e2-2003>
- [2] 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)".
- [3] ETS 300 012-1 (1998): "Integrated Services Digital Network (ISDN); Basic User Network Interface (UNI); Part 1: Layer 1 specification".
- [4] ETS 300 047-3 (1992): "Integrated Services Digital Network (ISDN); Basic access - safety and protection; Part 3: Interface I<sub>A</sub> - protection".
- [5] ETS 300 102-1 (1990): "Integrated Services Digital Network (ISDN); User-network interface layer 3; Specifications for basic call control".
- [6] ITU-T Recommendation I.411 (1993): "ISDN user-network interfaces; Reference configurations".
- [7] ITU-T Recommendation I.430 (1995): "Basic user-network interface; Layer 1 specification".
- [8] ITU-T Recommendation X.200 (1994): "Information technology; Open Systems Interconnection; Basic reference model: The basic model".

### 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 [7] and in ITU-T Recommendation I.411 [6] 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 bidirectional 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 user-network interfaces.

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 bidirectional 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 user-network interfaces.

**interface I<sub>A</sub>:** User side of the ISDN user-network interface for the basic access.

**interface I<sub>B</sub>:** Network side of the ISDN user-network interface for the basic access.

**Network Termination (NT):** An equipment providing interface I<sub>B</sub>.

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<sub>B</sub> 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 [8] 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.

**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 find the result.

**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 user-network interface (see also ITU-T Recommendation I.411 [6]).

**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 user-network interface recommendation.

### 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
HDLC	High level Data Link Control
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
PS2	Power Source 2
PTNX	Private Telecommunication Network Exchange
Rx	Receive
Tx	Transmit
UI	Unit Interval (Layer 1)

## 4 Allocation of tests

### 4.1 Scope

Scope	Clause / subclause in ETS 300 012-1 [3]	Test defined in clause / subclause of this ETS
Scope	1	N/R

### 4.2 References

References	Clause / subclause in ETS 300 012-1 [3]	Test defined in clause / subclause of this ETS
References	2	N/R

SIST ETS 300 012-4 E2:2003

<https://standards.iteh.ai/catalog/standards/sist/1d70ee49-97f0-40b9-ba1f-8fca7860a5f0/sist-ets-300-012-4-e2-2003>

## 4.3 Definitions, symbols and abbreviations

Definitions, symbols and abbreviations	Clause / subclause in ETS 300 012-1 [3]	Test defined in clause / subclause of 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	6.2.1
State F2 (sensing)	3.1.5.1	6.2.1
State F3 (deactivated)	3.1.5.1	6.2.1
State F4 (awaiting signal)	3.1.5.1	6.2.1
State F5 (identifying input)	3.1.5.1	6.2.1
State F6 (synchronized)	3.1.5.1	6.2.1
State F7 (activated)	3.1.5.1	6.2.1
State F8 (lost framing)	3.1.5.1	6.2.1
NT states	3.1.5.2	N/R
State G1 (deactivated)	3.1.5.2	N/R
State G2 (pending activation)	3.1.5.2	N/R
State G3 (activated)	3.1.5.2	N/R
State G4 (pending deactivation)	3.1.5.2	N/R
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 [3]	Test defined in clause / subclause of this ETS
Primitives associated with layer 1	4	N/R