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Integrated Services Digital Network (ISDN); Basic User-Network Interface (UNI); Part 1: Layer 1 specification

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Digitalno omrežje z
integriranimi storitvami
(ISDN)

Integrated Services Digital
Network (ISDN)

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Integrated Services Digital Network (ISDN); Basic User-Network Interface (UNI); Part 1: Layer 1 specification

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Transmission and Multiplexing (TM).

The present document 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 [10].

The present document includes editorial improvements of Safety related clauses.

National transposition dates	
Date of latest announcement of this EN (doa):	31 August 2000
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	28 February 2001
Date of withdrawal of any conflicting National Standard (dow):	28 February 2001

1 Scope

The present document specifies requirements for the ISDN basic rate UNI including the physical, electrical and functional characteristics and the information exchange with higher layers. This ensures that interface implementations in an ISDN equipment for use with ISDN basic access is portable within Europe with regard to layer 1 interface aspects and that interworking with higher layer protocols for ISDN is supported.

The present document is applicable to equipment having interface I_A or I_B for the connection to the ISDN basic access intended to be installed on customer premises according to ITU-T Recommendation I.411 [9], the present document is for application to interfaces at reference points S, T and S/T (coincident S and T) of the ISDN reference configuration.

For the case where the present document is applied to the T and the S/T reference point, the main body of the part 1 and the parts 6 and 7 are normative.

For the case where the present document is applied to the S reference point, annex A to this part 1 is also normative.

The present document does not specify:

- safety requirements;
- interface or equipment overvoltage protection requirements;
- immunity requirements against electromagnetic interference;
- emission limitation requirements.

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.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

- [1] ITU-T Recommendation G.117 (1996): "Transmission aspects of unbalance about earth".
- [2] ITU-T Recommendation I.412 (1988): "ISDN user-network interfaces; interface structures and access capabilities".
- [3] CCITT Recommendation X.211 (1988): "Physical service definition of open systems interconnection for CCITT applications".
- [4] EN 28877 (1993): "Information technology; Telecommunications and information exchange between systems; Interface connector and contact assignment for ISDN Basic Access Interface located at reference points S and T (ISO/IEC 8877:1992)".
- [5] 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)".
- [6] ENV 41004: "Reference Configuration for Connectivity Relations of Private Telecommunication Network Exchanges".
- [7] ETSI ETS 300 047-3 (1992): "Integrated Services Digital Network (ISDN); Basic access - safety and protection; Part 3: Interface I_A - protection".

- [8] ISO/IEC 9646-1 (1994): "Information technology; Open Systems Interconnection; Conformance Testing Methodology and Framework; Part 1: General concepts".
- [9] ITU-T Recommendation I.411 (1993): "ISDN user-network interfaces; reference configurations".
- [10] ITU-T Recommendation I.430 (1995): "Basic user-network interface; layer 1 specification".
- [11] ITU-T Recommendation Q.921 (1993): "ISDN user-network interface-data link layer specification".
- [12] ITU-T Recommendation Q.931 (03/93): "ISDN user-network interface layer 3 specification for basic call control".
- [13] EN 50081: "Electromagnetic compatibility; Generic emission standard".

3 Definitions, symbols and abbreviations

3.1 Definitions

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

3.1.1 General definitions

basic access: 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.

Implementation Conformance Statement (ICS): see ISO/IEC 9646-1 [8], subclause 3.4.6.

Integrated Services Digital Network (ISDN): integrated services network that provides digital connections between UNIs.

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interface: the present document defines the layer 1 characteristics of the UNI to be applied at the S or T reference points for the basic interface structure defined in ITU-T Recommendation I.412 [2]. The reference configuration for the interface is defined in ITU-T Recommendation I.411 [9] and is reproduced in figure 1.

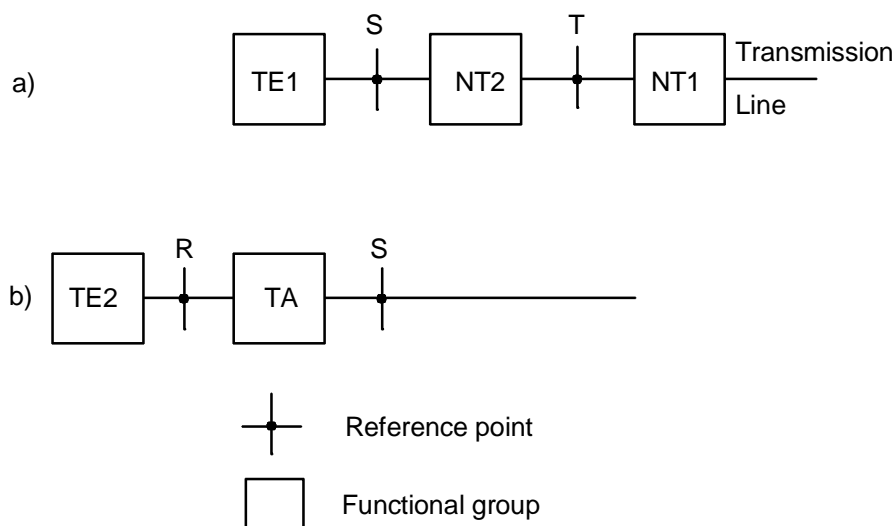


Figure 1: Definition of interface points according to the ISDN reference configuration

Network Termination (NT): the term NT is used to indicate network terminating layer 1 aspects of NT1 and NT2 functional groups unless otherwise indicated. However, in subclauses 3.1.5 and 7.2 the term NT is used to indicate the layer 1 network side of the basic access interface.

Terminal Equipment (TE): the term TE is used to indicate terminal terminating layer 1 aspects of TE1, TA and NT2 functional groups, unless otherwise indicated. However, in subclauses 3.1.5 and 7.2, the term TE is used to indicate the layer 1 terminal side of the basic access interface.

3.1.2 Definition of services

services required from the physical medium: layer 1 of this interface requires a balanced metallic transmission medium, for each direction of transmission, capable of supporting 192 kbit/s.

services provided to layer 2: layer 1 provides the following services to layer 2 and the management entity.

transmission capability: layer 1 provides the transmission capability, by means of appropriately encoded bit streams, for the B- and D-channels and the related timing and synchronization functions.

activation/deactivation: layer 1 provides the signalling capability and the necessary procedures to enable customer TEs and/or NTs to be deactivated when required and reactivated when required. The activation and deactivation procedures are defined in subclause 7.2.

D-channel access: layer 1 provides the signalling capability and the necessary procedures to allow TEs to gain access to the common resource of the D-channel in an orderly fashion while meeting the performance requirements of the D-channel signalling system. These D-channel access control procedures are defined in subclause 7.1.

maintenance: layer 1 provides the signalling capability, procedures and necessary functions at layer 1 to enable maintenance functions to be performed.

status indication: layer 1 provides an indication to the higher layers of the status of layer 1.

3.1.3 Primitives between layer 1 and other entities

Primitives represent, in an abstract way, the logical exchange of information and control between layer 1 and other entities. They neither specify nor constrain the implementation of entities or interfaces.

3.1.4 Modes of operation

Both point-to-point and point-to-multipoint modes of operation, as described below, are intended to be accommodated by the layer 1 characteristics of the UNI. In the present document, the modes of operation apply only to the layer 1 procedural characteristics of the interface and do not imply any constraints on modes of operation at higher layers.

Point-to-point operation: this mode of operation at layer 1 implies that only one source (transmitter) and one sink (receiver) are active at any one time in each direction of transmission at an S or T reference point. (Such operation is independent of the number of interfaces that may be provided on a particular wiring configurations - see clause 5).

Point-to-multipoint operation: this mode of operation at layer 1 allows more than one TE (source and sink pair) to be simultaneously active at an S or T reference point. (The multipoint mode of operation may be accommodated, as discussed in clause 5, with point-to-point or point-to-multipoint wiring configurations).

3.1.5 Definition of states

3.1.5.1 TE states

State F1 (INACTIVE): in this inactive (powered-off) state, the TE is not transmitting and cannot detect the presence of any input signals. In the case of locally powered TEs, which cannot detect the appearance/disappearance of power source 1 or 2, this state is entered when local power is not present. For TEs that can detect power source 1 or power source 2, this state is entered whenever loss of power (required to support all TE1 functions) is detected, or when the absence of power from source 1 or 2, whichever power source is used for determining the connection status, is detected.

State F2 (SENSING): this state is entered after the TE has been powered on but has not determined the type of signal (if any) that the TE is receiving. When in this state, a TE may go to a low-power consumption mode as specified in subclause 6.1.8.

State F3 (DEACTIVATED): this is the deactivated state of the physical protocol. Neither the NT nor the TE is transmitting. When in this state, a TE may go to a low-power consumption mode as specified in subclause 6.1.8.

State F4 (AWAITING Signal): when the TE is requested to initiate activation by means of a PH-ACTIVATE REQUEST primitive, it transmits a signal (INFO 1) and waits for a response from the NT.

State F5 (IDENTIFYING Input): at the first receipt of any signal from the NT, the TE ceases to transmit INFO 1 and awaits identification of signal INFO 2 or INFO 4.

State F6 (SYNCHRONIZED): when the TE receives an activation signal (INFO 2) from the NT, it responds with a signal (INFO 3) and waits for normal frames (INFO 4) from the NT.

State F7 (ACTIVATED): state F7 is the only state where B and D channel contain operational data. This is the normal activate state with the protocol activated in both directions.

State F8 (LOST Framing): this is the condition when the TE has lost frame synchronization and is awaiting re-synchronization by receipt of INFO 2 or INFO 4 or deactivation by receipt of INFO 0.

3.1.5.2 NT States

State G1 (DEACTIVATED): in this deactivated state, the NT is not transmitting. When in this state, an NT may go to a low-power consumption mode as specified in subclause 6.1.8.

State G2 (PENDING Activation): in this partially active state the NT sends INFO 2 while waiting for INFO 3. This state will be entered on request by higher layers, by means of a PH-ACTIVATE REQUEST primitive, or on the receipt of INFO 0 or lost framing while in the active state (G3). The choice to eventually deactivate is up to higher layers at the network side.

State G3 (ACTIVE): this is the normal active state where the NT and TE are active with INFO 4 and INFO 3, respectively. A deactivation may be initiated by the NT system management, by means of an MPH-DEACTIVATE REQUEST primitive, or the NT may be the active state all the time, under non-fault conditions.

State G4 (PENDING Deactivation): when the NT wishes to deactivate, it may wait for a timer to expire before returning to the deactive state.

3.2 Symbols

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

ONE	Binary "1"
ZERO	Binary "0"

3.3 Abbreviations

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

APS	Auxiliary Power Source
dc	direct current
HDLC	High level Data Link Control
ICS	Implementation Conformance Statement
IUT	Implementation Under Test
IXIT	Implementation eXtra Information for Testing
NT	Network Termination
PBX	Private Branch eXchange
PTNX	Private Telecommunication Network eXchange
TE	Terminal Equipment
TEI	Terminal Endpoint Identifier

4 Primitives associated with layer 1

The primitives to be passed across the layer 1/2 boundary or to the management entity and parameter values associated with these primitives are defined and summarized in table 1. For description of the syntax and use of the primitives, refer to CCITT Recommendation X.211 [3] and relevant detailed descriptions in clause 7.

Table 1: Primitives associated with layer 1

Generic	Specific name		Parameter		Message unit content
	REQUEST	INDICATION	Priority indicator	Message unit	
L1<->L2					
PH-DATA	X (note 1)	X	X (note 2)	X	Layer 2 peer-to-peer message
PH-ACTIVATE	X	X	-	-	
PH-DEACTIVATE	-	X	-	-	
M<->L1					
MPH-ERROR	-	X	-	X	Type of error or recovery from a previously reported error
MPH-ACTIVATE	-	X	-	-	
MPH-DEACTIVATE	X	X	-	-	
MPH-INFORMATION	-	X	-	X	Connected/disconnected
NOTE 1: PH-DATA REQUEST implies underlying negotiation between layer 1 and layer 2 for the acceptance of the data.					
NOTE 2: Priority indication applies only to the request type.					

iTeh STANDARD PREVIEW

5 Wiring configurations and location of interface points

5.1 General

<https://standards.iteh.ai/catalog/standards/sist/13b76ea6-b367-49d4-93ea-70d8593fb989/sist-en-300-012-1-v1-2-2-2003>

The electrical characteristics of the UNI are determined on the basis of certain assumptions about the various wiring configurations which may exist in the user premises. These assumptions are identified in two major configuration descriptions, subclauses 5.1.1 and 5.1.2, together with additional material contained in annex A. Figure 2 shows a general reference configuration for wiring in the user premises.

5.1.1 Point-to-point configuration

A point-to-point wiring configuration implies that only one source (transmitter) and one sink (receiver) are interconnected on an interchange circuit.

5.1.2 Point-to-multipoint configuration

A point-to-multipoint wiring configuration allows more than one source to be connected to the same sink or more than one sink to be connected to the same source on an interchange circuit. Such distribution systems are characterized by the fact that they contain no active logic elements performing functions (other than possibly amplification or regeneration of the signal).

5.1.3 Location of the interfaces

The wiring in the user premises is considered to be one continuous cable run with jacks for the TEs and NT attached directly to the cable or using stubs less than one metre in length. The jacks are located at interface points I_A and I_B (see figure 2). One interface point, I_A , is adjacent to each TE. The other interface point I_A , is adjacent to the NT. However, in some applications, the NT may be connected to the wiring without the use of a jack or with a jack that accommodates multiple interfaces (e.g., when the NT is a port on a PBX). The required electrical characteristics (described in clause 9) for I_A and I_B are different in some aspects.