



SLOVENSKI STANDARD SIST ETS 300 233 E1:2003

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Digitalno omrežje z integriranimi storitvami (ISDN) – Dostopovni digitalni oddelek za primarne funkcije ISDN

Integrated Services Digital Network (ISDN); Access digital section for ISDN primary rate

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Transmission and Multiplexing (TM) Technical Committee of the European Telecommunications Standards Institute (ETSI).

Annexes A to C of this ETS are normative whereas Annexes D and E are informative.

NOTE: ITU-T Recommendation G.962 (1993) is based upon this ETS.

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1 Scope

This ETS specifies the characteristics of an access digital section for the Integrated Services Digital Network (ISDN) primary rate access between the user-network interface (at the T reference point, defined in ETS 300 011 [1]) and the local exchange (at the V.3 reference point, defined in CCITT Recommendation Q.512 [4]) supporting the primary rate interface channel structure defined in CCITT Recommendation I.412 [3] and ETS 300 011 [1] and the additional functions required for operation and maintenance of the access digital section according to ETR 001 [2], Option 2.

NOTE: ITU-T Recommendation G.962 (1993) is based upon this ETS.

The requirements of this ETS satisfy network performance requirements of CCITT Recommendations G.821 [5] on error performance as well as CCITT Recommendations G.801 and I.350 with regard to availability.

Annex A (normative) to this ETS specifies requirements for interworking between the Primary Rate Access Digital Section (DS) and the Exchange Termination (ET) and the definition of the ET layer 1 state machine which are outside the scope of this ETS but which are nevertheless important.

Annex B (normative) specifies a modification of the requirements when Line Termination (LT) and ET functions are combined in one unit.

Annex C (normative), to be provided, will specify the requirements for conformance testing.

This ETS does not specify the requirements of the digital transmission system used within the access digital section.

2 Normative references

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This ETS incorporates by dated or 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] | ETS 300 011 (1992): "Integrated Services Digital Network (ISDN); Primary rate user-network interface; layer 1 specification and test principles". |
| [2] | ETR 001: "Integrated Services Digital Network (ISDN); Customer access maintenance". |
| [3] | CCITT Recommendation I.412 (1988): "ISDN user-network interfaces - Interface structures and access capabilities". |
| [4] | CCITT Recommendation Q.512 (1988): "Exchange interfaces for subscriber access". |
| [5] | CCITT Recommendation G.821 (1988): "Error performance of an international digital connection forming part of an integrated services digital network". |
| [6] | CCITT Recommendation G.823 (1988): "The control of jitter and wander within digital networks which are based on the 2048 kbit/s hierarchy". |
| [7] | CCITT Recommendation G.706 (1988): "Frame alignment and cyclic redundancy check (CRC) procedures relating to basic frame structures defined in Recommendation G.704". |
| [8] | CCITT Recommendation G.703 (1988): "Physical/electrical characteristics of hierarchical digital interfaces". |

- [9] CCITT Recommendation G.704 (1988): "Synchronous frame structures used at primary and secondary hierarchical levels".
- [10] CCITT Recommendation Q.940 (1988): "ISDN user-network interface protocol for management - general aspects".
- [11] CCITT Recommendation I.411 (1988): "ISDN user-network interfaces - Reference configuration".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this ETS, unless otherwise indicated, the term TE is used to indicate terminating layer 1 aspects of TE1, TA and NT2 functional groups.

When the term TE indicates terminating layer 1 aspects of TE1, then according to figure 2 of CCITT Recommendation I.411 [11], the S and T reference points coincide.

In this ETS references to LT only concern the LT inside the access digital section.

3.2 Abbreviations

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

AIS	Alarm Indication Signal
AUXP	AUXiliary Pattern
CRC-4	Cyclic Redundancy Check
DS	Primary Rate Access Digital Section
ET	Exchange Termination
ETS	European Telecommunication Standard
ETSI	European Telecommunications Standards Institute
FC4	Failure Condition
FE	Function Element
µs	micro second
HDLC	High Level Data Link Control
ISDN	Integrated Services Digital Network
LFA	Loss of Frame Alignment
LOS	Loss of Signal
LT	Line Termination
NF	Normal Frame
NOF	Normal Operational Frames
NT	Network Termination

PH	Packet Handler
RAI	Remote Alarm Indication
SIG	Signal between LT and NT1
TE	Terminal Equipment

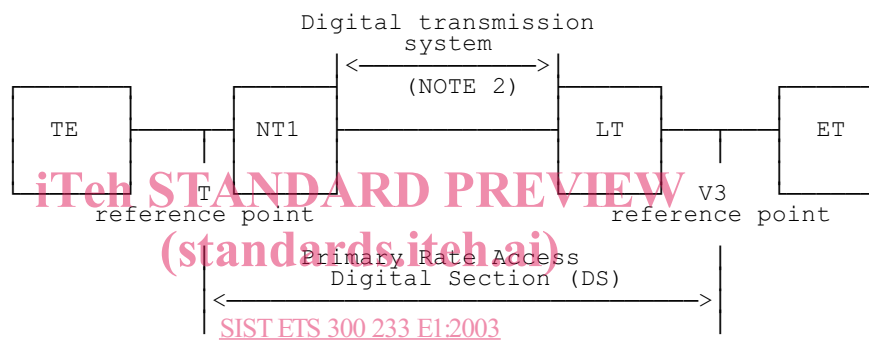
4 Configuration and application

4.1 Configuration

Figure 1 below shows the boundaries of the access digital section in relation to the digital transmission system definition.

The concept of the access digital section is used in order to allow a functional and procedural description and a definition of the network requirements.

The concept of a digital transmission system is used in order to describe the characteristics of an implementation, using a specific medium, in support of the access digital section.

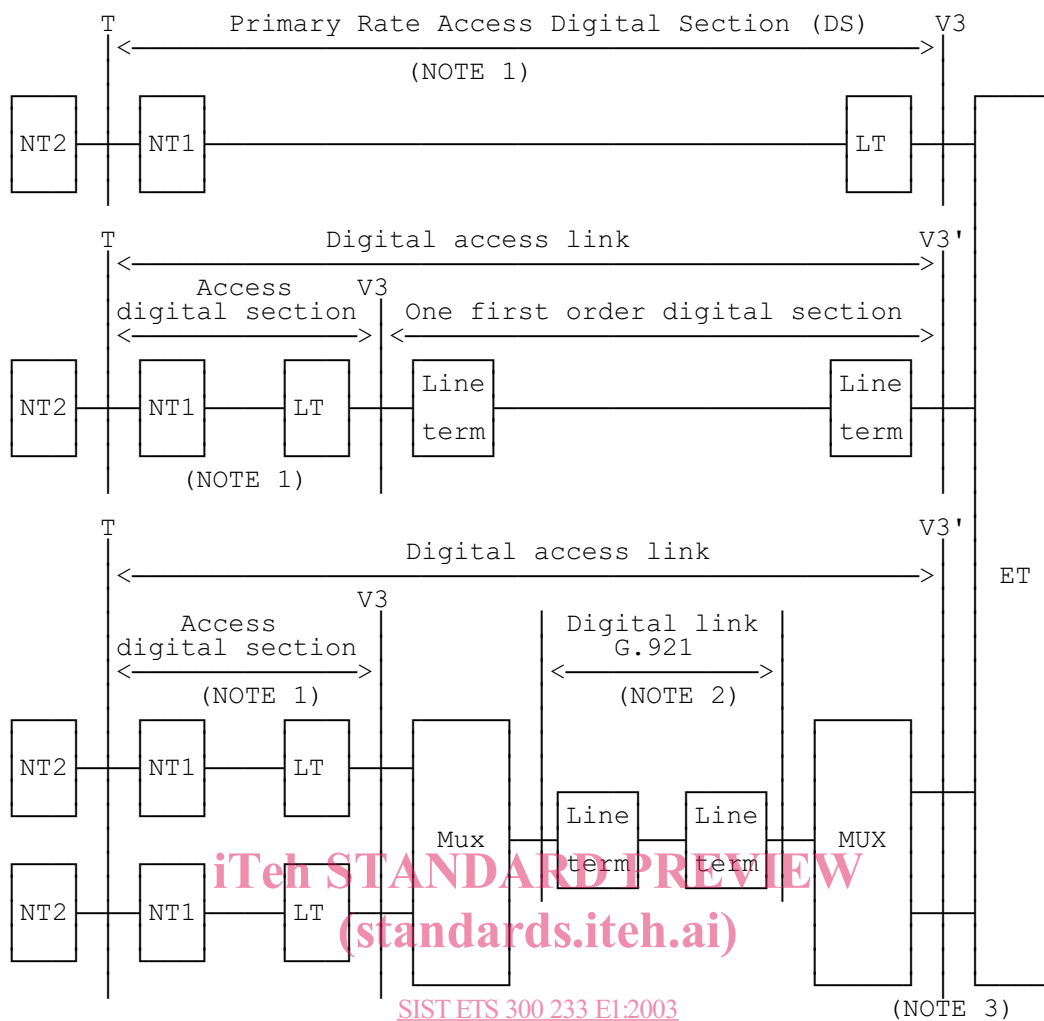


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NOTE 1: From a functional point of view, the information transferred via the reference points T and V3 are different and, therefore, the digital section is not symmetrical.

NOTE 2: Digital transmission system refers to either a line system using metallic media or optical fibres or to a radio system.

Figure 1: Access digital section and transmission system boundaries



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(NOTE 3)

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- NOTE 1: The access digital sections may include one or more regenerators.
- NOTE 2: Multiple applications of digital links and multiplexors may be possible, but see also subclause 7.2 "Jitter at the V3 reference point".
- NOTE 3: In the case of remote access, the digital access link is terminated at the ET by a V3' reference point which is functionally and electrically identical with the V3 reference point in the case of the direct access.
- NOTE 4: The Line Terminations (LTs) forming part of the first order digital section or the digital link are outside the scope of this ETS.

Figure 2: Examples of equipment configurations in the ISDN primary rate access

4.2 Application

The Primary Rate Access Digital Section (DS) may be applied as given in figure 2 for:

- direct access to the local exchange;
- remote access via one first order digital section or via higher order multiplex equipment forming a digital access link to the local exchange.

4.3 Modelling and relationship between the access digital section and the ET

The general model, as shown in figure 3, depicts the whole ISDN customer access layer 1 and adjacent entities. It also provides the basis to describe the functions performed by the access digital section and those performed by TE, ET and system management and how various functions are grouped. In particular, according to this model, the maintenance functions specified in this ETS are not confined to functions performed by the access digital section but include functions associated with ET layer 1.

This model includes primitive procedures between ET layer 1, ET layer 2 and system management:

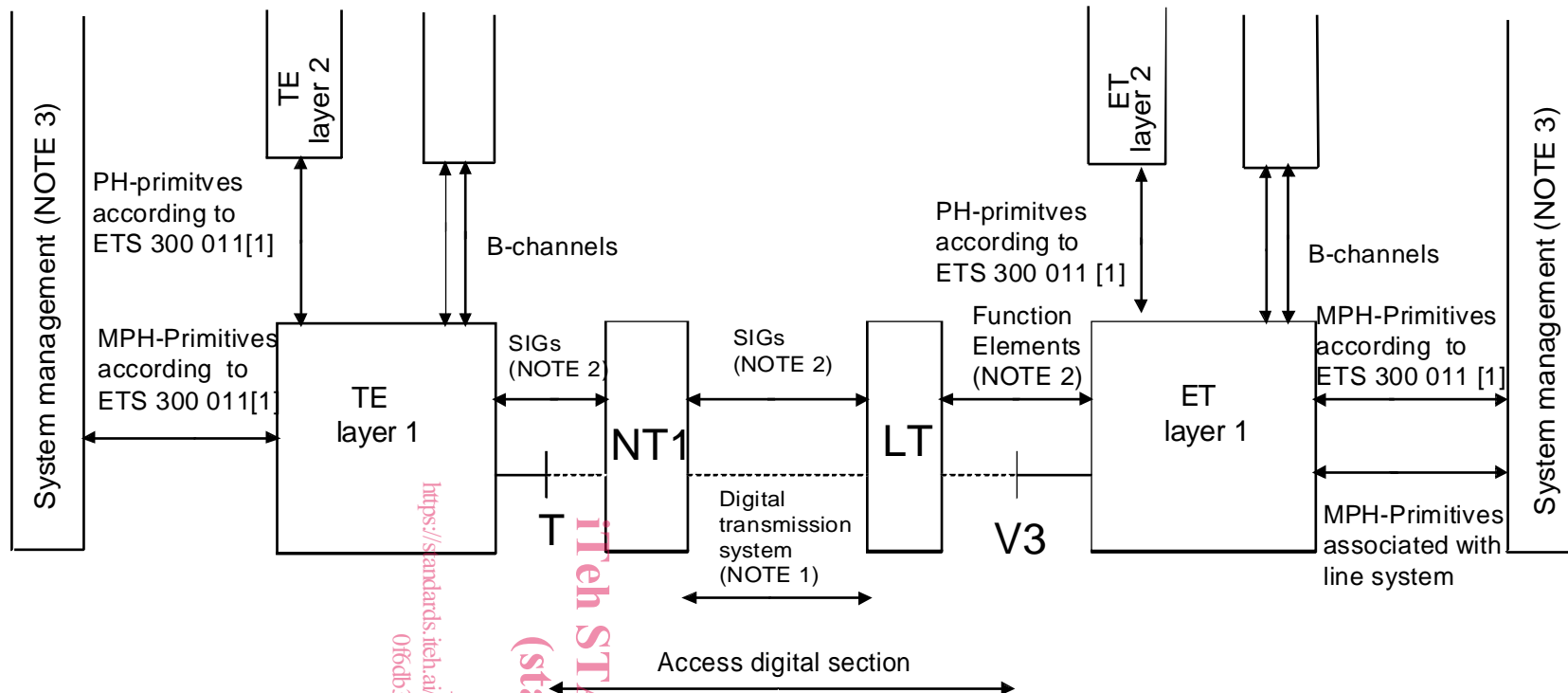
- a) ETS 300 011 [1] and CCITT Recommendations Q.920/Q.921 interactions between ET layer 1 and ET layer 2 and system management based on Packet Handler (PH) and MPH primitives, respectively, as defined in ETS 300 011 [1]. These interactions are for the support of functions specified in CCITT Recommendations Q.920 and Q.921;
- b) interactions between ET layer 1 and system management for the support of functions associated with the access digital section, based on MPH primitives.

The primitive procedures within TE comply with the specification according to ETS 300 011 [1].

This model does not constrain layer 1 arrangements between LT and NT1, nor the digital transmission system technology.

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NOTE 1: The digital transmission system refers to either a digital system using a metallic pair of wires, optical fibre or radio system.

NOTE 2: SIG, FE and primitives refer to an exchange of information. It does not imply any specific coding nor implementation. Some of these functions may be terminated in the LT and do not pass the digital transmission system.

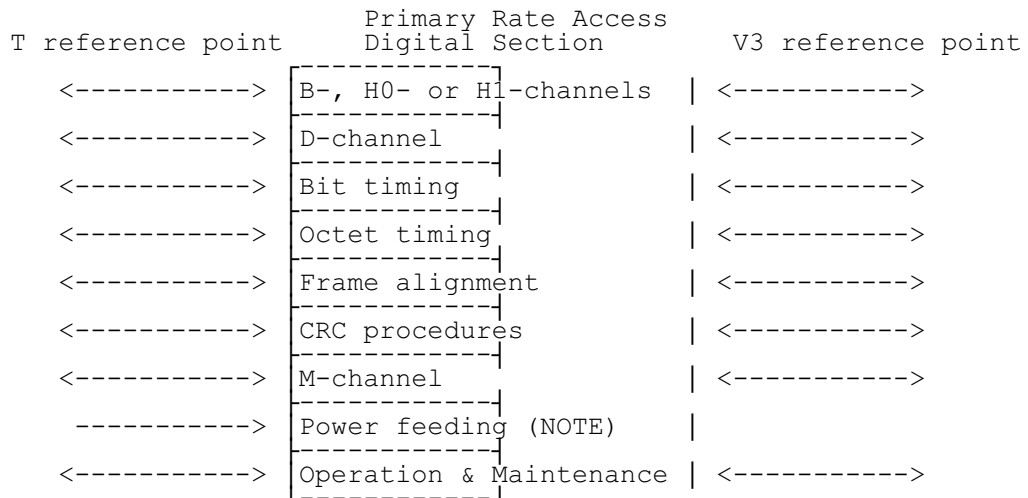
NOTE 3: The term system management corresponds to both system management and layer management as defined in CCITT Recommendation Q.940 [10].

Figure 3: General model of ISDN customer access layer 1 and adjacent entities

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5 Functions

Figure 4 below shows the functions which shall be supported by the Primary Rate Access Digital Section.



NOTE: This power-feed-function is optional and depends on the transmission medium used. Only the NT1 may be powered from the interface at the T reference point (see ETS 300 011 [1]).

Figure 4: Functions supported in the access digital section

For each direction of transmission the following functions shall be provided:

- 30 timeslots at 64 kbit/s (numbered 1 to 15 and 17 to 31) for the transport of any appropriate allocation of the B-, H0- and H1-channels,
- 1 timeslot at 64 kbit/s (numbered 16) for the transport of a D-channel;
- 1 timeslot at 64 kbit/s (numbered 0) for frame alignment, and to follow the procedures for multiframe alignment, CRC-4 procedures and maintenance.

5.1 B-channel

This function provides for the bi-directional transmission of up to 30 independent B-channels, each having a bit rate of 64 kbit/s as defined in CCITT Recommendation I.412 [3].

5.2 H0-channel

This function provides for the bi-directional transmission of up to 5 independent H0-channels, each having a bit rate of 384 kbit/s as defined in CCITT Recommendation I.412 [3].

5.3 H1-channel

This function provides for the bi-directional transmission of one H1-channel having a bit rate of 1 920 kbit/s as defined in CCITT Recommendation I.412 [3].

5.4 D-channel

This function provides for the bi-directional transmission of one D-channel at a bit rate of 64 kbit/s as defined in CCITT Recommendation I.412 [3].