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Broadband Integrated Services Digital Network (B-ISDN); Synchronous Digital Hierarchy (SDH) based user network access; Physical layer interfaces for B-ISDN applications

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33.080	Digitalno omrežje z integriranimi storitvami (ISDN)	Integrated Services Digital Network (ISDN)
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**Broadband Integrated Services Digital Network (B-ISDN);
Synchronous Digital Hierarchy (SDH) based user network access
Physical layer interfaces for B-ISDN applications**

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Network Aspects (NA) Technical Committee of the European Telecommunications Standards Institute (ETSI).

This ETS defines the Synchronous Digital Hierarchy (SDH) based user network access physical layer interfaces to be applied to the T_B , S_B reference points of the reference configurations of the Broadband Integrated Services Digital Network (B-ISDN) User Network Interface (UNI) for B-ISDN applications. It addresses the structure of the transmission system that is used at these interfaces as well as the implementation of the UNI related Operation And Maintenance (OAM) functions at the SDH-based physical layer.

The production of this ETS has taken into account the recommendations given in CCITT Recommendations I.413 [11] and I.432 [12].

Transposition dates	
Date of latest announcement of this ETS (doa):	31 May 1995
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	30 November 1995
Date of withdrawal of any conflicting National Standard (dow):	30 November 1995

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1 Scope

This European Telecommunication Standard (ETS) defines the physical layer interface to be applied to the S_B and T_B reference points of the reference configurations of the Broadband Integrated Services Digital Network (B-ISDN) Synchronous Digital Hierarchy (SDH) based User Network Interface (UNI) at 155 520 kbit/s and 622 080 kbit/s. It addresses separately the physical media and the transmission system used at these interfaces and addresses also the implementation of UNI related Operation And Maintenance (OAM) functions.

The selection of the physical medium for the interfaces at the S_B and T_B reference points should take into account that optical fibre is agreed as the preferred medium to be used to cable customer equipment. However, in order to accommodate existing cabling of customer equipment, other transmission media (e.g. coaxial cables) should not be precluded. Also, implementations should allow terminal interchangeability.

This ETS reflects in its structure and content the desire to take care of such early configurations and introduces a degree of freedom when choosing a physical medium at the physical layer.

2 Normative references

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] ITU-T Recommendation G.652: "Characteristics of a single-mode optical fibre cable".
- [2] CCITT Recommendation G.703: "Physical/electrical characteristics of hierarchical digital interfaces".
- [3] ITU-T Recommendation G.707: "Synchronous digital hierarchy bit rates".
- [4] ITU-T Recommendation G.708: "Network node interface for the synchronous digital hierarchy".
- [5] ITU-T Recommendation G.709: "Synchronous multiplexing structure".
- [6] ITU-T Recommendation G.783: "Characteristics of Synchronous Digital Hierarchy (SDH) multiplexing equipment functional blocks".
- [7] ITU-T Recommendation G.957: "Optical interfaces for equipments and systems relating to the synchronous digital hierarchy".
- [8] CCITT Recommendation I.113 (1992): "Vocabulary of terms for broadband aspects of ISDN".
- [9] CCITT Recommendation I.321 (1992): "B-ISDN protocol reference model and its application".
- [10] CCITT Recommendation I.361 (1992): "B-ISDN ATM layer specification".
- [11] CCITT Recommendation I.413 (1992): "B-ISDN user-network interface".
- [12] CCITT Recommendation I.432 (1992): "B-ISDN user-network interface - Physical layer specification".
- [13] CCITT Recommendation I.610 (1992): "B-ISDN operation and maintenance principles and functions".

- [14] CCITT Recommendation X.200: "Reference model of Open System Interconnection for CCITT Applications".
- [15] I-ETS 300 404: "Broadband Integrated Services Digital Network (B-ISDN); B-ISDN Operation And Maintenance (OAM) principles and functions".
- [16] IEC Publication 825: "Radiation safety of laser products equipment classification requirements and user's guide".
- [17] IEC Publication 950: "Safety of information technology equipment, including electrical business equipment".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this ETS, the definitions given in CCITT Recommendation I.113 [8] apply, specially for idle cell, valid cell and invalid cell.

to be defined: These items or values are not yet specified.

3.2 Abbreviations

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

AIS	Alarm Indication Signal
ATM	Asynchronous Transfer Mode
AU	Administrative Unit
B-NT	Broadband Network Termination
B-TA	Broadband Terminal Adapter
B-TE	Broadband Terminal Equipment
BER	Bit Error Rate
BIP	Bit Interleaved Parity
CATV	Category V
CLP	Cell Loss Priority
CMI	Coded Mark Inversion
CRC	Cyclic Redundancy Check
EMC	Electro-Magnetic Compatibility
EMI	Electro-Magnetic Interference
FEBE	Far End Block Error
FERF	Far End Receive Failure
HEC	Header Error Control
LAN	Local Area Network
LSB	Least Significant Bit
MA	Medium Adapter
MPH	Management Physical Header
MSB	Most Significant Bit
NNI	Network Node Interface
ISDN	Integrated Services Digital Network
B-ISDN	Broadband Integrated Services Digital Network
PH	Physical Header
NRZ	Non Return to Zero
OAM	Operation And Maintenance
OSI	Open Systems Interconnection
PM	Physical Medium
POH	Path Overhead
p.p.m.	parts per million
PTR	Pointer
SDH	Synchronous Digital Hierarchy
SOH	Section Overhead
STI	Surface Transfer Impedance
STM	Synchronous Transport Module
TC	Transmission Convergence

TFV	Terminal Failure Voltage
UNA	User Network Access
UNI	User Network Interface
VC	Virtual Container

4 Reference configuration at the user-network interface

4.1 Functional groups and reference points

The reference configurations defined for ISDN basic access and primary access are considered general enough to be applicable to all aspects of the B-ISDN accesses.

Figure 1 shows the B-ISDN reference configurations which contain the following:

- functional groups: B-NT1; B-NT2; B-TE1; TE2; B-TE2; and B-TA;
- reference points: T_B ; S_B ; and R.

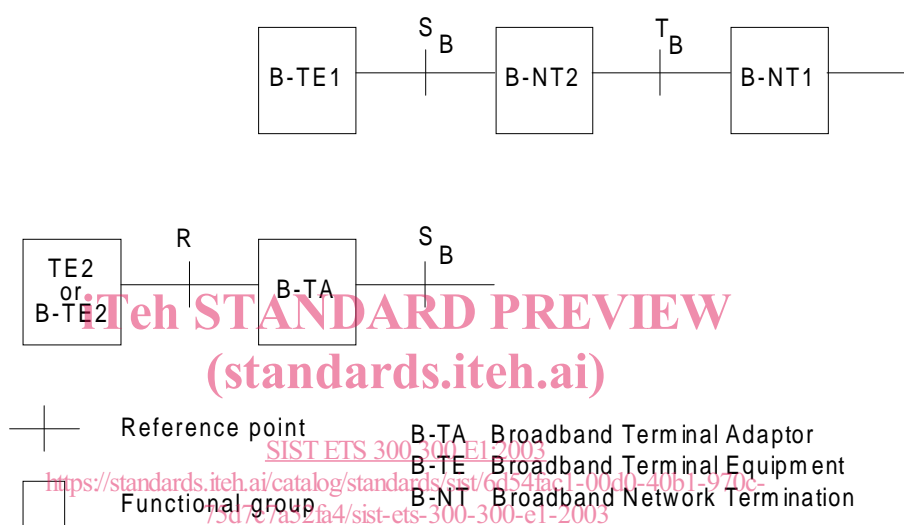


Figure 1: B-ISDN reference configurations

In order to clearly illustrate the broadband aspects, the notation for reference points and for functional groups with broadband capabilities are appended with the letter B (e.g. B-NT1, T_B). The broadband functional groups are equivalent to the functional groups defined in ISDN. Interfaces at the R reference point may or may not have broadband capabilities.

Interfaces at reference points S_B and T_B will be standardized. These interfaces will support all ISDN services.

4.2 Examples of physical realizations

Figure 2 gives examples of physical configurations illustrating combinations of physical interfaces at various reference points. The examples cover configurations that could be supported by standardized interfaces at reference points S_B and T_B . Other configurations may also exist. For example, physical configurations of B-NT2 may be distributed or use shared medium to support Local Area Network (LAN) emulation and other applications.

Figure 3 illustrates possible physical configurations, but does not preclude alternative configurations. Whether a single interface at the S_B reference point can cover different configurations, as illustrated in figure 3, is for further study.