SLOVENSKI STANDARD
SIST EN 50098-1:1997

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Customer premises for cabling for information technology - Part 1: ISDN basic access

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Informationstechnische Verkabelung von Gebäudekomplexen -- Teil 1: ISDN-Basisanschluss

Câblages dans les locaux des usagers pour les technologies de l'information -- Partie 1: Accès de base RNIS

Ta slovenski standard je istoveten z: **EN 50098-1:1994**

ICS:

33.080	Digitalno omrežje z integriranimi storitvami (ISDN)	Integrated Services Digital Network (ISDN)

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Descriptors: Cabling topology, cabling qualification, design requirements, ISDN basic access, ISDN S-bus, requirements for cabling components

English version

Customer premises cabling for information technology
Part 1: ISDN basic access

Câblages dans les locaux des usagers pour les technologies de l'information
Partie 1: Accès de base RNIS

Informationstechnische Verkabelung von Gebäudekomplexen
Teil 1: ISDN-Basisanschluß

This European Standard was approved by CENELEC on 1993-12-08. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

This European Standard has been prepared by CENELEC TC 115 *Electrotechnical aspects of telecommunication equipment.* It has been developed with the cooperation of CENELEC TC 46X *Communication Cables* and ETSI TM3 *Architecture, Functional Requirements and Interfaces of Transmission Networks.*

It was submitted to the CENELEC members for formal vote and was approved by CENELEC as EN 50098-1 on 1993-12-08.

The following dates were fixed:

- latest date of publication of an identical national standard (dop) 1994-09-01
- latest date of withdrawal of conflicting national standards (dow) 1994-09-01

This standard is the first of a series of European Standards for customer premises cabling.

EN 50098-1 (this standard) covers customer premises cabling for connection of basic access ISDN equipment.

EN 50098-2 will cover customer premises cabling for connection of primary access ISDN equipment.

Other subjects that will be covered by TC 115 are e.g.:

Recommendations for installation practices

Performance requirements of structured cabling schemes

Compatibility between different transmission systems in a single cable

The requirements in this standard have been derived from ETS 300 012, EN 28877, EN 60603-7 and ITU-T[1)] Recommendation I.430 (Blue Book). The reader is referred to EN 60950 and ETS 300 047-1 to ETS 300 047-5 for general safety requirements and to ENV 55102-1 and ENV 55102-2 for EMC requirements (see annex A).

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1) International Telecommunication Union - Telecommunications Standardization Sector (formerly CCITT)

Contents

Introduction

This standard is intended for use by those designing, planning or procuring cabling for ISDN basic access within a customer's premises. The configurations in this standard are designed to be effective when either implemented with cabling having the recommended characteristics, or implemented with the components specified in clause 7.

1 Scope

This standard defines the requirements for the design and configuration of customer premises cabling for the connection of basic access ISDN equipment.

It defines

- design requirements for ISDN basic access with point-to-point and point-to-multipoint cabling configurations;
- minimum cabling requirements for the installation of new cabling;
- criteria for the use of existing cabling.

The standard applies to the customer premises cabling. It describes the cabling requirements, needed to transmit ISDN basic access signals as defined by ITU-T Recommendation I.430. The requirements placed on the customer premises cabling are solely those necessary to enable terminal equipment conforming to ETS 300 012 to operate into the Network Termination (NT) via configurations defined in this standard.

2 Normative references

This European Standard 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 European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 28877	Information processing systems; Interface connector and contact assignments for ISDN basic access interface, located at reference points S and T
EN 60603-7	Connectors for frequencies below 3 MHz for use with printed boards; Part 7: Detail specificationfor connectors, 8-way, including fixed and free connectors with common mating features (IEC 603-7:1990)
ITU-T Rec I.430 (Blue Book)	ISDN user-network interface; Layer 1 recommendations

3 Definitions

The meaning of the term *round trip delay* can be found in ITU-T Recommendation I.430 (Blue Book), A.2.

Furthermore, for the purposes of this standard, the following definitions apply:

3.1 **cabling**: The assembly of all cables, connections, patch panels and other passive components which comprise the telecommunications infrastructure.

3.2 **network termination**: The functional group on the network side of a user-network interface.

NOTE: A network termination always comprises a transmission part NT1 and optionally a switching part NT2.

3.3 **power feeding**: The function which provides for the capability to transfer power across the interface of the NT.

3.4 **terminal equipment**: The functional group on the user side of a user-network interface.

NOTE: Terminal equipment includes terminal(s), terminal adapter(s) and, if any, NT2 functional group.

4 Abbreviations and symbols

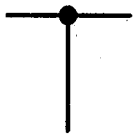
4.1 Abbreviations

IEC	International Electrotechnical Commission
ISDN	Integrated services digital network
ISO	International Organisation for Standardization
NEXT	Near end crosstalk
NT1	Network termination 1
NT2	Network termination 2
S	S reference point
S_0	S_0 interface
T	T reference point
TE	Terminal equipment
TR	Terminating resistor

NOTE: The meanings of the abbreviations S, S_0 and T conform to ITU-T Recommendation I.430.

4.2 Symbols

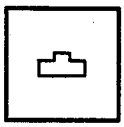
cable



spur with a junction to a cable

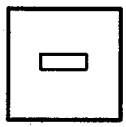
Network Termination

Terminating Resistors



socket to EN 28877

plug to EN 28877



any socket

any plug

5 Design requirements

Signals passing between the NT and TE(s) for the various configurations are subject to attenuation, delay and distortion. Cabling components (including extension cords, adapters, cross connect components, sockets, junction boxes, cables, spurs etc.) and connected terminals all contribute to these effects. The design requirements for the cabling are dependent on the configuration chosen.

5.1 Insertion loss

The insertion loss is measured from the NT to the TR at 96 kHz with 100 Ω source and load impedances. The maximum insertion loss for each configuration is shown in table 1.

Table 1: Maximum insertion loss for each configuration

Configuration	Insertion loss at 96 kHz
Point-to-point	6 dB
Extended passive bus	4 dB
Short passive bus	not critical
Y-configuration	not critical

5.2 Longitudinal conversion loss

The longitudinal conversion loss of the cabling shall be equal to, or greater than, 43 dB when measured at 96 kHz.

5.3 Round trip delay

The round trip delay introduced by the cabling shall not exceed:

a) 2,0 µs for the total cabling of both the short passive bus at 96 kHz and the Y-configuration;

b) 0,5 µs differential round trip delay for the cabling between the first and last socket of the extended passive bus.

These requirements are illustrated in figure 1.

5.4 Power feeding

The length of the cabling may be limited by the cable resistivity, the number of terminals, their power consumption and the capability of the remote power sources.

The loop resistance has to be controlled in order to fulfil the power feeding requirements and to avoid static saturation of inductive components in NT and TEs due to the difference in d.c. resistances of the two wires making up the twisted pair. The d.c. resistance unbalance of the two wires shall not exceed 3 % (see ETS 300 012, subclause 7.2.1.3), if the loop resistance is greater than 5 Ω.

In the majority of cases power is supplied via the phantom of the transmit and receive pairs. In this case only two pairs are used. In some applications a third pair is needed for power source 2 and power sink 2.

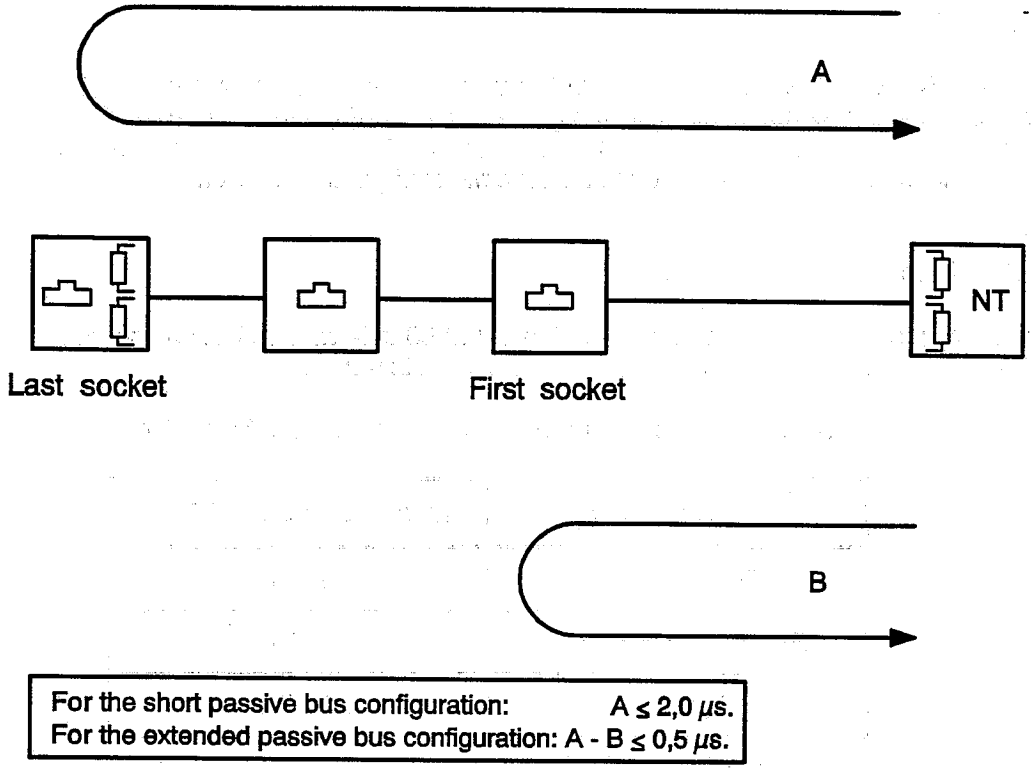


Figure 1: Round trip delay requirements

5.5 Electromagnetic environment

The ISDN basic access is designed to work in most environments. However, its performance may be degraded by interference from external electromagnetic sources (such as motors) and interference from other transmission systems sharing the same cable.

The impulsive noise generated by, for instance, analogue telephony or unbalanced data interfaces, can cause interference with signals carried on the ISDN cabling.

Crosstalk can be limited by using pairs for ISDN basic rate in separate cables or in separate bundles of pairs in the same cable. CENELEC will be developing standards on the subject of sharing different transmission systems in the same cable. Before sharing of ISDN S-bus with other transmission systems in the same cable it shall be verified that they do not interfere with each other.

In noisy environments or adjacent to sensitive equipment, shielded cables may be advisable. Cables routed outside of buildings may require protection devices. The attenuation and capacitance of protection devices shall be taken into account.

5.6 Spurs

Spurs will add capacitance to the cabling; therefore, the length of spurs used for connection of terminal sockets shall not exceed 1 m. The length of a spur used to attach a NT should not exceed 0,5 m.

5.7 Near end crosstalk (NEXT) attenuation

The NEXT attenuation of the cabling shall be greater than 35 dB at 96 kHz. It is recommended that the NEXT attenuation of the cable be greater than 54 dB for satisfactory noise immunity (see 7.1).

6 Configurations

The following design requirements are common to all ISDN basic access user network interface configurations:

a) Where S_0 interfaces can be extended under fallback mode (e. g. when the NT2 is bypassed), further loss and delay will be introduced into the link. The design requirements apply to worst case conditions.

b) The TE may be hardwired to the cable termination. If a TE cord is used it shall comply with EN 28877.

c) Terminating resistors (see 7.3) are needed at both ends of the transmit and receive pairs. Locations are shown in figures 2 to 5. If a specific configuration requires the terminating resistors at the NT, these terminating resistors shall always be present either within the NT or at the connection point between the NT (cord) and the bus cabling.

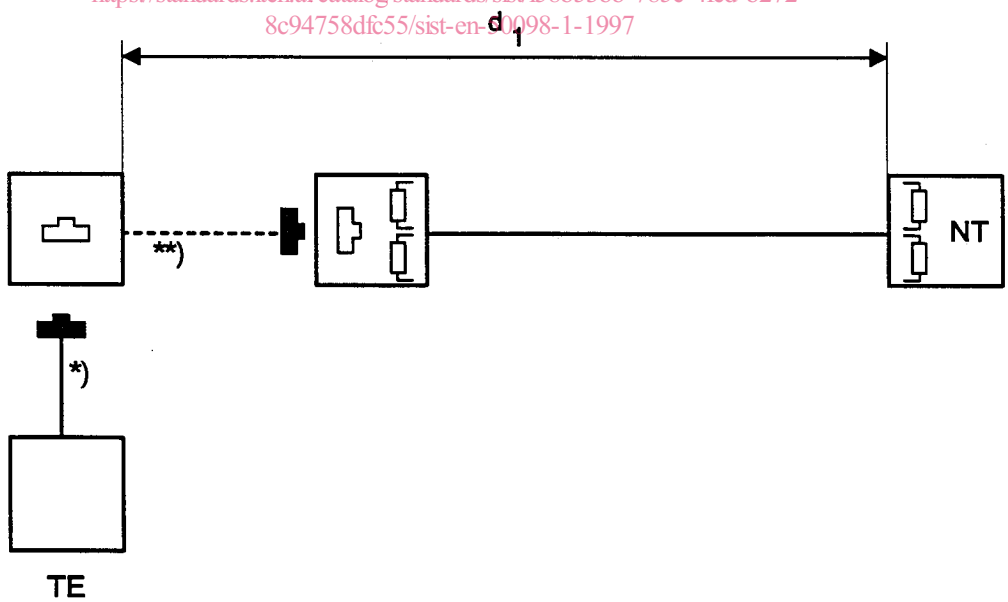
d) The NT may be connected to the cabling in three ways:

- hardwired;
- with a socket integral to the NT;
- via a flexible cord with a plug.

EN 28877 and EN 60603-7 may be applied for the case with a connector at the NT. If however hardwiring is used, it is recommended that a socket complying to EN 28877 and EN 60603-7 be available close to the NT for supervision and maintenance.

6.1 The point-to-point configuration

The point-to-point configuration is illustrated in figure 2.



d_1 Total length of cabling from NT to socket
*) TE connecting cord or integral cord
**) Optional extension cord
Maximum number of sockets = 1
Maximum number of terminals = 1

Figure 2: Point-to-point configuration