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Poslovne telekomunikacije (BTC) - Digitalni zakupljeni vodi za prenosni hitrosti 34 Mbit/s in 140 Mbit/s (D34U, D34S, D140U, D140S) - Omrežni vmesnik

Business TeleCommunications (BTC); 34 Mbit/s and 140 Mbit/s digital leased lines (D34U, D34S, D140U, D140S); Network interface presentation

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Business TeleCommunications (BTC); 34 Mbit/s and 140 Mbit/s digital leased lines (D34U, D34S, D140U and D140S); Network interface presentation

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Business TeleCommunications (BTC) Technical Committee of the European Telecommunications Standards Institute (ETSI).

This ETS resulted from a mandate from the Commission of the European Community (CEC) to provide harmonised standards for the support of the Directive on Open Network Provision (ONP) of leased lines (92/44/EEC).

There are four other standards directly related to this ETS:

- ETS 300 687: "Business TeleCommunications (BTC); 34 Mbit/s digital leased lines (D34U and D34S); Connection characteristics";

- ETS 300 688: "Business TeleCommunications (BTC); 140 Mbit/s digital leased lines (D140U and D140S); Connection characteristics";

- ETS 300 689: "Business TeleCommunications (BTC); 34 Mbit/s digital leased lines (D34U and D34S); Terminal equipment interface";

- ETS 300 690: "Business TeleCommunications (BTC); 140 Mbit/s digital leased lines (D140U and D140S); Terminal equipment interface".

Transposition dates	
Date of adoption of this ETS:	15 March 1996
Date of latest announcement of this ETS (doa):	30 June 1996
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	31 December 1996
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This ETS is based on information from ITU-T Recommendations and ETSI publications and the relevant documents are quoted where appropriate.

Introduction

The Council Directive on the application of Open Network Provision (ONP) to leased lines (92/44/EEC) concerns the harmonisation of conditions for open and efficient access to, and use of, the leased lines provided over public telecommunications networks, and the availability throughout the European Union of a minimum set of leased lines with harmonised technical characteristics.

The 34 Mbit/s and 140 Mbit/s unstructured and structured leased lines are not part of the minimum set of leased lines under the leased line Directive, however these standards are being written with the intention that where 34 Mbit/s or 140 Mbit/s leased lines are offered, they will be in accordance with these harmonised standards.

Under the Second Phase Directive (91/263/EEC), terminal equipment for connection to these leased lines will be required to fulfil certain essential requirements.

ETS 300 166 and ITU-T Recommendation G.703 are used as the basis for the interface presentation requirements.

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1 Scope

This ETS specifies the technical requirements and conformance tests for the network interface presentations of 34 Mbit/s and 140 Mbit/s digital leased lines. This includes:

- the 34 Mbit/s Digital Unstructured leased line operating at 34 368 kbit/s;
- the 140 Mbit/s Digital Unstructured leased line operating at 139 264 kbit/s;
- the 34 Mbit/s digital structured leased line operating at 34 368 kbit/s for the support of an unstructured 33 920 kbit/s information transfer rate;
- the 140 Mbit/s digital structured leased line operating at 139 264 kbit/s for the support of an unstructured 138 240 kbit/s information transfer rate.

A connection is presented via interfaces at Network Termination Points (NTPs). This ETS defines the network interface as presented by the leased line provider and should be used in conjunction with the appropriate companion standard, ETS 300 687 (34 Mbit/s) or ETS 300 688 (140 Mbit/s), which specifies the connection characteristics between NTPs of the leased line. This ETS and the appropriate connection characteristics standard together describe the technical characteristics of the relevant leased line.

This ETS is applicable to leased lines, including part time leased lines, whose establishment or release does not require any protocol exchange or other intervention at the NTP.

This ETS covers the mechanical and electrical characteristics of the network interface and specifies the conformance tests for equipment of the kind that provides the interface presentation. Some of the tests described in this ETS are not designed to be applied to the interface of an installed leased line; such tests may be applied to equipment of the kind used to provide the interface. This ETS does not include details concerning the implementation of the tests nor does it include information on any regulations concerning testing. There is no requirement for each leased line to be tested in accordance with this ETS before it is brought into service or returned into service following repair.

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 into it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1] EN 60950 (1992): "Safety of information technology equipment including electrical business equipment".

[2] IEC 169-8:1978: "Radio frequency connectors - Part 8: R.F coaxial connectors with inner diameters of outer conductor 6,5 mm (0,256 in) with bayonet lock - Characteristic impedance 50 ohms (Type BNC)".

[3] IEC 169-13 (1976): Part 13: "R.F. coaxial connectors with inner diameter of outer conductor 5,6 mm (0,22 in) - Characteristic impedance 75 ohms (Type 1,6/5,6) - Characteristic impedance 50 ohms (Type 1,8/5,6) with similar mating dimensions".

[4] ISO/IEC 10173 (1991): "Information technology - Integrated Services Digital Network (ISDN) primary access connector at reference points S and T".

[5] ITU-T Recommendation G.703 (1991): "Physical/electrical characteristics of hierarchical digital interfaces".

[6] ITU-T Recommendation O.151 (1992): "Error performance measuring equipment for digital systems at the primary rate and above".

NOTE: This ETS also contains a number of informative references which have been included to indicate the sources from which various material has been derived, hence they do not have an associated normative reference number. Details of these publications are given in annex D. In some cases the same publication may have been referenced in both a normative and an informative manner.

3 Definitions and abbreviations

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

3.1 Definitions

leased lines: The telecommunications facilities provided by a public telecommunications network that provide defined transmission characteristics between network termination points and that do not include switching functions that the user can control, (e.g. on-demand switching).

Network Termination Point (NTP): All physical connections and their technical access specifications which form part of the public telecommunications network and are necessary for access to and efficient communication through that public network.

PRBS(2^{23}-1): A Pseudo Random Bit Sequence (PRBS) (as defined in subclause 2.2 of ITU-T Recommendation O.151 [6]).

Safety Extra-Low Voltage (SELV) circuit: A secondary circuit which is so designed and protected that under normal and single fault conditions, the voltage between any two accessible parts and, for class 1 equipment, between any accessible part and the equipment protective earthing terminal does not exceed a safe value (subclause 1.2.8.5 of EN 60950 [1]).

3.2 Abbreviations

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

ac	alternating current
AMI	Alternate Mark Inversion
BNC	Bayonet Nut Connector
CMI	Coded Mark Inversion
D140S	140 Mbit/s Digital Structured leased line
D140U	140 Mbit/s Digital Unstructured leased line
D34S	34 Mbit/s Digital Structured leased line
D34U	34 Mbit/s Digital Unstructured leased line
dc	direct current
EMC	ElectroMagnetic Compatibility
HDB3	High Density Bipolar code 3
NTP	Network Termination Point
ONP	Open Network Provision
ppm	parts per million
PRBS	Pseudo Random Bit Sequence
RX	RX is a signal input (at either the leased line interface or the test equipment, see figure 1)
SELV	Safety Extra-Low Voltage
TX	TX is a signal output (at either the leased line interface or the test equipment, see figure 1)

4 Requirements

These requirements define the network interface presentation for:

- the 34 Mbit/s Digital Unstructured leased line (D34U) which provides a bi-directional point-to-point digital transmission capability with a usable bit rate of 34 368 kbit/s - no structuring of the data is provided, or shall be required, by the network and any structuring is the responsibility of the user;

- the 140 Mbit/s Digital Unstructured leased line (D140U) which provides a bi-directional point-to-point digital transmission capability with a usable bit rate of 139 264 kbit/s - no structuring of the data is provided, or shall be required, by the network and any structuring is the responsibility of the user;

- the 34 Mbit/s Digital Structured leased line (D34S) which provides a bi-directional point-to-point digital transmission capability for the support of an unstructured 33 920 kbit/s information transfer rate; the frame structure in the 34 368 kbit/s bit stream is defined in ETS 300 687 - any structuring of the data within the transparent 33 920 kbit/s part of the frame is the responsibility of the user;

- the 140 Mbit/s Digital Structured leased line (D140S) which provides a bi-directional point-to-point digital transmission capability for the support of an unstructured 138 240 kbit/s information transfer rate; the frame structure in the 139 264 kbit/s bit stream is defined in ETS 300 688 - any structuring of the data within the transparent 138 240 kbit/s part of the frame is the responsibility of the user.

The provision of timing is the responsibility of the user, however in certain installations, the leased line provider may be able to offer a service which is synchronised to the network.

NOTE 1: The network interface is not designed for power feeding capabilities.

NOTE 2: If equipment providing the interface requires a mains supply, the leased line provider should bring this to the attention of the user so that the user can provide mains supply back-up facilities, if required.

The mechanical characteristics, safety, overvoltage protection requirements and ElectroMagnetic Compatibility (EMC) requirements are common for the 34 Mbit/s and 140 Mbit/s leased lines. The electrical characteristics are different and are defined in separate subclauses.

4.1 Mechanical characteristics

Requirement: The network interface shall provide two coaxial 75 Ω sockets, one each for transmit and receive, these sockets being either:

a) 75 Ω sockets (type 1,6/5,6) complying with IEC 169-13 [3]; or

b) 75 Ω BNC sockets complying with the general requirements of IEC 169-8 [2] with the mating dimensions specified in annex B of ISO/IEC 10173 [4].

The outer conductor of the coaxial pair shall be connected to signal ground both at the input port and at the output port.

NOTE 1: When connecting the terminal equipment to the Network Termination Point (NTP), any difference in ground potential between the two equipments may produce a voltage across the signal ground connection and may cause damage. See DEN/EE-02004 for details of earthing requirements within the customer's premises.

NOTE 2: The transmit pair is the output from the network interface. The receive pair is the input to the network interface, as shown in figure 1. Where the terms "output" and "input" are used without qualification in this ETS, they refer to the network interface.

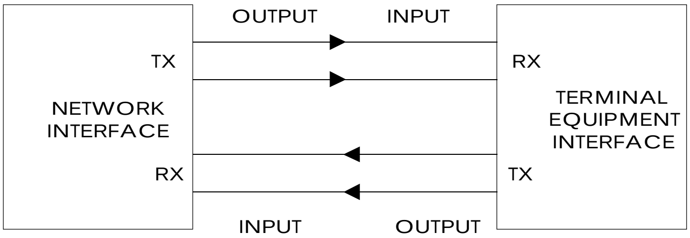

Figure 1

Test: There shall be a visual inspection that the sockets are of the correct type.

4.2 Electrical characteristics - 34 Mbit/s

4.2.1 Output port

4.2.1.1 Signal coding at the output port

Requirement: The signal transmitted at the output port shall comply with the High Density Bipolar code 3 (HDB3) encoding rules (see annex B).

Test: The test shall be conducted according to subclause A.2.1.1.

4.2.1.2 Waveform shape

Requirement: The pulse at the output port shall comply with the requirements given in figure 2 and table 1, based on ITU-T Recommendation G.703.

Test: The test shall be conducted according to subclause A.2.2.1.

Table 1: Waveform shape at output port

Pulse shape (nominally rectangular)	All marks of a valid signal shall conform with the mask (see figure 2). The value V corresponds to the nominal peak voltage of a mark.
Test load impedance	75 Ω non-reactive
Nominal peak voltage V of a mark	1,0 V
Peak voltage of a space	0 ± 0,1 V
Nominal pulse width	14,55 ns
Ratio of the amplitudes of positive and negative pulses at the centre of the pulse interval	0,95 to 1,05
Ratio of the widths of positive and negative pulses at the nominal half amplitude	0,95 to 1,05