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Poslovne telekomunikacije (BTC) - Digitalni zakupljeni vodi za prenosno hitrost 2 048 kbit/s in za nestrukturirane signale (D2048U) - Priključ itvene zahteve za vmesnik terminalske opreme

Business TeleCommunications (BTC); 2 048 kbit/s digital structured leased lines (D2048S); Attachment requirements for terminal equipment interface

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Foreword

This Technical Basis for Regulation (TBR) has been produced by the Business Telecommunications (BTC) Technical Committee of the European Telecommunications Standards Institute (ETSI).

This TBR results from a mandate from the Commission of the European Community (CEC) to provide harmonized standards for the support of the Second Phase Directive (91/263/EEC).

This TBR 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 on public telecommunications networks, and the availability throughout the European Union (EU) of a minimum set of leased lines with harmonized technical characteristics.

The consequence of the Directive is that telecommunications organisations within the EU shall make available a set of leased lines between points in these countries with specified connection characteristics and specified interfaces.

Two classes of standard will be used for the interfaces of terminal equipment designed for connection to the ONP leased lines. European Telecommunications Standards (ETSs), which are voluntary, give the full technical specifications for these interfaces, whereas Technical Basis for Regulations (TBRs) give the essential requirements under the Second Phase Directive (91/263/EEC) for attachment to the leased lines. This TBR is a subset of the corresponding ETS 300 420.

CCITT Recommendations G.703, G.704 and G.706, as qualified by ETS 300 166, are used as the basis for the terminal interface.

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1 Scope

This TBR specifies the attachment requirements and corresponding test principles for a terminal equipment interface for connection to the Network Termination Points (NTPs) of ONP 2 048 kbit/s digital structured leased lines (D2048S) using 120 õ interfaces with an information rate of 1 984 kbit/s without restriction on binary content. A terminal equipment interface that conforms to this TBR will also conform with TBR 012 for connection to an ONP 2 048 kbit/s unstructured leased line.

The term "attachment requirements" in the context of this TBR describes the essential requirements for access which have to be fulfilled under the Second Phase Directive (91/263/EEC). Conformance to these requirements does not guarantee end-to-end interoperability.

This TBR is applicable to all interfaces designed for connection to the ONP 2 048 kbit/s structured leased line. It covers the essential requirements for the physical and electrical characteristics of the terminal equipment interface.

Customer premises wiring and installation between the terminal equipment and the NTP are outside the scope of this TBR.

2 Normative references

This TBR incorporates by dated and 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 TBR only when incorporated into it by amendment or revision. For undated references the latest edition of the publication referred to applies.

[1] CCITT Recommendation G.703 (1991): "Physical/electrical characteristics of hierarchical digital interfaces".

[2] CCITT Recommendation G.704 (1991): "Synchronous frame structures used at primary and secondary hierarchical levels".

[3] CCITT Recommendation O.151 (1992), subclause 2.1: "Error performance measuring equipment for digital systems at the primary rate and above".

[4] CCITT Recommendation O.171 (1992): "Timing jitter measuring equipment for digital systems".

[5] ETS 300 046-3 (1992): "Integrated Services Digital Network (ISDN); Primary rate access - safety and protection, Part 3: Interface I_a - protection".

NOTE: This TBR 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 E. In some cases the same publication may have been referenced in both a normative and an informative manner.

3 Definitions and abbreviations

3.1 Definitions

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

errored Sub-MultiFrame: A Sub-MultiFrame (SMF) where the calculated Cyclic Redundancy Check-4 bit (CRC-4)1 does not correspond with the CRC-4 contained within the next SMF (see subclause C.2.2).

frame: A sequence of 256 bits of which the first 8 bits define the frame structure (see annex C).

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

multiframe: A sequence of two SMFs containing the multiframe alignment word (see annex C).

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^{15}-1): Pseudo Random Bit Sequence (PRBS) (as defined in subclause 2.1 of CCITT Recommendation O.151 [3]).

S_a bits: Bits 4 to 8 (bits S_{a4} to S_{a8}) in frames not containing the frame alignment signal (see annex C).

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).

Sub-Multiframe (SMF): A sequence of 8 frames, each of 256 bits, over which the CRC-4 is calculated (see annex C).

terminal equipment: Equipment intended to be connected to the public telecommunications network, i.e.:

- to be connected directly to the termination of a public telecommunication network; or

- to interwork with a public telecommunications network being connected directly or indirectly to the termination of a public telecommunications network,

in order to send, process, or receive information.

3.2 Abbreviations

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

ac	alternating current
AIS	Alarm Indication Signal
AMI	Alternate Mark Inversion
CRC-4	Cyclic Redundancy Check-4 bit
D2048S	2 048 kbit/s digital structured leased line
dc	direct current
EMC	ElectroMagnetic Compatibility
HDB3	High Density Bipolar code of order 3 (see annex B)
NTP	Network Termination Point
ONP	Open Network Provision

ppm	parts per million
PRBS	Pseudo Random Bit Sequence
RAI	Remote Alarm Indication
RX	RX is a signal input (at either the terminal equipment interface or the test equipment, see figure 1)
SELV	Safety Extra-Low Voltage
SMF	Sub-MultiFrame
TX	TX is a signal output (at either the terminal equipment interface or the test equipment, see figure 1)
TBR-RT	TBR Requirements Table
UI	Unit Interval

4 Requirements

The terminal equipment interface is for use with 2 048 kbit/s structured leased lines which provide bi-directional, point-to-point digital connections with an information transfer rate of 1 984 kbit/s without restriction on binary content. Any structuring of the data within the transparent 1 984 kbit/s part of the frame is the responsibility of the user.

4.1 Physical characteristics

Justification: Without a connection method defined, it is impossible for the terminal equipment to connect to the network, therefore this is required for the terminal equipment to interwork with the network (article 4f).

Currently no standardised connector is readily available. Consequently, the only method of connection that can be specified in this TBR is the use of solid conductors of 0,4 mm to 0,6 mm. This TBR requires the terminal equipment to be capable of presenting either a point for the attachment of unterminated solid conductors, or solid conductors themselves (see subclause 4.1.1). It is a requirement that such a connection method be available to be provided for use with the terminal equipment if necessary.

In order to allow connection to be made using other methods (e.g. connectors), the terminal equipment is permitted to be supplied with a connection method suitable for use with those methods (see subclause 4.1.2).

NOTE 1: The following are examples of arrangements that comply with the requirements. The list below should not be regarded as an exhaustive list of all permitted arrangements:

a) a cord, permanently connected to the terminal equipment at one end and unterminated at the other end, with wires that are solid conductors with diameters in the range 0,4 mm to 0,6 mm;

b) a cord, connected via a plug and socket to the terminal equipment at one end and unterminated at the other end, with wires that are solid conductors with diameters in the range 0,4 mm to 0,6 mm;

c) an insulation displacement connector, designed to accept wires with solid conductors with diameters in the range 0,4 mm to 0,6 mm, but with no cord;

d) a screw connector, designed to accept wires with solid conductors with diameters in the range 0,4 mm to 0,6 mm, but with no cord;

e) the arrangement in b) plus one or more additional alternative cords with the same plug or socket arrangement at the terminal end and any plug or socket at the other end;