SLOVENSKI STANDARD
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Dostop in terminali (AT) - Analogni 4-ģiļ ni zakupljeni vodi z govorno pasovno ģirino ter navadno in posebno kakovostjo (A4O in A4S) - Vmesnik terminalske opreme

Access and Terminals (AT); Ordinary and Special quality voice bandwidth 4-wire analogue leased lines (A4O and A4S); Terminal equipment interface

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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Access and Terminals (AT).

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

There are two other standards directly related to the present document:

- EN 300 451: "Access and Terminals (AT); Ordinary quality voice bandwidth 4-wire analogue leased line (A4O); Connection characteristics and network interface presentation".
- EN 300 452: "Access and Terminals (AT); Special quality voice bandwidth 4-wire analogue leased line (A4S); Connection characteristics and network interface presentation".

The present document is based on information from ITU-T Recommendations and ETSI publications and the relevant documents are quoted where appropriate.

National transposition dates	
Date of adoption of this EN:	29 June 2001
Date of latest announcement of this EN (doa):	30 September 2001
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 March 2002
Date of withdrawal of any conflicting National Standard (dow):	31 March 2002

Introduction

The Council Directive on the application of ONP to leased lines (92/44/EEC), concerns the harmonization 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 (EU) of a minimum set of leased lines with harmonized technical characteristics.

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

Two categories (voluntary and regulatory) of standard were used for the interfaces of terminal equipment designed for connection to the ONP leased lines. Technical Basis for Regulations (TBRs) gave the earlier essential requirements under the Directive 91/263/EEC, later replaced by 98/13/EC, for attachment to the leased lines, whereas other voluntary standards (ETSs or ENs) gave the full technical specifications for these interfaces. The present document, which is based on an earlier ETS, belongs to the second category.

The requirements of TBR 17 are a subset of the present document.

The present version of the present document has been produced to introduce some necessary changes.

ITU-T Recommendations M.1020 and M.1040 were used as the basis for the leased line standards to which this terminal equipment interface relates.

1 Scope

The present document specifies the physical and electrical characteristics (except safety, overvoltage and EMC aspects) and corresponding test principles for a terminal equipment interface for connection to the network termination points of Open Network Provision (ONP) ordinary quality or special quality voice bandwidth 4-wire analogue leased lines defined by EN 300 451 and EN 300 452.

The present document is written only to ensure that the interface of the terminal equipment is compatible with the ONP ordinary quality or special quality voice bandwidth 4-wire analogue leased line. It is applicable to all interfaces designed for connection to these leased lines, however in the cases of apparatus that carries a particular service, of complex apparatus and of apparatus in private networks, other requirements may apply in addition to the present document.

Customer premises wiring and installation between the terminal equipment and the Network Termination Point (NTP) are outside the scope of the present document.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

[1] ISO/IEC 8877 (1992): "Information technology. Telecommunications and information exchange between systems. Interface connector and contact assignments for ISDN Basic Access Interface located at reference points S and T".

[2] ITU-T Recommendation P.56 (1993): "Objective measurement of active speech level".

[3] ITU-T Recommendation P.64 (1999): "Determination of sensitivity/frequency characteristics of local telephone systems".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

leased lines: telecommunications facilities provided by a public telecommunication 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 telecommunication network and are necessary for access to and efficient communication through that public network

reference impedance Z_R: this is 600 Ω. See also clause A.1.2

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

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

in order to send, process, or receive information

voice bandwidth: band of frequencies over the range 300 Hz to 3 400 Hz

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

a	Return loss
DTMF	Dual Tone Multi-Frequency
EMC	ElectroMagnetic Compatibility
NTP	Network Termination Point
ONP	Open Network Provision
p_m	Sound pressure at the mouth reference point (used in the calculation of SLR)
rms	root mean square
RX	RX is a signal input (at either the terminal equipment or the test equipment, see figure 1)
SLR	Sending Loudness Rating
S_{mJ}	Sending sensitivity (used in the calculation of SLR)
S_{mJn}	Sending sensitivity at frequency f_n (used in the calculation of SLR)
TX	TX is a signal output (at either the terminal equipment or the test equipment, see figure 1)
W_{sn}	Sending weighting factor (used in the calculation of SLR)
Z_R	Reference impedance
Z_T	Terminating impedance

4 Requirements

4.1 Physical characteristics

Requirement: The terminal equipment shall provide one or more of the following connection methods:

a) an 8-contact plug of the type specified in ISO/IEC 8877 [1] with contact assignments as specified in table 1;

b) a set of connection contacts (e.g. an insulation displacement connector or screw terminal block) to which solid conductors with diameters in the range 0,4 mm to 0,6 mm may be connected;

c) a wiring arrangement connected by any means to the terminal equipment, with unterminated solid wire conductors with diameters in the range 0,4 mm to 0,6 mm at the distant end from the terminal equipment.

Where a) and c) are provided, these may be detachable by the user such that only one is connected to the terminal equipment at any time.

NOTE: The normal presentation of the leased line is by means of a socket.

Table 1: Contact assignment

Contact number	Terminal equipment
1	Unused
2	Unused
3 & 6	Transmit pair (Output port)
4 & 5	Receive pair (Input port)
7	Unused
8	Unused
NOTE: The transmit pair is the output from the terminal equipment. The receive pair is the input to the terminal equipment as shown in figure 1. Where the terms "output" and "input" are used without qualification in the present document, they refer to the terminal equipment interface.	

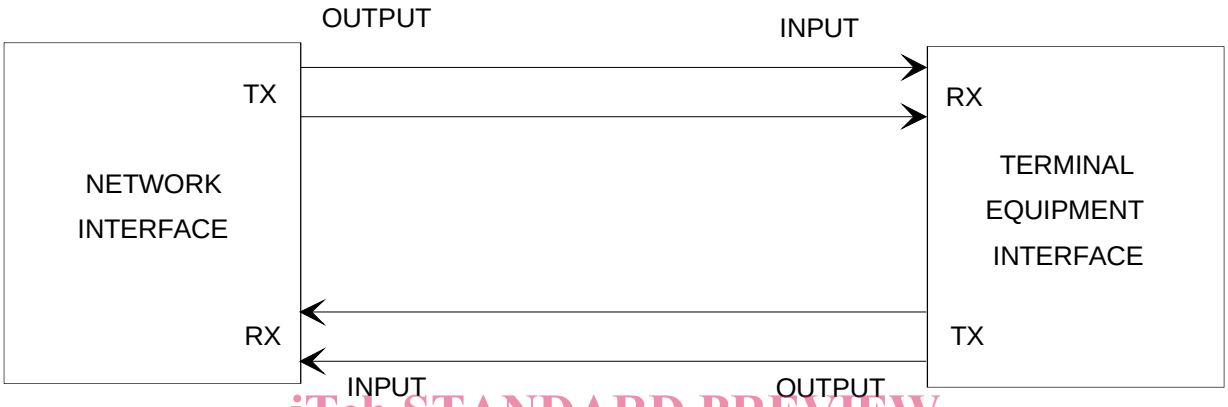

Figure 1: Leased line configuration conventions

Test: There shall be a visual inspection that one or more of the connection methods are provided. The contact assignments and connection methods are tested indirectly through the tests in annex A.

4.2 Electrical characteristics

The requirements of clause 4.2 apply only in the intended operating state of the terminal equipment.

4.2.1 Return loss

Requirement: The return loss of the impedance of the input and output ports of the terminal equipment interface with respect to the reference impedance, in the frequency range 200 Hz to 4 000 Hz, shall be greater than or equal to 8 dB throughout the range when tested using a stimulus signal at a voltage equivalent to that of a signal power of -13 dBm at 1 020 Hz.

Test: The test shall be conducted according to clause A.2.1.

4.2.2 Longitudinal conversion loss

Requirement: The longitudinal conversion loss of the input and output ports of the terminal equipment interface shall be greater than or equal to the values given in table 2 and figure 2.

NOTE: The longitudinal conversion loss specifies the unwanted transverse signal detected by the terminal equipment when a longitudinal signal is applied equally to the terminals of the interface. Certain networks may have high longitudinal signal levels (e.g. 65 V root mean square (rms)); in this case, a higher longitudinal conversion loss may be necessary to ensure adequate operation of the terminal equipment.

Table 2: Longitudinal conversion loss, minimum values

Frequency range	Minimum value
300 Hz to 600 Hz	40 dB
600 Hz to 3 400 Hz	46 dB

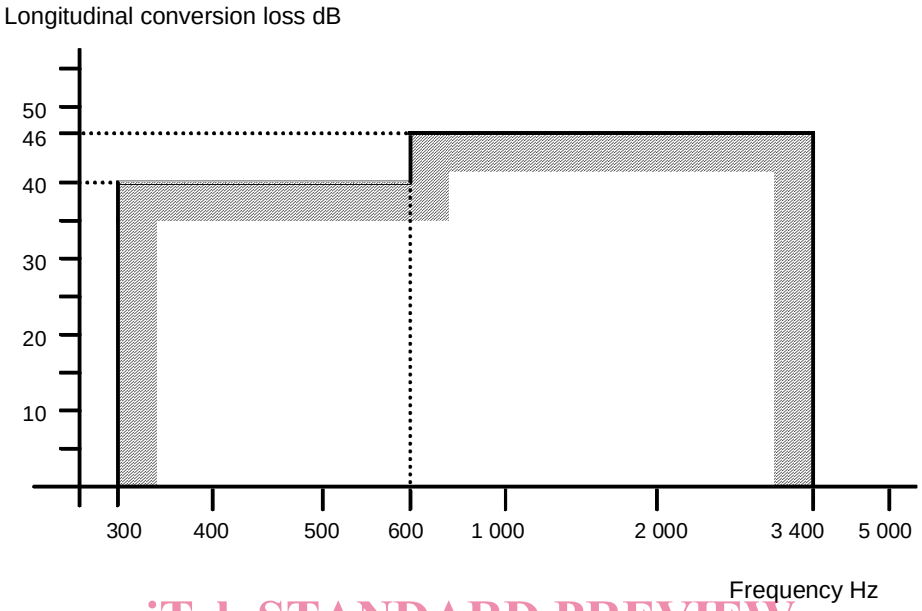

Figure 2: Longitudinal conversion loss, minimum values

Test: The test shall be conducted according to clause A.2.2.

4.2.3 Transmission signals

The source and nature of the output signal from the terminal equipment interface can be classified in several different ways thus dividing the terminal equipments into several non-exclusive categories. One type of terminal equipment may therefore need to be treated as a member of more than one of the categories. For the purposes of the present document the general categories requiring identification are defined as follows:

a) any terminal equipment where the output signal is derived in real time from an integral acoustic interface. See clause 4.2.3.1;

b) any terminal equipment where the output signal is generated electrically within the terminal equipment. See clause 4.2.3.2;

c) any through connecting terminal equipment where the output signal is derived from another electrical interface. See clause 4.2.3.3.

NOTE: Terminal equipments may belong to more than one category. A telephone may be in both category a) for telephony and category b) for the generation of Dual Tone Multi-Frequency (DTMF) tones. A function for generating synthetic or recorded speech or music, such as is found in answering machines or voice mail, is included in category b).