



# SLOVENSKI STANDARD

## SIST EN 300 248 V1.2.1:2004

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**Dostop in terminali (AT) - Digitalni zakupljeni vodi za prenosno hitrost 2 048 kbit/s in za nestrukturirane signale (D2048U) - Vmesnik terminalske opreme**

Access and Terminals (AT); 2 048 kbit/s digital unstructured leased line (D2048U); Terminal equipment interface

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**ICS:**

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# ETSI EN 300 248 V1.2.1 (2001-07)

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*European Standard (Telecommunications series)*

**Access and Terminals (AT);  
2 048 kbit/s digital unstructured leased line (D2048U);  
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 results from a mandate from the European Commission to provide European 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 300 418: "Access and Terminals (AT); 2 048 kbit/s digital unstructured and structured leased lines (D2048U and D2048S); Network interface presentation".
- EN 300 247: "Access and Terminals (AT); 2 048 kbit/s digital unstructured lease line (D2048U); Connection characteristics".

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

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## Introduction

The Council Directive on the application of Open Network Provision (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 on public telecommunications networks and the availability throughout the Community (EC) of a minimum set of leased lines with harmonized technical characteristics.

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

EN 300 166 and ITU-T Recommendation G.703 [1] were used as the basis for the terminal interface.

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. This document, which is based on an earlier ETS, belongs to the second category.

The requirements of TBR 12 are a subset of the present document.

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

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## 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 ONP 2 048 kbit/s digital unstructured leased lines using 120  $\Omega$  interfaces.

The present document is to ensure that the interface of the terminal equipment is compatible with the ONP 2 048 kbit/s digital unstructured leased line. It is applicable to all interfaces designed for connection to the leased line, 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.

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## 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, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

- [1] ITU-T Recommendation G.703 (1998): "Physical/electrical characteristics of hierarchical digital interfaces".
- [2] ITU-T Recommendation O.151 (1992): "Error performance measuring equipment operating at the primary rate and above".

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## 3 Definitions

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

**Leased lines:** 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

**Terminal Equipment (TE):** equipment intended to be connected to the public telecommunications network, i.e.:

- a) to be connected directly to the termination of a public telecommunications network; or
- b) 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.

## 4 Abbreviations

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

D2048U	2 048 kbit/s digital unstructured ONP leased line
DC	Direct Current
EMC	Electro-Magnetic 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(2 <sup>15</sup> -1)	Pseudo Random Bit Sequence (as defined in clause 2.1 of ITU-T Recommendation O.151 [2])
rms	root mean square
RX	Receive (a signal input at either the terminal equipment interface or the test equipment)
SDH	Synchronous Digital Hierarchy
TE	Terminal Equipment
TX	Transmit (a signal output at either the terminal equipment interface or the test equipment)
UI	Unit Interval

## 5 Requirements

The 2 048 kbit/s unstructured leased line provides a bidirectional point-to-point digital leased line with a usable bit rate of 2 048 kbit/s where timing is not provided from the network. The provision of circuit timing is the responsibility of the user. No structuring of the data is provided by the network and any structuring is the responsibility of the user.

### 5.1 Physical characteristics

Currently no standardized connector is readily available. Consequently, the only method of connection that can be specified in the present document is the use of solid conductors of 0,4 mm to 0,6 mm. The present document requires the TE to be capable of presenting either a point for the attachment of unterminated solid conductors, or solid conductors themselves (see clause 5.1.1). It is a requirement that such a connection method be available to be provided for use with the TE if necessary.

In order to allow connection to be made using other methods (e.g. connectors), the TE is permitted to be supplied with a connection method suitable for use with those methods (see clause 5.1.2).

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;
- f) the arrangement in c) or d) plus one or more cords suitable for connection to the terminal equipment at one end and any plug or socket at the other end.

The transmit pair is the output from the terminal equipment interface. The receive pair is the input to the terminal equipment interface, 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.

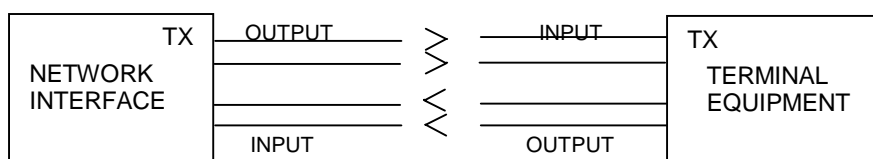


Figure 1

NOTE 2: The use of a shielded cord or cable may be necessary to meet radiation and immunity requirements defined in ElectroMagnetic Compatibility (EMC) standards.

### 5.1.1 Hardwired connection

**Requirement:** The terminal equipment shall provide:

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

**Test:** There is no test. All subsequent tests are carried out via the specified connection method.

### 5.1.2 Alternative means of connection

Any alternative means of connection may be provided in addition to the connection arrangements under clause 5.1.1.

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## 5.2 Electrical characteristics

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### 5.2.1 Output port

#### 5.2.1.1 Signal coding

**Requirement:** Coding of the digital signal transmitted at the output port shall be in accordance with High Density Bipolar code of order 3 (HDB3) encoding rules (see annex B).

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

#### 5.2.1.2 Waveform shape

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

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

**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) irrespective of the polarity. The value V corresponds to the nominal peak voltage of a mark.
Test load impedance	120 $\Omega$ non-reactive
Nominal peak voltage V of a mark	3 V
Peak voltage of a space	0 $\pm$ 0,3 V
Nominal pulse width	244 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