



**SLOVENSKI STANDARD**  
**SIST EN 301 437 V1.1.1:2004**  
**01-oktober-2004**

HYfa ]bUg\_UcdfYa UfH9Ł!`Df]\_`1 ]hj YbYnU hYj YnUj gYYj fcdg\_c`cXcVf]hYj `nU  
df]\_`1 Yj Ub^Y`bUUbUc[ bU^Uj bU\_ca i hfUbUH^YZ`bg\_Uca fYj^UfDGHBgŁ  
hYfa ]bUg\_YcdfYa YfH9Łž\_]`dcXd]fUglcf]hYj [ c j cfbYh^YZ`b]^ždf]\_`UhYf]^Y  
ca fYjbc`bUg^Uj`^Ub^Yž`Y^Y`bUj c`cž]nj YXYbc`g`hcbg\_c`g][ bU]nUW^c`fB HA : Ł

Terminal Equipment (TE); Attachment requirements for pan-European approval for connection to the analogue Public Switched Telephone Networks (PSTNs) of TE supporting the voice telephony service in which network addressing, if provided, is by means of Dual Tone Multi Frequency (DTMF) signalling

**(standards.iteh.ai)**

[SIST EN 301 437 V1.1.1:2004  
https://standards.iteh.ai/catalog/standards/sist/c93901f8-13ed-4f7f-b0ab-415c8b4af8ed/sist-en-301-437-v1-1-1-2004](https://standards.iteh.ai/catalog/standards/sist/c93901f8-13ed-4f7f-b0ab-415c8b4af8ed/sist-en-301-437-v1-1-1-2004)

**Ta slovenski standard je istoveten z: EN 301 437 Version 1.1.1**

**ICS:**

33.040.35 Telefonska omrežja Telephone networks

**SIST EN 301 437 V1.1.1:2004 en**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN 301 437 V1.1.1:2004](https://standards.iteh.ai/catalog/standards/sist/c93901f8-13ed-4f7f-b0ab-415c8b4af8ed/sist-en-301-437-v1-1-1-2004)

<https://standards.iteh.ai/catalog/standards/sist/c93901f8-13ed-4f7f-b0ab-415c8b4af8ed/sist-en-301-437-v1-1-1-2004>

# EN 301 437 V1.1.1 (1999-06)

*Candidate Harmonized European Standard (Telecommunications series)*

**Terminal Equipment (TE);  
Attachment requirements for pan-European  
approval for connection to the analogue  
Public Switched Telephone Networks (PSTNs)  
of TE supporting the voice telephony service in which  
network addressing, if provided, is by means of  
Dual Tone Multi Frequency (DTMF) signalling**

**iTeh STANDARD PREVIEW  
(standards.iteh.ai)**

[SIST EN 301 437 V1.1.1:2004](https://standards.iteh.ai/catalog/standards/sist/c93901f8-13ed-4f7f-b0ab-415c8b4af8ed/sist-en-301-437-v1-1-1-2004)

<https://standards.iteh.ai/catalog/standards/sist/c93901f8-13ed-4f7f-b0ab-415c8b4af8ed/sist-en-301-437-v1-1-1-2004>



---

**Reference**

DEN/ATA-005070 (db000ico.PDF)

---

**Keywords**

DTMF, PSTN, voice, regulation, terminal

**ETSI**

---

**Postal address**

F-06921 Sophia Antipolis Cedex - FRANCE

---

**Office address**

650 Route des Lucioles - Sophia Antipolis  
Valbonne - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C

Association à but non lucratif enregistrée à la  
Sous-Prefecture de Grasse (06) N° 7803/88

<https://standards.etsi.org/standards-search/3ed-4f7f-b0ab-415c8b4af8ed/sist-en-301-437-v1-1-1-2004>

---

**Internet**

[secretariat@etsi.fr](mailto:secretariat@etsi.fr)

Individual copies of this ETSI deliverable  
can be downloaded from

<http://www.etsi.org>

If you find errors in the present document, send your  
comment to: [editor@etsi.fr](mailto:editor@etsi.fr)

---

**Copyright Notification**

No part may be reproduced except as authorized by written permission.  
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 1999.  
All rights reserved.

# Contents

Intellectual Property Rights .....	6
Foreword .....	6
Introduction .....	6
1 Scope .....	8
2 References .....	9
3 Definitions and abbreviations .....	10
3.1 Definitions .....	10
3.1.1 General terms .....	10
3.1.2 States .....	10
3.2 Abbreviations .....	10
4 Requirements .....	10
4.1 General requirement .....	10
4.2 Physical characteristics of the connection to the PSTN .....	10
4.3 Requirements in all conditions .....	11
4.3.1 Polarity .....	11
4.4 General requirements in quiescent state .....	11
4.4.1 DC resistance .....	11
4.4.2 Characteristics of TE for ringing signals .....	11
4.4.2.1 Impedance .....	11
4.4.2.2 Transient response .....	11
4.4.2.3 DC current .....	11
4.4.3 Impedance unbalance about earth .....	11
4.4.4 Resistance to earth .....	11
4.5 Ringing signal detector sensitivity .....	12
4.6 Transition from quiescent to loop state .....	12
4.6.1 Acceptance of breaks in the loop in a call attempt .....	12
4.6.2 Loop current characteristics .....	12
4.7 General loop steady state requirements .....	12
4.7.1 DC characteristics .....	13
4.7.2 Impedance .....	13
4.7.3 Sending level limitations .....	13
4.7.3.1 Mean sending levels .....	13
4.7.3.2 Instantaneous voltage .....	13
4.7.3.3 Voltage level in a 10 Hz bandwidth .....	13
4.7.3.4 Sending levels above 4,3 kHz .....	14
4.7.4 Impedance unbalance about earth .....	14
4.7.4.1 Longitudinal Conversion Loss .....	14
4.7.4.2 Output Signal Balance .....	14
4.7.5 Resistance to earth .....	14
4.8 Call attempt .....	14
4.8.1 Automatic dialling .....	14
4.8.1.1 Dialling without dial tone detection .....	15
4.8.1.2 Dialling with dial tone detection .....	15
4.8.2 DTMF signalling .....	15
4.8.2.1 Frequency combinations .....	15
4.8.2.2 Signalling levels .....	15
4.8.2.2.1 Absolute levels .....	15
4.8.2.2.2 Level difference .....	15
4.8.2.3 Unwanted frequency components .....	15
4.8.2.4 Tone duration .....	16
4.8.2.5 Pause duration .....	16
4.8.3 Automatically repeated call attempts .....	16

4.9	Transition from loop to quiescent state.....	16
4.10	Safety.....	16
4.11	EMC.....	16
<b>Annex A (normative): Test methods.....</b>		<b>17</b>
A.1	General.....	17
A.1.1	Acoustic environment for tests.....	17
A.2	Test impedances and feeding bridge.....	17
A.3	Details for testing voice stimulated TE.....	17
A.3.1	Voice signal to be used during tests.....	17
A.3.1.1	Type.....	17
A.3.1.2	Levels.....	18
A.3.2	Electro-acoustic interfaces.....	19
A.3.2.1	Handset.....	19
A.3.2.2	Hands-free.....	19
A.3.2.3	Headset.....	19
A.3.2.4	Other interfaces.....	19
A.3.3	Electrical interfaces simulations.....	19
A.3.3.1	Analogue 2-wire NTP (Network Termination Point).....	19
A.3.3.2	Analogue 2-wire TCP (TCP of TE behind TCE).....	19
A.3.3.3	Other harmonized interfaces.....	19
A.3.3.4	Non harmonized interfaces.....	19
A.4	Test methods.....	19
A.4.1	General requirement.....	20
A.4.2	Physical characteristics of the connection to the PSTN.....	20
A.4.3	Requirements in all conditions.....	20
A.4.3.1	Polarity.....	20
A.4.4	General requirements in quiescent state.....	20
A.4.4.1	DC resistance.....	20
A.4.4.2	Characteristics of TE for ringing signals.....	20
A.4.4.2.1	Impedance.....	20
A.4.4.2.2	Transient response.....	20
A.4.4.2.3	DC current.....	20
A.4.4.3	Impedance unbalance about earth.....	20
A.4.4.4	Resistance to earth.....	20
A.4.5	Ringing signal detector sensitivity.....	20
A.4.6	Transition from quiescent to loop state.....	21
A.4.6.1	Acceptance of breaks in the loop in a call attempt.....	21
A.4.6.2	Loop current characteristics.....	21
A.4.7	General loop steady state requirements.....	21
A.4.7.1	DC characteristics.....	21
A.4.7.2	Impedance.....	21
A.4.7.3	Sending level limitations.....	21
A.4.7.3.1	Mean sending levels.....	21
A.4.7.3.2	Instantaneous voltage.....	22
A.4.7.3.3	Voltage level in a 10 Hz bandwidth.....	22
A.4.7.3.4	Sending levels above 4,3 kHz.....	22
A.4.7.4	Impedance unbalance about earth.....	22
A.4.7.4.1	Longitudinal Conversion Loss.....	22
A.4.7.4.2	Output Signal Balance.....	22
A.4.7.5	Resistance to earth.....	22
A.4.8	Call attempt.....	22
A.4.8.1	Automatic dialling.....	22
A.4.8.1.1	Dialling without dial tone detection.....	22
A.4.8.1.2	Dialling with dial tone detection.....	22
A.4.8.2	DTMF signalling.....	23
A.4.8.2.1	Frequency combinations.....	23
A.4.8.2.2	Signalling levels.....	23

A.4.8.2.2.1	Absolute levels.....	23
A.4.8.2.2.2	Level difference .....	23
A.4.8.2.3	Unwanted frequency components.....	23
A.4.8.2.4	Tone duration .....	24
A.4.8.2.5	Pause duration .....	24
A.4.8.3	Automatically repeated call attempts .....	24
A.4.9	Transition from loop to quiescent state.....	24
<b>Annex B (normative): Requirements Table (RT).....</b>		<b>25</b>
B.1	Guidance for completion of the RT .....	25
B.1.1	Condition table.....	25
B.1.2	Requirements table .....	25
<b>Annex C (informative): Reasons for omitting 10 Hz signal limitations.....</b>		<b>28</b>
Bibliography .....		29
History.....		30

## iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 301 437 V1.1.1:2004](https://standards.iteh.ai/catalog/standards/sist/c93901f8-13ed-4f7f-b0ab-415c8b4af8ed/sist-en-301-437-v1-1-1-2004)

<https://standards.iteh.ai/catalog/standards/sist/c93901f8-13ed-4f7f-b0ab-415c8b4af8ed/sist-en-301-437-v1-1-1-2004>

---

## Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available **free of charge** from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<http://www.etsi.org/ipr>).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

---

## Foreword

This European Standard (Telecommunications series) has been produced by ETSI Project Analogue Terminals and Access (ATA).

The present document has been produced by ETSI in response to a mandate from the European Commission issued under Council Directive 98/34/EC (as amended) laying down a procedure for the provision of information in the field of technical standards and regulations.

The present document is intended to become a Harmonized Standard as requested by the above mentioned mandate, the reference of which will be published in the Official Journal of the European Communities referencing the Council Directive relating to telecommunications terminal equipment and satellite earth station equipment, including the mutual recognition of their conformity (Directive 98/13/EC [12]).

A common technical regulation may be established by the European Commission in accordance with the Directive.

Technical specifications relevant to the 98/13/EC Directive [12] are given in the Requirements Table (RT) in annex B.

<https://standards.iteh.ai/catalog/standards/sist/c93901f8-13ed-47f-b0ab-415c8b4af8ed/sist-en-301-437-v1-1-1-2004>

### National transposition dates

Date of adoption of this EN:	28 May 1999
Date of latest announcement of this EN (doa):	31 August 1999
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	30 November 1999
Date of withdrawal of any conflicting National Standard (dow):	31 May 2000

---

## Introduction

The existing analogue presentation of Public Switched Telephone Networks (PSTNs) in European countries are technically somewhat different, due to historical reasons. The services being offered to the end users also differ to a certain extent.

Terminal equipment is undergoing constant and rapid development, and it is therefore imperative that the delay in, and cost of, market introduction caused by the approval procedures is the minimum possible. Otherwise, new innovative products may be available to Europe at later dates than to other regions in the world. Also, countries in Europe where the market is comparatively small may never benefit from these products, if the cost of market introduction is too high.



According to directive 98/13/EC [12], a Terminal Equipment (TE) is required, among other things, to:

- not cause harm to the network - Article 5(d);
- be able to inter-work with the network in order to set up, hold, modify, charge for and clear down a connection - Article 5(f);
- inter-work via the public telecommunications network, in justified cases - Article 5(g).

Although different, the networks have some basic commonalities. By restricting the requirements to cover only the inter-working that is essential for the establishment of a call to/from a terminal the signalling aspects can be simplified and harmonized.

The present document specifies a harmonized set of requirements which will allow terminals that are capable of supporting any voice telephony service, to be analogue connected to the existing European PSTNs. It covers all relevant essential requirements in directive 98/13/EC [12]. All safety requirements are covered by the LVD and therefore there are no requirements for Articles 5(a) and 5(b). All EMC requirements are covered by the EMC directive and therefore no requirements for Articles 5(c) are included in the present document. Article 5(e) is not applicable for a non-radio system. Article 5(g) is only applicable for voice terminals that support the voice telephony justified case service.

The present document specifies the connection arrangements (plug or socket, at the supplier's choice) to be provided by the terminal equipment. An adapter may be required between the terminal and the existing national network termination point in individual countries. Such an adapter is outside the scope of the present document.

The pan-European approval requirements for TE access to an analogue presented PSTN are related to the network's capabilities. A single terminal may consume all of this (given) capability, or it can be shared by a number of terminals all being connected to the NTP in an arbitrary combination of parallel and/or series connection in which case the performance of each individual terminal will need to be better than required by the present document to ensure satisfactory inter-working with the network. Connection of terminal equipment in series and/or parallel is a national matter, but guidance may be found in EG 201 120 [1].

NOTE: On certain networks, some lines are unable to provide a line current as high as 18 mA. Where for the purpose of the present document, a TE that has been declared by the manufacturer to be for use only on lines providing a loop current greater than 18 mA, the supplier should convey this limitation in its use to the end user, but the way in which this is expressed is left to the manufacturer.

---

# 1 Scope

The present document specifies the technical characteristics (electrical and mechanical interface requirements and access control protocol) under Articles 5(d) and 5(f) of Directive 98/13/EC [12] to be provided by a single terminal equipment which is intended:

- a) for pan-European approval;
- b) for connection by 2-wires to an analogue interface of a PSTN. This interface is characterized by DC loop seizure and clearing, uses low frequency AC ringing signals below the speech pass-band to indicate an incoming call and in the transmission phase has an approximate bandwidth of 3 kHz at the network termination point; and
- c) for supporting any voice telephony service.

The objective of the present document is to ensure that no harm occurs to the public network, and to ensure inter-working between the network and a single terminal so that calls can be routed successfully through the network.

The present document applies to terminal equipment that is intended to originate and/or receive calls. Where it is intended to originate calls the present document specifies the requirements for DTMF signalling. If other signalling methods are provided, in addition to DTMF, these other signalling methods, if they are intended to be used in certain European countries, may be subject to additional national regulations.

A test is given for each requirement in the present document including measurement methods. The terminal equipment may be stimulated to perform the tests by additional equipment if necessary.

The present document specifies the connection arrangements (plug or socket, at the suppliers choice) to be provided by the terminal equipment. An adapter may be required between the terminal and the existing national network termination point in individual countries. Such an adapter is outside the scope of the present document.

Where the origination or reception of calls by the terminal equipment is invoked, or otherwise controlled, by other equipment external to the terminal equipment, the terminal equipment still needs to be capable of fulfilling the essential requirements under Articles 5(d) and 5(f) at the interface to the public network. The present document requires the manufacturer or supplier of the terminal equipment to declare the conditions met by such external devices so that their use does not cause the terminal equipment to fail to meet the essential requirements.

NOTE 1: Terminal to terminal inter-operability for handset telephony is addressed in TBR 38 [9].

NOTE 2: Facilities for Supplementary signalling (e.g. reception of metering pulses from the network) if provided in the terminal, and intended to be used in certain European countries, may be subject to the appropriate National Regulations.

NOTE 3: The Electromagnetic Compatibility (EMC) and safety requirements fall beyond the scope of the present document. These requirements are covered by Directives 89/336/EEC [11] (EMC) and 73/23/EEC [10] (Safety).

## 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, subsequent revisions do apply.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

- [1] EG 201 120: "Public Switched Telephone Network (PSTN); Method of rating terminal equipment so that it can be connected in series and/or in parallel to a Network Termination Point (NTP)".
- [2] ITU-T Recommendation P.38: "Transmission characteristics of operator telephone systems (OTS)".
- [3] ITU-T Recommendation P.51: "Artificial mouth".
- [4] ITU-T Recommendation P.64: "Determination of sensitivity/frequency characteristics of local telephone systems".
- [5] ITU-T Recommendation P.59: "Artificial conversational speech".
- [6] ITU-T Recommendation P.340: "Transmission characteristics of hands-free telephones".
- [7] TBR 10: "Digital Enhanced Cordless Telecommunications (DECT); General terminal attachment requirements: Telephony applications".
- [8] TBR 21: "Terminal Equipment (TE); Attachment requirements for pan-European approval for connection to the analogue Public Switched Telephone Networks (PSTNs) of TE (excluding TE supporting the voice telephony service) in which network addressing, if provided, is by means of Dual Tone Multi Frequency (DTMF) signalling".
- [9] TBR 38: "Public Switched Telephone Network (PSTN); Attachment requirements for a terminal equipment incorporating an analogue handset function capable of supporting the justified case service when connected to the analogue interface of the PSTN in Europe".
- [10] 73/23/EEC: "Council Directive of 19 February 1973 on the harmonization of the laws of the Member States relating to electrical equipment designed for use within certain voltage limits".
- [11] 89/336/EEC: "Council Directive of 3 May 1989 on the approximation of the laws of the Member States relating to electromagnetic compatibility".
- [12] 98/13/EC: "Directive of the European Parliament and of the Council of 12 February 1998 relating to telecommunications terminal equipment and satellite earth station equipment, including the mutual recognition of their conformity".
- [13] TR 101 149: "2-wire analogue voice band interfaces; Terminal Equipment transmitting voice signals; Test simulation for level limitation requirements".
- [14] ITU-T Recommendation G.101: "The transmission plan".
- [15] 98/34/EC: "Directive of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations".

## 3 Definitions and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions given in TBR 21 [8] and the following apply.

#### 3.1.1 General terms

As defined in TBR 21 [8].

#### 3.1.2 States

As defined in TBR 21 [8].

### 3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply together with those in TBR 21 [8].

dB	decibel
dBPa	sound pressure level with respect to 1 Pa, expressed in dB
dBV <sub>emf</sub>	voltage level (rms) with respect to 1 V <sub>emf</sub> , expressed in dB
emf	electromotive force
HFRP	Hands-Free Reference Point
ICP	Installation Connection Point, see EG 201 120 [1]
ITU	International Telecommunication Union
MRP	Mouth Reference Point
Pa	Pascal
TCE	Through Connected Equipment
TBR	Technical Basis for Regulation

## 4 Requirements

**Requirement:** The requirement of clause 4 of TBR 21 [8] shall apply.

**Justification:** 98/13/EC [12], Article 5(f); Inter-working with the PSTN requires the TE to be capable of sending signals to and/or receiving signals from the PSTN.

### 4.1 General requirement

**Requirement and test:** The requirement and the associated test of subclause 4.1 of TBR 21 [8] shall apply.

**Justification:** 98/13/EC [12], Articles 5(d) and 5(f). Where the origination or reception of calls by the TE is invoked, or otherwise controlled by other equipment external to the TE, the TE should still be capable of fulfilling the essential requirements of the directive at the interface to the public network.

### 4.2 Physical characteristics of the connection to the PSTN

**Requirement and test:** The requirement and the associated test of subclause 4.2 of TBR 21 [8] shall apply. In the case of multiline equipment the TCP may be presented to the NTP using other methods of connection.

**Justification:** 98/13/EC [12], Article 5(f); Inter-working with the PSTN requires a TE to be galvanically connected to the two wires presented by the network at the NTP. To facilitate the use of adapters, the TE requires a known type of connection arrangement.