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Public Switched Telephone Network (PSTN); Category II specification for 1 200 bits per second half duplex and 1 200/75 bits per second asymmetrical duplex modems standardized for use on the PSTN

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**Public Switched Telephone Network (PSTN);
Category II specification for 1 200 bits per second
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duplex modems standardized for use on the PSTN**

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Foreword

This second edition European Telecommunication Standard (ETS) has been produced by the Terminal Equipment (TE) Technical Committee of the European Telecommunications Standards Institute (ETSI).

This ETS contains the technical characteristics required for end-to-end interworking over the Public Switched Telephone Network (PSTN) for 1 200 bit/s half duplex and 1 200/75 bit/s asymmetrical duplex modems standardized for use over the PSTN.

These requirements are based upon, and do not conflict with, CCITT Recommendation V.23 [3] except in the case of subclause 5.3.1 where the frequency tolerances specified are tighter than those given. Additionally, requirements are included relating to end-to-end inter-operability over PSTN connections. Such requirements are in excess of the CCITT/ITU-T Recommendations.

Except where otherwise stated, a modem which complies with CCITT Recommendation V.23 [3] should always meet the requirements of this ETS which relate to parameters specified in that CCITT Recommendation.

Clause 4 of this ETS references the requirements common to both Category I and II modems, which are contained in final draft prETS 300 114 [1], clause 4. The definitions for Category I and Category II modems can be found in the foreword of final draft prETS 300 114 [1].

Clause 5 of this ETS contains Category II requirements specific to 1 200 bits per second half duplex and 1 200/75 asymmetrical duplex modems. In the case of certain functions common to a number of different types of modem (e.g. Auto-answering sequence) reference is made to clause 5 of final draft prETS 300 114 [1] which contains the relevant requirements.

Transposition dates	
Date of adoption of this ETS:	26 April 1996
Date of latest announcement of this ETS (doa):	31 August 1996
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	29 February 1997
Date of withdrawal of any conflicting National Standard (dow):	29 February 1997

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1 Scope

This ETS contains the technical characteristics required for end-to-end interworking over the Public Switched Telephone Network (PSTN) of modems supporting:

- half duplex operation over the PSTN at 1 200 bit/s; and/or
- asymmetrical duplex operation over the PSTN at 1 200/75 bit/s

standardized for use over the PSTN, in accordance with CCITT Recommendation V.23 [3].

The objective of this specification, the application of which is entirely voluntary, is to provide the users with an added degree of assurance that modems in compliance with this specification can interwork with each other, under most network conditions.

The term "modem" in the context of this ETS includes all physical implementation practices for a voice band modem, which is conductively connected to the PSTN.

This ETS specifies up to four modes of operation/use (see subclause 5.2).

This ETS also contains descriptions of the tests to be performed in order to confirm compliance with the functional requirements contained herein. A general description of the test conditions and test requirements is given in annex A (normative).

NOTE: To aid reading, the term "forward channel" is sometimes used to describe the channel capable of transmitting up to 1 200 bit/s, and the term "backward channel" is similarly used to describe the channel capable of transmitting up to 75 bit/s.

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

- [1] Final draft prETS 300 114 (1996): "Public Switched Telephone Network (PSTN); Basic Category I and Category II specification for modems standardized for use on the PSTN".
- [2] ETS 300 001: "Attachments to Public Switched Telephone Network (PSTN); General technical requirements for equipment connected to an analogue subscriber interface in the PSTN".
- [3] CCITT Recommendation V.23 (1984): "600/1200-baud modem standardized for use in the general switched telephone network".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this ETS, the definitions contained in final draft prETS 300 114 [1] apply, together with the following:

degree of start-stop distortion: In start-stop transmission the ratio of the maximum measured difference, irrespective of sign, between the actual and theoretical intervals separating any significant instant from the significant instant of the start element immediately preceding it, to the unit interval. The highest absolute value of degrees of individual distortion of the significant instants of a start-stop signal is reached within a specific time interval. The degree of distortion of start-stop modulation, restitution or signal is expressed as a percentage. The result of measurement is completed by an indication of the period of the observation. The start-stop distortion is positive when the significant instant occurs after the ideal instant and conversely, negative when it occurs before.

degree of synchronous start-stop distortion: Determined when the assumed unit interval is that appropriate to the actual modulation rate. The degree of synchronous start-stop distortion is measured by adjusting the scanning rate of the distortion measuring set. The start-stop distortion is positive when the significant instant occurs after the ideal instant and conversely, negative when it occurs before. For the determination of the actual mean modulation rate, account is only taken of those significant instants of modulation (or restitution) that correspond to a change on the same sense as that occurring at the beginning of the start element.

3.2 Abbreviations

For the purposes of this ETS, the abbreviations given in final draft prETS 300 114 [1] apply:

RFS	Ready For Sending
TE	Terminal Equipment

4 General requirements

4.1 References to other ETSS

The modem shall comply with final draft prETS 300 114 [1], clause 4.

NOTE: Final draft prETS 300 114 [1] in turn refers to ETS 300 001 [2] for the majority, if not all, of its requirements.

4.2 Information to be provided by the applicant

4.2.1 Information required for testing purposes

The applicant shall declare for which of the modes of operation/use identified in this ETS, the modem is supposed to undergo tests.

Compliance will be considered to have been accomplished by provision of the relevant information.

NOTE: This may be carried out by completion of forms such as those provided in annex B.

4.2.2 Instructions for use

Instructions for use shall be made available with the apparatus. The instructions for use shall include:

- the apparatus or types of apparatus to which the instructions apply;
- any information specifically indicated in this ETS for inclusion in the "Instructions for use"; and
- any national restrictions on the use of the apparatus.

For the purpose of compliance with this ETS, any additional information shall be disregarded unless it is subject of another ETS.

Compliance shall be checked by inspection.

5 Functional requirements specific to Category II modems

5.1 General requirements

To comply with the requirements of this ETS, it shall be necessary that the modem provide:

- half-duplex mode with switched carrier or asymmetrical duplex mode of operation/use with continuous carriers, as specified in CCITT Recommendation V.23 [3];
- frequency shift binary modulation with synchronous or asynchronous mode of use;
- signalling rates of up to 1 200 bit/s in the forward channel and, optionally, of up to 75 bit/s in the backward channel.

NOTE 1: In the following, references are made to interchange circuits between the modem and the DTE, as defined in CCITT Recommendation V.24. DTEs using certain customised modems will generally not provide an interface with such interchange circuits. For these cases the references to V.24 type interchange circuits indicate equivalent functionality of a DTE and a modem.

NOTE 2: With asymmetrical duplex modems providing a CCITT Recommendation V.24 interface, it is common practice to provide the interchange circuit for the 75 bit/s channel on the relevant pin for the 1 200 bit/s channel.

5.2 Modes of operation/use

It shall be possible to configure the modem to operate in at least one of the following modes of operation/use:

- a) 1 200/1 200 bit/s half duplex asynchronous;
- b) 1 200/75 bit/s asymmetrical duplex asynchronous;
- c) 75/1 200 bit/s asymmetrical duplex asynchronous;
- d) 1 200/1 200 bit/s half duplex synchronous.

It is the applicant's responsibility to specify for which of these modes of operation/use the modem is supposed to undergo tests.

NOTE 1: In the above representation, the first number indicates the rate at which data is received, and the second number indicates the rate at which data is transmitted.

NOTE 2: In this ETS, a clear distinction cannot be made between mode of operation and mode of use, and therefore no attempt has been made to separate the above list into these categories.

5.3 Line signals

The channels defined are within the telephone bandwidth.

NOTE: The allocation of channels is described in subclause 5.5.

5.3.1 Carrier frequencies

The nominal characteristic frequencies are listed in table 1:

Table 1: Frequency allocation

	Binary 0 (Fa)	Binary 1 (Fz)
1 200 bit/s chl	2 100 Hz	1 300 Hz
75 bit/s chl	450 Hz	390 Hz

For modes a), c) and d), as defined in subclause 5.2, the characteristic frequencies Fa and Fz as measured at the line terminals of the modem shall not deviate by more than ± 3 Hz for the 1 200 bit/s channel; and for mode b) ± 2 Hz for the 75 bit/s channel (if provided in the modem) from those given in table 1.

NOTE: These frequency tolerances are tighter than those specified by CCITT Recommendation V.23 [3].

Compliance shall be checked by the method described in annex A, clause A.2.

5.3.2 Spectral power

The national network dependent spectral power limits are given in final draft prETS 300 114 [1], clause 4.

NOTE: This refers in turn to ETS 300 001 [2].