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**Digital cellular telecommunications system (Phase 2+) (GSM);  
Universal Mobile Telecommunications System (UMTS);  
Cellular text telephone modem;  
Minimum performance requirements  
(3GPP TS 26.231 version 14.0.0 Release 14)**



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**ETSI**

650 Route des Lucioles  
F-06921 Sophia Antipolis Cedex - 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-Préfecture de Grasse (06) N° 7803/88

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## Foreword

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# Foreword

This technical description has been produced by the 3<sup>rd</sup> Generation Partnership Project, Technical Specification Group Services and System Aspects, Working Group 4 (Codec).

The present document is a description of the Cellular Text Telephone Modem solution for reliable transmission of a text telephone conversation via the speech channel of cellular or PSTN networks.

The contents of the present document is subject to continuing work within 3GPP and may change following formal 3GPP approval. Should the 3GPP TSG modify the contents of this TS, it will be re-released by the 3GPP TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

- x the first digit:
  - 1 presented to 3GPP for information;
  - 2 presented to 3GPP for approval;
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- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the specification;

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# 1 Scope

This Technical Standard (TS) describes the minimum performance requirements for the Cellular Text Telephone Modem (CTM) for reliable transmission of text telephone text via the speech channel of cellular or PSTN networks. The transmitting parts of the Cellular Text Telephone Modem are specified in [1].

CTM is a general technology, independent of text telephone types. The tests are made only for one specific type of text telephone, the Baudot type. The tests are applicable only to a combination of a Baudot codec and CTM and tests the combined performance. A bit-exact implementation of the CTM transmitter as well as an example implementation of the remaining functions of such a combination are provided in [2].

The test scripts and test vectors required to perform this testing are included in a supplement, which is located in the zip archive `ctm_testing.zip`. The path and file names given in this specification refer to the file structures associated with this supplement. A second supplement (zip archive `ctm_score.zip`) provides the scoring program that is described in clause 6.

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# 2 Normative 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. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

- [1] 3GPP TS 26.226: "Cellular Text Telephone Modem (CTM), General Description".
- [2] 3GPP TS 26.230: "Cellular Text Telephone Modem (CTM), Transmitter Bit Exact C-Code".
- [3] TIA/EIA-IS 840: "Minimum Performance Standards for Text Telephone Signal Detector and Text Telephone Signal Regenerator".
- [4] GSM 05.02: "Digital cellular telecommunications system (Phase 2+); Multiplexing and multiple access on the radio path".
- [5] GSM 05.05: "Digital cellular telecommunications system (Phase 2+); Radio transmission and reception".

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# 3 Definitions and abbreviations

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

AMR	Adaptive Multi Rate Codec
CTM	Cellular Text Telephone Modem
FR	Full Rate Codec
HCO	Hearing Carry Over, (individual may be able to hear, but cannot speak); Alternating of sending speech and text.
MS	Mobile Station
PCM	Pulse Code Modulation
PCS	Personal Communication System
TCER	Total Character Error Rate
TTY	Text Telephone
VCO	Voice Carry Over, Alternating use of speech and text