



SLOVENSKI STANDARD
SIST EN 302 403 V7.2.1:2003
01-december-2003

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Digital cellular telecommunications system (Phase 2+) (GSM); GSM Cordless Telephony System (CTS), Phase 1; Service description; Stage 1 (GSM 02.56 version 7.2.1 Release 1998)

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Ta slovenski standard je istoveten z: **EN 302 403 Version 7.2.1**

ICS:

| | | |
|-----------|---|--|
| 33.070.50 | Globalni sistem za mobilno telekomunikacijo (GSM) | Global System for Mobile Communication (GSM) |
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ETSI EN 302 403 V7.2.1 (2000-08)

European Standard (Telecommunications series)

**Digital cellular telecommunications system (Phase 2+);
GSM Cordless Telephony System (CTS), Phase 1;
Service description;
Stage 1
(GSM 02.56 version 7.2.1 Release 1998)**

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Reference

DEN/SMG-010256Q7

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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

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Special Mobile Group (SMG).

The present document was submitted to Public Enquiry with the ETSI number 301 403. For vote the number was changed to 302 403 because the number 301 403 is reserved and was allocated accidentally.

The present document specifies the stage 1 description for the Cordless Telephony System (CTS) within the digital cellular telecommunications system.

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

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- 7 Indicates GSM Phase 2+ Release 1998,
 - x the second digit is incremented for technical enhancements, corrections, updates, etc
 - y the third digit is incremented when editorial only changes have been incorporated in the specification.

National transposition dates

| | |
|--|-----------------|
| Date of adoption of this EN: | 21 July 2000 |
| Date of latest announcement of this EN (doa): | 31 October 2000 |
| Date of latest publication of new National Standard or endorsement of this EN (dop/e): | 30 April 2001 |
| Date of withdrawal of any conflicting National Standard (dow): | 30 April 2001 |

Introduction

Today, there exists a clear distinction between the public mobile telephone systems for wide area coverage on the one hand, and private cordless telephone systems for local area coverage on the other hand. Recently, attempts have been made to integrate the wide area cellular and the local area cordless function into one and the same Mobile Equipment (ME). However, because of the incompatibility between the existing cellular and cordless standards, this results in ME implementations with rather low cost-efficiency.

The intention of the GSM Cordless Telephony System (CTS) is therefore to provide cordless functionality to a standard GSM Mobile Station (MS) with minimum impact on the MS. The impact would ideally be limited to an upgrade of the ME and SIM software. This can only be accomplished if the radio interface of the cordless system is identical, or very similar, to the standard GSM radio interface.

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1 Scope

The scope of the present document is to describe the Service aspects of a GSM Cordless Telephony System (CTS), which provides the possibility for users of GSM terminals to have cordless access to a fixed network, such as PSTN/ISDN or a radio network such as GSM..

Due to the time constraints to have a first specification ready for market needs, a phased approach is necessary. The first phase aims primarily at an application supporting the speech teleservice (including DTMF support) in a residential single cell environment. The focus is on the requirements necessary to elaborate the radio interface and the security aspects for such an application.

To not prevent or impede the evolution of CTS to additional services and functions, later phases may have to be considered when now defining the means to fulfil the above mentioned requirements for the first phase of CTS. Therefore, additional support on the CTS radio interface for later phase services (e.g. SMS, subscriber authentication and GSM supplementary services), is included already in CTS Phase 1, provided that such services are clearly defined. Other expected services and functions in later phases are included in Annex A.

The standardisation of the physical layers of the GSM-CTS fixed network interface is not in the scope of the present document. However, consideration may need to be given to communication of application data between CTS and PLMN via the fixed network.

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.
- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.
- For this Release 1998 document, references to GSM documents are for Release 1998 versions (version 7.x.y).

- [1] GSM 01.04: "Digital cellular telecommunication system (Phase 2+); Abbreviations and acronyms".
- [2] GSM 02.07: "Digital cellular telecommunications system (Phase 2+); Mobile Stations (MS) features".
- [3] GSM 02.09: "Digital cellular telecommunications system (Phase 2+); Security aspects".
- [4] GSM 02.81: "Digital cellular telecommunication system (Phase 2+); Line identification Supplementary Services - Stage 1".
- [5] GSM 02.96: "Digital cellular telecommunication system (Phase 2+); Name identification Supplementary Services - Stage 1".
- [6] GSM 03.40: "Digital cellular telecommunications system (Phase 2+); Short Message Service (SMS)".
- [7] ETSI ETS 300 111 (1992): "Integrated Services Digital Network (ISDN); Telephony 3,1 kHz teleservice, service description".
- [8] ETSI ETS 300 109 (1992): "Integrated Services Digital Network (ISDN); Circuit-mode 64 kbit/s 8 kHz structured bearer service category usable for speech information transfer; Service description".

- [9] ETSI ETS 300 110 (1992): "Integrated Services Digital Network (ISDN); Circuit-mode 64 kbit/s 8 kHz structured bearer service category usable for 3,1 kHz audio information transfer; Service description".
- [10] ETSI EN 301 144-1 V1.1.1 (1998-01): "The Signalling application for the mobility management service on the alpha interface; Part 1: Protocol specification".
- [11] GSM 02.30: "Digital cellular telecommunication system (Phase 2+); Man Machine Interface (MMI) of the Mobile Station (MS)".
- [12] GSM 05.05: "European digital cellular telecommunication system (Phase 2+); Radio transmission and reception".

3 Definitions and abbreviations

3.1 Definitions

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

FP Enrolment: The procedure where a CTS-FP is loaded with data necessary to obtain CTS operation. After this procedure CTS operation may commence.

MS Enrolment: The procedure where a CTS-MS is associated for the first time with a CTS-FP. After this procedure CTS-MS has access to this CTS-FP.

Attachment: The procedure where an MS attaches to a certain CTS-FP. When attached, it is possible to make and receive calls via the CTS-FP. The CTS-MS must have been initialised correctly to the CTS-FP before attachment can take part.

Generic Frequency List (GFL): The Generic Frequency List (GFL) contains all absolute radio frequency channel numbers (ARFCN), as defined in GSM 05.05, on which the CTS-FP is allowed to operate. The CTS-FP will never use frequencies which are not listed in the GFL.

CTS Mobile Station: A GSM MS with CTS capability.

CTS Fixed Part: The CTS-FP is a device which offers a personal cordless coverage and acts as a link between the CTS-MS and the fixed network or the GSM network.

GSM Operator: The GSM operator is the operator who provides GSM cellular service to the MS.

CTS licence exempt frequencies: A frequency band that may be allocated by national regulator to CTS usage outside of a GSM licence allocated to a GSM operator.

CTS operator: The CTS operator is the operator who provides the GFL to the CTS-FP. The CTS operator may be the same than the GSM operator.

FP-SIM: The FP-SIM is the SIM card inserted in the CTS-FP, which materialised the CTS subscription. The FP-SIM belongs to the CTS operator.

CTS subscription: When a GSM licensed band is used, the right to use a CTS operator's frequency spectrum for communication between a CTS-FP and CTS-MS(s).

CTS-FP owner: A person who has the CTS-FP control and may authorise MS Enrolment.

CTS user: A person who has a CTS-MS which is allowed to do CTS operations.

CTS-MS local number: A number in the range of 0-99 optionally assigned to the CTS-MS at enrolment. This number is used for CTS internal calls.

CTS-Roaming: The right for an additional CTS-MS to be enrolled to a CTS-FP which is initialised to an operator other than the HPLMN operator of the additional CTS-MS.

3.2 Abbreviations

In addition to those below, abbreviations used in the present document are listed in GSM 01.04.

| | |
|--------|---|
| CTS | Cordless Telephony System |
| CTS-FP | Cordless Telephony System - Fixed Part |
| CTS-MS | Cordless Telephony System - Mobile Station |
| FP-SIM | Fixed Part – Subscriber Identity Module |
| GFL | Generic Frequency List |
| IFPEI | International Fixed Part Equipment Identity |
| ISDN | Integrated Services Digital Network |
| MS | Mobile Station |
| PSTN | Public Switched Telephone Network |
| SMS-MO | Short Message Service - Mobile Originated |
| SMS-MT | Short Message Service - Mobile Terminated |

4 Description

4.1 System overview

The GSM Cordless Telephone System (GSM-CTS) described in the present document is a radio communications system based on a GSM-compatible cellular interface between a private radio base station called CTS Fixed Part (CTS-FP) and a CTS mobile station (CTS-MS). The CTS-FP is connected either via a wireline to the PSTN/ISDN network or via a radio connection to a GSM network.

When connected to the fixed network, the CTS-FP will be compliant with the existing fixed network standards (e.g. support the telephony 3,1 kHz teleservice (see [7]), the speech bearer service (see [8]) and the 3,1 kHz audio bearer service (see [9]) in case of an ISDN CTS-FP and the relevant national standards in case of PSTN CTS-FP). There is no direct radio communication between different CTS-FPs. However, this does not preclude indirect communication, e.g. via the fixed network or via the MS.

When connected to a GSM network, the CTS-FP is compliant with the existing ETSI standards applicable to a GSM mobile. From the GSM network point of view, the CTS-FP is seen as a standard GSM mobile including a standard GSM SIM card. (i.e. the CTS-FP may include 2 SIM cards: one for the GSM subscription and one for the CTS subscription).

An illustration of the CTS concept is shown in figure 1. Due to the low transmit power of the CTS-FP, the coverage area is restricted and limited. When the CTS-MS comes in range of the CTS-FP, it may attach to the CTS. When connected to the fixed network, from then on, the user can make and accept calls directly via the PSTN without the intervention of the public cellular network. When attached, the MS checks whether it is still in range of the CTS and whether it is paged. As an option, the MS may simultaneously work in both the cellular and the cordless mode, in a so called parallel mode, i.e. be attached both in the GSM PLMN and the CTS. When the MS comes out of range of the CTS it may switch to the GSM mode. This switch shall be indicated to the user. When the CTS-MS is in either CTS mode or GSM mode and is searching for a potential channel to attach with in the other mode, it shall be able to respond to paging messages from the mode in which it is currently attached.

The radio interface between the CTS-FP and the CTS-MS is a modified GSM interface. The carrier frequencies used are the same as assigned for cellular service. These carrier frequencies can be part of a licence exempt band or a licensed band.

When CTS-FP operates in a licenced band:

- these frequencies can be reserved by the operator for GSM-CTS usage, or can be shared with the cellular system. In every case, however, the GSM operator controls, on an area and time basis, on which frequencies the CTS is allowed to operate. In case of co-existence in the same operating area, a procedure shall be deployed to minimise interference between GSM PLMN and CTS users.

NOTE: The frequencies used for CTS could be in any frequency band defined for GSM, i.e. GSM900, DCS1800 or PCS1900. This applies both to the CTS-FP and the CTS-MS.