SLOVENSKI STANDARD
SIST ETS 300 930 E1:2003

01-december-2003

8][ ]HǓb]˙WY˙] b]˙hΥY_ca i b]_UWΥ^g_]˙g]ghΥa ˙Ë˙: i b_WΥ^Υj ˙nj Yn]˙n˙a cVΥ`bc˙dcgHǓ˙c fΑGL̆j ˙gHǔb´Í ˙a ]fc j Ub´Ǔ]b˙gdfY´Ya Ub´Ǔf¦ GΑ ˙$' "&&žfUn`]]WǓ) '$'%L̆

Digital cellular telecommunications system; Functions related to Mobile Station (MS) in idle mode and group receive mode (GSM 03.22 version 5.0.1)

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Ta slovenski standard je istoveten z: **ETS 300 930 Edition 1**

SIST ETS 300 930 E1:2003
https://standards.iteh.ai/catalog/standards/sist/98b7e0af-a2c3-4071-8db9-
0899ed68249b/sist-ets-300-930-e1-2003

ICS:

33.070.50	Globalni sistem za mobilno telekomunikacijo (GSM)	Global System for Mobile Communication (GSM)

SIST ETS 300 930 E1:2003 **en**

iTeh STANDARD PREVIEW
(standards.iteh.ai)

EUROPEAN
TELECOMMUNICATION
STANDARD

ETS 300 930

May 1997

Source: ETSI TC-SMG

Reference: DE/SMG-030322Q

ICS: 33.020

Key words: Digital cellular telecommunications system, Global System for Mobile communications (GSM)

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST ETS 300 930 E1:2003
https://standards.iteh.ai/catalog/standards/sist/98b7e0af-a2c3-4071-8db9-
a79ce46e1a0e/sist-ets-300-930-e1-2003

Digital cellular telecommunications system;
Functions related to Mobile Station (MS)
in idle mode and group receive mode
(GSM 03.22 version 5.0.1)

ETSI

European Telecommunications Standards Institute

ETSI Secretariat

Postal address: F-06921 Sophia Antipolis CEDEX - FRANCE
Office address: 650 Route des Lucioles - Sophia Antipolis - Valbonne - FRANCE
X.400: c=fr, a=atlas, p=etsi, s=secretariat - **Internet:** secretariat@etsi.fr

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

Page 2
ETS 300 930 (GSM 03.22 version 5.0.1): May 1997

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Whilst every care has been taken in the preparation and publication of this document, errors in content, typographical or otherwise, may occur. If you have comments concerning its accuracy, please write to "ETSI Editing and Committee Support Dept." at the address shown on the title page.

Contents

Page 4
ETS 300 930 (GSM 03.22 version 5.0.1): May 1997

iTeh STANDARD PREVIEW

(standards.iteh.ai)

Foreword

This European Telecommunication Standard (ETS) has been produced by the Special Mobile Group (SMG) Technical Committee (TC) of the European Telecommunications Standards Institute (ETSI).

This ETS specifies functions related to Mobile Station (MS) in idle mode and group receive mode within the digital cellular telecommunications system.

This ETS is a GSM Technical Specification version 5. The ETS from which this ETS has evolved is GSM Phase 2 GSM ETS 300 535 Edition 4 (GSM 03.22 version 4.11.0).

The contents of this ETS is subject to continuing work within TC-SMG and may change following formal TC-SMG approval. Should TC-SMG modify the contents of this ETS, it will be resubmitted for OAP by ETSI with an identifying change of release date and an increase in version number as follows:

Version 5.x.y

where:

   y   the third digit is incremented when editorial only changes have been incorporated in the specification;

   x   the second digit is incremented for all other types of changes, i.e. technical enhancements, corrections, updates, etc.

The specification from which this ETS has been derived was originally based on CEPT documentation, hence the presentation of this ETS may not be entirely in accordance with the ETSI drafting rules.

Transposition dates	
Date of adoption:	4 April 1997
Date of latest announcement of this ETS (doa):	31 August 1997
Date of latest publication of new National Standard or endorsement of this ETS (dop/e):	28 February 1998
Date of withdrawal of any conflicting National Standard (dow):	28 February 1998

Blank page

iTeh STANDARD PREVIEW
(standards.iteh.ai)

1 Scope

This European Telecommunication Standard (ETS) gives an overview of the tasks undertaken by a GSM mobile station (MS) when in idle mode, that is, switched on but not having a dedicated channel allocated, e.g. not making or receiving a call, or when in group receive mode, that is, receiving a group call or broadcast call but not having a dedicated connection. It also describes the corresponding network functions.

> NOTE: The term GSM MS is used for any type of MS supporting one, or combinations, of the frequency bands specified in GSM 05.05 (e.g. GSM 900 and DCS 1 800).

This ETS outlines how the requirements of the GSM 02 series Technical Specifications (especially GSM 02.11) on idle mode operation shall be implemented. Further details are given in GSM 04.08 and GSM 05.08.

Clause 2 of this ETS gives a general description of the idle mode process. Clause 3 outlines the main requirements and technical solutions of those requirements. Clause 4 describes the processes used in idle mode. There is inevitably some overlap between these clauses. Clause 5 describes the cell change procedures for a MS in group receive mode.

1.1 Normative references

This ETS incorporates by dated and 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]   GSM 01.04 (ETR 350): "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".

[2]   GSM 02.01: "Digital cellular telecommunications system (Phase 2+); Principles of telecommunications services supported by a GSM Public Land Mobile Network (PLMN)".

[3]   GSM 02.02 (ETS 300 904): "Digital cellular telecommunications system (Phase 2+); Bearer Services (BS) supported by a GSM Public Land Mobile Network (PLMN)".

[4]   GSM 02.03 (ETS 300 905): "Digital cellular telecommunications system (Phase 2+); Teleservices supported by a GSM Public Land Mobile Network (PLMN)".

[5]   GSM 02.04 (ETS 300 918): "Digital cellular telecommunications system (Phase 2+); General on supplementary services".

[6]   GSM 02.06 (ETS 300 919): "Digital cellular telecommunications system (Phase 2+); Types of Mobile Stations (MS)".

[7]   GSM 02.07 (ETS 300 906): "Digital cellular telecommunications system (Phase 2+); Mobile Station (MS) features".

[8]   GSM 02.09 (ETS 300 920): "Digital cellular telecommunications system; Security aspects".

[9]   GSM 02.11 (ETS 300 921): "Digital cellular telecommunications system; Service accessibility".

[10]   GSM 02.16: "Digital cellular telecommunications system; International Mobile station Equipment Identities (IMEI)".

[11] GSM 02.17 (ETS 300 922): "Digital cellular telecommunications system; Subscriber Identity Modules (SIM); Functional characteristics".

[12] GSM 02.24 (ETS 300 923): "Digital cellular telecommunications system; Description of Charge Advice Information (CAI)".

[13] GSM 02.30 (ETS 300 907): "Digital cellular telecommunications system (Phase 2+); Man-Machine Interface (MMI) of the Mobile Station (MS)".

[14] GSM 02.40: "Digital cellular telecommunications system; Procedures for call progress indications".

[15] GSM 02.41: "Digital cellular telecommunications system (Phase 2+); Operator determined barring".

[16] GSM 02.81: "Digital cellular telecommunications system; Line identification Supplementary Services - Stage 1".

[17] GSM 02.82: "Digital cellular telecommunications system (Phase 2+); Call Forwarding (CF) supplementary services - Stage 1".

[18] GSM 02.83: "Digital cellular telecommunications system; Call Waiting (CW) and Call Hold (HOLD) Supplementary Services - Stage 1".

[19] GSM 02.84: "Digital cellular telecommunications system; MultiParty (MPTY) Supplementary Services - Stage 1".

[20] GSM 02.85: "Digital cellular telecommunications system; Closed User Group (CUG) Supplementary Services - Stage 1".

[21] GSM 02.86: "Digital cellular telecommunications system; Advice of Charge (AoC) Supplementary Services - Stage 1".

[22] GSM 02.88: "Digital cellular telecommunications system; Call Barring (CB) Supplementary Services - Stage 1".

[23] GSM 04.08 (ETS 300 940): "Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 specification".

[24] GSM 05.02 (ETS 300 908): "Digital cellular telecommunications system (Phase 2+); Multiplexing and multiple access on the radio path".

[25] GSM 05.08 (ETS 300 911): "Digital cellular telecommunications system (Phase 2+); Radio subsystem link control".

1.2 Definitions and abbreviations

For the purposes of this ETS, the following definitions apply:

Home PLMN: This is a PLMN where the MCC and MNC of the PLMN identity are the same as the MCC and MNC of the IMSI.

Selected PLMN: This is the PLMN that has been selected according to subclause 3.1, either manually or automatically.

Available PLMN: This is a PLMN where the MS has found a cell that satisfies conditions (ii) and (iv) of subclause 3.2.1.

Registered PLMN (RPLMN): This is the PLMN on which certain LU outcomes have occurred (see table 1).

Allowable PLMN: This is a PLMN which is not in the list of forbidden PLMNs in the SIM.

Visited PLMN of home country: This is a PLMN, different from the home PLMN, where the MCC part of the PLMN identity is the same as the MCC of the IMSI.

Registration: This is the process of camping on a cell of the PLMN and doing any necessary LUs.

Camped on a cell: The MS (ME if there is no SIM) has completed the cell selection/reselection process and has chosen a cell from which it plans to receive all available services. Note that the services may be limited, and that the PLMN may not be aware of the existence of the MS (ME) within the chosen cell.

Current serving cell: This is the cell on which the MS is camped.

Suitable Cell: This is a cell on which an MS may camp. It must satisfy criteria (i) to (iv) of subclause 3.2.1. For an MS in group receive mode, the suitable cell is determined by the criteria defined in subclause 5.2.3.

Acceptable Cell: This is a cell that the MS may camp on to make emergency calls. It must satisfy criteria (ii) and (iv) of subclause 3.2.1.

Group call: A communication in which several MSs can receive, but at most one may be allowed to transmit on a radio channel. Examples of group calls are those established for the voice group call service (VGCS, see GSM 03.68).

Broadcast call: A communication in which several MSs can receive, but only the originator of the call is allowed to transmit on the radio channel. Examples of the broadcast call are those established for the voice broadcast service (VBS, see GSM 03.69).

Group receive mode: State of the MS when it is engaged in a group or broadcast call as a listener.

The PLMN to which a cell belongs (PLMN identity) is given in the system information transmitted on the BCCH (MCC + MNC part of LAI).

Abbreviations used in this ETS are listed in GSM 01.04.

2 General description of idle mode

When an MS is switched on, it attempts to make contact with a GSM public land mobile network (PLMN). The particular PLMN to be contacted may be selected either automatically or manually. The MS looks for a suitable cell of the chosen PLMN and chooses that cell to provide available services, and tunes to its control channel (BCCH plus CCCH). This choosing is known as "camping on the cell". The MS will then register its presence in the location area (LA) of the chosen cell if necessary, by means of a location updating (LU) or IMSI attach procedure. If the MS loses coverage of a cell, it reselects onto the most suitable alternative cell of the selected PLMN and camps on that cell. If the new cell is in a different LA, an LU request is performed. If the MS loses coverage of a PLMN, either a new PLMN is selected automatically, or an indication of which PLMNs are available is given to the user, so that a manual selection can be made.

The purpose of camping on a cell in idle mode is threefold:

a)   It enables the MS to receive system information from the PLMN.

b)   If the MS wishes to initiate a call, it can do this by initially accessing the network on the CCCH of the cell on which it is camped (with the exceptions defined in subclauses 3.5.3 and 3.5.4).

c)   If the PLMN receives a call for the MS, it knows (in most cases) the LA of the cell in which the MS is camped. It can then send a "paging" message for the MS on CCCHs of all the cells in the LA. The MS will then receive the paging message because it is tuned to the CCCH of a cell in that LA, and the MS can respond on that CCCH.

If the MS is unable to find a suitable cell to camp on, or the SIM is not inserted, or if it receives certain responses to an LU request (e.g., "illegal MS"), it attempts to camp on a cell irrespective of the PLMN identity, and enters a "limited service" state in which it can only attempt to make emergency calls.

Page 10
ETS 300 930 (GSM 03.22 version 5.0.1): May 1997

The idle mode tasks can be subdivided into 3 processes:

- PLMN selection.

- Cell selection and reselection.

- Location updating.

The relationship between these processes is illustrated in figure 1. The states and state transitions within each process are shown in figures 2 to 4.

3 Requirements and technical solutions

The following subclauses list the main requirements of idle mode operation and give an outline of the technical solution.

3.1 PLMN selection and roaming

The MS normally operates on its home PLMN (HPLMN). However a visited PLMN (VPLMN) may be selected, e.g., if the MS loses coverage. There are two modes for PLMN selection:

i) Automatic mode - This mode utilizes a list of PLMNs in priority order. The highest priority PLMN which is available and allowable is selected.

ii) Manual mode - Here the MS indicates to the user which PLMNs are available. Only when the user makes a manual selection does the MS try to obtain normal service on the VPLMN.

There are two cases:

- International Roaming - This is where the MS receives service on a PLMN of a different country than that of the HPLMN.

- National Roaming - This is where the MS receives service from a PLMN of the same country as that of the HPLMN, either anywhere or on a regional basis. The MS makes a periodic search for the HPLMN while national roaming.

To prevent repeated attempts to have roaming service on a not allowed LA, when the MS is informed that an LA is forbidden, the LA is added to a list of "forbidden LAs for roaming" which is stored in the MS. This list is deleted when the MS is switched off or when the SIM is removed.

If a "PLMN not allowed" message is received by an MS in response to an LU request from a VPLMN, that VPLMN is added to a list of "forbidden PLMNs" in the SIM and thereafter that VPLMN will not be accessed by the MS when in automatic mode. A PLMN is removed from the "forbidden" list if, after a subsequent manual selection of that PLMN, there is a successful LU. This list is retained when the MS is switched off or the SIM is removed. The HPLMN shall not be stored on the list of "forbidden PLMNs".

3.2 Camping on a cell

3.2.1 Normal camping

For normal service, the MS has to camp on a suitable cell, tune to that cell's BCCH + CCCH, and possibly register within the PLMN so that the MS can:

a) Receive system information from the PLMN (on the BCCH), e.g., the cell options.

b) Receive paging messages from the PLMN, e.g., when there is an incoming call for the MS.

c) Initiate call setup for outgoing calls or other actions from the MS (where possible, see subclauses 3.5.3 and 3.5.4).