



SLOVENSKI STANDARD

SIST EN 300 927 V5.3.1:2003

01-december-2003

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Digital cellular telecommunications system (Phase 2+) (GSM); Numbering, addressing and identification (GSM 03.03 version 5.3.1 Release 1996)

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Ta slovenski standard je istoveten z: **EN 300 927 Version 5.3.1**
<https://standards.iteh.ai/catalog/standards/sist/en/300-927-v5-3-1-2003>

ICS:

33.070.50	Globalni sistem za mobilno telekomunikacijo (GSM)	Global System for Mobile Communication (GSM)
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SIST EN 300 927 V5.3.1:2003

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ETSI EN 300 927 V5.3.1 (2000-11)

European Standard (Telecommunications series)

**Digital cellular telecommunications system (Phase 2+);
Numbering, addressing and identification
(GSM 03.03 version 5.3.1 Release 1996)**

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GSM®

GLOBAL SYSTEM FOR
MOBILE COMMUNICATIONS

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Reference

REN/TSGN-000303QR3

Keywords

Digital cellular telecommunications system,
Global System for Mobile communications (GSM)**ETSI**

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Foreword

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

The present document defines the plans and principles of numbering, addressing and identification within the digital cellular telecommunications system (Phase 2+).

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

Version 5.x.y

where:

5 GSM Phase 2+ Release 1996.

x the second digit is incremented for changes of substance, i.e. 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:	3 November 2000
Date of latest announcement of this EN (doa):	28 February 2001
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 August 2001
Date of withdrawal of any conflicting National Standard (dow):	31 August 2001

1 Scope

The present document defines:

- a) an identification plan for mobile subscribers in the GSM system;
- b) principles of assigning telephone and ISDN numbers to MSs in the country of registration of the MS;
- c) principles of assigning Mobile Station (MS) roaming numbers to visiting MSs;
- d) an identification plan for location areas and base stations in the GSM system;
- e) an identification plan for MSCs and location registers in the GSM system;
- f) principles of assigning international mobile equipment identities;
- g) principles of assigning zones for regional subscription;
- h) an identification plan for groups of subscribers to the Voice Group Call Service (VGCS) and to the Voice Broadcast Service (VBS); and identification plan for voice group calls and voice broadcast calls; an identification plan for group call areas.

1.1 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 1996 document, references to GSM documents are for Release 1996 versions (version 5.x.y).
- [1] GSM 01.04 (ETR 350): "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".
 - [2] GSM 03.08: "Digital cellular telecommunications system (Phase 2+); Organization of subscriber data".
 - [3] GSM 03.20 (ETS 300 929): "Digital cellular telecommunications system (Phase 2+); Security related network functions".
 - [4] GSM 03.70: "Digital cellular telecommunications system (Phase 2+); Routeing of calls to/from Public Data Networks (PDN)".
 - [5] GSM 04.08 (ETS 300 940): "Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 specification".
 - [6] GSM 09.03: "Digital cellular telecommunications system (Phase 2+); Signalling requirements on interworking between the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN) and the Public Land Mobile Network (PLMN)".
 - [7] GSM 11.11 (ETS 300 977): "Digital cellular telecommunications system (Phase 2+); Specification of the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface".
 - [8] CCITT Recommendation E.164: "Numbering plan for the ISDN era".

- [9] CCITT Recommendation E.212: "Identification plan for land MSs".
- [10] CCITT Recommendation E.213: "Telephone and ISDN numbering plan for land MSs in public land mobile networks (PLMN)".
- [11] CCITT Recommendation X.121: "International numbering plan for public data networks".

1.2 Abbreviations

Abbreviations used in the present document are listed in GSM 01.04.

1.3 General comments to references

The identification plan for mobile subscribers defined below is that defined in CCITT Recommendation E.212.

The ISDN numbering plan for MSs and the allocation of mobile station roaming numbers is that defined in CCITT Recommendation E.213. Only one of the principles for allocating ISDN numbers is proposed for GSM PLMNs. Only the method for allocating MS roaming numbers contained in the main text of CCITT Recommendation E.213 is recommended for use in GSM PLMNs. If there is any difference between this Technical Specification and the CCITT Recommendations, the former shall prevail.

For terminology, see also CCITT Recommendations E.164 and X.121.

1.4 Conventions on bitordering

The following conventions hold for the coding of the different identities appearing in this Technical Specification and in other GSM Technical Specifications if not indicated otherwise:

- the different parts of an identity are shown in the figures in order of significance;
- the most significant part of an identity is on the left part of the figure and the least significant on the right.

When an identity appears in other Technical Specifications, the following conventions hold if not indicated otherwise:

- digits are numbered by order of significance, with digit 1 being the most significant;
- bits are numbered by order of significance, with the lowest bit number corresponding to the least significant bit.

2 Identification of mobile subscribers

2.1 General

A unique International Mobile Subscriber Identity (IMSI) shall be allocated to each mobile subscriber in the GSM system.

NOTE: This IMSI is the concept referred to by CCITT as "International Mobile Station Identity".

In order to support the subscriber identity confidentiality service the VLRs may allocate a unique Temporary Mobile Subscriber Identity (TMSI) to visiting mobile subscribers. The VLR must be capable of correlating the IMSI of an MS and the current TMSI for that MS.

In order to speed up the search for subscriber data in the VLR a supplementary Local Mobile Station Identity (LMSI) is defined.

The LMSI may be allocated by the VLR at location updating and is sent to the HLR together with the IMSI. The HLR makes no use of it but includes it together with the IMSI in all messages sent to the VLR concerning that MS.

2.2 Composition of IMSI

IMSI is composed as shown in figure 1.

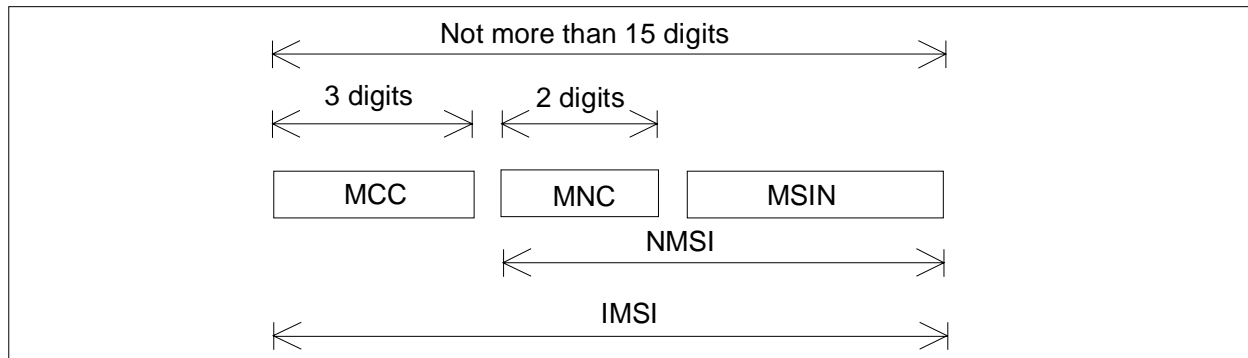


Figure 1: Structure of IMSI

IMSI is composed of three parts:

- i) Mobile Country Code (MCC) consisting of three digits. The MCC identifies uniquely the country of domicile of the mobile subscriber;
- ii) Mobile Network Code (MNC) consisting of two digits for GSM applications. The MNC identifies the home GSM PLMN of the mobile subscriber;
- iii) Mobile Subscriber Identification Number (MSIN) identifying the mobile subscriber within a GSM PLMN.

The National Mobile Subscriber Identity (NMSI) consists of the Mobile Network Code and the Mobile Subscriber Identification Number.

2.3 Allocation principles

IMSI shall consist of numerical characters (0 through 9) only.

The overall number of digits in IMSI shall not exceed 15 digits.

The allocation of Mobile Country Codes (MCCs) is administered by the CCITT and is given in annex A to CCITT Blue Book Recommendation E.212.

The allocation of National Mobile Subscriber Identity (NMSI) is the responsibility of each administration.

If more than one GSM PLMN exist in a country, a unique Mobile Network Code should be assigned to each of them.

The allocation of IMSIs should be such that not more than the digits MCC + MNC of the IMSI have to be analysed in a foreign GSM PLMN for information transfer.

2.4 Structure of TMSI

Since the TMSI has only local significance (i.e. within the VLR and the area controlled by the VLR), the structure and coding of it can be chosen by agreement between operator and manufacturer in order to meet local needs.

The TMSI consists of 4 octets. It can be coded using a full hexadecimal representation.

In order to avoid double allocation of TMSIs after a restart of a VLR, some part of the TMSI may be related to the time when it was allocated or contain a bit field which is changed when the VLR has recovered from the restart.

The TMSI shall only be allocated in ciphered form. See also GSM 03.20.

The network shall not allocate a TMSI with all 32 bits equal to 1 (this is because the TMSI must be stored in the SIM, and the SIM uses 4 octets with all bits equal to 1 for indicating that no valid TMSI is available).

2.5 Structure of LMSI

The LMSI consists of 4 octets and may be allocated by the VLR.

3 Numbering plan for mobile stations

3.1 General

Below the structure of the numbers used by a subscriber of a fixed (or mobile) network for calling a MS of a GSM PLMN is defined.

Also the structure of MS roaming numbers is defined.

One or more numbers of the ISDN numbering plan shall be assigned to a MS to be used for all calls to that station.

There may be a need for Mobile Stations (MS) to have a X.121 number. Because the MS has to have in any case a number from the ISDN numbering plan, the X.121 number will be in addition. Implications on numbering interworking functions which may need to be provided by the PLMN (if the use of X.121 numbers is required) are indicated in GSM 03.70.

NOTE: For card operated stations the ISDN number should be assigned to the holder of the card (personal number).

3.2 Numbering plan requirements

In principle, it should be possible for any subscriber of the ISDN or PSTN to call any MS in a GSM PLMN. This implies that ISDN numbers for MSs should comply with the ISDN numbering plan in each country.

The ISDN numbers of MSs should be composed in such a way that standard ISDN/PSTN charging can be used for calls to MSs.

It should be possible for each administration to develop its own independent numbering plan for MSs.

The numbering plan should not limit the possibility for MSs to roam among GSM PLMNs.

It should be possible to change the IMSI without changing the ISDN number allocated to a MS and vice versa.

In principle, it should be possible for any subscriber of the CSPDN/PSPDN to call any MS in a GSM PLMN. This implies that it may be necessary for an MS to have a X.121 number.

3.3 Structure of MS international PSTN/ISDN number (MSISDN)

The MS international ISDN numbers are allocated from the CCITT Recommendation E.164 numbering plan, see also CCITT Recommendation E.213. The MS international ISDN number will then be as shown in figure 2.