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Digitalni celiļ ni telekomunikacijski sistem (faza 2) âï Specifikacija vmesnika mobilne opreme za naroļ niģko identifikacijsko kartico (SIM-ME) (GSM 11.11 razliļ ica 4.20.1)

Digital cellular telecommunications system (Phase 2) (GSM); Specification of the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface (GSM 11.11 version 4.20.1)

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SIST ETS 300 608 E8:2003

Contents

Foreword 7

1 Scope 9

2 Normative references 9

3 Definitions, abbreviations and symbols 11
3.1 Definitions 11
3.2 Abbreviations 12
3.3 Symbols 13

4 Physical characteristics 13
4.1 Format and layout 13
4.1.1 ID-1 SIM 13
4.1.2 Plug-in SIM 13
4.2 Temperature range for card operation 14
4.3 Contacts 14
4.3.1 Provision of contacts 14
4.3.2 Activation and deactivation 14
4.3.3 Inactive contacts 14
4.3.4 Contact pressure 14
4.4 Precedence 15
4.5 Static Protection 15

5 Electronic signals and transmission protocols 15
5.1 Supply voltage Vcc (contact C1) 15
5.2 Reset (RST) (contact C2) 16
5.3 Programming voltage Vpp (contact C6) 16
5.4 Clock CLK (contact C3) 16
5.5 I/O (contact C7) 16
5.6 States 17
5.7 Baudrate 17
5.8 Answer To Reset (ATR) 17
5.8.1 Structure and contents 17
5.8.2 PTS procedure 19
5.9 Bit/character duration and sampling time 19
5.10 Error handling 20

6 Logical Model 20
6.1 General description 20
6.2 File identifier 20
6.3 Dedicated files 21
6.4 Elementary files 21
6.4.1 Transparent EF 21
6.4.2 Linear fixed EF 21
6.4.3 Cyclic EF 22
6.5 Methods for selecting a file 23
6.6 Reservation of file IDs 24

7 Security features 24
7.1 Authentication and cipher key generation procedure 24
7.2 Algorithms and processes 24
7.3 File access conditions 25

8 Description of the functions 26
8.1 SELECT 26

iTeh STANDARD PREVIEW
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SIST ETS 300 608 E8:2003
https://standards.iteh.ai/catalog/standards/sist/3970987c-2213-4f2a-922c-7d4f7e75f86/sist-ets-300-608-e8-2003

SIST ETS 300 608 E8:2003

8.2 STATUS ... 26
8.3 READ BINARY ... 26
8.4 UPDATE BINARY ... 27
8.5 READ RECORD ... 27
8.6 UPDATE RECORD ... 28
8.7 SEEK ... 28
8.8 INCREASE ... 29
8.9 VERIFY CHV ... 29
8.10 CHANGE CHV ... 29
8.11 DISABLE CHV ... 30
8.12 ENABLE CHV ... 30
8.13 UNBLOCK CHV ... 30
8.14 INVALIDATE ... 31
8.15 REHABILITATE ... 31
8.16 RUN GSM ALGORITHM ... 31
8.17 SLEEP ... 31

9 Description of the commands ... 31
9.1 Mapping principles ... 32
9.2 Coding of the commands ... 33
9.2.1 SELECT ... 34
9.2.2 STATUS ... 37
9.2.3 READ BINARY ... 37
9.2.4 UPDATE BINARY ... 37
9.2.5 READ RECORD ... 37
9.2.6 UPDATE RECORD ... 38
9.2.7 SEEK ... 38
9.2.8 INCREASE ... 39
9.2.9 VERIFY CHV ... 39
9.2.10 CHANGE CHV ... 39
9.2.11 DISABLE CHV ... 40
9.2.12 ENABLE CHV ... 40
9.2.13 UNBLOCK CHV ... 40
9.2.14 INVALIDATE ... 40
9.2.15 REHABILITATE ... 40
9.2.16 RUN GSM ALGORITHM ... 41
9.2.17 SLEEP ... 41
9.2.18 GET RESPONSE ... 41
9.3 Definitions and coding ... 41
9.4 Status conditions returned by the card ... 43
9.4.1 Responses to commands which are correctly executed ... 43
9.4.2 Memory management ... 43
9.4.3 Referencing management ... 43
9.4.4 Security management ... 43
9.4.5 Application independent errors ... 44
9.4.6 Commands versus possible status responses ... 44

10 Contents of the Elementary Files (EF) ... 45
10.1 Contents of the EFs at the MF level ... 45
10.1.1 EF_{ICCID} (ICC Identification) ... 45
10.2 Contents of files at the GSM application level ... 46
10.2.1 EF_{LP} (Language preference) ... 46
10.2.2 EF_{IMSI} (IMSI) ... 46
10.2.3 EF_{Kc} (Ciphering key Kc) ... 47
10.2.4 $EF_{PLMNsel}$ (PLMN selector) ... 48
10.2.5 EF_{HPLMN} (HPLMN search period) ... 48
10.2.6 EF_{ACMmax} (ACM maximum value) ... 49
10.2.7 EF_{SST} (SIM service table) ... 50
10.2.8 EF_{ACM} (Accumulated call meter) ... 51
10.2.9 EF_{GID1} (Group Identifier Level 1) ... 52
10.2.10 EF_{GID2} (Group Identifier Level 2) ... 52
10.2.11 EF_{SPN} (Service Provider Name) ... 52
10.2.12 EF_{PUCT} (Price per unit and currency table) ... 53

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SIST ETS 300 608 E8:2003
https://standards.iteh.ai/catalog/standards/sist/3970987c-2213-4f2a-922c-7d4f2c7f7f86/sist-ets-300-608-e8-2003

SIST ETS 300 608 E8:2003

10.2.13 EF_{CBMI} (Cell broadcast message identifier selection) 54
10.2.14 EF_{BCCH} (Broadcast control channels) 54
10.2.15 EF_{ACC} (Access control class) 54
10.2.16 EF_{FPLMN} (Forbidden PLMNs) 55
10.2.17 EF_{LOCI} (Location information) 56
10.2.18 EF_{AD} (Administrative data) 58
10.2.19 EF_{Phase} (Phase identification) 58
10.3 Contents of files at the telecom level 59
10.3.1 EF_{ADN} (Abbreviated dialling numbers) 59
10.3.2 EF_{FDN} (Fixed dialling numbers) 61
10.3.3 EF_{SMS} (Short messages) 62
10.3.4 EF_{CCP} (Capability configuration parameters) 63
10.3.5 EF_{MSISDN} (MSISDN) 64
10.3.6 EF_{SMSP} (Short message service parameters) 64
10.3.7 EF_{SMSS} (SMS status) 66
10.3.8 EF_{LND} (Last number dialled) 66
10.3.9 EF_{EXT1} (Extension1) 67
10.3.10 EF_{EXT2} (Extension2) 68
10.4 Files of GSM (figure 7) 68

11 Application protocol 70
11.1 General procedures 71
11.1.1 Reading an EF 71
11.1.2 Updating an EF 71
11.1.3 Increasing an EF 71
11.2 SIM management procedures 72
11.2.1 SIM initialization 72
11.2.2 GSM session termination 72
11.2.3 Language preference 73
11.2.4 Administrative information request 73
11.2.5 SIM service table request 73
11.2.6 SIM phase request 73
11.2.7 SIM Presence Detection 73
11.3 CHV related procedures 73
11.3.1 CHV verification 74
11.3.2 CHV value substitution 74
11.3.3 CHV disabling 74
11.3.4 CHV enabling 74
11.3.5 CHV unblocking 74
11.4 GSM security related procedures 75
11.4.1 GSM algorithms computation 75
11.4.2 IMSI request 75
11.4.3 Access control request 75
11.4.4 HPLMN search period request 75
11.4.5 Location information 75
11.4.6 Cipher key 75
11.4.7 BCCH information 75
11.4.8 Forbidden PLMN 75
11.5 Subscription related procedures 75
11.5.1 Dialling numbers 75
11.5.2 Short messages 77
11.5.3 Advice of Charge (AoC) 78
11.5.4 Capability configuration parameters 78
11.5.5 PLMN selector 78
11.5.6 Cell broadcast message identifier 78
11.5.7 Group identifier level 1 79
11.5.8 Group identifier level 2 79
11.5.9 Service Provider Name 79

Annex A (normative): Plug-in SIM 80

Annex B (informative): FDN Procedures 81

iTeh STANDARD PREVIEW
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SIST ETS 300 608 E8:2003
https://standards.iteh.ai/catalog/standards/sist/3970987c-2213-4f2a-922c-7d4ec7f1b6/sist-ets-300-608-e8-2003

SIST ETS 300 608 E8:2003

Annex C (informative): Suggested contents of the EFs at pre-personalization 85

Annex D (informative): Bibliography 86

Annex E (Informative): Change History 87

History 88

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SIST ETS 300 608 E8:2003
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Foreword

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

This ETS specifies the Subscriber Identity Module (SIM) to Mobile Equipment (ME) interface within the digital cellular telecommunications system (Phase 2).

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/PNE Rules.

Transposition dates	
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1 Scope

This European Telecommunication Standard (ETS) defines the interface between the Subscriber Identity Module (SIM) and the Mobile Equipment (ME) for use during the network operation phase of GSM as well as those aspects of the internal organization of the SIM which are related to the network operation phase. This is to ensure interoperability between a SIM and an ME independently of the respective manufacturers and operators. The concept of a split of the Mobile Station (MS) into these elements as well as the distinction between the GSM network operation phase, which is also called GSM operations, and the administrative management phase are described in the Technical Specification GSM 02.17 [6].

This ETS defines:

- the requirements for the physical characteristics of the SIM, the electrical signals and the transmission protocols;
- the model which shall be used as a basis for the design of the logical structure of the SIM;
- the security features;
- the interface functions;
- the commands;
- the contents of the files required for the GSM application;
- the application protocol.

Unless otherwise stated, references to GSM also apply to DCS 1800.

This ETS does not specify any aspects related to the administrative management phase. Any internal technical realization of either the SIM or the ME are only specified where these reflect over the interface. This ETS does not specify any of the security algorithms which may be used.

This ETS defines the SIM/ME interface for GSM Phase 2. While all attempts have been made to maintain phase compatibility, any issues that specifically relate to Phase 1 should be referenced from within the relevant Phase 1 specification.

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2 Normative references

SIST ETS 300 608 E8:2003
https://standards.iteh.ai/catalog/standards/sist/3970987c-2213-4f2a-922c-7d4f2c7f7f86/sist-ets-300-608-e8-2003

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] GSM 01.02 (ETR 99): "Digital cellular telecommunications system (Phase 2); General Description of a GSM Public Land Mobile Network (PLMN)".

[2] GSM 01.04 (ETR 100): "Digital cellular telecommunications system (Phase 2); Abbreviations and acronyms".

[3] GSM 02.07 (ETS 300 505): "Digital cellular telecommunications system (Phase 2); Mobile Station (MS) features".

[4] GSM 02.09 (ETS 300 506): "Digital cellular telecommunications system (Phase 2); Security aspects".

[5] GSM 02.11 (ETS 300 507): "Digital cellular telecommunications system (Phase 2); Service accessibility".

[6] GSM 02.17 (ETS 300 509): "Digital cellular telecommunications system (Phase 2); Subscriber Identity Modules (SIM), Functional characteristics".

[7] GSM 02.24 (ETS 300 510): "Digital cellular telecommunications system (Phase 2); Description of Charge Advice Information (CAI)".

[8] GSM 02.30 (ETS 300 511): "Digital cellular telecommunications system (Phase 2); Man-Machine Interface (MMI) of the Mobile Station (MS)".

SIST ETS 300 608 E8:2003

[9] GSM 02.86 (ETS 300 519): "Digital cellular telecommunications system (Phase 2); Advice of charge (AoC) supplementary services - Stage 1".

[10] GSM 03.20 (ETS 300 534): "Digital cellular telecommunications system (Phase 2); Security related network functions".

[11] GSM 03.38 (ETS 300 628): "Digital cellular telecommunications system (Phase 2); Alphabets and language-specific information".

[12] GSM 03.40 (ETS 300 536): "Digital cellular telecommunications system (Phase 2); Technical realization of the Short Message (SMS) Service Point-to-Point (PP)".

[13] GSM 03.41 (ETS 300 537): "Digital cellular telecommunications system (Phase 2); Technical realization of the Short Message Service Cell Broadcast (SMSCB)".

[14] GSM 04.08 (ETS 300 557): "Digital cellular telecommunications system (Phase 2); Mobile radio interface layer 3 specification".

[15] GSM 04.11 (ETS 300 559): "Digital cellular telecommunications system (Phase 2); Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface".

[16] GSM 09.91 (ETR 174): "Digital cellular telecommunications system (Phase 2); Interworking aspects of the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface between Phase 1 and Phase 2".

[17] CCITT Recommendation E.118: "The international telecommunications charge card".

[18] CCITT Recommendation E.164: "Numbering plan for the ISDN era".

[19] CCITT Recommendation T.50: "International Alphabet No. 5". (ISO 646: 1983, Information processing - ISO 7-bits coded characters set for information interchange).

[20] ISO/IEC 7810 (1995): "Identification cards - Physical characteristics".

[21] ISO/IEC 7811-1 (1995): "Identification cards - Recording technique - Part 1: Embossing".

[22] ISO/IEC 7811-3 (1995): "Identification cards - Recording technique - Part 3: Location of embossed characters on ID-1 cards".

[23] ISO 7816-1 (1987): "Identification cards - Integrated circuit(s) cards with contacts, Part 1: Physical characteristics".

[24] ISO 7816-2 (1988): "Identification cards - Integrated circuit(s) cards with contacts, Part 2: Dimensions and locations of the contacts".

[25] ISO/IEC 7816-3 (1989): "Identification cards - Integrated circuit(s) cards with contacts, Part 3: Electronic signals and transmission protocols".

[26] GSM 11.12 (ETS 300 641): "Digital cellular telecommunications system (Phase 2); Specification of the 3 Volt Subscriber Identity Module - Mobile Equipment (SIM - ME) interface".

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3 Definitions, abbreviations and symbols

3.1 Definitions

For the purposes of this ETS, the following definitions apply. For further information and definitions, refer to GSM 01.02 [1].

access conditions: A set of security attributes associated with a file.

application: An application consists of a set of security mechanisms, files, data and protocols (excluding transmission protocols).

application protocol: The set of procedures required by the application.

card session: A link between the card and the external world starting with the ATR and ending with a subsequent reset or a deactivation of the card.

current directory: The latest MF or DF selected.

current EF: The latest EF selected.

data field: Obsolete term for Elementary File.

Dedicated File (DF): A file containing access conditions and, optionally, Elementary Files (EFs) or other Dedicated Files (DFs).

directory: General term for MF and DF.

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Elementary File (EF): A file containing access conditions and data and no other files.

file: A directory or an organized set of bytes or records in the SIM.

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file identifier: The 2 bytes which address a file in the SIM.

GSM or DCS 1800 application: Set of security mechanisms, files, data and protocols required by GSM or DCS 1800.

GSM session: That part of the card session dedicated to the GSM operation.

IC card SIM: Obsolete term for ID-1 SIM.

ID-1 SIM: The SIM having the format of an ID-1 card (see ISO 7816-1 [23]).

Master File (MF): The unique mandatory file containing access conditions and optionally DFs and/or EFs.

padding: One or more bits appended to a message in order to cause the message to contain the required number of bits or bytes.

plug-in SIM: A second format of SIM (specified in clause 4).

record: A string of bytes within an EF handled as a single entity (see clause 6).

record number: The number which identifies a record within an EF.

record pointer: The pointer which addresses one record in an EF.

root directory: Obsolete term for Master File.

SIST ETS 300 608 E8:2003

3.2 Abbreviations

For the purposes of this ETS, the following abbreviations apply, in addition to the those listed in GSM 01.04 [2].

A3	Algorithm 3, authentication algorithm; used for authenticating the subscriber
A5	Algorithm 5, cipher algorithm; used for enciphering/deciphering data
A8	Algorithm 8, cipher key generator; used to generate K_C
A38	A single algorithm performing the functions of A3 and A8
ACM	Accumulated Call Meter
ADN	Abbreviated Dialling Number
ADM	Access condition to an EF which is under the control of the authority which creates this file
ALW	ALWays
AoC	Advice of Charge
APDU	Application Protocol Data Unit
ATR	Answer To Reset
BCCH	Broadcast Control CHannel
BCD	Binary Coded Decimal
BTS	Base Transmitter Station
CB	Cell Broadcast
CBMI	Cell Broadcast Message Identifier
CCITT	The International Telegraph and Telephone Consultative Committee (now also known as the ITU Telecommunications Standardization sector)
CCP	Capability/Configuration Parameter
CHV	Card Holder Verification information; access condition used by the SIM for the verification of the identity of the user
CLA	CLAss
DCS	Digital Cellular System
DF	Dedicated File (abbreviation formerly used for Data Field)
DTMF	Dual Tone Multiple Frequency
EF	Elementary File
ETSI	European Telecommunications Standards Institute
etu	elementary time unit
FDN	Fixed Dialling Number
GSM	Global System for Mobile communications
HPLMN	Home PLMN
IC	Integrated Circuit
ICC	Integrated Circuit(s) Card
ID	IDentifier
IEC	International Electrotechnical Commission
IMSI	International Mobile Subscriber Identity
ISO	International Organization for Standardization
Kc	Cryptographic key; used by the cipher A5
Ki	Subscriber authentication key; the cryptographic key used by the authentication algorithm, A3, and cipher key generator, A8
LAI	Location Area Information; information indicating a cell or a set of cells
lgth	The (specific) length of a data unit
LND	Last Number Dialled
LSB	Least Significant Bit
MCC	Mobile Country Code
ME	Mobile Equipment
MF	Master File
MMI	Man Machine Interface
MNC	Mobile Network Code
MS	Mobile Station
MSISDN	Mobile Station international ISDN number
MSB	Most Significant Bit
NET	NETwork
NEV	NEVer
NPI	Numbering Plan Identifier
PIN/PIN2	Personal Identification Number / Personal Identification Number 2 (obsolete terms for CHV1 and CHV2, respectively)

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SIST ETS 300 608 E8:2003

PLMN	Public Land Mobile Network
PTS	Protocol Type Select (response to the ATR)
PUK/PUK2	PIN Unblocking Key / PIN2 Unblocking Key (obsolete terms for UNBLOCK CHV1 and UNBLOCK CHV2, respectively)
RAND	A RANDom challenge issued by the network
RFU	Reserved for Future Use
SIM	Subscriber Identity Module
SMS	Short Message Service
SRES	Signed RESponse calculated by a SIM
SSC	Supplementary Service Control string
SW1/SW2	Status Word 1 / Status Word 2
TMSI	Temporary Mobile Subscriber Identity
TON	Type Of Number
TP	Transfer layer Protocol
TPDU	Transfer Protocol Data Unit
TS	Technical Specification
UNBLOCK CHV1/2	value to unblock CHV1/CHV2
VPLMN	Visited PLMN

3.3 Symbols

For the purposes of this ETS, the following symbols apply.

Vcc	Supply voltage
Vpp	Programming voltage
'0' to '9' and 'A' to 'F'	The sixteen hexadecimal digits

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4 Physical characteristics

Two physical types of SIM are specified. These are the "ID-1 SIM" and the "Plug-in SIM".

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The physical characteristics of both types of SIM shall be in accordance with ISO 7816-1,2 [22, 23] unless otherwise specified. The following additional requirements shall be applied to ensure proper operation in the GSM environment.

4.1 Format and layout

The information on the exterior of either SIM should include at least the individual account identifier and the check digit of the IC Card Identification (see clause 10, EF_{ICCID}).

4.1.1 ID-1 SIM

Format and layout of the ID-1 SIM shall be in accordance with ISO 7816-1,2 [22, 23].

The card shall have a polarization mark (see GSM 02.07 [3]) which indicates how the user should insert the card into the ME.

The ME shall accept embossed ID-1 cards. The embossing shall be in accordance with ISO/IEC 7811 [21]. The contacts of the ID-1 SIM shall be located on the front (embossed face, see ISO/IEC 7810 [20]) of the card.

NOTE: Card warpage and tolerances are now specified for embossed cards in ISO/IEC 7810 [20].

4.1.2 Plug-in SIM

The Plug-in SIM has a width of 25 mm, a height of 15 mm, a thickness the same as an ID-1 SIM and a feature for orientation. (see figure A.1 in normative annex A for details of the dimensions of the card and the dimensions and location of the contacts).

Annexes A.1 and A.2 of ISO 7816-1 [23] do not apply to the Plug-in SIM.