SLOVENSKI STANDARD
SIST EN 300 477 V1.2.2:2003

01-december-2003

Svetovne osebne telekomunikacije (UPT) ï UPT, faza 2 ï Funkcijska specifikacija vmesnika ļ ipne kartice (ICC) sistema UPT in naprav za sprejemanje te kartice (CAD) ï Dvotonska veļ frekvenļ na (DTMF) naprava, ki sprejema kartice UPT

Universal Personal Telecommunication (UPT); UPT phase 2; Functional specification of the interface of a UPT Integrated Circuit Card (ICC) and Card Accepting Devices (CAD); UPT card accepting Dual Tone Multiple Frequency (DTMF) device

Ta slovenski standard je istoveten z: **EN 300 477 Version 1.2.2**

ICS:

33.040.35	Telefonska omrežja	Telephone networks
35.240.15	Identifikacijske kartice in sorodne naprave	Identification cards and related devices

SIST EN 300 477 V1.2.2:2003 **en**

EN 300 477 V1.2.2 (1999-05)

European Standard (Telecommunications series)

Universal Personal Telecommunication (UPT); UPT phase 2; Functional specification of the interface of a UPT Integrated Circuit Card (ICC) and Card Accepting Devices (CAD); UPT card accepting Dual Tone Multiple Frequency (DTMF) device

Reference
REN/NA-064012 (4f000ipc.PDF)

Keywords
card, DTMF, UPT

ETSI

Postal address
F-06921 Sophia Antipolis Cedex - FRANCE

Office address
650 Route des Lucioles - Sophia Antipolis
Valbonne - 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

Internet
secretariat@etsi.fr
Individual copies of this ETSI deliverable
can be downloaded from
http://www.etsi.org
If you find errors in the present document, send your
comment to: editor@etsi.fr

Contents

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in SR 000 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available **free of charge** from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://www.etsi.org/ipr).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Network Aspects (NA).

National transposition dates	
Date of adoption of this EN:	23 April 1999
Date of latest announcement of this EN (doa):	31 July 1999
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 January 2000
Date of withdrawal of any conflicting National Standard (dow):	31 January 2000

1 Scope

The present document defines the interface between the Universal Personal Telecommunication (UPT) card and the Card Accepting Device (CAD) for the operational phase. It also defines those aspects of the internal organization of the UPT card which are related to the operational phase. This is to ensure interoperability between a UPT card and a CAD independently to the respective manufacturers and UPT service provider.

The present document only defines the interface between a UPT card and a card reading Dual Tone Multiple Frequency (DTMF) device (I-ETS 300 380 [1]).

NOTE: Other types of CADs are under study.

The present document defines:

- the requirements for the physical characteristics of the UPT card, the electrical signals and the transmission protocol;
- the model which shall be used as a basis for the design of the logical structure of the UPT card;
- the security features;
- the interface functions;
- the commands for operating the interface functions;
- the contents of the files required for the UPT application;
- the service set to be supported in the UPT card;
- the application protocol (security, services, etc.);
- the Implementation Conformance Statement (ICS) proformas.

The present document does not specify any aspects related to the administrative management phase. Any internal technical realization of either the UPT card or the CAD are only specified where these reflect over the interface. The present document does not specify any of the security algorithms which may be used.

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.

[1] I-ETS 300 380: "Universal Personal Telecommunication (UPT); Access devices Dual Tone Multi Frequency (DTMF) sender for acoustical coupling to the microphone of a handset telephone".

[2] ETS 300 391-1: "Universal Personal Telecommunication (UPT); Specification of the security architecture for UPT phase 1; Part 1: Specification".

[3] I-ETS 300 045 (1992): "European digital cellular telecommunication system (Phase 1); Subscriber Identity Module - Mobile Equipment (SIM-ME) interface specification (GSM 11.11)".

[4] CCITT Recommendation T.50 (1988): "International alphabet No 5 "(ISO 646: 1983, Information processing - ISO 7-bits coded characters set for information interchange)".

[5] ISO 639 (1988): "Code for the representation of names of languages".

[6] ISO 7810 (1985): "Identification cards - Physical characteristics".

[7] ISO 7811-1 (1985): "Identification cards - Recording technique - Part 1: Embossing".

[8] ISO 7811-3 (1985): "Identification cards - Recording technique - Part 3: Location of embossed characters on ID-1 cards".

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

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

[11] ISO/IEC 7816-3 (1990): "Identification cards - Integrated circuit(s) cards with contacts - Part 3: Electronic signals and transmission protocols".

[12] ISO/IEC 7816-4: "Information technology - Identification cards - Integrated circuit(s) cards with contacts - Part 4: Interindustry commands for interchange".

[13] ISO 8859-1 (1987): "Information processing - 8-bit single-byte coded graphic character sets - Part 1: Latin alphabet No. 1".

[14] EN 726-3 (1994): "Terminal Equipment (TE); Requirements for IC cards and terminals for telecommunication use Part 3: Application independent card requirements".

[15] EN 726-6 (1994): "Terminal Equipment (TE); Requirements for IC cards and terminals for telecommunication use - Part 6: Telecommunication features".

[16] ENV 1375-1: "Identification card systems - Intersector integrated circuit(s) card additional formats - Part 1: ID-000 card size and physical characteristics".

3 Definitions, symbols and abbreviations

3.1 Definitions

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

access conditions: set of security attributes associated with a file

ADM: access condition to an EF which is under the control of the authority which creates this file

administrative phase: part of the card life between the manufacturing phase and the usage phase

application: application consists of a set of security mechanisms, files, data and protocols (excluding transmission protocols) which are located and used in the Integrated Circuit (IC) card and outside the IC card (external application)

application protocol: set of procedures required by the application

CAD_{UPT}: card accepting device for UPT. All type of telecommunication terminals with a card reader accepting a UPT card

card holder verification: authentication of the user to the UPT card

card session: link between the card and the external world starting with the Answer To Reset (ATR) and ending with a subsequent reset or a de-activation of the card

CHV1: CHV; access condition used by the PIM for the verification of the identity of the user

current directory: latest Master File (MF) or Dedicated File (DF) selected

current Elementary File (EF): latest EF selected

current file: latest MF, DF or EF selected

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

device holder verification: authentication of the user to the UPT access device

directory: general term for MF or DF

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

file: directory or an organized set of bytes or records in the PIM

file identifier: 2 bytes which address a file in the UPT card

ID-1 UPT card: UPT card having the format of an ID-1 card (see ISO/IEC 7816-1 [9])

Local Personal Identification Number (LPIN): used for card holder verification

Master File (MF): unique mandatory DF representing the root

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

PIM: data, functions and procedures residing in an IC card needed to gain access to UPT. It can be implemented as part of a multi-application card or as a UPT dedicated card

plug-in UPT card: second format of UPT card (see clause 4)

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

record number: number which identifies a record within an EF

record pointer: record pointer is used to address one record in an EF

Special Local Personal Identification Number (SLPIN): used to unblock the CHV1

UPT card application: set of security mechanisms, files, data and protocols which are located and used in the UPT card for the UPT service

UPT card session: link between the UPT card and the CAD_{UPT} starting with the ATR and ending with the subsequent reset or deactivation of the card

3.2 Symbols

For the purposes of the present document, the following symbols apply:

Vcc	Supply voltage
Vpp	Programming voltage
'0' to '9' and 'A' to 'F'	The sixteen hexadecimal digits
V_{OH}	High level output voltage
V_{OL}	Low level output voltage
V_{IH}	High level input voltage
V_{IL}	Low level input voltage
Icc	Supply current at Vcc
I_{OH}	High level output current
I_{OL}	Low level output current
I_{IH}	High level input current
I_{IL}	Low level input current
t_R	Risetime from 10 % to 90 % of signal amplitude
t_F	Falltime from 90 % to 10 % of signal amplitude

C_{out}	Output capacitance
C_{in}	Input capacitance

3.3 Abbreviations

For the purposes of the present document, the following abbreviations apply:

AC	Authentication Code
ADN	Abbreviated Dialling Number
APDU	Application Protocol Data Unit
ATR	Answer To Reset
BCD	Binary Coded Decimal
CAD	Card Accepting Device
CHV	Card Holder Verification information
DF	Dedicated File
DTMF	Dual Tone Multiple Frequency
EF	Elementary File
etu	elementary time unit
IC	Integrated Circuit
ICC	Integrated Circuit(s) Card
ID	Identifier
lgth	the (specific) length of a data unit
LND	Last Number Dialled
LPIN	Local Personal Identification Number
LSB	Least Significant Bit
MF	Master File
MMI	Man Machine Interface
MSB	Most Significant Bit
n_s	16 least significant bits of sequence number
NPI	Numbering Plan Identifier
PIM	Personal Identification Module
PIN	Personal Identification Number
PTS	Protocol Type Select (response to the ATR)
PUI	Personal User Identity
RFU	Reserved for Future Use
SLPIN	Special Local Personal Identification Number
SW1	Status Word 1
SW2	Status Word 2
TON	Type Of Number
UPT	Universal Personal Telecommunication

4 Physical characteristics

Two physical types of UPT card are specified. These are the "ID-1 card" (see ISO 7810 [6]) and the "plug-in card" (see ENV 1375-1 [16]).

The physical characteristics of both types of UPT card shall be in accordance with ISO/IEC 7816-1 [9] and ISO/IEC 7816-2 [10] unless otherwise specified. The following additional requirements shall be applied to ensure proper operation in the UPT environment.

4.1 Format and layout

The identification number as defined in EF_{ID} (see clause 10) shall be present on the outside of the ID-1 card. The information on the outside of the plug-in card shall include at least the individual account identifier and the check digit of the IC card identification.

4.1.1 ID-1 size

Format and layout of the ID-1 card shall be in accordance with ISO/IEC 7816-1 [9] and ISO/IEC 7816-2 [10].

The card should have a polarization mark which indicates how the user should insert the card into the CAD_{UPT}.

The CAD_{UPT} shall accept embossed ID-1 cards. The embossing shall be in accordance with ISO 7811-1 [7] and ISO 7811-3 [8]. The contacts of the ID-1 card shall be located on the front (embossed face, see ISO 7810 [6]) of the card.

4.1.2 Plug-in size

The plug-in card has a width of 25 mm, a height of 15 mm, a thickness the same as an ID-1 card and a feature for orientation. See annex A for details of the dimensions of the card and the dimensions and location of the contacts.

Clauses A.1 and A.2 of ISO/IEC 7816-1 [9] do not apply to the plug-in UPT card.

Annex A of ISO/IEC 7816-2 [10] applies with the location of the reference points adapted to the smaller size. The three reference points P1, P2 and P3 measure 7,5 mm, 3,3 mm and 20,8 mm, respectively, from 0 with the values in table A.1 of ISO/IEC 7816-2 [10] replaced by the corresponding values of figure A.1.

4.2 Temperature range for card operation

The temperature range for full operational use shall be between -25°C and +70°C with occasional peaks of up to +85°C. "Occasional" means not more than 4 hours each time and not more than 100 times during the life time of the card.

4.3 Contacts

The provision of contacts shall be in accordance with ISO/IEC 7816-2 [10].

4.3.1 Provision of contacts

CAD_{UPT}: There need not be any contacting elements in positions C4 and C8.

Contact C6 need not be provided.

UPT card: Contacts C4 and C8 need not be provided by the UPT card.

Contact C6 shall not be bonded in the UPT card.

4.3.2 Activation and deactivation

The CAD_{UPT} shall connect, activate and deactivate the UPT card in accordance with the operating procedures specified in ISO/IEC 7816-3 [11].

For any voltage level, monitored during the activation sequence, or during the deactivation sequence, the order of the contact activation/deactivation shall be respected.

NOTE 1: It is recommended that whenever possible the deactivation sequence defined in ISO/IEC 7816-3 [11] should be followed by the CAD_{UPT} on all occasions when the CAD_{UPT} is powered down.

NOTE 2: The voltage level of Vcc used by UPT differs from that specified in ISO/IEC 7816-3 [11]. Vcc is powered when it has a value between 4,5 V and 5,5 V.

4.3.3 Contact pressure

The contact pressure shall be large enough to ensure reliable and continuous contact (e.g. to overcome oxidization and to prevent interruption caused by vibration). The radius of any curvature of the contacting elements shall be greater than or equal to 0,8 mm over the contact area.

Under no circumstances may a contact force be greater than 0,5 N per contact.

4.4 Precedence

For a CAD_{UPT} which accepts both an ID-1 PIM and a plug-in PIM, the ID-1 PIM shall take precedence over the plug-in PIM.

5 Electronic signals and transmission protocols

Electronic signals and transmission protocols shall be in accordance with ISO/IEC 7816-3 [11] unless otherwise specified. The following additional requirements shall be applied to ensure proper operation in the UPT environment.

The choice of the transmission protocol(s), to be used to communicate between the PIM and the CAD_{UPT}, shall at least include that specified and denoted by T = 0 in ISO/IEC 7816-3 [11].

The values given in the tables hereafter are derived from ISO/IEC 7816-3 [11], subclause 4.2 with the following considerations:

- V_{OH} and V_{OL} always refer to the device (CAD_{UPT} or PIM) which is driving the interface. V_{IH} and V_{IL} always refer to the device (CAD_{UPT} or PIM) which is operating as a receiver on the interface;
- this convention is different to the one used in ISO/IEC 7816-3 [11], which specifically defines an ICC for which its current conventions apply. The following clauses define the specific core requirements for the PIM, which provide also the basis for Type Approval. For each state (V_{OH}, V_{IH}, V_{IL} and V_{OL}) a positive current is defined as flowing out of the entity (CAD_{UPT} or PIM) in that state;
- the high current options of ISO/IEC 7816-3 [11] for V_{IH} and V_{OH} are not specified for the PIM as they apply to NMOS technology requirements. No realization of the PIM using NMOS is foreseen.

5.1 Supply voltage

The PIM shall be operated within the following limits:

Table 1: Electrical characteristics of VCC under normal operating conditions

Symbol	Minimum	Maximum	Unit
Vcc	4,5	5,5	V
Icc		10	mA

The current consumption of the PIM shall not exceed the value given in table 1 at any frequency and voltage accepted by the PIM.

When the PIM is in idle state (see below) the current consumption of the card shall not exceed 200 µA at 1 MHz and 25°C.

The CAD_{UPT} shall support the current as required above. It shall also be able to counteract spikes in the current consumption of the card up to a maximum charge of 40 nAs with no more than 400 ns duration and a maximum amplitude of 200 mA, ensuring that the supply voltage stays in the specified range.

NOTE: A possible solution would be to place a capacitor (e.g. 100 nF, ceramic) as close as possible to the contacting elements.