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

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**ICS:**

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

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

**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 92 94 42 00 - Fax: +33 93 65 47 16

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## Foreword

This European Telecommunication Standard (ETS) has been produced by the Network Aspects (NA) Technical Committee of the European Telecommunications Standards Institute (ETSI).

Transposition dates	
Date of adoption of this ETS:	16 August 1996
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## 1 Scope

This European Telecommunication Standard (ETS) 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.

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

NOTE: Other types of CADs are under study.

This ETS 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.

This ETS 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. This ETS does not specify any of the security algorithms which may be used.

## 2 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] | 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); UPT Phase 2; Realisation of the security architecture".  |
| [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): "Codes 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".
- [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: "Identification cards - Integrated circuit(s) cards with contacts, Part 4: Inter-Industry 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 this ETS, the following definitions apply:

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

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

**application:** An 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:** The set of procedures required by the application.

**CAD<sub>UPT</sub>:** 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:** A 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.

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

**current Elementary File (EF):** The latest EF selected.

**current file:** The latest MF, DF or EF selected.

**Dedicated File (DF):** A 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):** A file containing access conditions and data and no other files.

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

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

**ID-1 UPT card:** The 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):** The 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:** A second format of UPT card (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:** A 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:** The set of security mechanisms, files, data and protocols which are located and used in the UPT card for the UPT service.

**UPT card session:** A 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 Abbreviations

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

AC	Authentication Code
ADM	Access condition to an EF which is under the control of the authority which creates this file
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
CHV1	CHV; access condition used by the PIM for the verification of the identity of the user
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
Igth	the (specific) length of a data unit
LND	Last Number Dialed
LPIN	Local Personal Identification Number
LSB	Least Significant Bit
MF	Master File
MMI	Man Machine Interface
MSB	Most Significant Bit
n	sequence number
$n_s$	16 least significant bits of sequence number
NPI	Numbering Plan Identifier
PIM	Personal Identification Module (see clause 3.1)
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

### 3.3 Symbols

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

$V_{cc}$	Supply voltage
$V_{pp}$	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 $V_{cc}$
$I_{OH}$	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

## 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.

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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  $-25^{\circ}\text{C}$  and  $+70^{\circ}\text{C}$  with occasional peaks of up to  $+85^{\circ}\text{C}$ . "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].