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Integrated circuit cards — Enhanced terminal accessibility using cardholder preference interface

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National foreword

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INTERNATIONAL STANDARD

ISO/IEC 12905

First edition
2011-07-15

Integrated circuit cards — Enhanced terminal accessibility using cardholder preference interface

Cartes à circuit intégré — Amélioration de l'accès aux terminaux via une interface d'acquisition des préférences du porteur de carte

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Foreword

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ISO/IEC 12905 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 17, *Cards and personal identification.*

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Introduction

Card system terminals, which are commonly used worldwide in modern society and whose numbers are still growing, do not operate effectively enough for cardholders with special needs or senior citizens because most of those terminals only have uniform man-machine interfaces.

This International Standard aims to improve the man-machine interface through which cardholders interact with terminals by defining a mechanism by which terminal functions can be adjusted to the individual's preferences.

It can help terminal design to be more user-friendly by allowing the cardholder to carry his preferences within his card. This will benefit both ordinary cardholders and those with special needs.

The purpose of this International Standard is to prescribe the contents and the form of unifying assistance information that can be mutually used in international systems to improve interoperability. Moreover, this will benefit manufacturers as currently system developers have to design and fund for each system.

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INTERNATIONAL STANDARD ISO/IEC 12905:2011(E)

Integrated circuit cards — Enhanced terminal accessibility using cardholder preference interface

1 Scope

This International Standard specifies a set of data elements to be personalized into an integrated circuit card, encoding cardholder preferences. These data elements are to be retrieved from the card and to be used to indicate to the terminal that the user has special needs regarding the user interface. It is not intended to standardize the actual application programming interface or other terminal-specific software allowing the functionality, nor does it cover the actual alignment of the card to the card-reader slot.

This International Standard is independent of the physical interface and is applicable to situations where the cardholder operates the card-accepting equipment (e.g. a cash dispenser, ticket machine, vending machine). It applies not only to ID-1 type cards, but also to SIM/UIM (ID-000) on mobile phones and form-factor-free contactless integrated circuit cards which are specified in ISO/IEC 14443.

This International Standard comprises:

— data elements containing the user preferences,

— the storage/retrieval formats for input and output of these data elements,

— security related to the information contained in these data elements,

— the access method to these data elements, and

— protection of cardholder information.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 7816-4:2005, *Identification cards — Integrated circuit cards — Part 4: Organization, security and commands for interchange*

ISO/IEC 7816-6:2004, *Identification cards — Integrated circuit cards — Part 6: Interindustry data elements for interchange*

ISO 639-1:2002, *Codes for the representation of names of languages — Part 1: Alpha-2 code*

ISO/IEC 19785-3:2007, *Information technology — Common Biometric Exchange Formats Framework — Part 3: Patron format specifications*

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3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
data element
item of information seen at the interface for which are specified a name, a description of logical content, a format and a coding

[ISO/IEC 7816-4:2005]

3.2
data object
information seen at the interface consisting of the concatenation of a mandatory tag field, a mandatory length field and a conditional value field

[ISO/IEC 7816-4:2005]

3.3
template
set of BER-TLV data objects forming the value field of a constructed BER-TLV data object

[ISO/IEC 7816-4:2005]

3.4
UCI dataset
set of data elements for each cardholder preference

4 Symbols and abbreviated terms

ACR	access control rule
b8..b1	bits one to eight of a byte
BCD	binary coded decimal
DO	data object
ICC	integrated circuit card
PIN	personal identification number
SMS	short message service
TLV	tag, length, value
UCI	universal cardholder information

5 Overview

5.1 Universal Cardholder Information

This standard specifies a set of data elements to be personalized into the card encoding cardholder preferences. A set of data elements is called Universal Cardholder Information (UCI).

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The UCI is held on the card, supplied and approved by a cardholder and openly accessible by all. It may be used by the terminal and its applications to provide service in the form required by the cardholder.

The UCI core dataset is intended to be read before the cardholder uses the application. That is, it may be read just after the card is presented to the terminal or just after application selection.

5.2 Flexibility

The UCI should be specified in a flexible manner to cater for existing pre-defined situations, new and as yet undetermined environments (i.e. systems and terminal types), different application scenarios, and provider-specific requirements. UCI should be independent from specific systems or terminals.

In addition, the UCI may be modified either temporarily or permanently by cardholder request; for example, if the cardholder is subject to a change in his / her circumstances.

The implications of this are:

— many of the UCI dataset elements are optional, as determined by the cardholder, where the provision of personal preference information is concerned. Where optional data elements specified in this standard are used, the formats shall be as specified in this standard;

— UCI allows itself to be formally extended through the use of versions and version numbers, as well as informally extended on a case by case basis by providers and implementers who need to supply additional information in a standardised manner;

— a certificate or digital signature may optionally be associated with UCI data to warrant its authenticity and integrity;

— implementation of the on-card UCI application is not confined to its use in IC Cards compliant with ISO/IEC 7816. It may also be implemented on IC Cards compliant with other specifications providing that those cards support the provisions of this standard.

5.3 Privacy of user related information

User privacy is provided as follows:

— the terminal shall not retain the data elements or objects stored on the card;

— a set of the data elements which is used for user preference should not be used for personal identification purposes. It may be linked to the personal information or it may be used without such a link;

— the data elements which are defined in this standard are not intended as a description of any or all of the obstacles faced by cardholders;

— the UCI shall always be available;

— modification of UCI preferences data by user shall require the permission of the cardholder.

6 Requirements for interoperability

6.1 Basic Rules of UCI

The UCI dataset is accessible as chains of constructed data objects (DOs), with access mechanisms specified in this standard. Each constructed DO is known as one UCI Component. Constructed DOs shall use BER-TLV format. Constructed DOs shall use BER-TLV encoding according to ISO/IEC 7816-4.

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The UCI dataset is recorded to the individual card for providing customization options when the cardholder uses the terminal (e.g. change the size of characters on screen or change the contrast of the screen). See Annex A for a full list of options.

Annex C shows the relationship between the data objects listed in Annex A and those listed in ISO/IEC 24786, *Information technology — User interfaces — Accessible user interface for accessibility settings* on information devices.

6.2 UCI Structure

There are two types of UCI - Global or Local. Global UCI is common to all applications in an ICC. Local UCI exists in each application file. For the Local UCI, different Access Control Rules (ACRs) may apply. Figure 1 shows the Global UCI and Local UCI.

The Global UCI shall be mandatory for any implementation complying with this standard. In addition, application files may contain application specific user preferences in each Local UCI after a successful application selection.

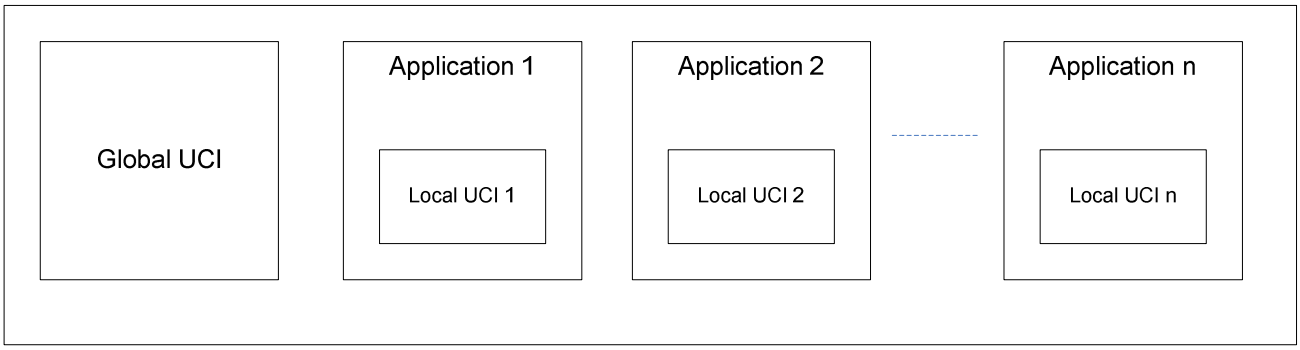

Figure 1 — Global UCI and Local UCI

6.3 Organization of UCI

6.3.1 Organization of Global UCI

The Global UCI shall be constructed as a logical hierarchy of Data Objects, both constructed and primitive (see ISO/IEC 7816-4:2005). A DO with tag '65' shall constitute Global UCI root, meaning that after initialization or after selection of Global UCI, Global UCI shall be accessible directly at the interface as a constructed DO with tag '65'.

Figure 2 illustrates the types of data element specified in Global UCI. It does not show all possible data elements or components.

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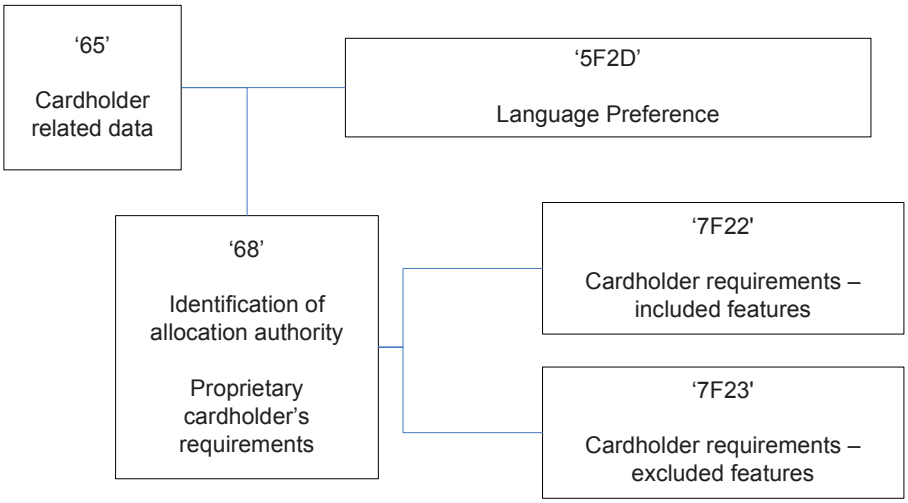

Figure 2 — Global UCI DOs

6.3.2 Organization of Local UCI

Figure 3 illustrates the types of data element specified in Local UCI. It does not show all possible data elements or components. Local UCI may include Tag '68' as root, Tag '7F22' and Tag'7F23'.

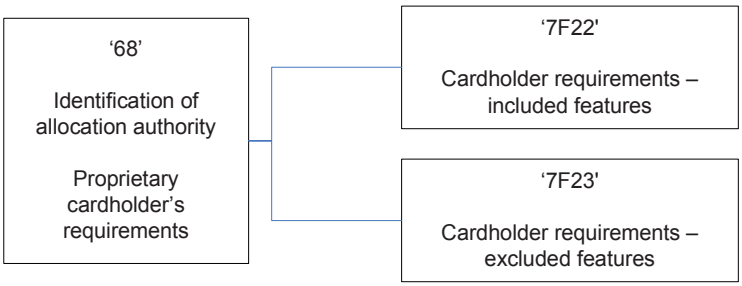

Figure 3 — Local UCI DOs

7 UCI organization and content

7.1 General structure of Global UCI

The Global UCI dataset as seen at the interface (card edge) is held in a card and shall be composed of Components, each of which shall be a single constructed DO identified by a tag as specified in Table 1.

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Table 1 — Global UCI Components

Name	Tag	Mandatory Optional	Content
Global UCI	'65'	M	Global Universal Cardholder Information (UCI)
Preferred Language	'5F2D'	M	Cardholder preferred language according to ISO/IEC 7816-6 and ISO 639-1.
Tag allocation authority and proprietary cardholder's requirements	'68'	M	Template containing at least a tag allocation authority (tag '06', '41', '42' or '4F'), and. a data object by which this authority indicates proprietary cardholder's requirements, possibly related to a disability.
Proprietary cardholder's requirements by tag allocation authority.	'70'-'77' Except '73'	O	Non-interindustry DOs defined by a Tag Allocation Authority shall be encapsulated in the template of the DOs '70' to '77', along with a DO which identifies the Tag Allocation Authority.
Cardholder's requirements for included features	'7F22'	O	Data element containing a cardholder's requirements for included features.
Cardholder's requirements for excluded features	'7F23'	O	Data element containing cardholder's requirements for excluded features.

7.2 Global UCI components

Each Global UCI Components DO shall be formatted according to the structure (BER-TLV) and encoding specified in ISO/IEC 7816-6. The Global UCI is made up of DOs of the following sources.

7.2.1 Global UCI, Tag '65'

The Global UCI shall be constructed as a logical hierarchy of DOs, both constructed and primitive (see ISO/IEC 7816-4:2005). A DO with tag '65' shall constitute Global UCI root, meaning that after initialization or after selection of Global UCI, Global UCI shall be accessible directly at the interface as a constructed DO with tag '65'.

7.2.2 Cardholder preferred language, Tag '5F2D'

Language preferences, in desired priority order, to be used, for example, by the terminal to communicate with the Cardholder (display, printer, audio). The first language shall be mandatory. Up to 4 languages may be included. This DO has a variable length with value field of 2-8 bytes. The value field of this data object shall encode the language coded according to ISO 639-1 in 2 bytes. The first (left-most) language coded has highest priority and should be used by the terminal as the default value.

7.2.3 Tag allocation authority and proprietary cardholder's requirements. Tag '68'

Within the UCI Component, the special needs constructed DO (tag '68') template shall contain at least the DOs specified or referenced in this and following sub-clauses, containing the data elements for user preferences for the configuration of the terminal interface and environment. Refer to Annex A for a description of these data elements and to Annex B for a table for the Tags used for the BER-TLV encoding of these data elements.

The template of the ⟦AC1⟩ DO tag '68' ⟨AC1⟧ may in addition contain DOs encoding cardholder special needs defined in other standards or specifications, by using a compatible tag allocation scheme as defined in ISO/IEC 7816-6. The length of the UCI constructed DO is determined by the number of special needs code data elements present, as decided and confirmed by the cardholder.

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The template contains at least a tag allocation authority (tag '06', '41', '42' or '4F'), and a DO by which this authority indicates the proprietary cardholder's requirements. The DO identifies the Tag Allocation Authority (AC1 tag '06' for an OID AC1 encoding a standard reference, tag '41' Country code (ISO 3166-1) and optional national data, tag '42' Issuer identification number (ISO/IEC 7812-1) and tag '4F' AID).

7.2.4 Proprietary cardholder's requirements, Tag '70'-'77' except '73'

DOs defined by a Tag Allocation Authority other than the present standard shall be encapsulated in the template of the DOs tag '70' to '77', along with a DO which identifies the Tag Allocation Authority (tag '06' for an OID encoding a standard reference, tag '41' national authority, tag '42' Issuer identification number).

7.2.5 Cardholder's requirements for included features, Tag '7F22'

Data element containing a cardholder's requirements for included features e.g. cardholder requires audio assistance from an ATM (automated teller machine).

7.2.6 Cardholder's requirements for excluded features, Tag '7F23'

Data element containing cardholder's requirements for excluded features e.g. cardholder is not able to use fingerprint verification.

7.3 General structure of Local UCI

The Local UCI dataset as seen at the interface (card edge) is held in a card and shall be composed of Components, each of which shall be a single constructed DO identified by a tag as specified in Table 2.

Table 2 — Local UCI Components

Name	Tag	Mandatory Optional	Content
Tag allocation authority and proprietary cardholder's requirements	'68'	M	Template containing at least a tag allocation authority (tag '06', '41', '42' or '4F'), and a DO by which this authority indicates proprietary cardholder's requirements, possibly related to a disability.
Proprietary cardholder's requirements by tag allocation authority.	'70'-'77' Except '73'	O	Non-interindustry DOs defined by a Tag Allocation Authority shall be encapsulated in the template of the DOs tag '70' to '77', along with a DO which identifies the Tag Allocation Authority.
Cardholder's requirements for included features	'7F22'	O	Data element containing a cardholder's requirements for included features.
Cardholder's requirements for excluded features	'7F23'	O	Data element containing cardholder's requirements for excluded features.

7.4 UCI data objects

In addition to DOs described in Table 1, UCI interindustry DOs described in Table 2 may be found within any template of the UCI data set having the meaning defined by ISO/IEC 7816-6. Table 3 shows General use DOs.

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Table 3 — General use DOs

DO Name Controls	Tag	Definition and Additional Information
Taglist	'5C'	List of tags of DOs; use to indicate UCI Components to which a management Component applies.
Certificate	'7F21'	Used by the Card or UCI Issuer for traceability (Format not specified in this standard. A Country code is expected to specify the format if required for its UCI Components (tag '7F22' and '7F23'). It may be found within the template of the DO UCI (tag '7F22' and '7F23').
Object Identifier (OID)	'06'	DO identifying for the Tag Allocation Authority.
Discretionary data object	'53'	Use in the UCI for the Component plain text name (e.g. "CEN URI UCI" or "Universal Cardholder Information").
URL	'5F50'	May be used to point to a service provided by a server addressed by URL:
Display Message	'5F45'	Data element containing a message to display.

8 Construction of UCI

8.1 Construction of Global UCI

In a generic scenario, the structure of the template of the DO tag '65' may be of the form as shown in Table 4.

Table 4 — Example construction of Global UCI (Tag '65') General use data objects

Tag	L	Value						
'65'	var	Root of Global UCI Data objects						
		Tag	L	Value				
		'5F2D'	var	Language (4 max)				
				Language 1				
				Language 2				
				Language 3				
				Language 4				
		'68'	var	Tag allocation authority and proprietary cardholder's requirements				
				Tag	L	Value		
				'06'	var	Identification for Tag allocation authority. [AC1⟩ OID (see Table 1) ⟨AC1]		
				'70'	var	Proprietary cardholder's requirement 1 by tag allocation authority.		
				'71'	var	Proprietary cardholder's requirement 2 by tag allocation authority.		
				'7F22'	var	Cardholder requirements –included features		
						T1	L1	V1:Cardholder requirements –included feature 1
						T2	L2	V2:Cardholder requirements –included feature 2
						T3	L3	V3:Cardholder requirements –included feature 3
				'7F23'	var	Cardholder requirements – excluded features		
						T1	L1	V1:Cardholder requirements –excluded feature 1
						T2	L2	V2:Cardholder requirements –excluded feature 2

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