

INTERNATIONAL STANDARD

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7816-5

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Identification cards — Integrated circuit(s) cards with contacts —

Part 5:

Numbering system and registration procedure
for application identifiers

Cartes d'identification — Cartes à circuit(s) intégré(s) à contacts —

*Partie 5: Système de numérotation et procédure d'enregistrement pour les
identificateurs d'applications*



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Contents

Foreword	iv
1 Scope	1
2 Normative references	1
3 Definitions and abbreviations	1
3.1 Definitions	1
3.2 Abbreviations	2
4 Data elements for application	
Identification and selection	2
5 Coding of the data elements	2
5.1 Structure of an ASN.1 object	2
5.2 Application identifier	2
5.2.1 Registration category = '0' to '9'	3
5.2.2 Registration category = 'A'	3
5.2.3 Registration category = 'D'	3
5.2.4 Registration category = 'F'	3
5.2.5 Registration category = 'B', 'C', 'E'	3

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5.3	Additional data elements	3
5.3.1	Application label	3
5.3.2	Path	3
5.3.3	Command to perform	4
5.3.4	Discretionary data	4
5.3.5	Application template	4
5.4	Retrieval of ASN.1 objects	4
6	Use of the data elements	4
6.1	Application identification	4
6.2	Retrieval of the application identifier	4
6.3	Application selection	4
6.3.1	Direct application selection with AID	4
6.3.2	Selection by the use of a DIR file or an ATR file	4
6.3.3	Implicit application selection	5
6.4	Use of the 'command to perform' ASN.1 object	5
7	Registration of identifiers	5
7.1	Request for assignment of RIDs	5
7.2	Sponsoring authorities	5
7.2.1	Requests for assignment	5
7.2.2	Responsibilities of the sponsoring authorities	5
7.3	Registration authority	5
7.4	Registration Management Group (RMG)	5
Annexes		
A	Request registration form for a registered application provider identifier	6
B	National numbering systems for applications in integrated circuit(s) cards	7

Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

International Standard ISO/IEC 7816-5 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 17, *Identification cards and related devices*.

ISO/IEC 7816 consists of the following parts, under the general title *Identification cards — Integrated circuit(s) cards with contacts*:

- *Part 1: Physical characteristics*
- *Part 2: Dimensions and location of the contacts*
- *Part 3: Electronic signals and transmission protocols*
- *Part 4: Interindustry commands for interchange*
- *Part 5: Numbering system and registration procedure for application identifiers*

Annex A forms an integral part of this part of ISO/IEC 7816. Annex B is for information only.

Identification cards – Integrated circuit(s) cards with contacts–

Part 5 : Numbering system and registration procedure for application identifiers

1 Scope

This part of ISO/IEC 7816 specifies a numbering system for application identifiers and a registration procedure for application provider identifiers.

The numbering system described in this standard provides a means for an application and related services offered by a provider to identify if a given card contains the elements required by its application and related services.

An application identifier (AID) is used to address an application in the card.

This part of ISO/IEC 7816 specifies the coding of application identifiers together with means and mechanisms for addressing application parts in cards.

This part of ISO/IEC 7816 establishes the authorities and procedures to ensure and optimize the reliability of the corresponding registration.

2 Normative references

The following standards contain provisions which, through reference in this part of ISO/IEC 7816, constitute provisions to this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO/IEC 7816 are encouraged to investigate the possibility of applying the most recent editions of the standards listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 3166 : 1981, *Codes for the representation of names of countries*.

ISO/IEC 8824 : 1990, *Information technology – Open Systems Interconnection – Specification of Abstract Syntax Notation One (ASN.1)*.

ISO/IEC 8825 : 1990, *Information technology – Open Systems Interconnection – Specification of Basic Encoding Rules for Abstract Syntax Notation One (ASN.1)*.

ISO 7812 : 1987, *Identification cards – Numbering system and registration procedure for issuer identifiers*.

ISO 7816-1 : 1987, *Identification cards – Integrated circuit(s) cards with contacts – Part 1: Physical characteristics*.

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

ISO/IEC 7816-4:—¹⁾, *Identification cards – Integrated circuit(s) cards with contacts – Part 4: Interindustry commands for interchange*.

3 Definitions and abbreviations

For the purposes of this part of ISO/IEC 7816, the definitions given in ISO/IEC 7816-4, as well as the following definitions, apply.

3.1 Definitions

3.1.1 application identifier : A data element which identifies an application in a card. An application identifier may contain a registered application provider identifier. If it contains either a registered application provider identifier or an issuer identification number, then this identification is unambiguous.

3.1.2 application provider : An entity which provides those components of an application on a card required to perform the respective application.

¹⁾ To be published

3.1.3 application label : A data element for use at the man-machine interface.

3.1.4 application template : A data element, which may be present for example in a DIR file, and which contains one or more ASN.1 object(s) relevant to an application.

3.1.5 ASN.1 object : ASN.1 objects are defined in ISO/IEC 8824, and their coding in ISO/IEC 8825.

NOTE 1 The ASN.1 objects defined in this part of ISO/IEC 7816 are comprised of one byte of tag, followed by one byte of body length, followed by a body of at most 127 bytes. The number of bytes in the body is given by the length byte.
The body of a primitive ASN.1 object contains a data element. The body of a constructed ASN.1 object contains primitive or constructed ASN.1 objects.

3.1.6 ATR file : The answer to reset (ATR) file is an optional elementary file, as defined in ISO/IEC 7816-4.

3.1.7 data element : As defined in ISO/IEC 7816-4.

3.1.8 directory (DIR) file : An optional elementary file containing a list of applications supported by the card, and optional related data elements defined in this part of ISO/IEC 7816.

3.1.9 master file : As defined in ISO/IEC 7816-4.

3.1.10 path : As defined in ISO/IEC 7816-4. In this part of ISO/IEC 7816, all paths commence with the master file.

3.2 Abbreviations

- AID Application identifier.
- ASN.1 Abstract Syntax Notation 1, as defined in ISO 8824.
- ATR Answer-to-Reset, as defined in ISO/IEC 7816-3.
- BCD Binary coded decimal.
- IFD Interface device, as defined in ISO/IEC 7816-3.
- IIN Issuer identification number, as defined in ISO 7812.
- PIX Proprietary application identifier extension.
- PTS Protocol type selection, as defined in ISO/IEC 7816-3.
- RID Registered application provider identifier.

4 Data elements for application identification and selection

The following data elements are defined in this part of ISO/IEC 7816 :

- The application identifier (AID) comprised of either the registered application provider identifier (RID) and optionally the proprietary application identifier extension (PIX) or the proprietary application identifier;
- The application label;
- The path to a file;
- A command to perform;
- Discretionary data;
- The application template.

5 Coding of the data elements

5.1 Structure of an ASN.1 object

If a data element defined in this clause is represented as an ASN.1 object, it shall be encoded according to table 1.

Table 1 – ASN.1 coding of data elements

TAG 1 byte	LENGTH(L) 1 byte	VALUE(data element) L bytes	TYPE
'4F'	'01' to '10'	Application identifier (AID)	P
'50'	'00' to '10'	Application label	P
'51'	'00' to '7E'	Path	P
'52'	'04' to '7F'	Command to perform, see ISO/IEC 7816-4	P
'53'	'00' to '7F'	Discretionary data	P
'73'	'00' to '7F'	Discretionary ASN.1 objects	C
'61'	'03' to '7F'	Application template	C
TYPE : P = primitive ASN.1 object, C = constructed ASN.1 object			
All other application class tags are reserved by ISO			

5.2 Application identifier

The AID is coded using hexadecimal notation. The most significant 4 bits of the first byte are the registration category (see table 2), which is used to

differentiate registered and proprietary application identifiers.

Table 2 – Registration category values

'0'-'9'	As defined in ISO 7812
'A'	International registration
'B'	Reserved for ISO
'C'	Reserved for ISO
'D'	National registration
'E'	Reserved for ISO
'F'	Proprietary non-registered

The PIX allows an application provider to identify their application(s). The PIX has a free coding. If the AID is 16 bytes long, then the value 'FF' for the least significant byte is reserved for future use.

5.2.1 Registration category = '0' to '9'

The first part of the AID is the IIN (The registration category is the first digit of the IIN).

If the IIN contains an odd number of digits, it shall be padded with 'F' (i.e. bit 4 to bit 1 of the least significant byte shall be set to 1).

If a PIX is present, it shall be preceded by a byte coded as 'FF'.

The coding of the AID is therefore :

< ----- Application identifier (AID) ----- >		
IIN, as defined in ISO 7812	'FF'	Proprietary application identifier extension (PIX)
length not defined in < - ISO/IEC 7816 -->		
< ----- 2 to 16 bytes ----- >		

5.2.2 Registration category = 'A'

The RID consists of the following fields :

- Registration category : 4 bits, coded as 1010.
- Registered application provider number, 36 bits as 9 BCD digits. Other codings are reserved for ISO use.

The coding of the AID is therefore :

< ----- Application identifier (AID) ----- >	
Registered application provider identifier (RID)	Proprietary application identifier extension (PIX)
< ----- 5 bytes ----- > < ----- ≤ 11 bytes ---- >	

5.2.3 Registration category = 'D'

The RID consists of the following fields

- Registration category : 4 bits, coded as 1101.
- Country code of the national registration authority, 12 bits as 3 BCD digits, coded according to ISO 3166, numeric part only.
- Field(s) specified by the national authority, 24 bits, BCD coding recommended.

The coding of the AID is therefore :

< ----- Application identifier (AID) ----- >	
Registered application provider identifier (RID)	Proprietary application identifier extension (PIX)
< ---- 5 bytes ----- > < ---- ≤ 11 bytes ---- >	

5.2.4 Registration category = 'F'

The coding of the remaining part of the AID is proprietary, the format of the AID is therefore :

< ----- Application identifier (AID) ----- >	
Proprietary application identifier	
< ----- 1 to 16 bytes ----- >	

WARNING Within the category 'F', where identifiers are not registered, the same value of the AID may be used by different application providers.

5.2.5 Registration category = 'B','C','E'

These values are reserved for ISO.

5.3 Additional data elements

In addition to the application identifier, the following data elements may be used for the application selection.

5.3.1 Application label

This data element of free coding may be specified by an application provider for use at the man-machine interface, e.g. trademark to be displayed to the customer.

Application label
< ----- 0 to 16 bytes ----- >

5.3.2 Path

The number of bytes of this data element is even.

Path
< ----- variable from 0 to 126 bytes ----- >

5.3.3 Command to perform

The 'command to perform' data element is a command APDU relevant to application selection.

Command to perform, see ISO/IEC 7816-4
--

< ----- variable from 4 to 127 bytes ----- >
--

5.3.4 Discretionary data

The application provider may put any relevant data in this data element.

Discretionary data

< ----- variable from 0 to 127 bytes ----- >
--

OR

Discretionary ASN.1 objects

< ----- variable from 0 to 127 bytes ----- >
--

5.3.5 Application template

The application template shall contain one or more of the ASN.1 objects relevant to an application. Within the application template,

- the ASN.1 object containing the application identifier is mandatory,
- all other ASN.1 objects defined in this part of ISO/IEC 7816 are optional.

ASN.1 objects relevant to an application
--

< ----- variable from 3 to 127 bytes ----- >
--

5.4 Retrieval of ASN.1 objects

The ASN.1 objects defined in this part of ISO/IEC 7816 may be found:

- In the historical bytes of the ATR,
- In a DIR file,
- In the ATR file,
- In any command or response message where ASN.1 is used, e.g. in the file control information of a file, see ISO/IEC 7816-4.

The DIR file contains only a sequence of application identifiers and/or application templates. Erased ASN.1 objects may be replaced by a sequence of '00' or 'FF' bytes.

If present in the historical bytes of the ATR, the tag and length of the ASN.1 object containing the AID shall be coded according to ISO/IEC 7816-4.

6 Use of the data elements

6.1 Application identification

The application identification shall enable the IFD

- To ascertain that an application may be initiated in the card ;
- To identify the access method to a specific application in the card.

6.2 Retrieval of the application identifier

If application identifier retrieval is offered by the card, the application identifier(s) may be read in the DIR file(s), and/or ATR file, as defined in ISO/IEC 7816-4.

For single application cards, the AID may be found in the historical bytes.

NOTE 2 See ISO/IEC 7816-4 for the coding conventions in the historical bytes.

6.3 Application selection

A card shall support one or more of the following application selection methods :

- Direct application selection with AID;
- Application selection by the use of a DIR file or an ATR file;
- Implicit application selection.

6.3.1 Direct application selection with AID

Direct application selection is performed by the use of the SELECT FILE command, specifying the AID as dedicated file name.

If this mechanism is supported by the card, then the IFD may explicitly select an application to be performed, without previously checking that the respective application is present in the card.

If the respective application is not present, then the card shall reject the command.

If the application is present, the card shall execute the SELECT FILE command according to ISO/IEC 7816-4.

6.3.2 Selection by the use of a DIR file or an ATR file

A DIR file contains a sequence of application template ASN.1 objects, or AID ASN.1 objects. Such sequences may be present in the ATR file.

The contents of the DIR file and/or ATR file determine which command(s) shall be performed in order to select the application :

- a (set of) SELECT FILE command(s)
- a (set of) command(s)

6.3.3 Implicit application selection

An application may be selected implicitly after ATR and possible PTS. This is indicated in the historical bytes, see ISO/IEC 7816-4.

When the AID is present in the historical bytes, it denotes the implicitly selected application.

NOTE 3 The implicit application selection is not recommended for multi-application cards.

6.4 Use of the 'command to perform' ASN.1 object.

This ASN.1 object contains a command message relevant to application selection. If several such objects are related to an application, the commands shall be performed in the order presented.

7 Registration of identifiers

7.1 Request for assignment of RIDs

A named and identified application provider may make a request to its national standards body for the assignment of a RID using the registration form shown in annex A.

In the absence of a national standards body, the request shall be made to the secretariat of the ISO technical body responsible for this part of ISO/IEC 7816. The national standards body (or the secretariat of the ISO technical body responsible for this part of ISO/IEC 7816 as appropriate), then acts as "the sponsoring authority" (see 7.2) in respect of the request.

7.2 Sponsoring authorities

7.2.1 Requests for assignment

Requests for the assignment of RIDs may be forwarded to the registration authority (see 7.3) by the following bodies:

- any member body of ISO;
- the ISO technical body responsible for this part of ISO/IEC 7816;
- any organization authorized by ISO for purposes concerned with the RIDs.

7.2.2 Responsibilities of the sponsoring authorities

The responsibilities of the sponsoring authorities shall be

- a) to receive registration forms for RIDs from within their countries or areas of responsibility;
- b) to forward to the registration authority those requests for a RID which are in compliance with this part of ISO/IEC 7816.

7.3 Registration authority

For the purpose of this part of ISO/IEC 7816 and according to the rules for the designation and operation of registration authorities in the ISO Directives, the ISO Council has designated :

KTAS

ISO/IEC 7816-5 Registration authority

Teglholmsgade 1

DK-1790 Copenhagen V

to act as registration authority.

With regard to the initial assignment of RIDs, changes and deletions of RIDs and subsequent additions to the register, the responsibilities of the registration authority shall be

- a) to allocate the application provider number, to register the RID and to notify the sponsoring authority as to the disposition of the request;
- b) to maintain a register of the identifiers assigned to application providers;
- c) to submit annually, to the secretariat of the ISO technical body responsible for this part of ISO/IEC 7816, a copy of this register. The form in which this copy shall be provided shall be agreed upon by the registration authority and the secretariat of the ISO technical body responsible for this part of ISO/IEC 7816.
- d) to make available upon request a copy of the register to national standard bodies. Such copies are for the exclusive use of national standard bodies and should not be distributed to third parties.

7.4 Registration Management Group (RMG)

A group shall be established to form the Registration Management Group (RMG).

The responsibilities of the Registration Management Group shall be as resolved by the ISO technical body responsible for this part of ISO/IEC 7816.

Annex A

(normative)

Request registration form for a registered application provider identifier

This request is submitted in accordance with International Standard ISO/IEC 7816-5, *Identification cards – Integrated circuit(s) cards with contacts – Numbering system and registration procedure for application identifiers*.

A.1 To be completed by the requesting organization

Name of organization	
Address to be registered	
Principal contact in organization	
Telephone number	Fax number
Address for correspondence/billing	
Date	Signature

A.2 To be completed by national standards body

Request received by	
Date	Signature

A.3 To be completed by ISO/IEC 7816-5 registration authority

Registered application provider identifier	
Date	Signature

Annex B

(informative)

National numbering systems for applications in integrated circuit(s) cards

B.1 Introduction

Registration category value 'D' has been assigned for use by national standards bodies in order to establish national numbering systems for applications in integrated circuit(s) cards.

B.2 Operation of national numbering systems

National standards bodies are advised to establish rules by means of national standards or other methods, for identifying applications in integrated circuit(s) cards in a national numbering system. They are also recommended to make arrangements for the administration of the system, including the procedures to be adopted for application providers, when the application providers make a request for and are assigned RIDs in accordance with the rules, and the maintenance of a register of assigned RIDs (copies of which should be supplied at regular intervals to the registration authority at no cost). To this end, they may wish to appoint a responsible organization to act as their agents in the administration and maintenance of the system within their countries.

B.3 Contact with the registration authority

National standards bodies that intend to set up national numbering systems for applications in integrated circuit(s) cards are asked to notify the registration authority accordingly and to supply that authority with details of the national procedures for the assignment of numbers, the method used to identify applications in integrated circuit(s) cards, and the name of the organization administering the system.

NOTE Where no national standards body exists, or if the national standards body is unable or unwilling to establish a national numbering system, application providers in that country may apply to the secretariat of the ISO technical body responsible for this part of ISO/IEC 7816 for assistance in finding a national standards body from among its member bodies to volunteer to support those user needs.

B.4 Role of registration management group

The registration management group in the ISO technical body responsible for this part of ISO/IEC 7816 shall, on request, provide advice and counsel to any national standards body on the national numbering system.

ICS 35.240.40

Descriptors: data processing, data storage devices, identification cards, ic cards, identification methods, international identification number, organizations for code assignment.

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