INTERNATIONAL STANDARD

ISO/IEC
7816-6

Second edition
2004-05-15

Identification cards — Integrated circuit cards —

Part 6:
Interindustry data elements for interchange

Cartes d'identification — Cartes à circuit intégré

Partie 6: Éléments de données intersectoriels pour les échanges

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC 7816-6 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Identification cards*, Subcommittee SC 17, *Cards and personal identification*.

This second edition, together with the second editions of parts 4, 5, 8 and 9, after an in-depth reorganization of these five parts, cancels and replaces:

— ISO/IEC 7816-4:1995, *Information technology — Identification cards — Integrated circuit(s) cards with contacts — Part 4: Interindustry commands for interchange*

— ISO/IEC 7816-4:1995/Amd.1:1997, *Information technology — Identification cards — Integrated circuit(s) cards with contacts — Part 4: Interindustry commands for interchange — Amendment 1: Impact of secure messaging on the structure of APDU messages*

— ISO/IEC 7816-5:1994, *Identification cards — Integrated circuit(s) cards with contacts — Part 5: Numbering system and registration procedure for application identifiers*

— ISO/IEC 7816-5:1994/Amd.1:1996, *Identification cards — Integrated circuit(s) cards with contacts — Part 5: Numbering system and registration procedure for application identifiers — Amendment 1*

— ISO/IEC 7816-6:1996, *Identification cards — Integrated circuit(s) cards with contacts — Part 6: Interindustry data elements*

— ISO/IEC 7816-6:1996/Cor.1:1998, *Identification cards — Integrated circuit(s) cards with contacts — Part 6: Interindustry data elements — Technical corrigendum 1*

— ISO/IEC 7816-6:1996/Amd.1:2000, *Identification cards — Integrated circuit(s) cards with contacts — Part 6: Interindustry data elements — Amendment 1: IC manufacturer registration*

— ISO/IEC 7816-8:1999, *Identification cards — Integrated circuit(s) cards with contacts — Part 8: Security-related interindustry commands*

— ISO/IEC 7816-9:2000, *Identification cards — Integrated circuit(s) cards with contacts — Part 9: Additional interindustry commands and security attributes*

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

— *Part 1: Cards with contacts — Physical characteristics*

— *Part 2: Cards with contacts — Dimensions and location of the contacts*

— *Part 3: Cards with contacts — Electrical interface and transmission protocols*

— *Part 4: Organization, security and commands for interchange*

— *Part 5: Registration of application providers*

— *Part 6: Interindustry data elements for interchange*

— *Part 7: Interindustry Commands for Structured Card Query Language (SCQL)*

— *Part 8: Commands for security operations*

— *Part 9: Commands for card management*

— *Part 10: Cards with contacts — Electrical interface for synchronous cards*

— *Part 11: Personal verification through biometric methods*

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— *Part 15: Cryptographic information application*

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Introduction

ISO/IEC 7816 is a series of standards specifying integrated circuit cards and the use of such cards for interchange. These cards are identification cards intended for information exchange negotiated between the outside world and the integrated circuit in the card. As a result of an information exchange, the card delivers information (computation result, stored data), and / or modifies its content (data storage, event memorization).

— Five parts are specific to cards with galvanic contacts and three of them specify electrical interfaces.

- ISO/IEC 7816-1 specifies physical characteristics for cards with contacts.

- ISO/IEC 7816-2 specifies dimensions and location of the contacts.

  o ISO/IEC 7816-3 specifies electrical interface and transmission protocols for asynchronous cards.

  o ISO/IEC 7816-10 specifies electrical interface and answer to reset for synchronous cards.

  o ISO/IEC 7816-12 specifies electrical interface and operating procedures for USB cards.

— All the other parts are independent from the physical interface technology. They apply to cards accessed by contacts and / or by radio frequency.

- ISO/IEC 7816-4 specifies organization, security and commands for interchange.
- ISO/IEC 7816-5 specifies registration of application providers.
- ISO/IEC 7816-6 specifies interindustry data elements for interchange.
- ISO/IEC 7816-7 specifies commands for structured card query language.
- ISO/IEC 7816-8 specifies commands for security operations.
- ISO/IEC 7816-9 specifies commands for card management.
- ISO/IEC 7816-11 specifies personal verification through biometric methods.
- ISO/IEC 7816-15 specifies cryptographic information application.

ISO/IEC 10536[14] specifies access by close coupling. ISO/IEC 14443[17] and ISO/IEC 15693[18] specify access by radio frequency. Such cards are also known as contactless cards.

Identification cards — Integrated circuit cards —

Part 6:
Interindustry data elements for interchange

1   Scope

This document specifies, directly or by reference, data elements, including composite data elements, that may be used in interindustry interchange.

It identifies the following characteristics of each data element:

⎯ identifier;

⎯ name;

⎯ description and reference;

⎯ format and coding (if not available in other ISO International Standards or parts of ISO/IEC 7816).

The layout of each data element is described as seen at the interface between the interface device and the card.

This document provides the definition of data elements without consideration of any restrictions on the usage of the data elements.

It does not cover the internal implementation within the card and/or the outside world.

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 (all parts), *Identification cards — Integrated circuit cards*

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 defined a name, a description of logical content, a format and a coding
[ISO/IEC 7816-4]

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]

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3.3
template
set of BER-TLV data objects forming the value field of a constructed BER-TLV data object
[ISO/IEC 7816-4]

4 Abbreviations and notation

For the purposes of this document, the following notation applies.

A	alphabetic character
N	numeric (binary-coded decimal format)
S	special character
An	alphanumeric character
ans	alphanumeric and special characters
...	denotes a range of values between two numbers

Any number following the notation denotes the number of digits or characters. For example,

— a3 means three alphabetic characters;

— n...3 means up to three binary-coded decimal digits;

— n2...4 means two, three or four binary-coded decimal digits.

If the number of bits representing a data element is not a multiple of eight, then the mapping into a byte string should be defined in the context of the respective data element. If not specified otherwise, the appropriate number of bits shall be set to one in the last byte starting from bit 1.

5 Maintenance of interindustry data objects

It is the intention that every interindustry data object, specified at the time of publication, should be listed in this document. To allow the introduction, deletion or amendment of any data object, the following procedures shall be adopted:

— **Interindustry data objects from ISO/IEC 7816 —** if any part of ISO/IEC 7816 introduces new data objects, then the normal ballot process shall approve them. Following publication of that part of ISO/IEC 7816, these data objects will be incorporated into this document at the next revision.

— **Interindustry data objects from other standards —** for such data objects, an amendment to this document will be required and this will be subject to the normal ISO/IEC JTC 1 voting procedures. Following successful ballot the data objects will be incorporated into this document.

6 Specific interindustry data elements

According to its needs, any application may use the following interindustry data elements and templates.

6.1 Name of an individual

Referenced by tag '5B', this interindustry data element consists of up to 39 bytes; each byte is a character as defined in ISO/IEC 7501-1[7]. The data element consists of surname, i.e., family name, given name(s), i.e., forename(s), name suffix, e.g., Jr., number, and filler(s), all coded according to ISO/IEC 8859-1[12].

National languages with non-Latin characters shall be transliterated or transcribed into the Latin alphabet using the appropriate ISO standard. In cases where names cannot be shown in full or a special alphabet is needed or the transliteration or transcription is not sufficient, the qualified name template should be used.

6.2 Proprietary login data

Referenced by tag '5E', this interindustry data element consists of login data with proprietary structures not specified in ISO/IEC 7816.

6.3 Magnetic stripe data

The coding of the magnetic stripe data is as follows:

— referenced respectively by tags '5F21', '5F22' and '5F23', these interindustry data elements shall code card tracks 1, 2 and 3. Such a tag shall be used when the data element is identical to the data coded on the corresponding track on the magnetic stripe of the card (see ISO/IEC 7813[9] and ISO 4909)[6];

— referenced respectively by tags '56', '57' and '58', these interindustry data elements shall code application tracks 1, 2 and 3. Such a tag shall be used when, while formatted according to ISO/IEC 7813 and ISO 4909, the data element may differ from the data coded on the corresponding track of the magnetic stripe of the card.

6.4 PIN usage policy

Referenced by tag '5F2F', this interindustry data element shall consist of two bytes. It lists the tests the terminal shall perform in order to determine whether a PIN (personal identification number) is applicable to the current transaction, and, therefore, whether the terminal should prompt for the PIN. If set to one, bit 8 of the first byte specifies that a PIN applies to this application and the terminal should prompt for the PIN. The meaning of the other fifteen bits is application-dependent. If all bits are set to zero, then the terminal should not prompt for the PIN. If bit 8 of the first byte is set to one or if any test implies a PIN, but the PIN cannot be presented, then the action to take is application-dependent.

6.5 Login template

Referenced by tag '6A', this interindustry template shall consist of one or more primitive data objects. Within the login template, the context-specific class (first byte in the range '80' to 'BF') is reserved for login data objects such as qualifiers, numbers, texts and delay indicators, as listed in Table 1 and specified hereafter.

Table 1 — Login data objects

Tag		Meaning
'6A'		Interindustry template for nesting login data objects with the following tags
	'80'	Qualifier
	'81'	Number
	'82'	Text
	'83', '84'	Delay indicators
In this context, ISO/IEC JTC 1/SC17 reserves any other data object of the context-specific class (first byte from '80' to 'BF')		

— **Qualifier** — Referenced by tag '80' in a login template, this data element shall consist of one to nine bytes: a mandatory first byte coding a rank, followed by up to eight optional bytes coding a mnemonic. It shall qualify the subsequent objects in the template, until the next qualifier, if any.

- The rank is a number from zero to 255. If two or more qualifiers have the same rank within the same context, then only the set of objects qualified by the most recent one is valid.

- The mnemonic is a string of up to eight bytes consisting of 7-bit characters (bit 8 set to 0, see ISO/IEC 646[2]) to display at the man-machine interface.

— **Number** — Referenced by tag '81' in a login template, this data element shall consist of an even number of quartets where each quartet codes one character for representing a telephone number according to Table 2.

Table 2 — Telephone number

Quartet	Character	Meaning
'0' to '9'	0 to 9	Decimal digits
'A'	(	Opening bracket
'B'	)	Closing bracket
'C'	C	Requirement for connecting to the line before continuing
'D'	+	Introduction to an international telephone number
'E'	-	If first, introduction of a number to use without prefix If not first, requirement for a delay (two seconds) before continuing
'F'		Reserved for padding

⎯ **Text —** Referenced by tag '82' in a login template, this data element shall consist of one or more bytes where each byte codes one character. Bit 8 sets the difference between data characters (bit 8 set to zero) and control characters (bit 8 set to one). The byte string consists of one or more strings of data characters (7-bit character, see ISO/IEC 646[2]) separated by strings of control characters. The following control characters are defined.

- '80' — A message has to be received before sending the next character.

- 'C0' — A modulation has to be present before sending the next character.

- '8X' — X characters have to be received in echo before waiting for a message.

⎯ **Delay indicators —** Referenced by tag '83' or '84' in a login template, this data element shall consist of one byte as specified in Table 3.

- When present, a delay indicator data object with tag '83' fixes the time for detecting an end of message. The default value shall be two seconds.

- When present, a delay indicator data object with tag '84' fixes the time for detecting an absence of response. The default value shall be sixty seconds.

Table 3 — Delay indicator byte

b8	b7	b6	b5	b4	b3	B2	b1	Meaning
0	0							Any other value is reserved for future use by ISO/IEC JTC1/SC17.
-	-	x	x	-	-	-	-	The time unit is
-	-	0	0	-	-	-	-	⎯ 100 milliseconds
-	-	0	1	-	-	-	-	⎯ 1 second
-	-	1	0	-	-	-	-	⎯ 10 seconds
-	-	1	1	-	-	-	-	⎯ 100 seconds
				x	x	x	x	Number of time units from zero to fifteen

6.6 Qualified name template

Referenced by tag '6B', this interindustry template shall consist of

⎯ one or more object identifiers (tag '06') referring to the standards defining the qualified name presentation;

⎯ a name (tag '80' or 'A0'), the value and coding of which are defined by the aforementioned standards;

⎯ other related optional information (e.g. sex, nationality, place of birth).

6.7 Cardholder image template

Referenced by tag '6C', this interindustry template shall contain at least one data object as defined hereafter, possibly preceded by an tag allocation authority indicator (see ISO/IEC 7816-4) for identifying the authority responsible for the data object format.

— **Cardholder biometric data** — referenced by tag '5F2E', this interindustry data element contains biometric data for verifying the claimed identity of the person presenting the card. Examples of biometric data are fingerprints, palm prints, voiceprints, dynamic signatures, etc.

— **Cardholder portrait image** — referenced by tag '5F40', this interindustry data element shall be formatted as defined in ISO/IEC 10918-1[15], unless otherwise specified and / or requested by an authority.

— **Cardholder handwritten signature image** — referenced by tag '5F43', this interindustry data element shall be formatted as defined in ISO/IEC 11544[16] unless otherwise specified and/or requested by an authority.

   NOTE — The use of this interindustry data object should be associated with appropriate security measures.

Further information on personal verification through biometric methods may be found in ISO/IEC 7816-11.

6.8 Application image template

Referenced by tag '6D', this interindustry template shall contain at least an application image (tag '5F44'), i.e. an icon or a logo related to the application. It may also contain an authority indicator (see Table 11) identifying the authority responsible for the data format of the application image. In the absence of authority indicator, the format shall be as defined in ISO/IEC 10918-1[15].

6.9 Display control template

Referenced by tag '7F20', this interindustry template may contain one or more data objects, the value of which, either directly or indirectly through templates, is not intended to be displayed and should only be used, when relevant, for processing of transmission.

7 Identification of integrated circuit manufacturers

7.1 Scope

This clause specifies

— a numbering system for integrated circuit manufacturer identifiers and

— rules for registration of integrated circuit manufacturers and rules for assignment of identifiers

to identify manufacturers of integrated circuits to be embedded in contact and / or contactless integrated circuits cards. The assigned values of the integrated circuit manufacturer identifiers will form the register, published as SC17 Standing Document 5.

Applications for a number may be made using the form in Annex A.

7.2 Identifier

The identifier is referenced by tag '5F4D'. It may be present in pre-issuing data (compact header '6Y' in the historical bytes and interindustry tag '46' in EF.ATR) on a proprietary basis.

NOTE — In amendment 1 to the first edition of ISO/IEC 7816-6, tag '5F4B' references an integrated circuit manufacturer identifier (a data element of one byte). In the first edition of ISO/IEC 7816-9, tag '5F4B' references a certificate holder authorization (a data element of five or more bytes). Consequently, tag '5F4B' is now deprecated in ISO/IEC 7816.