
**Information technology — Identification
cards — Integrated circuit(s) cards with
contacts —**

Part 3:

Electronic signals and transmission protocols

*Technologies de l'information — Cartes d'identification — Cartes à circuit(s)
intégré(s) à contacts —*

Partie 3: Signaux électroniques et protocoles de transmission

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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. 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 7816-3 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 17, *Identification cards and related devices*.

This second edition cancels and replaces the first edition (ISO/IEC 7816-3:1989), which has been technically revised. It also incorporates Amendment 1:1992 and Amendment 2:1994.

ISO/IEC 7816 consists of the following parts, under the general title *Information technology — 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*
- Part 6: *Interindustry data elements*
- Part 7: *Interindustry commands for structured card query language*

Annex A of this part of ISO/IEC 7816 is for information only.

Introduction

ISO/IEC 7816 is a series of International Standards describing the parameters for integrated circuit(s) cards with contacts and the use of such cards for international interchange.

The integrated circuit(s) cards with contacts are identification cards intended for information exchange negotiated between the outside and the integrated circuit within the card. During each information exchange, the card delivers information (computation results, stored data) and/or modifies its content (data storage, event memorization).

During the preparation of this International Standard, information was gathered concerning relevant patents upon which application of this standard might depend. Relevant patents were identified in France and USA, the patent holder being Bull S.A. in each case. However, ISO cannot give authoritative or comprehensive information about the evidence, validity or scope of the patents or similar rights.

The patent holder has stated that licenses will be granted in appropriate terms to enable the application of this part of ISO/IEC 7816, provided that those who seek licenses agree to reciprocate.

Further information is available from

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

Part 3:

Electronic signals and transmission protocols

1 Scope

This part of ISO/IEC 7816 specifies the power and signal structures, and information exchange between an integrated circuit(s) card and an interface device such as a terminal.

It also covers signal rates, voltage levels, current values, parity convention, operating procedure, transmission mechanisms and communication with the card.

It does not cover information and instruction content, such as identification of issuers and users, services and limits, security features, journaling and instruction definitions.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 7816. 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 ISO and IEC maintain registers of currently valid International Standards.

ISO 1177:1985, *Information processing — Character structure for start/stop and synchronous character oriented transmission.*

ISO/IEC 3309:1993, *Information technology — Telecommunications and information exchange between systems — High-level data link control (HDLC) procedures — Frame structure.*

ISO/IEC 7810:1995, *Identification cards — Physical characteristics.*

1) Currently under revision.

ISO 7816-1:1987¹⁾, *Identification cards — Integrated circuit(s) cards with contacts — Part 1: Physical characteristics.*

ISO 7816-2:1988¹⁾, *Identification cards — Integrated circuit(s) cards with contacts — Part 2: Dimensions and location of the contacts.*

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

3 Terms and definitions

The term “identification card” is defined in ISO/IEC 7810. For the purposes of this part of ISO/IEC 7816, the following definitions apply.

3.1 devices

3.1.1

interface device

terminal, communication device or machine to which the card is electrically connected during operation

3.1.2

operating card

card which can correctly carry out all its functions

3.2

etu (abbreviation for “elementary time unit”) nominal duration of a moment on contact I/O

3.3 resets

3.3.1

cold reset

first reset occurring after activation

3.3.2

warm reset

any reset which is not a cold reset