

# norm

# NEN-ISO/IEC 14443-3 (en)

Identification cards - Contactless integrated circuit(s) cards - Proximity cards - Part 3: Initialization and anticollision (ISO/IEC 14443-3:2001, IDT)

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**Identification cards — Contactless  
integrated circuit(s) cards — Proximity  
cards —**

**Part 3:  
Initialization and anticollision**

*Cartes d'identification — Cartes à circuit(s) intégré(s) sans contact —  
Cartes de proximité —*

*Partie 3: Initialisation et anticollision*

Preview

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PREVIEW

## 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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 14443-3 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 17, *Identification cards and related devices*.

ISO/IEC 14443 consists of the following parts, under the general title *Identification cards — Contactless integrated circuit(s) cards — Proximity cards*:

- Part 1: *Physical characteristics*
- Part 2: *Radio frequency power and signal interface*
- Part 3: *Initialization and anticollision*
- Part 4: *Transmission protocol*

Annexes A, B, C and D of this part of ISO/IEC 14443 are for information only.

## Introduction

ISO/IEC 14443 is one of a series of International Standards describing the parameters for identification cards as defined in ISO/IEC 7810, and the use of such cards for international interchange.

This part of ISO/IEC 14443 describes polling for proximity cards entering the field of a proximity coupling device, the byte format and framing, the initial Request and Answer to Request command content, methods to detect and communicate with one proximity card among several proximity cards (anticollision) and other parameters required to initialize communications between a proximity card and a proximity coupling device. Protocols and commands used by higher layers and by applications and which are used after the initial phase are described in ISO/IEC 14443-4.

ISO/IEC 14443 is intended to allow operation of proximity cards in the presence of other contactless cards conforming to ISO/IEC 10536 and ISO/IEC 15693.

The International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC) draw attention to the fact that it is claimed that compliance with this part of ISO/IEC 14443 may involve the use of patents.

ISO and IEC take no position concerning the evidence, validity and scope of this patent right.

The holders of these patent rights have assured ISO and IEC that they are willing to negotiate licences under reasonable and non discriminatory terms and conditions with applicants throughout the world. In this respect, the statements of the holders of patent rights are registered with the ISO and IEC. Information may be obtained from:

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### Details

US Patent 4,810,862 and JP 2564480  
"System for judging propriety of use of an integrated circuit card with a card terminal", issued on March 07, 1989

Japan Patent No. 2564480  
US Patent No. 4810862  
British Patent No. 209092  
German Patent No. P 3689089.8  
French Patent No. 209092  
Swiss Patent No. 209092  
Canadian Patent No. 1301891  
Netherlands Patent No. 209092  
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 AT-PS 401 127  
 Related to "anticollision" as specified in  
 ISO/IEC 14443-3

The following companies may hold patents relating to this part of ISO/IEC 14443 but have not provided details of the patents or agreed to provide licences.

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WO 89 05549 A

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# Identification cards — Contactless integrated circuit(s) cards — Proximity cards —

## Part 3: Initialization and anticollision

### 1 Scope

This part of ISO/IEC 14443 describes:

- polling for proximity cards (PICCs) entering the field of a proximity coupling device (PCD);
- the byte format, the frames and timing used during the initial phase of communication between PCDs and PICCs;
- the initial Request and Answer to Request command content;
- methods to detect and communicate with one PICC among several PICCs (anticollision);
- other parameters required to initialize communications between a PICC and PCD;
- optional means to ease and speed up the selection of one PICC among several PICCs based on application criteria.

Protocol and commands used by higher layers and by applications and which are used after the initial phase are described in ISO/IEC 14443-4.

This part of ISO/IEC 14443 is applicable to PICCs of Type A and of Type B (as described in ISO/IEC 14443-2).

NOTE Part of the timing of data communication is defined in ISO/IEC 14443-2.

### 2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 14443. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO/IEC 14443 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO/IEC 7816-3:1997, *Information technology — Identification cards — Integrated circuit(s) cards with contacts — Part 3: Electronic signals and transmission protocols.*

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

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 13239, *Information technology — Telecommunications and information exchange between systems — High-level data link control (HDLC) procedures.*

ISO/IEC 14443-2, *Identification cards — Contactless integrated circuit(s) cards — Proximity cards — Part 2: Radio frequency power and signal interface.*

ISO/IEC 14443-4, *Identification cards — Contactless integrated circuit(s) cards — Proximity cards — Part 4: Transmission protocol.*

ITU-T X.25, *Interface between Data Terminal Equipment (DTE) and Data Circuit-terminating Equipment (DCE) for terminals operating in the packet mode and connected to public data networks by dedicated circuit.*

ITU-T V.41, *Code-independent error-control system.*

ITU-T V.42, *Error-correcting procedures for DCEs using asynchronous-to-synchronous conversion.*

### 3 Terms and definitions

For the purposes of this part of ISO/IEC 14443, the terms and definitions given in ISO/IEC 14443-2, ISO/IEC 7816-3 and the following apply.

#### 3.1 anticollision loop

algorithm used to prepare for dialogue between PCD and one or more PICCs out of the total number of PICCs responding to a request command

#### 3.2 bit collision detection protocol

anticollision method for PICCs of Type A, employing collision detection at bit level within a frame

#### 3.3 byte

8 bits of data designated b8 to b1, from the most significant bit (MSB, b8) to the least significant bit (LSB, b1)

#### 3.4 collision

transmission by two PICCs in the same PCD energizing field and during the same time period, such that the PCD is unable to distinguish from which PICC the data originated

#### 3.5 elementary time unit

etu  
for this part of ISO/IEC 14443, one etu is defined as  $1 \text{ etu} = 128/f_c$  (i.e. 9,4  $\mu\text{s}$  nominal)

#### 3.6 frame

sequence of data bits and optional error detection bits, with frame delimiters at start and end

#### 3.7 higher layer protocol

protocol layer (not described in this part of ISO/IEC 14443) that makes use of the protocol layer defined in this part of ISO/IEC 14443 to transfer information belonging to the application or higher layers of protocol that is not described in this part of ISO/IEC 14443

#### 3.8 timeslot protocol

method whereby a PCD establishes logical channels with one or more PICCs of Type B, which makes use of timeslot allocation for PICC response

**3.9****request command**

command requesting PICC of the appropriate type to respond if they are available for initialization

**4 Symbols and abbreviated terms**

For the purposes of this part of ISO/IEC 14443, the following abbreviations are used:

ADC	Application Data Coding, Type B
AFI	Application Family Identifier. Card preselection criteria by application, Type B
APf	Anticollision Prefix f, used in REQb/WUPB, Type B
APn	Anticollision Prefix n, used in Slot-MARKER Command, Type B
ATQA	Answer To Request, Type A
ATQB	Answer To Request, Type B
ATTRIB	PICC selection command, Type B
BCC	UID CLn check byte, calculated as exclusive-or over the 4 previous bytes, Type A
CID	Card IDentifier
CLn	Cascade Level n, Type A
CT	Cascade Tag, Type A
CRC_A	Cyclic Redundancy Check error detection code A
CRC_B	Cyclic Redundancy Check error detection code B
E	End of communication, Type A
EGT	Extra Guard Time, Type B
EOF	End Of Frame, Type B
etu	Elementary time unit.
FDT	Frame Delay Time, Type A
<i>fc</i>	Carrier frequency
FO	Frame Option
<i>fs</i>	Subcarrier frequency
FWI	Frame Waiting time Integer
FWT	Frame Waiting Time
HLTA	Halt Command, Type A
HLTB	Halt Command, Type B

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