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Cards and security devices for personal identification — Contactless proximity objects —

Part 3: Initialization and anticollision

Cartes et dispositifs de sécurité pour l'identification personnelle — Objets sans contact de proximité —

Partie 3: Initialisation et anticollision

ICS: 35.240.15

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives or www.iec.ch/members_experts/refdocs).

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This document was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 17, *Cards and security devices for personal identification*.

This fifth edition cancels and replaces the fourth edition published in 2018, which has been technically revised.

The main changes are as follows:

— technical and editorial improvements;

— compatibility with extended IC manufacturer codes defined in ISO/IEC 7816-6.

A list of all parts in the ISO/IEC 14443 series can be found on the ISO and IEC websites.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html and www.iec.ch/national-committees.

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Introduction

The ISO/IEC 14443 series describes the parameters for identification cards or objects for international interchange.

This document 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 needed 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. Part of the timing of data communication is defined in ISO/IEC 14443-2. Test methods for this document are defined in ISO/IEC 10373-6.

The ISO/IEC 14443 series is intended to allow operation of proximity cards in the presence of other contactless cards or objects conforming to the ISO/IEC 10536 [1] series and the ISO/IEC 15693 [2] series and near field communication (NFC) devices conforming to ISO/IEC 18092 and ISO/IEC 21481 [3].

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Cards and security devices for personal identification — Contactless proximity objects —

Part 3: Initialization and anticollision

1 Scope

This document describes the following:

— polling for proximity cards or objects (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;

— optional capability to allow a device to alternate between the functions of a PICC and a PCD to communicate with a PCD or a PICC, respectively. A device which implements this capability is called a PXD.

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

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 14443-2:2020, *Cards and security devices for personal identification — Contactless proximity objects — Part 2: Radio frequency power and signal interface*

ISO/IEC 14443-4:2018, *Cards and security devices for personal identification — Contactless proximity objects — Part 4: Transmission protocol*

ISO/IEC 18092, *Telecommunications and information exchange between systems — Near Field Communication Interface and Protocol 1 (NFCIP-1)*

3 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

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— IEC Electropedia: available at https://www.electropedia.org/

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* (3.9)

3.2
byte
8 bits of data designated b8 to b1, from the most significant bit (MSB, b8) to the least significant bit (LSB, b1)

3.3
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

3.4
frame
sequence of data bits and optional error detection bits, with delimiters at start and end

3.5
frame error
error on SOF, start and stop bits, parity bits, EOF

3.6
higher layer protocol
protocol specified in ISO/IEC 14443-4 or proprietary protocol

3.7
PCD Mode
mode in which a PXD operates as a PCD

3.8
PICC Mode
mode in which a PXD operates as a PICC

3.9
request command
command requesting PICCs of the appropriate type to respond if they are available for initialization

3.10
transmission error
frame error (3.5) or CRC_A or CRC_B error

4 Symbols, abbreviated terms and notations

4.1 Symbols and abbreviated terms

For the purposes of this document, the symbols and abbreviated terms given in ISO/IEC 14443-2 and the following apply.

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

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