INTERNATIONAL STANDARD

ISO/IEC 14443-3

Fourth edition
2018-07

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

Reference number
ISO/IEC 14443-3:2018(E)

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Published in Switzerland

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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.

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).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

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

This fourth edition cancels and replaces the third edition (ISO/IEC 14443-3:2016), which has been technically revised.

The following are the main changes since the last edition:

— RFU handling rules and clarifications have been added;

— Annexes D and E have been removed.

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

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Introduction

The ISO/IEC 14443 series of standards 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 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.

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

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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.

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 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.

NOTE 1 Part of the timing of data communication is defined in ISO/IEC 14443-2.

NOTE 2 Test methods for this document are defined in ISO/IEC 10373-6.

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 7816-4, *Identification cards — Integrated circuit cards — Part 4: Organization, security and commands for interchange*

ISO/IEC 7816-6, *Identification cards — Integrated circuit cards — Part 6: Interindustry data elements for interchange*

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

ISO/IEC 14443-2, *Cards and security devices for personal identification — Contactless proximity objects —Part 2: Radio frequency power and signal interface*

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

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 terminological databases for use in standardization at the following addresses:

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

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

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
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 frame 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 layer (not described in this document) that makes use of the protocol layer defined in this document to transfer information belonging to the application or higher layers of protocol that is not described in this document

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 or CRC_A or CRC_B error

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