

ISO/IEC JTC1/SC17
Cards and personal identification

2009-08-27

ISO/IEC JTC1/SC17 N 3723

WG8 N 1584

DOCUMENT TYPE: Notification of Ballot

TITLE: Notification of Ballot - ISO/IEC PDAM 14443-3:2009 - Identification cards - Contactless integrated circuit(s) cards - Proximity cards - Part 3: Initialization and anticollision - AMENDMENT 4: Electromagnetic disturbance handling.

BACKWARD POINTER: N 3722

SOURCE: SECRETARIAT ISO/IEC JTC1/SC17

STATUS: This ballot has been posted to the ISO Electronic balloting application and is available under the Balloting Portal, Committee Internal Balloting.

Simultaneous NP ballot with 17n3722.

ACTION ID: Vote

WORK ITEM: To be advised

DUE DATE: 2009-11-26

DISTRIBUTION: P and L-Members of ISO/IEC JTC1/SC17
JTC1 Secretariat
ISO/IEC ITTF

MEDIUM: SERVER

NO. OF PAGES: 7

Secretariat ISO/IEC JTC1/SC17, APACS, Mercury House, Triton Court, 14 Finsbury Square,
London EC2A 1LQ, England;
Telephone +44 (0)20 7711 6255; Fax: +44 (0)20 7711 6299; e-mail: chris.starr@ukpayments.org.uk

WG8 N 1542 R2

ISO/IEC JTC 1/SC 17 N 3xxx

Date: 2009-06-1

ISO/IEC 14443-3:2009/PDAM 4

ISO/IEC JTC 1/SC 17/WG 8

Secretariat: DIN

Identification cards — Contactless integrated circuit(s) cards - Proximity cards — Part 3: Initialization and anticollision

AMENDMENT 4: Electromagnetic disturbance handling

Cartes d'identification — Cartes à circuit(s) intégré(s) sans contact - Cartes de proximité — Partie 3: Initialisation et anticollision

AMENDEMENT 4: Gestion de perturbation électromagnétique

Warning

This document is not an ISO International Standard. It is distributed for review and comment. It is subject to change without notice and may not be referred to as an International Standard.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Document type: International Standard
Document subtype: Amendment
Document stage: (30) Committee
Document language: E

C:\B\wg8.de\TOTAL_WG8_Website\wg8.de_offline\secure\wg8n1542r1_WD14443-3_AM4_on_EMD.doc STD Version 2.1c2

Copyright notice

This ISO document is a working draft or committee draft and is copyright-protected by ISO. While the reproduction of working drafts or committee drafts in any form for use by participants in the ISO standards development process is permitted without prior permission from ISO, neither this document nor any extract from it may be reproduced, stored or transmitted in any form for any other purpose without prior written permission from ISO.

Requests for permission to reproduce this document for the purpose of selling it should be addressed as shown below or to ISO's member body in the country of the requester:

[Indicate the full address, telephone number, fax number, telex number, and electronic mail address, as appropriate, of the Copyright Manger of the ISO member body responsible for the secretariat of the TC or SC within the framework of which the working document has been prepared.]

Reproduction for sales purposes may be subject to royalty payments or a licensing agreement.

Violators may be prosecuted.

Contents

Page

Foreword	iv
8 Electromagnetic disturbance handling	1
8.1 EMD handling timing constraints	2
8.2 Recommendations for a PCD EMD handling algorithm	2

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.

Amendment 4 to ISO/IEC 14443-3:2009 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 17, *Cards and personal identification*.

Identification cards — Contactless integrated circuit(s) cards - Proximity cards — Part 3: Initialization and anticollision

AMENDMENT 4: Electromagnetic disturbance handling

Page 5, clause 4

Insert the following new symbol at the end of the clause:

EMD Electromagnetic disturbance as defined in ISO/IEC 14443-2/Amendment 3

$t_{E,PICC}$ Low EMD time, PICC

$t_{E,PCD}$ Low EMD time, PCD

$V_{E,PICC}$ EMD limit, PICC

$V_{E,PCD}$ EMD limit, PCD

Page 48

Insert the following new clause 8 after clause 7:

8 Electromagnetic disturbance handling

This clause enhances the robustness of the contactless communication between PCD and PICC against electromagnetic disturbance (EMD).

While the PCD is waiting for the PICC response, the PICC is processing the requested command. The PICC dynamic current consumption during execution time might cause an arbitrary load modulation effect on the magnetic field. In some cases the PCD might misinterpret EMD as data sent by the PICC and this might negatively impact proper reception of the PICC response.

The effect of the EMD on the PCD reception might depend on

- the PICC operation and speed,
- the PCD and PICC antenna geometries and relative distance (coupling factor),
- the sensitivity of PCD receiver channel.

This clause improves the robustness of the contactless communication from PICC to PCD by

- defining EMD handling timing constraints for PICC and for PCD,
- recommending a PCD algorithm for EMD handling.

8.1 EMD handling timing constraints

The low EMD time $t_{E,PICC}$ is the time period before the start of PICC data transmission, when the PICC shall not produce an EMD level higher than the EMD limit $V_{E,PICC}$ as defined in ISO/IEC 14443-2/Amendment 3.

This low EMD time $t_{E,PICC}$ has a value of $F - 800/fc$ with a maximum value of $1288/fc$ where F equals FDT for type A and TR0 for type B. The minimum value is $0/fc$ for $TR0 \leq 800/fc$. The low EMD time $t_{E,PCD}$ is the time period to allow the PCD to recover from electromagnetic disturbances.

The PCD shall be ready to process a PICC frame no later than $t_{E,PCD}$ after the last time the EMD level was above $V_{E,PCD}$.

This low EMD time $t_{E,PCD}$ has a value of $F - 868/fc$ with a maximum value of $1220/fc$ where F equals FDT for type A and TR0 for type B. The minimum value is $0/fc$ for $TR0 \leq 868/fc$.

NOTE The minimum values of $t_{E,PICC}$ and $t_{E,PCD}$ $0/fc$ may only be reached when short TR0 is allowed by the PCD (see ISO/IEC 14443-3, 7.10.3.1).

The low EMD time for PCD and PICC are illustrated in Figure 33.

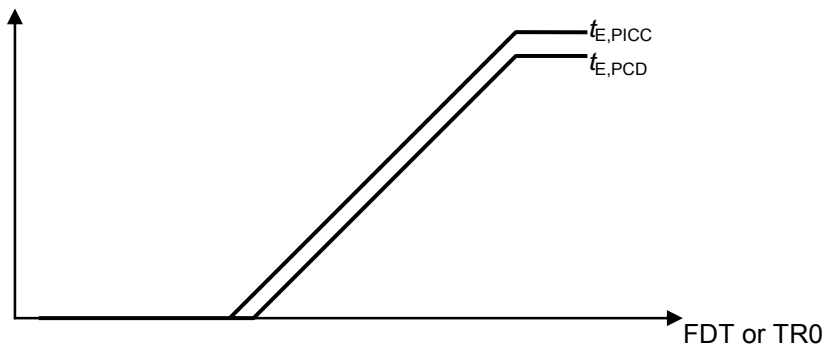


Figure 33 — Low EMD time

8.2 Recommendations for a PCD EMD handling algorithm

As it is important for a PCD to distinguish between EMD and frame reception errors, the following PCD recommendations are defined to maximize the EMD rejection while applying error detection and recovery as defined in 14443-4. They do not apply to anticollision procedure type A nor when a protocol different from ISO/IEC 14443-4 is used.

When the PCD is ready to start receiving the PICC frame it should continuously check for frame errors (SOF, Start and Stop bits, Parity bits, EGT, EOF). As soon as an error occurs:

- if the number of supposed received bytes is less than 3, the PCD should consider them as EMD and should restart its reception process;
- else the PCD should continue the reception process then apply the error detection and recovery when the whole frame has been received.

NOTE To avoid unnecessary reception of EMD, PCDs need not be ready to start receiving PICC frames less than $868/fc$ after the end of their command frames (unless for type B when minimum TR0 has been reduced).

Because EMD handling requires the PCD to distinct between likely EMD and transmission errors the PCD should implement a more precise handling of errors in the following scenarios.

- When receiving an incorrect response to a PPS request (see 5.6.2.1 of ISO/IEC 14443-4) the PCD should not resend the PPS request. Instead it may continue operation either
 - by polling for PICC presence using the old and/or the new communication parameters or
 - by sending S(DESELECT) using the old and/or the new communication parameters or
 - by switching the operating field off then on, then starting a polling sequence or
 - by trying by other means to reestablish communication to the PICC.
- When an invalid block is received (see 7.5.4.2 rule 4 of ISO/IEC 14443-4), an R(NAK) block shall be sent (except in the case of PICC chaining or S(DESELECT)) but not before maximum block transmission time has elapsed. Alternatively the PCD might wait 33 ms before sending R(NAK) in any case.
- When an invalid block is received in the case of PICC chaining (see 7.5.4.2 rule 5 of ISO/IEC 14443-4), an R(ACK) block shall be sent but not before maximum block transmission time has elapsed. Alternatively the PCD might wait 33 ms before sending R(ACK) in any case.