ISO/IEC JTC 1/SC 17
Cards and personal identification
Secretariat: BSI (United Kingdom)

Document type: Disposition of Comments Report

Title: Disposition of comments: FCD ISO/IEC 10373-6:2011/PDAM9 — Identification cards — Test methods — Part 6: Proximity cards — AMENDMENT 9: Test methods for electromagnetic disturbances

Status:

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STATUS: Resolution of comments on 17n4045.

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Email of secretary: chris.starr@ukpayments.org.uk

Committee URL: http://isotc.iso.org/livelink/livelink/open/jtc1sc17

ISO/IEC JTC1/SC17/WG8 N 1751
ISO/IEC JTC1/SC17 N 4303

Disposition of comments on:
FCD ISO/IEC 10373-6:2011/PDAM9 — Identification cards — Test methods — Part 6: Proximity cards — AMENDMENT 9: Test methods for electromagnetic disturbances

Reference documents:
Ballot is in SC17 N 3936 = WG8 N 1708
Ballot Result is in SC17 N 4045 = WG8 N 1731

Project Editor:
Florian Peters, Germany

The following pages provide the details of the comments and detailed information about their resolutions, how WG8 had resolved each received comment from the FCD Ballot (FPDAM) at the WG8 meeting, held in Takamatsu, Japan, on 2010-09-29/10-01.

In addition, WG8 approved a lately detected correction, laid down as WG8 N 1786 as attachment, at the WG8 meeting, held in Ispra, Italy, on 2011-03-28/30.

Following the guideline of the SC17 Secretariat, WG8 decided by WG8 Resolutions 49.10 (contained in WG8 N 1796 = SC17 N xxxx) to issue the new text of 10373-6/AM9, with re-numbered amendment AM2, i.e. WG8 N 1750 R1, for FDIS (FDAM) balloting.

Template for comments

Date: 2010-09-23	Document: **ISO/IEC 10373-6/FPDAM9**

1	2	(3)	4	5	(6)	(7)
MB[1]	**Clause No./ Subclause No./ Annex** (e.g. 3.1)	**Paragraph/ Figure/Table/ Note** (e.g. Table 1)	**Type of com-ment**[2]	**Comment (justification for change) by the MB**	**Proposed change by the MB**	**Proposed Editors Disposition**
FR1	title		ED	Consistency with the expression "electromagnetic disturbance" which is singular in 14443-2 and 14443-3 titles and in the text	Replace the title by "Test methods for electromagnetic disturbances" by "Test methods for electromagnetic disturbance" and " Méthodes d'essai pour les perturbations électromagnétiques" by " Méthodes d'essai pour perturbation électromagnétique"	Acc

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FR2	introduction		ED	The word "level" refers to the level of the EMD, not the EMD itself. It should be used only in these cases. No comma before shall	Replace The electromagnetic disturbance (EMD) level refers to the EMD parasitically generated by the PICC through the activities of the digital circuits. A too-high EMD level can disrupt the communication between the PCD and the PICC because it can be incorrectly interpreted by the PCD as a valid PICC to PCD communication. Therefore, the EMD emitted by the PICC immediately before its response, shall not exceed a maximum value. The EMD is determined like load modulation with a time domain measurement. with The electromagnetic disturbance (EMD) refers to the EMD parasitically generated by the PICC through the activities of the digital circuits. A too-high EMD level can disrupt the communication between the PCD and the PICC because it can be incorrectly interpreted by the PCD as a valid PICC to PCD communication. Therefore, the EMD level emitted by the PICC immediately before its response shall not exceed a maximum value. The EMD level is determined like load modulation with a time domain measurement.	Resolved , introduction will be deleted
FR3	5.2.2		ed	Annex I is now used in FDIS 10373-6	Rename annex I to annex J in this amendment (and page 194 to page 199) Refer to annex J Same comment in 5.2.3.1, step e)	

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FR4	Figure Amd.9.1		ed	ISO style, consistency with amended document	Use regular lower case letters, not small upper case letters. No upper case "P" for "pattern" Same comments for figure Amd.9.2	acc
FR5	Figure Amd.9.1		ed	Consistency within the figure	Add "Transmission" below PCD (or delete "Transmission" below reference PICC) Same comment for figure Amd.9.2	Resolved by deleting "transmission", addit. All font are set back to ISO standard style in all Fig. Of the AMD.
FR6	7.1.7.2		te	As it is a PCD test, $t_{E,PCD}$ should be used	Replace $t_{E,PICC}$ by $t_{E,PCD}$	acc
FR7	Figure Amd.9.2		ed	There is a small artefact below the box "Test Pattern"	Delete this semi hidden letter	acc
FR8	7.1.7.3		ed	There is a white zone which partly hides the bottom of the paragraph	Clean the document	Needed for numeration, deleted when brought to final IS AMD
FR9	7.2.2.1	Note 1	ED	The low EMD time $t_{E,PICC}$is a function of FDT for type A and TR0 for type B	Replace The low EMD time $t_{E,PICC}$ is a function of FDT as defined in of ISO/IEC 14443-3/Amd.4. by The low EMD time $t_{E,PICC}$ is a function of FDT/TR0 as defined in of ISO/IEC 14443-3/Amd.4.	Acc,

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FR10	7.2.2.4	Step h), last sentence	ED	The exceptions are defined in 14443-2/Amd.3 and should not be redefined. Up to 2 periods above $V_{E,PICC}$ are allowed.	Replace If the value is in between then check that the signal amplitude never exceeds $V_{E,PICC}$ for a time period greater than 16/*fc*. by If this value is in between then check that the signal amplitude complies with the specific requirements defined in ISO/IEC 14443-2/Amd.3 (maximum number of periods above $V_{E,PICC}$, maximum period duration and minimum time between periods).	Resolved by new sentence
FR11	7.2.2.5		ED	The test report subclause refers to the wrong document	Replace with the exceptions defined in ISO/IEC 14443-3/Amd.4. by with the exceptions defined in ISO/IEC 14443-2/Amd.3.	Acc, but sentences was slightly changed, due to FR10,and others
FR12	Annex I	Page 7	ed	Some stars are missing in 2 "stars lines" below explanations in page 7	Unless useful replace the 2 spaces by stars	Acc
FR13	Annex I		ed	Other programs in 10373-6 use a font with fix spacing (Courier)	Use appropriate font and in necessary rearrange multiline comments for easy reading.	Will be checked with ISO rules and changed and brought into the correct order before IS
FR14	Annex I		ed	Consistency of wording	Replace "sample rate" with "sampling rate": - 4 times in comments - 1 time in a printf command	acc

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FR15	Annex I	Page 8	ed	Consistency - "char*" is used once "char *" is used many times - "*)" is used once "*)" is used many times - indentation is not always regular	Homogenise the spaces close to * and to)	Generally accepted but postponed. This will also be done according to the ISO rules, since changing the font results in very different appearance of the **
FR16	Annex I		ed	The program comments are not consistent with each other	Homogenise: - the function start comments - the function end comment (if they are needed) - the "sub function start" comments	Acc, will be done before IS but has to be in accordance with FR14,FR15 and ISO rules.
FR17	Annex I	Page 10	ed	typo	Replace "coputation" by "computation"	acc
AT 1	5.2.2	3. sentence	TE	It is not specified which time window of the signal should be captured	Replace the sentence: This captured signal shall be windowed by a Bartlett window having exactly two subcarrier cycles before transformation with The complete EMD sequence shall be captured and windowed by a Bartlett window having exactly two subcarrier cycles before transformation	Resolved by new wording
AT2	7.1.6.2	e)	TE	The term "a level higher" is not clear	Replace with: factor 2	Resolved by adding" e.g. two"

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UK1	7.1.6.2	b)	ed	Removal of doubt over use of the word particular	Change bullet b to read: Place the Reference PICC at a designated position in the PCD operating volume.	acc
UK2	7.1.6.2	Following j)	te	Removal of doubt over use of the word particular	Change sentence following bullet j) as follows: Repeat step b) to j) for other designated positions within the operating volume.	Acc
UK3	7.1.6.1		te	Remove note	Remove note entirely (not relevant to this clause)	Resolved by several other comments e.g. from Germany
UK4	7.1.7.1		ed	Improve English	Remove the words “Or Not” from first sentence	acc
UK5	7.1.7.1		te	Add note	Add note removed from 7.1.6.1 at end of this clause NOTE The low EMD time $t_{E,PCD}$ is a function of FDT/TR0 as defined in of ISO/IEC 14443-3/Amd.4.	Resolve d by D and FR
UK6	7.2.2.1		ed	Improve English	Change first sentence to read : The purpose of this test is to determine that the PICC does…….	acc
DE 1	5.2	clause numbering	ge, ED	A new test setup or tool shall be added as a new clause after existing clauses.	Clause "EMD Test Setup" shall be inserted as new sub clause 5.5	acc
DE 2	5.2	complete sub clause	ge, ED	The descriptions and naming conventions of the "EMD Test Setup" is not harmonized within the clause e.g. test equipment, test setup, test apparatus. A block diagram might be helpful to understand the EMD	Introduce a block diagram of the EMD Test Setup (hardware) and a suitable name for the "EMD test instrument".	Resolved, the procedure has been rewritten

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				Test Setup which contains: Signal generator, test PCD assembly, suitable scope and PC software or Spectrum Analyzer as an alternative Sometimes the wording "test setup" is used for the "EMD test instrument "connected to the sense coils. The "EMD test instrument" could be either a scope and PC software or as an alternative a spectrum analyzer.		
DE 3	5.2.2 5.2.3.1 step e)	reference to Annex I	ed	Annex I was replaced by Annex J in FDIS 10373-6.	Replace Annex I by Annex J	acc
DE 4	5.2.2	last paragraph	te	.... and there shall be some additional margin on $t_{E,PICC}$ requirement and no... Requirement has to be defined more precise.	Define requirement "some additional margin"	Resolved by adding a precise value of margin
DE 5	7.1.6.1	NOTE	ed	The NOTE right after first paragraph belongs to PCD EMD recovery test.	Move NOTE at the end of step f) in 7.1.7.2	acc
DE 6	7.1.6.2	step c)	ed	Same description as for load modulation reception test in FDIS 10373-6 shall be used	Replace step c) by: "Apply and adjust a DC voltage at CON2 to obtain a DC voltage at connector CON3 of 3 V or optionally 6 V when supporting "Class 1" at that position."	acc
DE 7	7.1.6.2	step d)	te	The requirement in step d) reads as: "The initial load modulation amplitude V_{EMD} of the test pattern shall be lower than $V_{E,PCD}$." For the computation of $V_{E,PCD}$, the actual field strength is a necessary input parameter. This has to be known and determined using the test PCD assembly.	Replace step d) by a procedure to adjust the initial load modulation amplitude.	Resolved by modif. the wording
DE 8	7.1.6.2 7.1.7.2	Figure Amd.9.1	ed	Remove color in figures		Acc, checked with ISO rules for final IS.AMD if slight gray shadows are allowed

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		up to Figure Amd.9.4				
DE 9	7.2.2.3		te	The requirement of testing each 14443-3 command leads to excessive test efforts.	Replace first sentence by: "The PICC EMD test shall be performed for ISO/IEC 14443-3 commands."	Acc
JP1	5.2.3.1	d)	ed	The use of """ isn't desirable. It should be to use "of" instead of """.	Replace “Record the sense coils’ signal” by “Record the signal of the sense coils”	Acc
JP2	7.1.5		ed	“:” is replaced to “.” ,because the sentences have ended,	Replace “:” by “.”.	Acc, but not relevant for the standard since this is deleted afterwards
JP3	7.1.6	h)	ed	The use of """ isn't desirable. It should be to use "of" instead of """.	Replace “the current value of the Reference PICC’s V_{EMD}” by “the current value of V_{EMD} on the Reference PICC”.	acc
JP4	7.1.6.2	Figure Amd.9.1	ed	The dotted circle in “NEXT PCD COMMAND” is redundant.	Remove the dotted circle.	Resolved by dotted outline of rect.
JP5	7.1.7.2	Dash after f)	ed	For consistency.	Replace b1 = 0 and b2 = 1 by b1 = (0)b and b2 = (1)b, respectively.	Acc
JP6	7.1.7.2	Figure Amd.9.2	ed	The dotted circle in “NEXT PCD COMMAND” is redundant.	Remove the dotted circle.	acc
JP7	7.1.7.2	Figure Amd.9.3	ed	For consistency.	Replace “bit1” and “bit2” by “b1” and “b2”, respectively.	Acc, See also decision of JP5
JP8	7.1.7.3	1st paragraph	ed	A part of “answer (or was able to r” is missing.	Complete the phrase “answer (or was able to r”.	Completed in this version.
JP9	ANNEX I		ED	The syntax error exists. The type declaration statement of the file info function is missing. In some cases, when run the program, only outputs a	Replace “double” by “long double”.	Resolved by adding a note to ANNEX I (ANNEX J)

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				single line data composed by (Time, USB, LSB). Confirmed that changing type declaration statement "double" to "long double" will make the single line data increase to few thousand lines.		
NL1	5.2.2	3. sentence	TE	It is not specified which time window of the signal should be captured	Replace the sentence: This captured signal shall be windowed by a Bartlett window having exactly two subcarrier cycles before transformation with The complete EMD sequence shall be captured and windowed by a Bartlett window having exactly two subcarrier cycles before transformation	Resolved, several countries commented on this , wording changed
NL2	7.1.6.2	e)	TE	The term "a level higher" is not clear	Replace with: factor 2	Resolved by AT2

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Noise requirements for the electromagnetic disturbance test

Prepared by:
Jean-Marc Chareau (JRC)
Florian Peters (BDR)

References

- ISO/IEC 14443-2:2010/FPDAM 3
  - limits for electromagnetic disturbances for PICC and PCD (sensitivity)
  - TF2/WG8 experts well agreed on EMD limits in 2010
  - current status: Final Commitee Draft

- ISO/IEC 10373-6:2010/AM9
  - test Methods for the above mentioned standard
  - current status: Final Commitee Draft

  - editor **put on hold** this document, since the parameter
    - „noise floor precondition“ was requested to change back to the previously agreed value, after Takamatsu

Noise floor definition

Text of FDAM ballot of 10373-6:2010/FDAM 9 (WG8N1708)

5.2.3 Noise floor precondition test

The noise floor test is passed if the noise standard deviation is at least three times smaller than the EMD limit *V*E,PICC, when measured as described in 5.2.3.1.

New version of 10373-6:2010/FDAM 9 (WG8N1750)

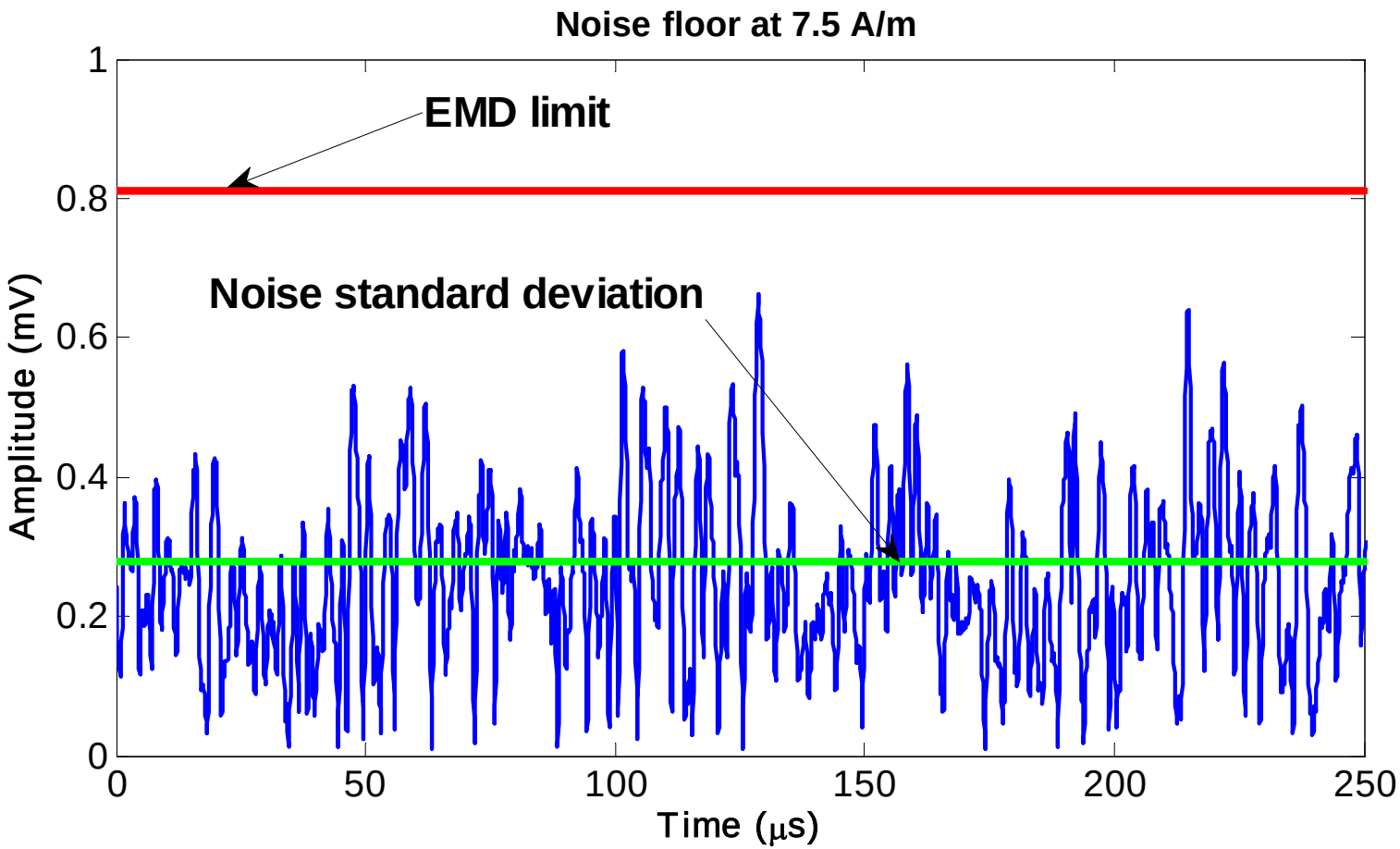
5.5.3 Noise floor precondition test

The noise floor test is passed if the noise standard deviation is at least two times smaller than the EMD limit *V*E,PICC, when measured as described in 5.5.3.1.

Test setup noise level SHALL be much smaller than the EMD limit:

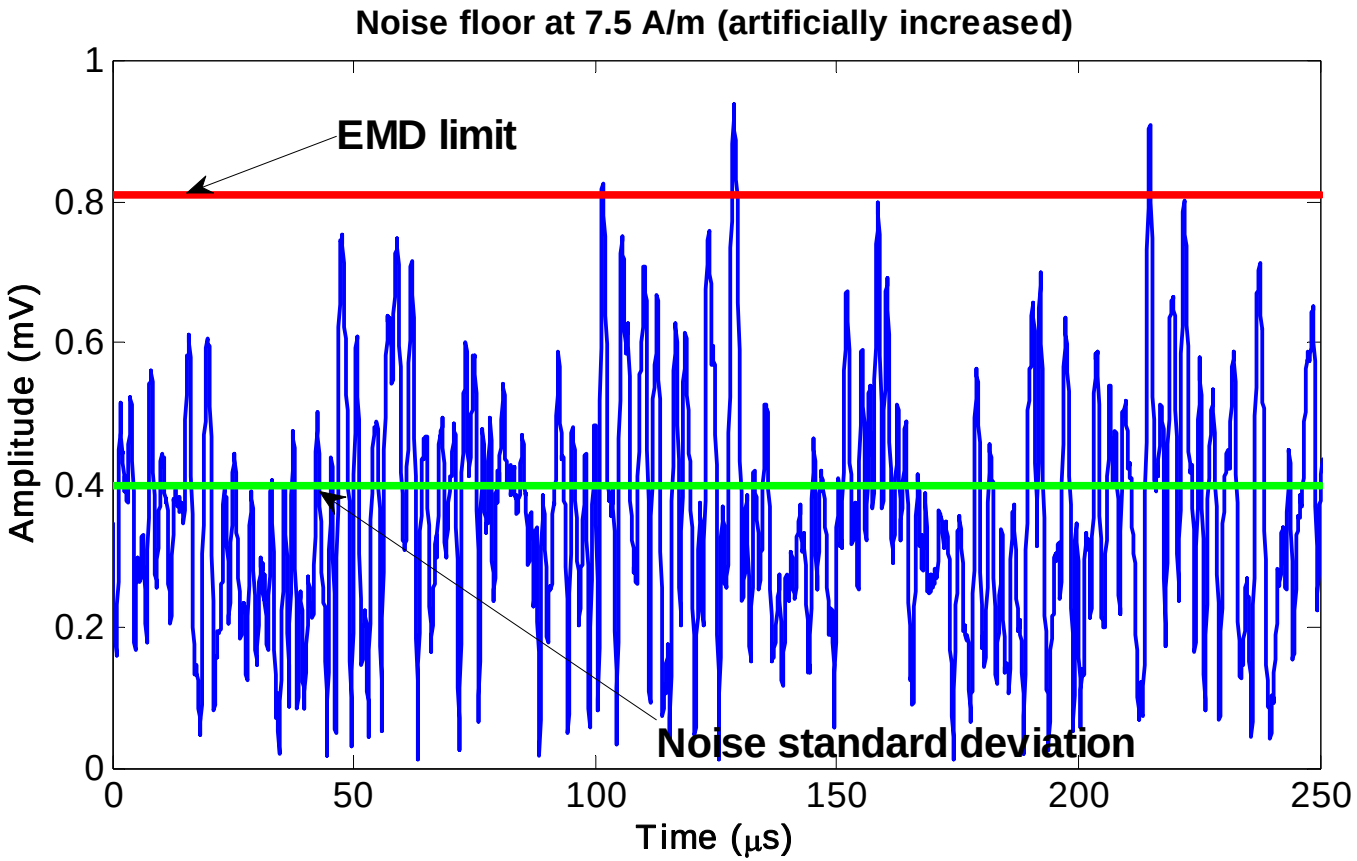
A factor two is not enough !

Examples of noise floor measurements



Noise floor = EMD limit / 3: Low probability to exceed the EMD limit

Two times



Noise floor = EMD limit / 2

Few spikes above the limit
PICC will FAIL the test

Conclusions

- Recent change of noise floor precondition leads to wrongly detected PICC test failures
- Noise standard deviation MUST be at least 3 times smaller than the EMD limit
- This precondition is perfectly achievable even at high field strength as demonstrated in previous contributions by JRC, Gemalto, IFX, BDr, NXP, and others (TF2N 645, 648, 649, 651,654)