FINAL
DRAFT

AMENDMENT

ISO/IEC 14443-3:2001 FDAM 3

ISO/IEC JTC **1**

Secretariat: **ANSI**

Voting begins on:
2005-12-13

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

Part 3: Initialization and anticollision

AMENDMENT 3: Handling of reserved fields and values

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

Partie 3: Initialisation et anticollision

AMENDEMENT 3: Maniement de champs et valeurs réservés

Please see the administrative notes on page iii

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Reference number
ISO/IEC 14443-3:2001/FDAM 3:2005(E)

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Foreword

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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.

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Amendment 3 to ISO/IEC 14443-3:2001 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 17, *Cards and personal identification*.

As part of maintaining ISO/IEC 14443-3:2001, a need was raised to better clarify the handling of fields and values reserved by ISO/IEC for future use. This Amendment addresses the required document enhancements.

ISO/IEC 14443-3:2001 defines certain fields and values as Reserved for Future Use (RFU) by new ISO/IEC rules that may be added in later versions. This Amendment includes clarification that products that comply to ISO/IEC 14443-3:2001 shall not improperly use RFU fields and values, plus documentation of product behaviour, that when followed by PICC and PCD designs commenced after publication of ISO/IEC 14443-3:2001, should assist with backward compatibility and interoperability for future definition by ISO of RFU fields and values. Consequently, many of the references to “should” may be changed into a definitive “shall” in the second edition; thus, it is recommended to implement them at this time.

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

Part 3: Initialization and anticollision

AMENDMENT 3: Handling of reserved fields and values

Page 4, Clause 4 "Symbols and abbreviated terms"

Add the following abbreviations after the SELECT line:

"SFGI Start-up Frame Guard time Integer

SFGT Start-up Frame Guard Time"

Page 11, Subclause 6.2.3 (renumbered to 6.3.3) "READY State"

Replace the first sentence with the following:

"In the READY State, the bit frame anticollision method shall be applied."

Page 11, Subclause 6.2.6 (renumbered to 6.3.6) "READY State"*

Replace the first sentence with the following:

"The READY* State is similar to the READY State. The bit frame anticollision method shall be applied."

Page 12, Subclause 6.3.1 (renumbered to 6.4.1) "REQA and WUPA commands"

Add the following paragraphs below Table 2 "Coding of Short Frame", as the last paragraphs in the subclause:

"A PCD sending an RFU value is not compliant with this standard.

A PICC receiving an RFU value should consider the short frame as an error (see Figure 6) and should not send a response."

Page 15, Subclause 6.4.2.1 (renumbered to 6.5.2.1) "Coding of ATQA"

Add the following as the last paragraphs in the subclause:

"A PICC sending an ATQA with (b8,b7) = (11)b or (b16 to b13) <> (0000)b or b6 <> (0)b is not compliant with this standard.

A PCD detecting a collision in any bit of (b16 to b1) shall commence with the first step of the anticollision loop (see Subclause 6.5.3.1).

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The PCD shall commence with the first step of the anticollision loop regardless of any value in the proprietary field b12 to b9.

A PCD receiving (b8,b7) = (11)b or (b16 to b13) <> (0000)b or b6 <> (0)b should ignore the values and should commence with the first step of the anticollision loop (see Subclause 6.5.3.1)."

Page 18, Subclause 6.4.3.3 (renumbered to 6.5.3.3) "Coding of NVB (Number of Valid Bits)"

Add the following paragraphs below Table 7 "Coding of NVB", as the last paragraphs in the subclause:

"The PCD shall set NVB only to values defined in Table 7 except that for byte counts 6 and 7 only bit count of 0 is allowed. A PCD setting NVB to any forbidden value is not compliant with this standard.

A PCD setting the byte count (b8 to b5) to any value outside the range 2 to 7 is not compliant with this standard.

A PCD setting the bit count (b4 to b1) > 7 for byte count equal 2 to 5 or setting the bit count (b4 to b1) to any value other than 0 for byte count equal 6 or 7 is not compliant with this standard."

Page 19, Subclause 6.4.3.4 (renumbered to 6.5.3.4) "Coding of SAK (Select acknowledge)"

Add the following below Table 8 "Coding of SAK", as the last paragraphs in the subclause:

"NOTE 'x' in this table means 'a don't care value'.

For b3 = (1)b the PCD shall ignore any other bit of SAK. For b3 = (0)b the PCD shall interpret b6 and shall ignore any of the remaining bits of SAK. A PCD behaving differently is not compliant with this standard."

Page 20, Subclause 6.4.4 (renumbered to 6.5.4) "UID contents and cascade levels"

Add the following paragraphs as the last paragraphs in the subclause:

"A PICC sending uid0 with an RFU value is not compliant with this standard. A PICC sending a proprietary number shall fulfil all other requirements of the anticollision sequence including CT, otherwise such a PICC is not compliant with this standard.

During the anticollision, the PCD shall regard uid0 with RFU or proprietary values as a regular uid0."

Page 21, Subclause 7.1.3 "Frame format"

Remove the last sentence "See 7.10.3 for exceptions."

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Page 29, Subclause 7.7.3 "Coding of AFI"

Replace the last row in Table 12 "AFI coding" with the following:

"

'9'-'D'	'0',Y	RFU	
'E'	'0',Y	Machine Readable Travel Documents (MRTDs)	Y=1 Passport Y=2 Visa Other Y values RFU
'F'	'0',Y	RFU	

"

Add the following paragraph as the last paragraph in the subclause:

"A PCD sending a REQB/WUPB command with an AFI field set to an RFU value is not compliant with this standard.

The PICC shall not respond when the AFI field is set to a value which is RFU."

Page 29, Subclause 7.7.4 "Coding of PARAM"

Replace Figure 21 with the following figure:

"

b8	b7	b6	b5	b4	b3	b2	b1
RFU			Extended ATQB supported	REQB / WUPB	N (Number of slots)		

All RFU bits shall be set to 0.

Figure 21 — Coding of PARAM

"

Replace definition before Table 13 with the following:

"b4 = 0 defines REQB: PICCs in IDLE state or READY state shall process this command.
b4 = 1 defines WUPB: PICCs in IDLE state or READY state or HALT state shall process this command.
b1, b2 and b3 are used to code the number of slots N according to Table 13.
b5 indicates the PCD capability to support extended ATQB response from the PICC. The use of extended ATQB is optional for the PICC. The coding of b5 is as follows:

— b5 = 0 defines: extended ATQB defined in subclause 7.9.4.7 is not supported by the PCD.

— b5 = 1 defines: extended ATQB defined in subclause 7.9.4.7 is supported by the PCD."

Add the following paragraphs as the last paragraphs in the subclause before Table 13:

"A PCD sending a REQB/WUPB command with (b8 to b6) <> (000)b is not compliant with this standard.

The PICC should ignore (b8 to b6) and its interpretation of any other field of the whole frame shall not change."

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Page 30, Subclause 7.7.4 "Coding of PARAM"

Add the following paragraphs after Table 13 "Coding of N":

"A PCD sending (b3 to b1) = (101)b or (11x)b is not compliant with this standard.

Until the RFU values (101)b or (11x)b are assigned by ISO, a PICC receiving (b3 to b1) = (101)b or (11x)b should interpret it as (b3 to b1) = (100)b (16 slots)."

Page 32, Subclause 7.9.4 "Protocol Info"

Replace figure 25 with the following figure:

"

1st byte	2nd byte		3rd byte			4th byte (optional) Extended ATQB	
Bit_Rate_capability (8 bits)	Max_Frame_Size (4 bits)	Protocol _Type (4 bits)	FWI (4 bits)	ADC (2 bits)	FO (2 bits)	SFGI (4 bits)	RFU (4 bits)
MSB LSB	MSB	LSB	MSB		LSB	MSB	LSB

All RFU bits shall be set to 0.

Figure 25 — Protocol Info format

"

Page 32, Subclause 7.9.4.2 "ADC"

Add the following paragraph as the last paragraph in the subclause:

"A PICC setting (b4,b3) any value other than (00)b or (01)b is not compliant with this standard."

Page 32, Subclause 7.9.4.3 "FWI"

Add the following paragraphs after the FWI definitions:

"In case of extended ATQB supported by the PICC and the PCD,

— FWT applies after the Answer to ATTRIB command,

— the waiting time for the Answer to ATTRIB command is a fixed value given by the formula

Answer to ATTRIB waiting time = (256 x 16/ *fc*) x 2^4 (~ 4,8 ms).

It is strongly recommended to use a FWT as low as possible to protect communications speed when retry occurs."

Add the following paragraphs as the last paragraphs in the subclause:

"A PICC setting FWI = 15 is not compliant with this standard.

Until the RFU value 15 is assigned by ISO, a PCD receiving FWI = 15 should interpret it as FWI = 4.

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NOTE This clause is added for PCD's compatibility with future PICCs when ISO defines the behaviour for an RFU value of 15."

Page 33, Subclause 7.9.4.4 "Protocol_Type"

Add the following paragraph as the last paragraph in the subclause:

"The PCD should not continue communicating with a PICC that sets b4 to (1)b."

Page 33, Subclause 7.9.4.5 "Max_Frame_Size"

Add the following paragraphs as the last paragraphs in the subclause:

"A PICC setting Maximum Frame Size Code = '9'-'F' is not compliant with this standard.

Until the RFU values '9'-'F' are assigned by ISO, a PCD receiving Maximum_Frame_Size Code = '9'-'F' should interpret it as Maximum Frame Size Code = '8' (256 bytes).

NOTE This clause is added for PCD's compatibility with future PICCs when ISO defines the behaviour for a RFU values of '9'-'F'."

Page 33, Subclause 7.9.4.6 "Bit_Rate_capability"

Add the following paragraphs as the last paragraphs in the subclause:

"A PICC setting b4 = 1 is not compliant with this standard.

Until the RFU values with b4 = 1 are assigned by ISO, a PCD receiving Bit_Rate_capability with b4 = 1 should interpret the Bit_Rate_capability byte as if b8 to b1 = 0 (only ~106 kbit/s in both directions)."

Page 33, Add the following subclause before Subclause 7.10:

"**7.9.4.7 Extended ATQB (optional)**

The optional Extended ATQB byte (optional 4th byte of protocol info field) consists of two parts:

— the least significant half byte (b4 to b1) is RFU and shall be set to (0000)b;

— the most significant half byte (b8 to b5) defines the Start-up Frame Guard time Integer (SFGI).

The SFGI codes an integer value used to define the Start-up Frame Guard Time (SFGT).

The SFGT defines a specific guard time needed by the PICC before it is ready to receive the next frame after it has sent the Answer to ATTRIB command. SFGI is coded in the range from 0 to 14. The value of 15 is RFU. The values in the range from 0 to 14 are used to calculate the SFGT with the formula given below. The default value of SFGI is 0.

$$SFGT = (256 \times 16/fc) \times 2^{SFGI}$$

For SFGI = 0, SFGT is minimal (~ 302 µs).

For SFGI = 14, SFGT is maximal (~ 4949 ms).

A PICC setting SFGI = 15 is not compliant with this standard.

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Until the RFU value 15 is assigned by ISO, a PCD receiving SFGI = 15 shall interpret it as SFGI = 0.

A PICC sending an ATQB response with (b4 to b1) <> (0000)b is not compliant with this standard.

The PCD shall ignore (b4 to b1) and its interpretation of any other field of the whole frame shall not change. A PCD changing its interpretation of any other field of the whole frame when (b4 to b1) <> (0000)b is not compliant with this standard.

When answering a REQB/WUPB command with bit b5 set to 0 (no extended ATQB supported), the PICC shall not send the optional 4th byte in its ATQB response."

Page 34, Subclause 7.10.3 "Coding of Param 1"

Add the following paragraphs as the last paragraphs in the subclause:

"A PCD setting (b2,b1) <> (00)b is not compliant with this standard.

The PICC should ignore any value (b2,b1) and its interpretation of any other field of the whole frame shall not change."

Page 34, Subclause 7.10.3.1 "Minimum TR0"

Add the following paragraphs as the last paragraphs in the subclause:

"A PCD setting (b8,b7) = (11)b is not compliant with this standard.

Until the RFU value (11)b is assigned by ISO, a PICC receiving (b8,b7) = (11)b should interpret it as (b8,b7) = (00)b, the default value."

Page 34, Subclause 7.10.3.2 "Minimum TR1"

Add the following paragraphs as the last paragraphs in the subclause:

"A PCD setting (b6,b5) = (11)b is not compliant with this standard.

Until the RFU value (11)b is assigned by ISO, a PICC receiving (b6,b5) = (11)b should interpret it as (b6,b5) = (00)b, the default value."

Page 35, Subclause 7.10.3.3 "EOF/SOF"

Add the following paragraph as the last paragraph in the subclause after Table 23:

"SOF/EOF suppression applies only for communications at *fc*/128 (~106 kbit/s). For bit rates higher than fc/128 (~106 kbit/s) the PICC shall always provide SOF and EOF."

Page 35, Subclause 7.10.4 "Coding of Param 2"

Add the following paragraphs as the last paragraphs in the subclause:

"A PCD setting Maximum Frame Size Code = '9'-'F' is not compliant with this standard.

Until the RFU values '9'-'F' are assigned by ISO, a PICC receiving Maximum Frame Size Code = '9'-'F' should interpret it as Maximum_Frame_Size Code = '8' (256 bytes)."

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Page 35, Subclause 7.10.5 "Coding of Param 3"

Add the following paragraphs as the last paragraphs in the subclause:

"A PCD setting (b8 to b5) <> (0000)b is not compliant with this standard.

The PICC should ignore and not answer the ATTRIB command when (b8 to b5) <> (0000)b."

Page 36, Subclause 7.10.6 "Coding of Param 4"

Add the following paragraphs as the last paragraphs in the subclause:

"A PCD setting CID = 15 is not compliant with this standard.

The PICC should ignore and not answer the ATTRIB command when received value of CID = 15, as any action in the PICC for CID = 15 may be decided in the future by ISO.

A PCD setting (b8 to b5) <> (0000)b is not compliant with this standard.

The PICC should ignore (b8 to b5) and its interpretation of any other field of the whole frame shall not change."

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