
**Identification cards — Contactless
integrated circuit cards — Proximity
cards —**

**Part 3:
Initialization and anticollision**

AMENDMENT 1: RFU handling rules

(standards.iteh.ai)

*Cartes d'identification — Cartes à circuit intégré sans contact —
Cartes de proximité —*

ISO/IEC 14443-3:2016/Amd 1:2016

Partie 3: Initialisation et anticollision

<https://standards.iteh.ai/catalog/standards/sist/b421047d-a2dd-4519-a7d0-440725204407/iso-iec-14443-3-2016-amd-1-2016>

AMENDEMENT 1: Règles de manipulation des bits RFU

iTeh STANDARD PREVIEW
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ISO/IEC 14443-3:2016/Amd 1:2016
<https://standards.iteh.ai/catalog/standards/sist/b421047d-a2dd-4519-a7d0-4407252003c4/iso-iec-14443-3-2016-amd-1-2016>



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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 ISO documents 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).

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Amendment 1 to ISO/IEC 14443-3:2016 was prepared by Technical Committee ISO/JTC 1, *Information technology*, Subcommittee SC 17, *Cards and personal identification*.

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Identification cards — Contactless integrated circuit cards — Proximity cards —

Part 3: Initialization and anticollision

AMENDMENT 1: RFU handling rules

Amendment 1: RFU handling rules

Page 5, Clause 4

Add new text after the last dash.

“For the purposes of this document, the following general rules apply:

- A PICC or PCD sending RFU bits shall set these bits to the value indicated herein or to (0)^b if no value is given.
- A PICC or PCD receiving RFU bits shall ignore the value of these bits and shall maintain and not change its function, unless explicitly stated otherwise.”

Page 6, Clause 6

Delete the second paragraph. [ISO/IEC 14443-3:2016/Amd 1:2016](https://standards.iteh.ai/catalog/standards/sist/b421047d-a2dd-4519-a7d0-4407252003c4/iso-iec-14443-3-2016-amd-1-2016)

Page 16, 6.4.1

<https://standards.iteh.ai/catalog/standards/sist/b421047d-a2dd-4519-a7d0-4407252003c4/iso-iec-14443-3-2016-amd-1-2016>

Delete the penultimate sentence.

Replace the last sentence with:

“A PICC receiving a short frame containing an RFU value shall interpret this as Error (see Figure 7) and shall not send a response.”

Page 17, 6.4.3

Replace the last two paragraphs:

“If the PICC responds with any modulation during a period of 1 ms after the end of the frame containing the HLTA command, this response shall be interpreted as ‘not acknowledge’.

NOTE The PCD should apply an additional waiting time margin of 0,1 ms.”

with:

“When receiving a valid HLTA command in any state, the PICC shall not respond. The PCD shall not interpret any modulation received during a period of 1 ms after the end of the frame containing the HLTA command.

In ACTIVE or ACTIVE* state, the PICC may respond to an invalid HLTA command.”

Page 18, 6.5.2.1

Replace the first sentence with:

“Table 4 specifies the coding of ATQA.”

Replace Table 4 with:

Table 4 — Coding of ATQA

MSB											LSB				
b16	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1
Each bit RFU				Proprietary coding				UID size bit frame		RFU	Bit frame anticollision				

Delete the second paragraph after Table 4 and the last paragraph.

Page 20, 6.5.3.2

Replace the last paragraph and NOTE with:

“A PICC receiving an RFU value should interpret it as Error (see Figure 7) and should not send a response.”

Page 21, 6.5.3.3

Replace the two paragraphs after Table 8 with:

“The PCD shall set NVB only to values defined in Table 8 except that for byte counts 6 and 7 only bit count of 0 is allowed.

A PICC receiving a byte count value not specified in Table 8 (b8 to b5), or receiving a bit count value not specified in Table 8 (b4 to b1) for byte count equal 2 to 5 or set to any value other than 0 for byte count equal 6 or 7, should interpret it as Error (see Figure 7) and should not send a response.”

Page 22, 6.5.3.4

Replace the paragraph after Table 9 with:

“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.”

Page 23, 6.5.4

Replace:

“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.”

with:

“A PICC sending a proprietary number shall fulfil all other requirements of the anticollision sequence including CT.”

Page 25, Clause 7

Delete the second paragraph.

Page 36, 7.7.3

Delete the first sentence of the paragraph after Table 22.

Page 36, 7.7.4

Replace Figure 22 with:

b8	b7	b6	b5	b4	b3	b2	b1
Each bit RFU			Extended ATQB supported	REQB /WUPB	N		

Figure 22 — Coding of PARAM

Delete the second paragraph.

Delete the two paragraphs before Table 23.

Replace the paragraph after Table 23 with:

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

Delete the paragraph before the note.

Page 39, 7.9.4

Delete the last paragraph.

Page 39, 7.9.4.2

Replace the last paragraph with: [ISO/IEC 14443-3:2016/Amd 1:2016](https://standards.iteh.ai/catalog/standards/sist/b421047d-a2dd-4519-a7d0-4407252003c4/iso-iec-14443-3-2016-amd-1-2016)

“b4 is RFU.”

<https://standards.iteh.ai/catalog/standards/sist/b421047d-a2dd-4519-a7d0-4407252003c4/iso-iec-14443-3-2016-amd-1-2016>

Page 39, 7.9.4.3

Delete the paragraph after Formula (2).

Replace the last paragraph with:

“Until the RFU value 15 is assigned by ISO/IEC, a PCD receiving FWI = 15 shall interpret it as FWI = 4.”

Page 40, 7.9.4.4

Replace the last two paragraphs with:

“b4 is RFU.

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

Page 40, 7.9.4.5

Delete the second paragraph

Replace the third paragraph and NOTE with:

“Until the RFU values ‘D’ - ‘F’ are assigned by ISO/IEC, a PCD receiving Maximum Frame Size Code = ‘D’ - ‘F’ shall interpret it as Maximum Frame Size Code = ‘C’ (Maximum frame size = 4 096 bytes).

NOTE This PCD requirement is added for PCD’s compatibility with future PICCs when ISO/IEC further defines the behaviour for the RFU values of ‘D’ - ‘F’.”

Page 40, 7.9.4.6

Replace the first paragraph with:

“Table 29 defines the bit rates supported by the PICC.”

Replace the second paragraph with:

“Until the RFU values with $b_4 = (1)b$ are assigned by ISO/IEC, a PCD receiving Bit_Rate_capability with $b_4 = (1)b$ shall interpret the Bit_Rate_capability byte as if $(b_8 \text{ to } b_1) = (00000000)b$ (only $f_c/128$ in both directions).”

Page 41, 7.9.4.7

Replace the whole subclause with:

“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 (b_4 to b_1) is RFU;
- the most significant half byte (b_8 to b_5) 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 replacing TR2 which is 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 (3). The default value of SFGI is 0.

$$\text{SFGT} = (256 \times 16 / f_c) \times 2^{\text{SFGI}} \quad \text{ISO/IEC 14443-3:2016/Amd 1:2016} \quad (3)$$

[https://standards.iteh.ai/catalog/standards/sist/b421047d-a2dd-4519-a7d0-](https://standards.iteh.ai/catalog/standards/sist/b421047d-a2dd-4519-a7d0-4407252003c4/iso-iec-14443-3-2016-amd-1-2016)

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For SFGI = 0, SFGT is minimal ($\sim 302 \mu\text{s}$).

For SFGI = 14, SFGT is maximal ($\sim 4\,949 \text{ ms}$).

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

The PCD shall ignore (b_4 to b_1) and its interpretation of any other field of the whole frame shall not change.

When answering a REQB/WUPB command with bit b_5 set to $(0)b$ (no extended ATQB supported) the PICC shall not send the optional 4th byte in its ATQB response.”

Page 42, 7.10.3

Replace Figure 28 with:

b8	b7	b6	b5	b4	b3	b2	b1
Minimum TR0		Minimum TR1		EOF	SOF	Each bit RFU	

Figure 28 — Coding of Param1

Delete the second paragraph.

Page 43, 7.10.3.1

Replace the second paragraph with:

“Until the RFU value (11)b is assigned by ISO/IEC, a PICC receiving (b8,b7) = (11)b shall interpret it as (b8,b7) = (00)b, the default value.”

Page 43, 7.10.3.2

Replace the second paragraph with:

“Until the RFU value (11)b is assigned by ISO/IEC, a PICC receiving (b6,b5) = (11)b shall interpret it as (b6,b5) = (00)b, the default value.”

Page 44, 7.10.4

Delete the fourth paragraph.

Replace the last paragraph and NOTE with:

“Until the RFU values ‘D’ - ‘F’ are assigned by ISO/IEC, a PICC receiving Maximum Frame Size Code = ‘D’ - ‘F’ shall interpret it as Maximum Frame Size Code = ‘C’ (Maximum frame size = 4 096 bytes).”

NOTE This PICC requirement is added for PICC’s compatibility with future PCDs when ISO/IEC further defines the behaviour for the RFU values of ‘D’ - ‘F’.”

Page 44, 7.10.5

Replace the whole subclause with:

“7.10.5 Coding of Param 3

The PCD shall use b1 for the confirmation of the protocol type as specified in Table 26 and should use (b3,b2) for confirmation of minimum TR2 as specified in Table 27. b4 is RFU.

The PICC shall ignore (b3,b2) and the interpretation of any other field of the whole frame shall not change.

b8, b7, b6 and b5 are each RFU.

The PICC shall not respond to the ATTRIB command when b8 or b7 or b6 or b5 <> (0)b.”

Page 44, 7.10.6

Replace the whole subclause with:

“7.10.6 Coding of Param 4

The Param 4 byte consists of two parts:

- the least significant half byte (b4 to b1) is named Card Identifier (CID) and defines the logical number of the addressed PICC in the range from 0 to 14. The value 15 is RFU. The CID is specified by the PCD and shall be unique for each active PICC. If the PICC does not support CID, the PCD shall use CID = (0000)b and the PICC shall not respond to an ATTRIB command using CID <> (0000)b;
- b8, b7, b6 and b5 are each RFU.

Until the RFU value of CID = 15 is assigned by ISO/IEC, a PICC receiving CID = 15 shall not respond to the ATTRIB command.”

Page 45, 7.11

Replace the first dash of the second paragraph with:

- “— the least significant half byte (b4 to b1) contains the returned CID. When answering to a valid ATTRIB command, the PICC shall return the CID value received in the ATTRIB command, else the PCD shall consider the PICC response as a protocol error;”