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

AMENDMENT 2
Bit rates higher than *fc*/16 up to *fc* and increased frame size

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

AMENDEMENT 2
Débits binaires supérieurs à fc/16 jusqu'à fc et taille de trame augmentée

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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 2: Bit rates higher than *fc*/16 up to *fc* and increased frame size

Page 5, 6.1

Replace the subclause with the following:

"

Communication between PCD and PICC can be achieved with different bit rates.

Bit rates other than *fc* / 128 are optional and may be independently supported by PCD and PICC in each communication direction and calculated as defined in Table 1. If a bit rate with D > 16 is selected for PCD to PICC communication, then D shall be greater than 1 for PICC to PCD communication.

N/A

Table 1 — Bit rates

Divisor D	etu	Bit rate
1	128 / *fc* (~ 9,4 µs)	*fc* / 128 (~ 106 kbit/s)
2 (optional)	128 / (2 *fc*) (~ 4,7 µs)	*fc* / 64 (~ 212 kbit/s)
4 (optional)	128 / (4 *fc*) (~ 2,4 µs)	*fc* / 32 (~ 424 kbit/s)
8 (optional)	128 / (8 *fc*) (~ 1,2 µs)	*fc* / 16 (~ 848 kbit/s)
16 (optional)	128 / (8 *fc*) (~ 1,2 µs)	*fc* / 8 (~ 1,7 Mbit/s)
16 (optional)	128 / (16 *fc*) (~ 0,6 µs)	*fc* / 8 (~ 1,7 Mbit/s)
24 (optional)	128 / (8 *fc*) (~1,2 µs)	*fc* / 16/3 (~ 2,54 Mbit/s)
32 (optional)	128 / (8 *fc*) (~1,2 µs)	*fc* / 4 (~ 3,39 Mbit/s)
32 (optional)	128 / (16 *fc*) (~0,6 µs)	*fc* / 4 (~ 3,39 Mbit/s)
32 (optional)	128 / (32 *fc*) (~ 0,3 µs)	*fc* / 4 (~ 3,39 Mbit/s)
48 (optional)	128 / (16 fc) (~ 0,6 µs)	*fc* / 8/3 (~ 5,08 Mbit/s)
64 (optional)	128 / (16 *fc*) (~0,6 µs)	*fc* /2 (~ 6,78 Mbit/s)
64 (optional)	128 / (32 *fc*) (~ 0,3 µs)	*fc* /2 (~ 6,78 Mbit/s)
64 (optional)	128 / (64 *fc*) (~ 0,15 µs)	*fc* /2 (~ 6,78 Mbit/s)
96 (optional)	128 / (32 *fc*) (~ 0,3 µs)	*fc* / 4/3 (~ 10,17 Mbit/s)
128 (optional)	128 / (64 *fc*) (~ 0,15 µs)	*fc* (~ 13,56 Mbit/s)

NOTE The initial bit rate is *fc* / 128. This applies for the whole initialization and anticollision sequence.

"

Page 7, 6.2.1.1

Replace the row before the last row of Table 2 with the following:

"

fc / 128 or *fc* / 64 or *fc* / 32 or *fc* / 16 or *fc* / 8 or *fc* / 16/3 or *fc* / 4 or *fc* / 8/3 or *fc* / 2 or fc / 4/3 or fc	*fc* / 64 or *fc* / 32 or *fc* / 16 or *fc* / 8 or *fc* / 4 or *fc* / 2 or *fc*	Not applicable	≥ 1116 / *fc*	≥ 1116 / *fc*

"

Page 9, 6.2.3.2

Replace the 4th paragraph with the following:

"As an exception the last parity bit of a PICC standard frame shall be inverted if this frame is transmitted with bit rate higher than fc / 128. PICC standard frames are illustrated in Figure 4."

Page 9, 6.2.3.2

Replace the 5th paragraph with the following:

"PICC standard frames for bit rates higher than fc/128"

Page 24, 7.1.1

Add the following paragraph below Table 13:

"For bit rates higher than *fc*/16 bit boundaries shall occur at nominal bit positions."

Page 25, 7.1.4

In Table 17 replace "*fc*/16" with:

"> *fc*/32"

Page 26, 7.1.4

In Table 18 replace "*fc*/16" with:

"> *fc*/32"

Page 26, 7.1.4

In Table 20 replace "*fc*/16" with:

"> *fc*/32"

Page 40, 7.9.4.4

Replace Table 27 with the following:

"

b3	b2	Minimum TR2 for bit rates up to *fc*/16	Minimum TR2 for bit rates higher than *fc*/16
0	0	10 etu + 32 / *fs*	512 / *fc*
0	1	10 etu + 128 / *fs*	2048 / *fc*
1	0	10 etu + 256 / *fs*	4096 / *fc*
1	1	10 etu + 512 / *fs*	8192 / *fc*

"

Page 41, 7.9.4.6

Add after last paragraph:

N/A

"NOTE Bit rates higher than *fc*/16 are negotiated by S(Parameters) blocks."

Page 43, 7.10.3.1

Replace Table 30 with the following:

"

b8	b7	Minimum TR0 for a PCD to PICC bit rate of				
		***fc* / 128**	***fc* / 64**	***fc* / 32**	***fc* / 16**	**> *fc* / 16**
0	0	64 / *fs*	64 / *fs*	64 / *fs*	64 / *fs*	1024 / *fc*
0	1	48 / *fs*	32 / *fs*	32 / *fs*	32 / *fs*	512 / *fc*
1	0	16 / *fs*	16 / *fs*	16/ *fs*	16 / *fs*	256 / *fc*
1	1	RFU	RFU	RFU	RFU	RFU

"

Page 44, 7.10.3.2

Replace Table 31 with the following

"

b6	b5	Minimum TR1 for a PICC to PCD bit rate of	
		***fc* / 128**	**> *fc* / 128**
0	0	80 / *fs*	80 / *fs*
0	1	64 / *fs*	32 / *fs*
1	0	16 / *fs*	8 / *fs*
1	1	RFU	RFU

"

Page 44, 7.10.3.3

Replace last sentence of last paragraph with:

"For bit rates higher than *fc* / 128 (~ 106 kbit/s) up to *fc*/16 the PICC shall always provide SOF and EOF."

"

Page 45, 7.10.4

Add below Table 36:

"NOTE Bit rates higher than *fc*/16 are negotiated by S(Parameters) blocks."

Page 41, 7.9.4.5

Replace the subclause with the following:

"

Max_Frame_Size

Table 28 defines the maximum frame size.

Table 2 — Maximum frame size

Maximum Frame Size Code in ATQB	**'0'**	**'1'**	**'2'**	**'3'**	**'4'**	**'5'**	**'6'**	**'7'**	**'8'**	**'9'**	**'A'**	**'B'**	**'C'**	**'D' – 'F'**
Maximum Frame Size (bytes)	16	24	32	40	48	64	96	128	256	512	1024	2048	4096	RFU > 4096

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

Until the RFU values 'D' - 'F' are assigned by ISO/IEC, a PCD receiving Maximum Frame Size Code = 'D' - 'F' should interpret it as Maximum Frame Size Code = 'C' (4096 bytes).

"