

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

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

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AMENDMENT 2

Bit rates higher than $f_c / 16$ up to f_c and increased frame size

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Débits binaires supérieurs à $f_c / 16$ jusqu'à f_c et taille de frame augmentée

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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 higher than $fc/16$ is selected for PCD to PICC communication, then a bit rate higher than $fc/128$ shall be selected for PICC to PCD communication.

Table 1 — Bit rates

Divisor D	etu	Bit rate			
		1 bit / etu	2 bits / etu	3 bits / etu	4 bits / etu
1	$128 / fc$ (~ 9,4 μ s)	$fc / 128$ (~ 106 kbit/s)			
2 (optional)	$128 / (2 fc)$ (~ 4,7 μ s)	$fc / 64$ (~ 212 kbit/s)			
4 (optional)	$128 / (4 fc)$ (~ 2,4 μ s)	$fc / 32$ (~ 424 kbit/s)			
8 (optional)	$128 / (8 fc)$ (~ 1,2 μ s)	$fc / 16$ (~ 848 kbit/s)	$fc / 8$ (~ 1,7 Mbit/s)	$fc / 16/3$ (~ 2,54 Mbit/s)	$fc / 4$ (~ 3,39 Mbit/s)
16 (optional)	$128 / (16 fc)$ (~ 0,6 μ s)	$fc / 8$ (~ 1,7 Mbit/s)	$fc / 4$ (~ 3,39 Mbit/s)	$fc / 8/3$ (~ 5,09 Mbit/s)	$fc / 2$ (~ 6,78 Mbit/s)
32 (optional)	$128 / (32 fc)$ (~ 0,3 μ s)	$fc / 4$ (~ 3,39 Mbit/s)	$fc / 2$ (~ 6,78 Mbit/s)	$fc / 4/3$ (~ 10,17 Mbit/s)	
64 (optional)	$128 / (64 fc)$ (~ 0,15 μ s)	$fc / 2$ (~ 6,78 Mbit/s)	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 $fc / 2$	Not applicable	$\geq 1116 / fc$	$\geq 1116 / fc$
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"

Page 9, 6.2.3.2

Replace the 3rd 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, Figure 4

Replace the 2nd caption with the following:

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

Page 24, 7.1.1

Add the following paragraph below Figure 13:

"The start and stop bits are omitted for PSK modulation from PCD to PICC."

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, 7.1.3

Add the following paragraph below Figure 14:

"The SOF and EOF for PSK modulation from PCD to PICC are defined in ISO/IEC 14443-2:2010 Amd.1."

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 27, 7.1.6

Replace 3rd paragraph including list with:

"The maximum value of TR0 is:

- $4096 / fc$ ($\sim 302 \mu s$) for ATQB;
- $65536 / fc$ ($\sim 4,8 ms$) for S(DESELECT) and S(PARAMETERS) blocks (see ISO/IEC 14443-4, 8.1);
- $(4096 / fc) \times 2^{FWI} - TR1$ for all other frames (see 7.9.4.3)."

Page 27, 7.1.6

Replace 2nd sentence of last paragraph with:

"PCDs shall accept minimal and maximal values of TR0 with a margin of $16 / fc$ and of TR1 with a margin of $1 / fs$."

Page 40, 7.9.4.4

Replace Table 27 with the following:

"

b3	b2	Minimum TR2
0	0	$10 \text{ etu} + 512 / fc$
0	1	$10 \text{ etu} + 2048 / fc$
1	0	$10 \text{ etu} + 4096 / fc$
1	1	$10 \text{ etu} + 8192 / fc$

"

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)."

Page 41, 7.9.4.6

Add after last paragraph:

"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	
		$fc / 128$	$> fc / 128$
0	0	$1024 / fc$	$1024 / fc$
0	1	$768 / fc$	$512 / fc$
1	0	$256 / fc$	$256 / fc$
1	1	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

Replace Table 34 with following table:

"

Maximum Frame Size Code in ATTRIB	'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

"

Add below Table 36:

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

Replace last paragraph with:

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