

ISO/IEC 14443-3:2018 (E)

Cards and security devices for personal identification — Contactless proximity objects — Part 3: Initialization and anticollision

Contents

	Foreword
	Introduction
1	Scope
2	Normative references
3	Terms and definitions
4	Symbols, abbreviated terms and notations
4.1	Symbols and abbreviated terms
4.2	Notations
5	General requirements
5.1	Alternating PICC and PCD support (PXD)
5.2	Alternating between Type A and Type B commands
5.2.1	Polling
5.2.2	Influence of Type A commands on PICC Type B operation
5.2.3	Influence of Type B commands on PICC Type A operation
5.2.4	Transition to POWER#OFF state
5.3	RFU handling
6	Type A — Initialization and anticollision
6.1	etu
6.2	Frame format and timing
6.2.1	Frame delay time
6.2.1.1	Frame delay time PCD to PICC
6.2.1.2	Frame delay time PICC to PCD
6.2.2	Request Guard Time
6.2.3	Frame formats
6.2.3.1	Short frame
6.2.3.2	Standard frames
6.2.3.2.1	PCD standard frame for bit rates of $fc/128$, $fc/64$, $fc/32$ and $fc/16$ and PICC standard frame
6.2.3.2.2	PCD standard frame for bit rates of $fc/8$, $fc/4$ and $fc/2$
6.2.3.2.3	PCD standard frame for PCD to PICC bit rates of $3fc/4$, fc , $3fc/2$ and $2fc$
6.2.3.3	Bit oriented anticollision frame
6.2.4	CRC_A
6.3	PICC states
6.3.1	POWER#OFF state
6.3.2	IDLE state
6.3.3	READY state
6.3.4	ACTIVE state
6.3.5	HALT state
6.3.6	READY* state
6.3.7	ACTIVE* state
6.3.8	PROTOCOL state
6.4	Command set
6.4.1	REQA and WUPA commands
6.4.2	ANTICOLLISION and SELECT commands
6.4.3	HLTA command
6.5	Select sequence

- 6.5.1 Select sequence flowchart
 - 6.5.2 ATQA — Answer to Request
 - 6.5.2.1 Coding of ATQA
 - 6.5.2.2 Coding rules for bit frame anticollision
 - 6.5.3 Anticollision and Select
 - 6.5.3.1 Anticollision loop within each cascade level
 - 6.5.3.2 Coding of SEL (select code)
 - 6.5.3.3 Coding of NVB (number of valid bits)
 - 6.5.3.4 Coding of SAK (Select acknowledge)
 - 6.5.4 UID contents and cascade levels
- 7 **Type B — Initialization and anticollision**
- 7.1 Character, frame format and timing
 - 7.1.1 Character transmission format
 - 7.1.2 Character separation
 - 7.1.2.1 Character separation for bit rates up to $f_c/16$
 - 7.1.2.2 Character separation for bit rates of $f_c/8$, $f_c/4$ and $f_c/2$
 - 7.1.3 Frame format
 - 7.1.4 SOF
 - 7.1.5 EOF
 - 7.1.6 Timing before the PICC SOF
 - 7.1.7 Timing before the PCD SOF
 - 7.2 CRC_B
 - 7.3 Anticollision sequence
 - 7.4 PICC states description
 - 7.4.1 Initialization and anticollision flowchart
 - 7.4.2 General statement for state description and transitions
 - 7.4.3 POWER#OFF state
 - 7.4.4 IDLE state
 - 7.4.5 READY-REQUESTED sub-state
 - 7.4.6 READY-DECLARED sub-state
 - 7.4.7 PROTOCOL state
 - 7.4.8 HALT state
 - 7.5 Command set
 - 7.6 Anticollision response rules
 - 7.6.1 PICC with initialization only
 - 7.7 REQB/WUPB command
 - 7.7.1 REQB/WUPB command format
 - 7.7.2 Coding of anticollision prefix byte APf
 - 7.7.3 Coding of AFI
 - 7.7.4 Coding of PARAM
 - 7.8 Slot#MARKER command
 - 7.8.1 Slot#MARKER command format
 - 7.8.2 Coding of anticollision prefix byte APn
 - 7.9 ATQB Response
 - 7.9.1 ATQB response format
 - 7.9.2 Pseudo-Unique PICC Identifier (PUPI)
 - 7.9.3 Application data
 - 7.9.3.1 AFI
 - 7.9.3.2 CRC_B(AID)
 - 7.9.3.3 Number of applications
 - 7.9.4 Protocol Info
 - 7.9.4.1 FO
 - 7.9.4.2 ADC
 - 7.9.4.3 FWI
 - 7.9.4.4 Protocol_Type
 - 7.9.4.5 Max_Frame_Size
 - 7.9.4.6 Bit_Rate_capability
 - 7.9.4.7 Extended ATQB (optional)
 - 7.10 ATTRIB command
 - 7.10.1 ATTRIB command format
 - 7.10.2 Identifier
 - 7.10.3 Coding of Param 1
 - 7.10.3.1 Minimum TR0

7.10.3.2	Minimum TR1
7.10.3.3	EOF/SOF
7.10.4	Coding of Param 2
7.10.5	Coding of Param 3
7.10.6	Coding of Param 4
7.10.7	Higher layer INF
7.11	Answer to ATTRIB command
7.12	HLTB command and Answer
8	Electromagnetic disturbance handling
8.1	General
8.2	EMD timing constraints
8.3	Recommendations for a PCD algorithm for EMD handling
Annex A	(informative) Communication example Type A
Annex B	(informative) CRC_A and CRC_B encoding
B.1	CRC_A encoding
B.2	CRC_B encoding
B.3	Code sample written in C language for CRC calculation
Annex C	(informative) Type A timeslot — Initialization and anticollision
C.1	Terms and abbreviations
C.2	Timing and frame format
C.2.1	Timing definitions
C.2.2	Frame formats
C.3	PICC states
C.4	Command/response set
C.5	Timeslot anticollision sequence

Page count: 56