

ISO/IEC 14443-3:2016-06 (E)

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

Contents		Page
Foreword		v
Introduction		vi
1	Scope	1
2	Normative references	1
3	Terms and definitions	2
4	Symbols and abbreviated terms	3
5	Initial dialogs	4
5.1	Alternating PICC and PCD support (PXD)	4
5.2	Alternating between Type A and Type B commands	5
5.2.1	Polling	5
5.2.2	Influence of Type A commands on PICC Type B operation	5
5.2.3	Influence of Type B commands on PICC Type A operation	6
5.2.4	Transition to POWER-OFF state	6
6	Type A -- Initialization and anticollision	6
6.1	etu	6
6.2	Frame format and timing	6
6.2.1	Frame delay time	7
6.2.2	Request Guard Time	8
6.2.3	Frame formats	8
6.2.4	CRC_A	11
6.3	PICC states	12
6.3.1	POWER-OFF state	13
6.3.2	IDLE state	14
6.3.3	READY state	14
6.3.4	ACTIVE state	14
6.3.5	HALT state	14
6.3.6	READY* state	14
6.3.7	ACTIVE* state	14
6.3.8	PROTOCOL state	15
6.4	Command set	15
6.4.1	REQA and WUPA commands	15
6.4.2	ANTICOLLISION and SELECT commands	16
6.4.3	HLTA command	16
6.5	Select sequence	16
6.5.1	Select sequence flowchart	16
6.5.2	ATQA -- Answer to Request	17
6.5.3	Anticollision and Select	18
6.5.4	UID contents and cascade levels	22
7	Type B -- Initialization and anticollision	24
7.1	Character, frame format and timing	24
7.1.1	Character transmission format	24
7.1.2	Character separation	24
7.1.3	Frame format	25

7.1.4	SOF	25
7.1.5	EOF	26
7.1.6	Timing before the PICC SOF	27
7.1.7	Timing before the PCD SOF	27
7.2	CRC_B	28
7.3	Anticollision sequence	28
7.4	PICC states description	29
7.4.1	Initialization and anticollision flowchart	31
7.4.2	General statement for state description and transitions	31
7.4.3	POWER-OFF state	32
7.4.4	IDLE state	32
7.4.5	READY-REQUESTED sub-state	32
7.4.6	READY-DECLARED sub-state	32
7.4.7	PROTOCOL state	33
7.4.8	HALT state	33
7.5	Command set	33
7.6	Anticollision response rules	34
7.6.1	PICC with initialization only	34
7.7	REQB/WUPB command	34
7.7.1	REQB/WUPB command format	34
7.7.2	Coding of anticollision prefix byte APf	34
7.7.3	Coding of AFI	35
7.7.4	Coding of PARAM	35
7.8	Slot-MARKER command	36
7.8.1	Slot-MARKER command format	36
7.8.2	Coding of anticollision prefix byte APn	37
7.9	ATQB Response	37
7.9.1	ATQB response format	37
7.9.2	PUPI (Pseudo-Unique PICC Identifier)	38
7.9.3	Application data	38
7.9.4	Protocol Info	38
7.10	ATTRIB command	42
7.10.1	ATTRIB command format	42
7.10.2	Identifier	42
7.10.3	Coding of Param 1	42
7.10.4	Coding of Param 2	44
7.10.5	Coding of Param 3	44
7.10.6	Coding of Param 4	45
7.10.7	Higher layer INF	45
7.11	Answer to ATTRIB command	45
7.12	HLTB command and Answer	46
8	Electromagnetic disturbance handling	47
8.1	General	47
8.2	EMD handling timing constraints	47
8.3	Recommendations for a PCD EMD handling algorithm	48
Annex A (informative) Communication example Type A		49
Annex B (informative) CRC_A and CRC_B encoding		51
Annex C (informative) Type A timeslot -- Initialization and anticollision		54
Annex D (informative) Example of Type B Anticollision Sequence		58
Annex E (normative) Bit rates of 3fc/4, fc, 3fc/2 and 2fc from PCD to PICC		61
Bibliography		63