

ISO/IEC 18000-3:2009-11 (E)

Information technology - Radio frequency identification for item management - Part 3:
Parameters for air interface communications at 13,56_MHz

Contents

Page

Foreword	vi
Introduction.....	vii
1 Scope	1
2 Conformance	1
3 Normative references.....	1
4 Terms and definitions	2
5 Symbols and abbreviated terms	3
5.1 Symbols.....	3
5.2 Abbreviated terms	4
5.3 Notation	5
6 Requirements: Physical layer, collision management system and protocol values for 13,56 MHz systems.....	6
6.0 General and applicable to All Modes.....	6
6.0.1 Presentation as determined in ISO/IEC 18000-1	6
6.0.2 ISO/IEC 18000-3 Interoperability	6
6.0.3 ISO/IEC 18000-3 interrogator conformance/compliance	6
6.0.4 ISO/IEC 18000-3 tag compliance.....	6
6.0.5 Command structure and extensibility	6
6.0.6 Mandatory commands	6
6.0.7 Optional commands	7
6.0.8 Custom commands	7
6.0.9 Proprietary commands	7
6.1 Physical layer, collision management system and protocols for MODE 1	7
6.1.1 Read/Write system	7
6.1.2 Normative Aspects	7
6.1.3 Conformance and performance measurement aspects	7
6.1.4 Physical Layer	7
6.1.5 Protocol and collision management operating method	7
6.1.6 Commands	8
6.1.7 Parameter tables for interrogator to tag link	8
6.1.8 Parameter tables for tag to interrogator link	11
6.2 MODE 2: Physical layer, collision management system and protocols for MODE 2	14
6.2.1 Normative aspects: physical and media access control (MAC) parameters: interrogator to tag link	15
6.2.2 Tag to interrogator link	17
6.2.3 Description of operating method.....	20
6.2.4 Protocol parameters.....	25
6.2.5 Description of protocol operating method	25
6.2.6 Collision management parameters.....	41
6.2.7 Description of collision management parameters operating method (informative)	41
6.2.8 Tag order sequencing	49
6.2.9 Commands	49
6.2.10 Air interface application layer	49
6.2.11 Optional Functionality.....	49
6.3 MODE 3: Physical layer, collision management system and protocols for MODE 3	52
6.3.1 Protocol overview.....	52
6.3.2 General	52
6.3.3 Physical layer, collision management system and protocols	53

7	Marking of equipment	124
Annex A (informative)	MODE 1: mandatory and optional commands required to support the ISO/IEC 15962 data protocol	125
Annex B (informative)	MODE 2 and MODE 3: Phase Jitter Modulation	126
Annex C (normative)	MODE3: State transition tables	129
C.1	Present state: Ready	129
C.2	Present state: Arbitrate	130
C.3	Present state: Reply	131
C.4	Present state: Acknowledged	132
C.5	Present state: Open	133
C.6	Present state: Secured	134
C.7	Present state: Killed (optional)	136
Annex D (normative)	MODE 3: Command Response Tables	137
D.1	Command response: Power-up	137
D.2	Command response: <i>BeginRound</i>	137
D.3	Command response: <i>NextSlot</i>	138
D.4	Command response: <i>ResizeRound</i>	138
D.5	Command response: <i>ACK</i>	138
D.6	Command response: <i>NAK</i>	139
D.7	Command response: <i>Req_RN</i>	139
D.8	Command response: <i>Select</i>	139
D.9	Command response: <i>Read</i>	140
D.10	Command response: <i>Write</i>	140
D.11	Command response: <i>Kill</i>	141
D.12	Command response: <i>Lock</i>	141
D.13	Command response: <i>Access</i>	142
D.14	Command response: <i>BlockWrite</i>	142
D.15	Command response: <i>BlockErase</i>	142
D.16	Command response: <i>BlockPermalock</i>	143
D.17	Command response: <i>T₂ timeout</i>	143
D.18	Command response: <i>Invalid command</i>	144
Annex E (normative)	MODE 3: Error codes	145
Annex F (normative)	MODE 3: Slot counter	146
F.1	Slot-counter operation	146
Annex G (informative)	MODE 3: Example slot-count (Q) selection algorithm	147
G.1	Example algorithm an interrogator might use to choose Q	147
Annex H (informative)	MODE 3: Example of tag inventory and access	148
H.1	ASK Method: Example inventory and access of a single tag	148
H.2	PJM Method: Example inventory and access of a single or multiple tags	149
Annex I (informative)	MODE 3: Calculation of 5-bit and 16-bit cyclic redundancy checks	150
I.1	Example CRC-5 encoder/decoder	150
I.2	Example CRC-16 calculations	151
I.3	Example CRC-16c encoder/decoder	151
Annex J (informative)	MODE 3: ASK Method: Interrogator-to-tag link modulation	152
J.1	Baseband waveforms, modulated RF, and detected waveforms	152
Annex K (informative)	MODE 3: Example data flow exchange	153
K.1	Overview of the data-flow exchange	153
K.2	Tag memory contents and lock-field values	153
K.3	Data-flow exchange and command sequence	154
Annex L (informative)	MODE 3: Tag Features	155
L.1	Optional Tag passwords	155
L.2	Optional Tag memory banks and memory-bank sizes	155
L.3	Optional Tag commands	155
L.4	Optional Tag error-code reporting format	155

L.5	Optional Tag functionality	156
L.6	Optional Tag Feature.....	156
Annex M	(informative) Cyclic Redundancy Check (CRC) (16 bit)	157
M.1	The CRC error detection method.....	157
M.2	CRC calculation example.....	157
Annex N	(informative) Cyclic redundancy check (CRC) mode 2 (32 bit).....	159
N.1	The CRC 32 error detection method.....	159
N.2	CRC 32 calculation example	159
N.3	Practical example of CRC 32 calculation	161
Annex O	(informative) Known possible interferences between the MODES determined in this part of ISO/IEC 18000.....	162
Bibliography	163