ISO/IEC 15962:2004-10 (E)

Information technology - Radio frequency identif ication (RFID) for item management - Data protocol: data encoding rules and logical memory functions

Contents

Page

Foreword vi

Introduction vii

1 Scope 1

2 Normative references 1

3 Terms, definitions and abbreviated terms 2
3.1 Terms and definitions 2
3.2 Abbreviated terms 4

4 Protocol model 4
4.1 Overview 4
4.2 Layered protocol 5
4.3 Functional processes 6

5 Data structure 8
5.1.1 The 8-bit byte 8
5.1.2 N-bit encoding 8

6 Data Protocol Processor and the application interface 8
6.2 Universal Types 9
6.3 Length encoding and decoding 10
6.4 Decoding of Type values 10
6.4.1 Decoding of a BOOLEAN value 10
6.4.2 Decoding an INTEGER value 10
6.4.3 Decoding an OBJECT IDENTIFIER value 11
6.4.4 Decoding the OCTET STRING value 11
6.4.5 Decoding the SEQUENCE or SEQUENCE OF value 11

7 Data Protocol Processor and the air interface 12
7.1 Air interface services 12
7.2 Defining the system information 13
7.2.1 Tag Identifier 13
7.2.2 Physical block size 14
7.2.3 Number of blocks 14
7.2.4 Application Family Identifier 14
7.2.5 Storage Format 14
7.3 Configuring the Logical Memory 15
7.3.1 Non- directory structure of the Logical Memory 15
7.3.2 Directory structure of the Logical Memory 16
7.3.3 Self mapping RF tags 16

8 Data flows and processes 17
8.1 Application data 17
8.1.2 Processing example 18
8.2 Data object processing 19
8.2.1 Compaction process 19
8.2.2 Compaction Schemes 20
8.2.3 Compaction Type codes 21

8.2.4 Encoding the length of the compacted object 21
8.2.5 Example of encoding for the Logical Memory after compaction 21
8.3 Data formatting 22
8.3.1 Data Formatter Functions 22
8.3.2 Formatting the objectId 23
8.3.3 The Precursor for dataFormat not equal 2 24
8.3.4 The Precursor for the root-OID for dataFormat = 2 24
8.3.5 Encoding the RELATIVE-OID 24
8.3.6 Encoding the OBJECT IDENTIFIER 26
8.3.7 Encoding the root-OID for dataFormat = rootOidEncoded (2) 26
8.3.8 Encoding the object and its length 27
8.3.9 The offset byte 27
8.3.10 The Precursor expansion byte 27
8.3.11 The directory structure 27
8.3.12 Addressing from the directory 28
8.3.13 Structures of Logical Memory 28
8.4 Decoding the Logical Memory 28
8.4.1 Overall decode strategy 28
8.4.2 Decoding the storageFormat 28
8.4.3 Decoding the Precursor 29
8.4.4 Decoding the leading byte(s) of the encoded objectId 30

9 The Command / Response unit 31
9.1 Commands 31
9.1.1 Configure Application Family Identifier command 31
9.1.2 Configure Storage Format command 31
9.1.3 Inventory Tags command 32
9.1.4 Add Single Object command 32
9.1.5 Delete Object command 32
9.1.6 Modify Object command 32
9.1.7 Read Single Object command 33
9.1.8 Read ObjectIds command 33
9.1.9 Read All Objects command 34
9.1.10 Read Logical Memory Map command 34
9.1.11 Inventory And Read Objects command 34
9.1.12 Erase Memory command 35
9.1.13 Get Application-based System Information command 35
9.1.14 Add Multiple Objects command 35
9.1.15 Read Multiple Objects command 35
9.1.16 Read First Object command 36
9.2 Processing arguments 36
9.2.1 afiLock 36
9.2.2 avoidDuplicate 36
9.2.3 checkDuplicate 37
9.2.4 identifyMethod and numberOfTags 37
9.2.5 lockStatus 38
9.2.6 maxAppLength 38
9.2.7 objectLock 38
9.2.8 storageFormatLock 38
9.3 Completion codes 39
9.4 Execution codes 40

10 Communications between the Data Protocol and the RF tag 41

11 Compliance, or classes of compliance, to this International Standard 41
11.1 Compliance of the Data Protocol Processor 41
11.2 Compliance of the Tag Driver 41

Annex A (normative) Pro Forma Description for the Tag Driver 42

A.1 Defining the tagId 42
A.2 System information : applicationFamilyId 42

A.3 System information : storageFormat 42
A.4 Memory-related parameters 42
A.5 Support for commands 43

kHz 44

at 13,56 MHz 45

at 13,56 MHz 46

2,45 GHz - Mode 1 47
2,45 GHz - Mode 2 48

to 960 MHz 49

Annex C (normative) Data Compaction Schemes 51

C.1 Integer compaction 51
C.2 Numeric compaction 51
C.3 5-bit compaction 52
C.4 6-bit compaction 52
C.5 7-bit compaction 53
C.6 Octet encodation 54

Annex E (informative) Encoding Example 59

E.1 Starting position 59
E.2 The initial state of the entry for the Logical Memory 59
E.3 The Logical Memory after data compaction 59
E.4 The Logical Memory after formatting with a noDirectory accessMethod 60

Annex F (informative) Logical Memory Structures 62

F.1 Notation 62
F.2 Non-directory structured Logical Memory with root-OID implicitly encoded 62
F.3 Non-directory structured Logical Memory with root-OID explicitly encoded 63
F.4 Directory structured Logical Memory with root-OID implicitly encoded 63
F.5 Directory structured Logical Memory with root-OID explicitly encoded 63