

ISO/IEC 15962:2013-03 (E)

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

Contents	Page
Foreword	vii
Introduction	viii
1 Scope	1
2 Normative references	1
3 Terms, definitions and conventions	2
3.1 Terms and definitions	2
3.2 Conventions	2
4 Conformance	2
4.1 Conformance with the air interface	2
4.2 Conformance with the application interface	2
4.3 Conformance with the Access-Method	3
5 Protocol model	4
5.1 Overview	4
5.2 Layered protocol	4
5.3 Flexible implementation configurations	6
5.4 Functional processes - interrogator implementation	6
6 Data and presentation conventions	9
6.2 Extensible bit vector (EBV)	10
6.3 Object Identifier presentation in the application interface	10
6.4 The Object	12
6.5 The 8-bit byte	12
6.6 N-bit encoding	12
7 Data Processor - high level processing	12
8 Data Processor and the application interface	13
8.1 Application commands - overview	13
8.2 Application commands and responses- write	15
8.3 Application commands and responses- read	31
8.4 Application commands and responses- other	40
8.5 Air interface support for application commands	49
9 Data Processor and the air interface	49
9.1 Air interface services	49
9.2 Defining the system information	50
9.3 Configuring the Logical Memory	58
10 The Command/Response Unit: processing of command and response arguments	58
10.1 Process arguments	59
10.2 Completion-Codes	71
10.3 Execution-Codes	74
11 Access-Method	74
11.1 No-Directory structure	75

11.2	Directory structure	77
11.3	Packed-Objects structure	79
11.4	Tag Data Profile	80
11.5	Multiple-Records	80
	Data-Format 3	86
12.2	Specific support for ISO TC122 standards	87
13	Monomorphic-UII encoding	87
13.1	6-bit encoding	88
13.2	7-bit encoding	88
13.3	URN Code 40 encoding	88
13.4	8859-1 octet encoding	89
13.5	Application-defined 8-bit coding	89
	Annex A (informative) Air interface support for application commands	90
A.1	Overview	90
	Annex B (normative) Pro forma description for the Tag Driver	96
B.1	Defining the Singulation-Id	96
B.2	System information : AFI	96
B.3	System information: DSFID	96
B.4	Memory-related parameters	96
B.5	Support for commands	97
135	kHz	98
13,56	MHz	99
13,56	MHz	101
Mode 1	102
Mode 2	104
860	MHz to 960 MHz	104
860	MHz to 960 MHz	105
860	MHz to 960 MHz	107
860	MHz to 960 MHz	108
	Annex D (normative) Encoding rules for No-Directory Access-Method	112
D.1	Object processing	112
D.2	Encoding the length of the compacted Object	114
D.3	Processing the Object-Identifier	114
D.4	Processing the Relative-OID	116
D.5	Encoding the length and Object-Identifier or Relative-OID	119
D.6	The Precursor	120
D.7	The Offset byte	121
D.8	The Precursor expansion byte	121
D.9	Decoding the Logical Memory	122
	Annex E (normative) Basic Data Compaction Schemes	125
E.1	Integer compaction	125
E.2	Numeric compaction	125
E.3	5-bit compaction	126
E.4	6-bit compaction	126
E.5	7-bit compaction	127
E.6	Octet encodation	129

Annex G (informative) Encoding example for No-Directory structure	133
G.1 Starting position	133
G.2 Encoding the Object-Identifiers	133
G.3 The initial state of the entry for the Logical Memory	133
G.4 The Logical Memory after data compaction	134
G.5 The Logical Memory after formatting for a No-Directory Access-Method	134
Annex H (informative) Encoding example for Directory structure	136
H.1 The base data	136
H.2 Encoding the first Directory entry	136
H.3 Encoding the second Directory entry	137
H.4 Encoding the remaining Directory entries	137
H.5 Decoding the Directory and reading the target Object-Identifier	138
Annex I (normative) Packed-Objects structure	139
I.1 Overview	139
I.2 Overview of associated Annexes	139
I.3 High-level Packed-Objects format design	139
I.4 Format Flags section	142
I.5 Object Info section	144
I.6 Secondary ID Bits section	150
I.7 Aux Format section	150
I.8 Data section	152
I.9 ID Map and Directory encoding options	155
Annex J (normative) Packed Objects ID Tables	161
J.1 Packed Objects Data Format registration file structure	161
J.2 Mandatory and Optional ID Table columns	163
J.3 Syntax of OIDs, IDString, and FormatString columns	166
J.4 OID input/output representation	168
Annex K (normative) Packed Objects Encoding tables	170
Annex L (informative) Encoding example for Packed Objects	175
Annex M (informative) Decoding Packed Objects	179
M.1 Overview	179
M.2 Decoding Alphanumeric data	180
Annex N (normative) Tag Data Profile encoding	183
N.1 Scope	183
N.2 The Registered Table	183
N.3 Encoding the Tag Data Profile on the RFID tag	184
N.4 Decoding the Tag Data Profile	186
N.5 Modifying Data	187
Annex O (normative) Tag Data Profile ID tables	188
O.1 Tag-Data-Profile Data-Format registration file structure	188
O.2 File Header section	189
O.3 Table Header section	189
O.4 Table Trailer section	190
O.5 Mandatory ID Table columns	190
Annex P (informative) Encoding example for Tag Data Profile	192

P.1	Encoded data segment	192
P.2	Encoding the header segment	195
Annex Q (normative) Basic encoding rules for Multiple-Records Access-Method		196
Q.1	Overview	196
Q.2	Encoding the Multiple-Records header	196
Q.3	Encoding the preamble of an individual record that is not part of a hierarchical structure	200
Q.4	The record	203
Q.5	The directory	203
Q.6	Appending a new record	207
Q.7	Modifying an existing record	208
Q.8	Deleting an existing record	208
Q.9	Constructing the Object-Identifier from the MR-header, preamble and individual record	209
Annex R (normative) Multiple-Records encoding rules for hierarchical records		212
R.1	Overview	212
R.2	Encoding the Multiple-Records header	213
R.3	Encoding the preamble of hierarchical record	214
R.4	The hierarchical record	216
R.5	Data element list	216
R.6	The directory	218
R.7	Appending a new record	218
R.8	Modifying an existing record	218
R.9	Deleting a record	218
Annex S (informative) Encoding example for the Multiple-Records Access-Method		219
S.1	The heterogeneous multiple record example	219
S.2	An encoding example of a homogeneous multiple record	226
S.3	An encoding example of a hierarchical multiple record	229
T.1	DSFID	232
T.2	Precursor byte	232
T.3	Data byte-count indicator	232
T.4	Encoding and Decoding	233
T.5	Encoding and Decoding Example using Data Identifiers	234
T.6	Additional Code Values and other Precursor features	236
Standards		238
U.1	DSFID	238
U.2	Precursor byte	238
U.3	Data byte-count indicator	238
U.4	Encoding and Decoding	239
U.5	Encoding and Decoding Example	241
Annex V (normative) URN Code 40 encoding		243
V.1	Basic Character Set	243
V.2	Extended Encoding	244
V.3	Encoding Example	245
V.4	Resolver Example	245
Bibliography		246