

Information technology — Radio frequency identification for item management — Elementary tag licence plate functionality for ISO/IEC 18000 air interface definitions

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National foreword

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TECHNICAL REPORT

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Information technology — Radio frequency identification for item management — Elementary tag licence plate functionality for ISO/IEC 18000 air interface definitions

*Technologies de l'information — Identification de radiofréquence pour la
gestion d'objets — Fonctionnalité du numéro matricule utilisant des tags
élémentaires pour les définitions de l'interface d'air pour
l'ISO/CEI 18000*



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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of the joint technical committee is to prepare International Standards. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

In exceptional circumstances, the joint technical committee may propose the publication of a Technical Report of one of the following types:

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Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

ISO/IEC TR 24710, which is a Technical Report of type 3, was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 31, *Automatic identification and data capture techniques*.

Introduction

ISO/IEC 18000 (all parts) defines the operation of radio frequency identification (RFID) air interfaces for item identification and management.

ISO/IEC 18000 has been designed to encompass a full range of data capture and carrier functionality. Both read and write operations are enabled, and the interfaces can efficiently support both simple and complex data transactions.

This approach facilitates user implementation by providing consistency between differing types of RFID data transactions. Equally it provides architecture to guide future RFID development whilst maintaining the backward compatibility necessary to sustain market confidence.

Recent developments in the design and management of distributed databases holding item level information have focused attention on “identification data element” operation of RFID systems. In this application, the RFID tag carries only sufficient data to permit reference to attribute information held elsewhere. Typically this data does not change during the validity of the “licence” and is of relatively low bit count.

This Technical Report has been prepared to assist users intending to implement ISO/IEC 18000 RFID air interface standards, with particular focus on so-called elementary tags, i.e. tags possessing limited memory — typically but not exclusively 256 bits or less — and lacking write capability (but not excluding WORM devices).

The annexes to this Technical Report describe the implementation of ISO/IEC 18000-2, -3, -4, -6 and -7 in such an application.

Users are strongly advised to refer to ISO/IEC 15961 and ISO/IEC 15962 for a full exposition of the management issues relating to data strings used for identification data element purposes.

Bodies external to ISO also specify identification data element length and structure for particular applications.

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1 Scope

This Technical Report defines for each of ISO/IEC 18000-2, -3, -4, -6 and -7, and, where relevant, for each Mode within each part, a transaction that achieves an elementary tag “identification data element” for item identification and management.

The transaction uses the existing air interface protocols defined in the corresponding parts of ISO/IEC 18000 or a subset thereof.

2 Normative references

ISO/IEC 18000-2, *Information technology — Radio frequency identification for item management — Part 2: Parameters for air interface communications below 135 kHz*

ISO/IEC 18000-3, *Information technology — Radio frequency identification for item management — Part 3: Parameters for air interface communications at 13,56 MHz*

ISO/IEC 18000-4, *Information technology — Radio frequency identification for item management — Part 4: Parameters for air interface communications at 2,45 GHz*

ISO/IEC 18000-6, *Information technology — Radio frequency identification for item management — Part 6: Parameters for air interface communications at 860 MHz to 960 MHz*

ISO/IEC 18000-7, *Information technology — Radio frequency identification for item management — Part 7: Parameters for active air interface communications at 433 MHz*

ISO/IEC 19762 (all parts), *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 19762, the relevant part of ISO/IEC 18000, and the following apply.

3.1

elementary tag

RFID tag whose sole functionality is to provide an identification data element

NOTE Further data may be provided, however shall be avoided or be small in order to support the elementary tag concept.

3.2

identification data element

unique data element that may also be used as a location pointer to a database

NOTE Sometimes known as a “licence plate”.

4 Symbols and abbreviated terms

For the purposes of this document, the symbols and abbreviations given in ISO/IEC 19762, the relevant part of ISO/IEC 18000, and the following apply.

ET elementary tag

5 Requirements for elementary tag

This document provides a means to implement an elementary tag (ET) according to the protocol contained in ISO/IEC 18000-2, -3, -4, -6 and -7. It describes a tag which provides only an identification data element. The elementary tag provides complete upward compatibility with full-featured tags according to the relevant part of ISO/IEC 18000.

6 Functionality

6.1 System architecture for ET operation

The overall architecture for an ET system is simple and shown in Figure 1. The operation attributes are shown in Figure 2.

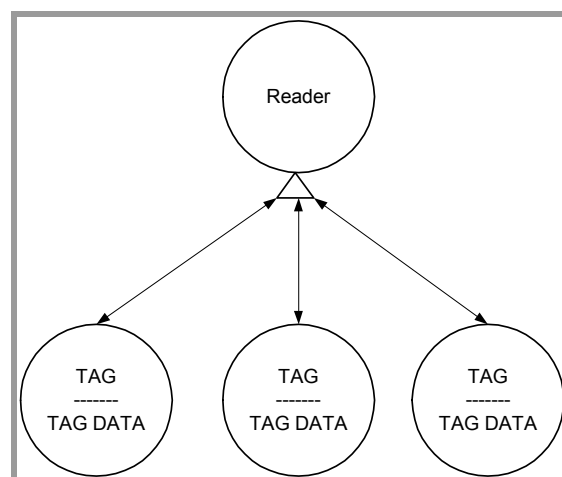


Figure 1 — Object class view of an ET system

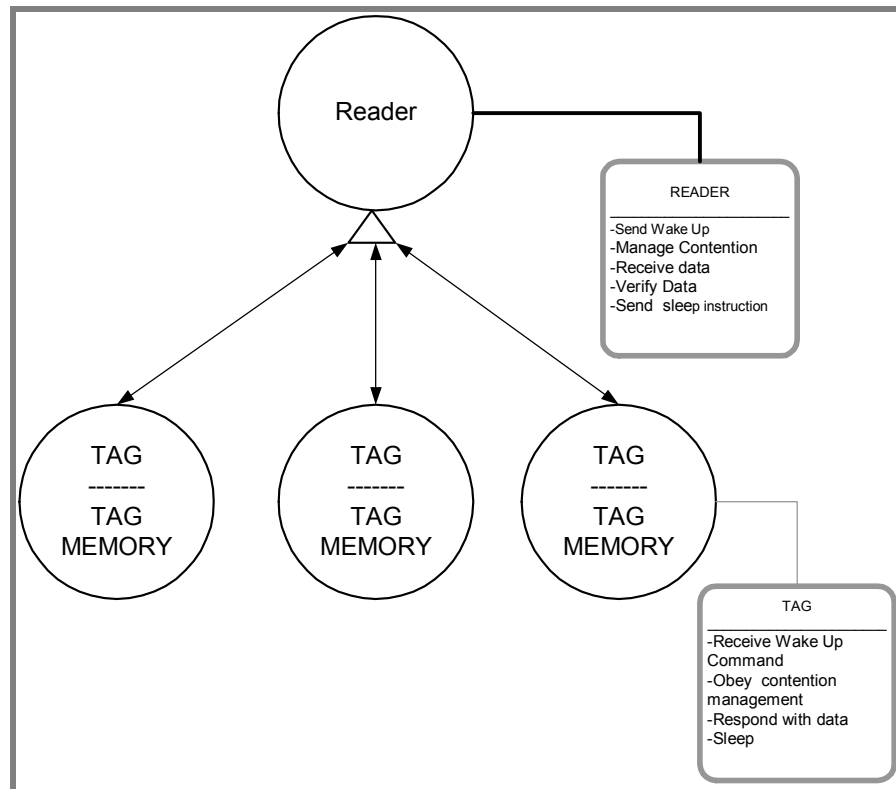


Figure 2 — Object class view of an ET system with attributes

6.2 A summary of ET system capability

6.2.1 Typically an ET conformant tag has a minimum memory of 64 bits. The application will determine the actual user memory size.

6.2.2 An ET interrogator interrogates any ET tags that come into its read zone which are compliant to the relevant ISO/IEC 18000 air interface.

6.2.3 Where more than one ET tag is within the reading zone of an interrogator, the interrogator manages the population of tags within the zone by the use of anti-collision methods described in the relevant part of ISO/IEC 18000. The interrogator shall be able to manage mixed ET/non-ET tag populations.

6.2.4 On receipt of the appropriate ET command(s) from an ET interrogator, the tag responds with its data content according to the relevant annex of this Technical Report.

6.2.5 After the interrogator has obtained the data from the tag, the tag shall be put into a general non-responsive state for a period of time, in order that the interrogator can transact with other tags in the interrogator zone.

6.2.6 A tag with extended functionality, but used in an ET application, retains a specified part of its memory for ET operation, and responds according to the relevant annex of this Technical Report.

6.3 Other capabilities

6.3.1 ET functionality does not support functions such as selective memory addressing, appending data, or rewriting data. Such functionality is supported within the general architecture of ISO/IEC 18000.

6.3.2 An ET conformant tag may be "Write Once/Read Many" (WORM) technology, it may be read/write, or it may be factory pre-programmed. The means of getting data into the ET tag are not the subject of this Technical Report.

6.3.3 Although not part of the ET system operation, an ET interrogator may have other capabilities (such as the ability to write to the tag memory).

6.4 Specific implementations

Annexes A through H detail the specific implementations based on the air interfaces specified in ISO/IEC 18000.