

# TECHNICAL REPORT

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## **Information technology — Radio frequency identification for item management — Application requirements profiles**

*Technologies de l'information — Identification par radiofréquence  
(RFID) pour la gestion d'objets — Profils de conditions d'application*

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## Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work. In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1.

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:

- type 1, when the required support cannot be obtained for the publication of an International Standard, despite repeated efforts;
- type 2, when the subject is still under technical development or where for any other reason there is the future but not immediate possibility of an agreement on an International Standard;
- type 3, when the joint technical committee has collected data of a different kind from that which is normally published as an International Standard (“state of the art”, for example).

Technical Reports of types 1 and 2 are subject to review within three years of publication, to decide whether they can be transformed into International Standards. Technical Reports of type 3 do not necessarily have to be reviewed until the data they provide are considered to be no longer valid or useful.

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 18001, 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

The Air Interface Standards of ISO/IEC JTC 1/SC 31 are contained in the various Parts of ISO/IEC 18000, under the general title *Information technology — Radio frequency identification for item management*.

*Part 1: Reference architecture and definition of parameters to be standardized*

*Part 2: Parameters for air interface communications below 135 kHz*

*Part 3: Parameters for air interface communications at 13,56 MHz*

*Part 4: Parameters for air interface communications at 2,45 GHz*

*Part 6: Parameters for air interface communications at 860 MHz to 960 MHz*

*Part 7: Parameters for active air interface communications at 433 MHz*

If antenna design, power levels, and the active/passive nature of the implementation design are held equal, each of these technologies have differing performance and operating parameters, including the distance achievable between tag and interrogator.

Specific implementations of the various Parts above may result in different performance and operating parameter trade-offs. Such trade-offs may include the ability to operate as intended under adverse environmental conditions such as noise or interference or other physical environment variations.

To understand the applicability of each frequency or technology it is necessary to understand the applications within which this technology will be used. A profile of the application requirements must be developed.

This Technical Report addresses these Application Requirements Profiles, providing the application detail from which one should be able to assess the applicability of the various technologies.

Seven distinct and separate efforts are included within this Technical Report.

AIM circulated a questionnaire in late 1998 to which 29 responses were received. These responses serve as the primary basis for this Technical Report.

In early 1999, a United States application standards committee, ANSI MH 10/SC 8, circulated another questionnaire to which 19 responses were received. These responses are included as validation of the AIM survey.

- In 1999, a German University study was released covering RFID in the retail supply chain from manufacturer to transporter to retailer, involving 82 responses. These responses are consolidated in this ARP report.
- In early 2000, Japan's contribution on RFID tags study.
- In 2000, Sweden's contribution on 2,45 GHz RFID tags study.
- In 2001, Australia's contribution on UHF.
- In 2001, AIM's contribution on UHF.

# Information technology — Radio frequency identification for item management — Application requirements profiles

## 1 Scope

This Technical Report provides:

- The result of three surveys identifying the applications for radio frequency identification (RFID) in an item management environment, and the resultant classification of these applications based on various operational parameters, including operating range and memory size.
- An explanation of some of the issues associated with the parameters of distance and number of tags within an RFID interrogator's field-of-view.
- A means by which classification of RF tags may be accomplished based on the application requirements defined in the survey results.
- Recommendations for areas of standardization to the parent committee (ISO/IEC JTC 1/SC 31/WG 4) based on the results of these surveys.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 19762 (all parts), *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary*<sup>1)</sup>

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1) To be published.