INTERNATIONAL STANDARD

ISO/IEC 18000-2

Second edition
2009-10-01

Information technology — Radio frequency identification for item management —

Part 2: Parameters for air interface communications below 135 kHz

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

Partie 2: Paramètres de communications d'une interface d'air à moins de 135 kHz

Reference number
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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.

ISO/IEC 18000-2 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 31, *Automatic identification and data capture techniques*.

This second edition cancels and replaces the first edition (ISO/IEC 18000-2:2004), which has been technically revised.

ISO/IEC 18000 consists of the following parts, 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*

Introduction

The International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC) draw attention to the fact that it is claimed that compliance with this document may involve the use of patents.

ISO and IEC take no position concerning the evidence, validity and scope of these patent rights.

The holders of these patent rights have assured ISO and IEC that they are willing to negotiate licences under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statements of the holders of these patent rights are registered with ISO and IEC. Information may be obtained from the following companies.

Patent number	Patent title	Patent holder	Contact	Affected sub clause
		ATMEL Germany GmbH	Leo Merken, Director of Intellectual Property 2325 Orchard Parkway, San Jose, CA, 95131 USA Phone 408-436-4251 Fax 408-487-2615 Email leo.merken@atmel.com	
		NXP B.V.	Harald Roeggla, Intellectual Property & Licensing Gutheil-Schoder-Gasse 8-12 1102 Vienna, Austria Phone 43-1-60-970-1469 Fax 43-1-60-870-1101 harald.roeggla@nxp.com	
US 6 177 858 Application 96 402556.3-Patent EP 0 777 194 CA 2 191 787 CA 2 191 788 US 5 923 251 Application 96 402554.8 Patent EP 0 777 192 US 5 808 550 Appication 96 402555.5- Patent EP 0 777 193		Winstead Assets Ltd	Craig Cook, director 12, rue des Petits Ruisseaux, 91370 Verrières le Buisson, France Phone +33(0) 169 752 170 Fax +33(0) 160 110 031 contact@spacecode-rfid.com	

CA 2 191 794 Application 90 909459.1-Patent EP 0 476 026 US 5426423 CA 2058 947				
EP 0640939,US 5430447,DE P69428309 EP831618, US5929801 (claims 1-15 and corresponding claims of other patents based on this patent) US 5793324 US 5053774 excluding claims 14-17 and 20 (and corresponding claims of other patents based on this patent)	Protection Against Manipulation of Batteryless Read/Write Transponders Method for Repeating Interrogations Until Failing to Receive Unintelligible Responses to Identify Plurality of Transponders by an Interrogator Transponder Signal Collision Avoidance System Transponder Arrangement	Texas Instruments Inc	Robby Holland Licensing Manager, Law Department P.o. Box 660199, MS 3999 Dallas, TX 75266-0199 Phone 1-972-917-4367 Fax 1-972-917-4418 Email r-holland3@ti.com	

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

Information technology — Radio frequency identification for item management —

Part 2:
Parameters for air interface communications below 135 kHz

1 Scope

This part of ISO/IEC 18000 defines the air interface for radio frequency identification (RFID) devices operating below 135 kHz. The purpose of this part of ISO/IEC 18000 is to provide a common technical specification for RFID devices that can be used by ISO committees developing RFID application standards. This part of ISO/IEC 18000 is intended to allow for compatibility and to encourage inter-operability of products in the international marketplace. This part of ISO/IEC 18000 defines the physical layer used for communication between the interrogator and the tag and further defines the communications protocol used in the air interface.

Two types of tag are defined by this part of ISO/IEC 18000: Type A and Type B, which differ only by their physical layer. Both support the same inventory (anti-collision) and protocol.

Type A tags are permanently powered by the interrogator, including during the tag-to-interrogator transmission, and operate at 125 kHz.

Type B tags are powered by the interrogator, except during the tag-to-interrogator transmission, and operate at 125 kHz or 134,2 kHz.

2 Conformance

In order to claim conformance, it is necessary to comply to all of the relevant clauses of this specification, except those marked ‘optional’. It is also necessary to operate within the local national radio regulations (which may require further restrictions).

The rules for RFID device conformity evaluation are defined in ISO/IEC TR 18047-2.

The tag shall be of either Type A or B.

NOTE Nothing in this International Standard prevents a tag from being of both types, although for technical reasons, it is unlikely that such tags are ever marketed.

The interrogator shall support both Types A and B.

The interrogator may be configured as Type A only, Type B only or Types A and B.

When configured as Types A and B, and when in the Inventory phase, the interrogator shall alternate between Type A and Type B interrogation. See Annex B.

2.1 RF emissions general population

Device manufacturers claiming conformance to this part of ISO/IEC 18000 shall certify that RF emissions do not exceed the maximum permitted exposure limits recommended by either IEEE C95.1:2005 or ICNIRP according to IEC 62369-1. If a device manufacturer is unsure as to which recommendation is to be cited for compliance, the manufacturer shall certify to ICNIRP limits.

2.2 RF emissions and susceptibility health care setting

Device manufacturers claiming conformance to this part of ISO/IEC 18000 shall certify that RF emissions and susceptibility comply with IEC 60601-1-2.

3 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.

IEC 62369-1, *Evaluation of human exposure to electromagnetic fields from short range devices (SRDs) in various applications over the frequency range 0 GHz to 300 GHz — Part 1: Fields produced by devices used for electronic article surveillance, radio frequency identification and similar systems*

IEC 60601-1-2, *Medical electrical equipment — Part 1-2: General requirements for basic safety and essential performance — Collateral standard: Electromagnetic compatibility — Requirements and tests*

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