
**Information technology — Radio
frequency identification for item
management —**

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

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

*Partie 4: Paramètres de communications d'une interface d'air à
2,45 GHz*





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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

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

This fourth edition cancels and replaces the third edition (ISO/IEC 18000-4:2015), which has been technically revised. The main changes compared to the previous edition are as follows:

— Mode 4, described in [Clause 9](#) as "MODE 4: Configurable data rate active RFID system", has been added.

A list of all parts in the ISO 18000 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document is one of a series of International Standards and Technical Reports developed by ISO/IEC JTC 1/SC 31 for the identification of items (item management) using radio frequency identification (RFID) technology.

This document defines four 2,45 GHz protocols. Each of the specific physical/data link configuration is defined in a separate subclause. The configuration descriptions include a physical layer and a data link layer.

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 concerning radio frequency identification technology given in all parts of this document.

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

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Information technology — Radio frequency identification for item management —

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

1 Scope

This document defines the air interface for radio frequency identification (RFID) devices operating in the 2,45 GHz industrial, scientific, and medical (ISM) band used in item management applications. This document provides a common technical specification for RFID devices that can be used by ISO committees developing RFID application standards. This document is intended to allow for compatibility and to encourage inter-operability of products for the growing RFID market in the international marketplace. This document defines the forward and return link parameters for technical attributes including, but not limited to, operating frequency, operating channel accuracy, occupied channel bandwidth, maximum equivalent isotropically radiated power (EIRP), spurious emissions, modulation, duty cycle, data coding, bit rate, bit rate accuracy, bit transmission order, and where appropriate, operating channels, frequency hop rate, hop sequence, spreading sequence, and chip rate. This document further defines the communications protocol used in the air interface.

This document contains four modes. Mode 1 is an interrogator talks first with passive tag. Mode 2 is a tag talks first with battery-assisted passive tag. Mode 3 is a globally available, ubiquitous network supporting (but not limited to) the logistics and transportation industry; agnostic to any device, commercial or otherwise, requiring global availability. Mode 4 is a configurable data rate active RFID system. It provides the functions of long range objects identification and environmental sense, and it is intended to realize the low cost device and low power consumption, long range identification, fast and reliable tags access. The detailed technical differences between the modes are shown in the parameter tables.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 646, *Information technology — ISO 7-bit coded character set for information interchange*

ISO/IEC 7816-6, *Identification cards — Integrated circuit cards — Part 6: Interindustry data elements for interchange*

ISO/IEC 15963, *Information technology — Radio frequency identification for item management — Unique identification for RF tags*

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

ISO/IEC/TR 18047-4, *Information technology — Radio frequency identification device conformance test methods — Part 4: Test methods for air interface communications at 2,45 GHz*

ISO/IEC/IEEE 8802-15-4:2018, *Information technology — Telecommunications and information exchange between systems — Local and metropolitan area networks — Specific requirements — Part 15-4: Wireless medium access control (MAC) and physical layer (PHY) specifications for low-rate wireless personal area networks (WPANs)*

IEEE 802.15.4:2006, *Information technology — Local and metropolitan area networks — Specific requirements — Part 15.4: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for Low Rate Wireless Personal Area Networks (WPANs)*