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International

ISO/IEC 18000-6

Fourth edition
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Information technology — Radio frequency identification for item management —

Part 6: General parameters for air interface communications at 860 MHz to 930 MHz

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

Partie 6: Paramètres de communications d'une interface radio entre 860 MHz et 960 MHz

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This document was prepared by Joint 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 18000-6:2013), which has been technically revised.

The main changes are as follows:

— the frequency range has been changed from “860 MHz to 960 MHz” to “860 MHz to 930 MHz”;

ISO/IEC 18000-65 has been added as an optional extension for streaming sensors.

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This document describes a passive backscatter radio frequency identification (RFID) system that supports the following system capabilities:

— identification and communication with multiple tags in the field;

— selection of a subgroup of tags for identification or with which to communicate;

— reading from and writing to or rewriting data many times to individual tags;

— user-controlled permanently lockable memory;

— data integrity protection;

— interrogator-to-tag communications link with error detection;

— tag-to-interrogator communications link with error detection;

— support for both passive back-scatter tags with or without batteries.

This document provides an overview for a passive-backscatter, RFID system operating in the 860 MHz to 930 MHz frequency range. The system comprises interrogators, also known as readers, and tags, also known as labels. The general overview describes four types called Type A, Type B, Type C and Type D. Details for each type are defined in the following documents and described in detail in the following paragraphs:

— Type A: ISO/IEC 18000-61

— Type B: ISO/IEC 18000-62

— Type C: ISO/IEC 18000-63

— Type D: ISO/IEC 18000-64

This document, together with ISO/IEC 18000-61, ISO/IEC 18000-62, ISO/IEC 18000-63 and ISO/IEC 18000-64, specifies the physical and logical requirements for a passive-backscatter, RFID system operating in the 860 MHz to 930 MHz frequency range.

NOTE The titles of ISO/IEC 18000-61, ISO/IEC 18000-62 and ISO/IEC 18000-64 list an upper frequency range of 960 MHz, which is intended to be modified at their next revision.

An interrogator transmits information to a tag by modulating an RF signal in the given frequency range. The tag receives both information and operating energy from this RF signal. Passive tags are those which receive all of their operating energy from the interrogator's RF waveform. If tags maintain a battery then they may operate using some passive principles; however, they do not necessarily get all their operating energy from the interrogator's RF waveform.

An interrogator receives information from a tag by transmitting a continuous-wave (CW) RF signal to the tag; the tag responds by modifying the reflection coefficient of its antenna, thereby backscattering and modulating an information signal to the interrogator. The system is Interrogator-Talks-First (ITF) for Types A, B and C, meaning that a tag modulates its antenna reflection coefficient with an information signal only after being directed to do so by an interrogator, or TOTAL, meaning that a tag modifies its antenna reflection coefficient with an information signal upon entering an interrogator's field after first listening for interrogator modulation in order to determine if the system is ITF or not. Interrogators and tags are not required to talk simultaneously; rather, communications are half-duplex, meaning that interrogators talk and tags listen, or vice versa.

This document further contains an optional “tag only talks after listening” Type D, an enhanced Tag Talks Only (TTO) technique. Type D uses Pulse-Position Encoding (PPE) or Miller encoding in the return link and does not define a dedicated forward link. In fact, tags may implement one of the types defined in this document (A, B, or C) besides Type D in order to allow enhanced tag access techniques.

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tree collision-arbitration algorithm. Type C uses PIE in the forward link and a random slotted collision-arbitration algorithm.

Type D is TOTAL based on Pulse Position Encoding or Miller $M = 2$ encoded subcarrier.

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