
**Information technology — Radio
frequency identification (RFID) for item
management: Data protocol —**

**Part 1:
Application interface**

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

Partie 1: Interface d'application

Withhold

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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.

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 15961-1 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 31, *Automatic identification and data capture techniques*.

This first edition of ISO/IEC 15961-1, together with ISO/IEC 15961-2, ISO/IEC 15961-3 and ISO/IEC 15961-4, cancels and replaces ISO/IEC 15961:2004, which has been technically revised.

ISO/IEC 15961 consists of the following parts, under the general title *Information technology — Radio frequency identification (RFID) for item management. Data protocol*:

- *Part 1: Application interface*
- *Part 2: Registration of RFID data constructs*
- *Part 3: RFID data constructs*

The following part is under preparation:

- *Part 4: Application interface commands for battery assist and sensor functionality*

Introduction

The technology of radio frequency identification (RFID) is based on non-contact electronic communication across an air interface. The structure of the bits stored on the memory of the RFID tag is invisible and accessible between the RFID tag and the interrogator only by the use of an air interface protocol, as specified in the appropriate part of ISO/IEC 18000. The result of the transfer of data between an application and an interrogator in open systems requires data to be encoded in a consistent manner on any RFID tag that is part of that open system. This is not only to allow equipment to be interoperable, but in the special case of data carriers, for the data to be encoded on the RFID tag in one systems implementation and to be read at a later time in a completely different and unknown systems implementation. The data bits stored on each RFID tag must be formatted in such a way as to be reliably read at the point of use if the RFID tag is to fulfil its basic objective. This reliability is achieved through the specification of a data protocol in this part of ISO/IEC 15961 and the data encoding rules of ISO/IEC 15962. Additionally, ISO/IEC 24791-1 specifies a software system infrastructure architecture that enables RFID system operations between business applications and RFID interrogators. Specific parts of the infrastructure standards address data management requirements (ISO/IEC 24791-2) and device interface requirements (ISO/IEC 24791-5). These support defined implementations that incorporate the encoding rules of ISO/IEC 15962 and the functional rules of the commands and responses in this part of ISO/IEC 15961.

Manufacturers of RFID equipment (interrogators, RFID tags, etc.) and users of RFID technology require standards-based data protocols for RFID for item management. This part of ISO/IEC 15961, ISO/IEC 15962, and ISO/IEC 24791 specify these protocols, which are layered above the air interface standards defined in ISO/IEC 18000.

The transfer of data to and from an application, supported by appropriate application commands, is the subject of this part of ISO/IEC 15961. The companion International Standard, ISO/IEC 15962, specifies the overall process and the methodologies developed to format the application data into a structure to store on the RFID tag.

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Information technology — Radio frequency identification (RFID) for item management: Data protocol —

Part 1: Application interface

1 Scope

This part of ISO/IEC 15961 focuses on the abstract interface between an application and the data processor, and includes the specification and definition of application commands and responses. It allows data and commands to be specified in a standardised way, independent of the particular air interface of ISO/IEC 18000.

This part of ISO/IEC 15961

- provides guidelines on how data shall be presented as objects;
- defines the structure of Object Identifiers, based on ISO/IEC 9834-1;
- specifies the commands that are supported for transferring data between an application and the radio frequency identification (RFID) tag;
- specifies the responses that are supported for transferring data between the RFID tag and the application;
- does not specify any required transfer syntax with ISO/IEC 15962, but provides the non-normative information in Annex A to provide backward compatibility with ISO/IEC 15961:2004.

It is expected that this part of ISO/IEC 15961 will be used as a reference to develop software appropriate for particular applications, or for particular RFID equipment.

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 9834-1, *Information technology — Open Systems Interconnection — Procedures for the operation of OSI Registration Authorities: General procedures and top arcs of the International Object Identifier tree* (equivalent to ITU-T Recommendation X.660)

ISO/IEC 15961-3, *Information technology — Radio frequency identification (RFID) for item management: Data protocol — Part 3: RFID data constructs*

ISO/IEC 15962:2013, *Information technology — Radio frequency identification (RFID) for item management — Data protocol: data encoding rules and logical memory functions*

ISO/IEC 19762-1, *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary — Part 1: General terms relating to AIDC*

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ISO/IEC 19762-3, *Information technology — Automatic identification and data capture (AIDC) techniques — Harmonized vocabulary — Part 3: Radio frequency identification (RFID)*

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