BS ISO/IEC 24791-5:2012

BSI Standards Publication

Information technology — Radio frequency identification (RFID) for item management — Software system infrastructure

Part 5: Device interface

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National foreword

This British Standard is the UK implementation of ISO/IEC 24791-5:2012.

The UK participation in its preparation was entrusted to Technical Committee IST/34, Automatic identification and data capture techniques.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Partie 5: Interface de dispositif

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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 24791-5 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology,* Subcommittee SC 31, *Automatic identification and data capture techniques*.

ISO/IEC 24791 consists of the following parts, under the general title *Information technology — Radio frequency identification (RFID) for item management — Software system infrastructure*:

— *Part 1: Architecture*

— *Part 2: Data management*

— *Part 3: Device management*

— *Part 5: Device interface*

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Introduction

RFID air interface technology is based on non-contact electro-magnetic communication among interrogators and tags. RFID software systems are composed of RFID interrogators, intermediate software systems, and applications that provide control and coordination of air interface operation, tag information exchange, and health and performance management of system components. RFID technology is expected to increase effectiveness in many aspects of business by further advancing the capabilities of Automatic Identification and Data Capture (AIDC). To achieve this goal through the successful adoption of RFID technology into real business environments, RFID devices, software systems, and business applications shall provide secure and interoperable services, interfaces, and technologies. This is the goal of the standards defined for RFID Software System Infrastructure (SSI), ISO/IEC 24791. The composition and operations of SSI exist in systems that implement other RFID standards including the air interfaces described in the ISO/IEC 18000 series and the data and interface functions defined in ISO/IEC 15962, ISO/IEC 15963, ISO/IEC 24753 and others.

The goal of this part of ISO/IEC 24791 is to define a device interface that provides RFID controlling software with low-level access to RFID air interface hardware. This low-level access gives programmers a degree of control over the sequencing of air protocol commands and direct access to air protocol command parameter. Using this low-level interface, programmers can optimize RFID data access and control operations.

The interface defined by this part of ISO/IEC 24791 supports the following features:

- efficient, binary transfer syntax over TCP/IP
- access to RFID air protocol commands and command parameters
- support for optimized RFID tag access operations whereby multiple operations can be performed on a tag with minimal tag state changes
- direct read/write access to all data on an RFID tag
- read one or more individual tag data items (encoded as defined by ISO/IEC 15962) as specified by their OID using URN notation
- [optional] decode data items (encoded as defined by ISO/IEC 15962) into their Unicode representation (UTF-8 encoded). Encoding data items is not supported
- support for RFID air protocol type defined by Type C of ISO/IEC 18000-6.

The interface defined in this part of ISO/IEC 24791 provides access to RFID air protocol commands and their respective command parameters. Therefore using this interface, tag memory banks can be locked, tags can be killed, and raw-binary RFID tag data can be accessed directly on a tag for both reading and writing. In addition, individual data items (encoded as defined by ISO/IEC 15962) can be read by specifying each data item's OID. Optionally, the interrogator can decode data items read into their character string representation. If the interrogator cannot decode a data item, then it will return the entire encoded package within which the data item resides. In this case, it is the responsibility of higher-level software to further decode the data item. The interface does not support RFID tag data encoding. It is the responsibility of higher-level software (i.e., software outside the interface defined by this part of ISO/IEC 24791 to perform data encoding (i.e., binary tag data representation as defined by ISO/IEC 15962) that is stored on RFID tags.

This part of ISO/IEC 24791 is composed of the EPCglobal™ standard, *Low Level Reader Protocol* [LLRP], in its entirety with extensions that support reading RFID tag data items that are encoded according to ISO/IEC 15962. As does the LLRP standard, this part of ISO/IEC 24791 defines both the abstract functional capabilities of the interrogator interface and the binary transfer syntax between the interrogator and a controlling system device. The transfer syntax is defined to be communicated over TCP/IP.

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Information technology — Radio frequency identification (RFID) for item management — Software system infrastructure

Part 5:
Device interface

1 Scope

This part of ISO/IEC 24791 defines an interface within the Software System Infrastructure (SSI) that provides RFID system control components with low-level access to RFID interrogators for the purpose of optimizing RFID data access and control operations. This interface is designed to be modular with the ability to support multiple RFID air protocols. However, in this this part of ISO/IEC 24791, the only RFID air protocol supported is Type C of ISO/IEC 18000-6.

2 Conformance

Conformance for this part of ISO/IEC 24791 shall satisfy the requirements of the EPCglobal LLRP specification and the requirements of the LLRP extensions defined in clause 9 of this part of ISO/IEC 24791. Clause 9 is partitioned into sub-clauses and each sub-clause includes a specific compliance requirement paragraph. Therefore, conformance to clause 9 of this part of ISO/IEC 24791 is defined by the shall statements of the compliance requirement paragraphs found within the sub-clauses of clause 9. The EPCglobal LLRP specification also has specific compliance requirement paragraphs. Therefore, conformance to the EPCglobal LLRP specification is defined by the shall statements of the compliance requirement paragraphs found in the LLRP specification.

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.*

ISO/IEC 8859-1, *Information technology — 8-bit single-byte coded graphic character sets — Part 1: Latin alphabet No. 1*

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

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

ISO/IEC 24791-1, *Information technology — Radio frequency identification (RFID) for item management — Software system infrastructure — Part 1: Architecture*

EPCglobal™ LLRP*, Low Level Reader Protocol*

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