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

Part 3: Device management

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Partie 3: Gestion de dispositif

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Contents

Page

Foreword ..... **v**

Introduction ..... **vi**

1 Scope **1**
1.1 General 1
1.2 Conformance 1
1.3 DCI and SNMP interface set 1
1.4 RDMP interface set 2

2 Normative references **2**

3 Terms and definitions **2**

4 Abbreviated terms **3**

5 Software system infrastructure architecture overview **4**

6 UML modelling **5**

7 Device management **5**
7.1 Architecture 5

8 DCI and SNMP interface set **7**
8.1 Discovery, configuration and initialization conformance group 7
8.1.1 General 7
8.1.2 Interrogator implementations 7
8.1.3 Device management implementations 7
8.2 Performance monitoring and diagnostics conformance group 7
8.2.1 General 7
8.2.2 Interrogator implementations 7
8.2.3 Data management implementations providing interrogator controller functionality 8

9 RDMP interface set **8**
9.1 General 8
9.2 XML namespace 8
9.3 Device discovery 9
9.4 Device metadata 9
9.4.1 General 9
9.4.2 Service discovery 9
9.5 Firmware update service 10
9.5.1 General 10
9.5.2 Firmware update service state machine 10
9.5.3 FUS Operations 12
9.6 Management service 16
9.6.1 General 16
9.6.2 Property identifier 16
9.6.3 Property value metadata 17
9.6.4 Device property profile 17
9.6.5 Sources and source types 17
9.6.6 MS operations 17
9.6.7 Standard properties 20
9.6.8 Other management operations 23
9.7 Operation error reporting 24
9.7.1 General 24
9.7.2 Common operation error codes 24
9.8 Monitoring service 25
9.8.1 General 25
9.8.2 Monitoring event structure 25
9.8.3 Events 25

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9.8.4 Statistics 27
9.9 Security 28
9.10 Extensibility 29
9.10.1 General 29
9.10.2 Extending monitoring events 29
Annex A (informative) **Implementation examples** **31**
Annex B (normative) **SSI Device Management MIB** **34**
Annex C (normative) **RDMP WSDLs and XSDs** **43**
Bibliography **45**

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of 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 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 second edition cancels and replaces the first edition (ISO/IEC 24791-3:2014), which has been technically revised.

The main changes compared to the previous edition are: the references have been updated to the latest standards.

A list of all parts in the ISO ISO/IEC 24791 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.

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Introduction

Radio frequency identification (RFID) air interface technology is based on non-contact electromagnetic 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 have to provide secure and interoperable services, interfaces, and technologies. This is the goal of the ISO/IEC 24791 series, created for RFID software system infrastructure (SSI).

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

Part 3: Device management

1 Scope

1.1 General

This document defines interfaces for device management of RFID systems. Interfaces are defined that provide for discovery, configuration, initialization and monitoring of RFID systems within the software system infrastructure (SSI).

This document only deals with devices that provide RFID related services. It does not distinguish the form factor of such RFID devices.

This document provides two distinct *interface sets*, one based on the GS1 EPCglobal DCI standard and the IETF SNMP RFCs and the other based on the Organization for the Advancement of Structured Information Standards (OASIS) DPWS standard. The definition of the Device Profile for RFID is referred to in this document as the RFID Device Management Profile, or RDMP.

Each interface option set provides interface definitions that provide ISO/IEC 24791-3 Client Endpoints and Services Endpoints with the mechanisms for:

— the discovery of the RFID devices and services on a local or remote subnet;

— a firmware upgrade service;

— a management service that implements configuration related functions;

— a monitoring service for reporting alerts, diagnostics, and performance information.

The two interface set definitions provided by this document allow for clients and services endpoints to implement and provide the services based on the specific characteristics of the RFID system to be implemented. Subclause 1.2 defines the Conformance requirements for systems that implement components of one or both of the interface sets.

1.2 Conformance

This document provides two interface sets; the DCI and SNMP Interface Set and the RDMP interface Set. If a certain implementation conforms to the mandatory functions of at least one of the interface sets, that implementation is conformant to this document.

1.3 DCI and SNMP interface set

This document divides the DCI capabilities into two *Conformance Groups:*

— Discovery, Configuration, and Initialization Conformance Group: this Conformance Group is defined in Clause 7. It specifies the protocols and operational procedures that are required for conforming Interrogator Implementations and Device Management Implementations, as defined in this document as well as in ISO/IEC 24791-1.

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— Performance Monitoring and Diagnostics Conformance Group: this Conformance Group is defined in Clause 8. It specifies the SNMP MIBs that can be implemented by Interrogator Implementations and Data Management Implementations as defined in this document as well as in ISO/IEC 24791-1. Conforming implementations claim conformance to the MODULE_COMPLIANCE statements in the SNMP MIBs appropriate for the particular implementation.

A conforming implementation has to implement all of the requirements of each Conformance Group for its particular function in the SSI, but an implementation is not required to claim conformance to either group.

1.4 RDMP interface set

This document specifies the following device management capabilities in RDMP:

— discovery of devices and hosted services in devices;

— a Firmware Upgrade Service to initialize and manage firmware on devices;

— a Management service to set and get device configuration and to perform specific device operations, such as reboot;

— a monitoring service to monitor the health of a device using events and statistics.

RDMP interface set is defined in Clause 9.

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

Devices Profile for Web Services (DPWS) Version 1.1, OASIS Standard July 2009. http://docs.oasis-open.org/ws-dd/dpws/1.1/os/wsdd-dpws-1.1-spec-os.pdf.

GS1 Discovery, Configuration, & Initialisation (DCI) Standard for Reader Operations, https://www.gs1.org/standards/epc-rfid

GS1 Reader Management, (RM v1.0.1), Ratified Standard, https://www.gs1.org/standards/epc-rfid

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
component
identifiable part of a service that provides specific functionality

3.2
data management
device functionality that includes or is a combination of reading, writing, collection, filtering, grouping, and event subscription and notification of RFID tag data to higher level applications and interfaces

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3.3
device management
functionality that includes or is a combination of monitoring and control of discovery, configuration, performance and diagnosis of one or more RFID interrogators

3.4
endpoint
component (3.1) that implements or exposes an interface to other components or uses the interface of another component

3.5
implementation
software and hardware that provides the reduction to practice of particular functionality

3.6
interrogator controller
software capability possibly embodied in a distinct physical device, within the *data management* (3.2) *implementation* (3.5) of the architecture in ISO/IEC 24791-1 and capable of exercising the data, control and management of interrogators over the device interface defined in ISO/IEC 24791-5

3.7
client
network *endpoint* (3.4) that sends messages to and/or receives messages from a service

3.8
hosted service
service with lifecycle under the control of another service

4 Abbreviated terms

For the purposes of this document, the abbreviated terms given in ISO/IEC 19762 and the following shall apply.

AC	Access controller
CAPWAP	Control and provisioning of wireless access pints
DCI	Discovery, configuration, initialization
DPWS	Devices profile for web services standard
IETF	Internet engineering task force
LLRP	Low level reader protocol
MIB	Management information base
MIB-II	Management information base version 2
RDMP	RFID device management profile
RFC	Request for comment
RM	Reader management
SNMP	Simple network management protocol
SOAP	Simple object access protocol
SSI	Software system infrastructure

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