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

**Part 63:
Parameters for air interface
communications at 860 MHz to 960
MHz Type C**

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

*Partie 63: Paramètres de communications d'une interface radio entre
860 MHz et 960 MHz, Type C*

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ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

	Page
Foreword	v
Introduction	vi
1 Scope	1
2 Conformance	1
2.1 Claiming conformance.....	1
2.2 General conformance requirements.....	2
2.2.1 Interrogators.....	2
2.2.2 Tags.....	2
2.3 Command structure and extensibility.....	3
2.3.1 Mandatory commands.....	3
2.3.2 Optional commands.....	3
2.3.3 Proprietary commands.....	3
2.3.4 Custom commands.....	3
2.4 Reserved for Future Use (RFU).....	3
2.5 Cryptographic Suite Indicators.....	3
3 Normative references	4
4 Terms and definitions	4
5 Symbols, abbreviated terms and notation	11
5.1 Symbols.....	12
5.2 Abbreviated terms.....	13
5.3 Notation.....	16
6 Protocol requirements - Type C	16
6.1 Protocol overview.....	16
6.1.1 Physical layer.....	16
6.1.2 Tag-identification layer.....	17
6.2 Protocol parameters.....	17
6.2.1 Signaling – Physical and media access control parameters.....	17
6.2.2 Logical – Operating procedure parameters.....	20
6.3 Description of operating procedure.....	21
6.3.1 Physical interface.....	21
6.3.2 Logical interface.....	43
7 Battery Assisted Passive (BAP) Interrogator Talks First Type C systems (optional)	117
7.1 Applicability.....	117
7.2 General overview, definitions, and requirements of BAP.....	117
7.3 Battery Assisted Passive inventoried flag and state machine behaviour modifications...119	119
7.3.1 Modification to ready state and power-down support for BAP Tags.....	119
7.3.2 Signal loss tolerance via timer (mandatory).....	119
7.3.3 Modified persistence of BAP PIE inventory flags (optional).....	122
7.4 Battery Assisted Passive PIE (optional).....	124
7.4.1 Flex_Query command (optional).....	124
7.4.2 BAP PIE detailed operation including optional Battery Saver Mode.....	126
7.5 Manchester mode Battery Assisted operation protocol extensions.....	132
7.5.1 Introduction.....	132
7.5.2 Physical layer.....	133
7.5.3 Manchester Activation.....	138
7.5.4 Commands summary.....	153
7.6 Extended Protocol Control.....	167
8 Sensor support	168
8.1 Applicability.....	168
8.2 Overview.....	168
8.3 Real Time Clock (RTC).....	169

8.3.1	General.....	169
8.3.2	Setting the RTC.....	169
8.3.3	BroadcastSync command (optional).....	170
8.3.4	Time synchronisation.....	170
8.4	HandleSensor command (optional).....	171
8.5	Simple Sensor.....	172
8.5.1	Type C and Simple Sensor.....	173
8.6	Sensor Directory System and Full Function Sensors.....	175
8.6.1	Sensor Access – General Approach.....	175
Annex A (normative) Extensible bit vectors (EBV).....		181
Annex B (normative) State-transition tables.....		182
Annex C (normative) Command-Response Tables.....		233
Annex D (informative) Example slot-count (Q) selection algorithm.....		261
Annex E (informative) Example Tag inventory and access.....		262
Annex F (informative) Calculation of 5-bit and 16-bit cyclic redundancy checks.....		263
Annex G (normative) Multiple- and dense-Interrogator channelized signaling.....		265
Annex H (informative) Interrogator-to-Tag link modulation.....		268
Annex I (normative) Error codes.....		270
Annex J (normative) Slot counter.....		272
Annex K (informative) Example data-flow exchange.....		273
Annex L (informative) Optional Tag Features.....		276
Annex M (informative) Cryptographic-Suite Checklist.....		279
Annex N (informative) Battery Assisted Tag to Interrogator synchronization.....		280
Annex O (normative) Simple Sensors Data Block.....		283
Annex P (normative) Record structures and commands for Ported Simple Sensors.....		295
Annex Q (informative) BAP PIE and Manchester mode tutorial guide.....		310
Annex R (informative) Manchester mode RF power control.....		320
Bibliography.....		325

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 document 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 and IEC 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 on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is 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 18000-63:2013), which has been technically revised.

ISO/IEC 18000 consists of the following parts, under the general title *Information technology — Radio frequency identification for item management*:

- *Part 1: Reference architecture and definition of parameters to be standardized*
- *Part 2: Parameters for air interface communications below 135 kHz*
- *Part 3: Parameters for air interface communications at 13,56 MHz*
- *Part 4: Parameters for air interface communications at 2,45 GHz*
- *Part 6: Parameters for air interface communications at 860 MHz to 960 MHz General*
- *Part 61: Parameters for air interface communications at 860 MHz to 960 MHz Type A*
- *Part 62: Parameters for air interface communications at 860 MHz to 960 MHz Type B*
- *Part 63: Parameters for air interface communications at 860 MHz to 960 MHz Type C*
- *Part 64: Parameters for air interface communications at 860 MHz to 960 MHz Type D*
- *Part 7: Parameters for active air interface communications at 433 MHz*

Introduction

This part of ISO/IEC 18000 defines the physical and logical requirements for a passive-backscatter, Interrogator-talks-first (ITF), radio-frequency identification (RFID) system operating in the 860 MHz – 960 MHz frequency range. The system comprises Interrogators, also known as Readers, and Tags, also known as Labels or Transponders.

An Interrogator transmits information to a Tag by modulating an RF signal in the 860 MHz – 960 MHz frequency range. The Tag receives both information and operating energy from this RF signal. Tags are passive, meaning that they receive all of their operating energy from the Interrogator's RF signal.

An Interrogator receives information from a Tag by transmitting a continuous-wave (CW) RF signal to the Tag; the Tag responds by modulating the reflection coefficient of its antenna, thereby backscattering an information signal to the Interrogator. The system is ITF, meaning that a Tag modulates its antenna reflection coefficient with an information signal only after being directed to do so by an Interrogator.

Interrogators and Tags are not required to talk simultaneously; rather, communications are half-duplex, meaning that Interrogators talk and Tags listen, or vice versa.

The described 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.

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.

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

The holders of these patent rights have assured ISO and IEC that they are willing to negotiate licences under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this respect, the statements of the holders of these patent rights are registered with ISO and IEC.

Information on the declared patents may be obtained from:

Contact details
<p>Patent Holder: Legal Name Atmel Automotive GmbH</p> <p>Contact for license application: Name & Department Leo Merken, Legal Department, ATMEL Corporation Address 2325 Orchard Parkway Address San Jose, CA 95131 USA Tel. +1 408 436 4251 Fax +1 408 487 2615 E-mail leo.merken@atmel.com URL (optional)</p>
<p>Patent Holder: Legal Name CISC Semiconductor Design+Consulting GmbH</p> <p>Contact for license application: Name & Department Markus Pistauer, CEO Address Lakeside B07 Address 9020 Klagenfurt, Austria Tel. +43(463) 508 808 Fax +43(463) 508 808-18 E-mail m.pistauer@cisc.at URL (optional) www.cisc.at</p>
<p>Patent holder: ETRI (Electronics Telecommunication Reseach Institute)</p> <p>Contact for license application: Name & Department: Min-Sheo Choi, Intellectual Property Management Team Address: 138 Gajeongno, Yuseong-gu Address: Daejeon, 305-700, Korea Tel. +82-42-860-0756 Fax +82-42-860-3831 E-mail choims@etri.re.kr URL (optional) www.etri.re.kr</p>

Contact details
<p>Patent Holder: Legal Name Impinj, Inc.</p> <p>Contact for license application: Name & Department Chris Diorio, CTO Address 701 N. 34th Street, Suite 300 Address Seattle, WA 98103, USA Tel. +1.206 834 1115 Fax +1.206 517.5262 E-mail diorio@impinj.com URL (optional) www.impinj.com</p>
<p>Patent Holder: Legal Name: Magellan Technology Pty. Limited</p> <p>Contact for license application: Name & Department: Ms Jean Angus Address: 65 Johnston St Address: Annandale, NSW 2038, Australia Tel. +61 2 9562 9800 Fax +61 2 9518 7620 E-mail: license@magellan-technology.com URL (optional): www.magellan-technology.com</p>
<p>Patent Holder: Legal Name NXP B.V.</p> <p>Contact for license application: Name & Department Aaron Waxler – IP Licensing & Claims Address 411 East Plumeria, Address San Jose, CA 95134-1924, USA Tel. +1 914 860-4296 Fax E-mail Aaron.Waxler@nxp.com URL (optional)</p>

Contact details
<p>Patent Holder: Legal Name SATO VICINITY Pty. Limited</p> <p>Contact for license application: Name & Department Mr. Hiromasa Konishi, Managing Director Address 8 Guihen Street, Annandale, NSW 2038, Australia Address Tel. +61 295 629 800 Fax +61 295 187 620 E-mail hiromasa.konishi@sato-global.com URL (optional) www.satovicinity.com</p>
<p>Patent Holder: Legal Name TAGSYS SAS</p> <p>Contact for license application: Name & Department Mr. Alain Fanet President Address 785 Voie Antiope, TI Athélia 3 Address F-13600 La Ciotat Tel. +33 332188900 Fax +33 332188900 E-mail alain.fanet@tagsysrfid.com URL (optional) www.tagsysrfid.com</p>
<p>Patent Holder: Legal Name University of Pittsburgh - Of the Commonwealth of Pennsylvania</p> <p>Contact for license application: Name & Department Marc S. Malandro, PhD, CLP, RTIP Address University of Pittsburgh, 200 Gardner Steel Conference Center Address Thackeray & O'Hara Streets, Pittsburgh, PA 15260 Tel. 412-624-8787 Fax 412-648-2259 E-mail mmalandro@innovation.pitt.edu URL (optional)</p>

Contact details**Patent Holder:**

Legal Name Zebra Technologies Corporation

Contact for license application:

Name & Department Glenn Frankenberger, Sr. IP Counsel, Legal Department

Address One Motorola Plaza

Address Holtsville, NY 11742

Tel. 631-738-5570

Fax 631-738-4110

E-mail glenn.frankenberger@zebra.com

URL (optional)

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Information technology — Radio frequency identification for item management —

Part 63:

Parameters for air interface communications at 860 MHz to 960 MHz Type C

1 Scope

This part of ISO/IEC 18000 defines the air interface for radio frequency identification (RFID) devices operating in the 860 MHz to 960 MHz Industrial, Scientific, and Medical (ISM) band used in item management applications. It provides a common technical specification for RFID devices that can be used by ISO committees developing RFID application standards. This part of ISO/IEC 18000 is intended to allow for compatibility and to encourage inter-operability of products for the growing RFID market in the international marketplace. It defines the forward and return link parameters for technical attributes including, but not limited to, operating frequency, operating channel accuracy, occupied channel bandwidth, maximum effective isotropic 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. It further defines the communications protocol used in the air interface.

This part of ISO/IEC 18000 specifies the physical and logical requirements for a passive-backscatter, Interrogator-Talks-First (ITF) systems. The system comprises Interrogators, also known as readers, and tags, also known as labels. An Interrogator receives information from a tag by transmitting a continuous-wave (CW) RF signal to the tag; the tag responds by modulating the reflection coefficient of its antenna, thereby backscattering an information signal to the Interrogator. The system is ITF, meaning that a tag modulates its antenna reflection coefficient with an information signal only after being directed to do so by an Interrogator.

In detail, this part of ISO/IEC 18000 contains Type C.

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

This part of ISO/IEC 18000 specifies

- physical interactions (the signalling layer of the communication link) between Interrogators and tags,
- logical operating procedures and commands between Interrogators and Tags.
- the collision arbitration scheme used to identify a specific tag in a multiple-tag environment.
- optional security commands that allow the use of crypto suites of ISO/IEC 29167.