International Standard

ISO/IEC 29167-11

Information technology — Automatic identification and data capture techniques —

Part 11: Crypto suite PRESENT-80 security services for air interface communications

Technologies de l'information — Identification et capture automatique de données —

Partie 11: Services de sécurité par suite cryptographique PRESENT-80 pour communications par interface radio

Third edition
2025-09

Reference number
ISO/IEC 29167-11:2025(en)

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Published in Switzerland

Contents

Page

Foreword ..... **v**

1 Scope **1**

2 Normative references **1**

3 Terms, definitions, symbols and abbreviated terms **1**
3.1 Terms and definitions 1
3.2 Symbols 2
3.3 Abbreviated terms 3

4 Conformance **3**
4.1 Air interface protocol specific information 3
4.2 Interrogator conformance and requirements 3
4.3 Tag conformance and requirements 3

5 Introduction of the PRESENT-80 cryptographic suite **4**

6 Parameter and variable definitions **4**

7 Crypto suite state diagram **4**

8 Initialization and resetting **5**

9 Authentication **5**
9.1 Introduction 5
9.2 Message and response formatting 5
9.3 Tag authentication: AuthMethod “00” 6
9.3.1 General 6
9.3.2 TAM1 message 6
9.3.3 Intermediate Tag processing 7
9.3.4 TAM1 response 8
9.3.5 Final Interrogator processing 8
9.4 Interrogator authentication: AuthMethod “01” 8
9.4.1 General 8
9.4.2 IAM1 message 9
9.4.3 Intermediate Tag processing #1 9
9.4.4 IAM1 response 9
9.4.5 Intermediate Interrogator processing 10
9.4.6 IAM2 message 10
9.4.7 Intermediate Tag processing #2 10
9.4.8 IAM2 response 11
9.4.9 Final Interrogator processing 11
9.5 Mutual authentication: AuthMethod “10” 11
9.5.1 General 11
9.5.2 MAM1 message 11
9.5.3 Intermediate Tag processing #1 12
9.5.4 MAM1 response 12
9.5.5 Intermediate Interrogator processing 12
9.5.6 MAM2 message 13
9.5.7 Intermediate Tag processing #2 13
9.5.8 MAM2 response 13
9.5.9 Final Interrogator processing 14

10 Communication **14**

11 Key table and Key update **14**

Annex A (normative) **Crypto suite state transition table** **15**

Annex B (normative) **Errors and error handling** **16**

Annex C (informative) **Description of PRESENT** **17**

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Annex D (informative) **Test vectors** **22**
Annex E (normative) **Protocol specific information** **24**
Bibliography **27**

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Foreword

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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 third edition cancels and replaces the second edition (ISO/IEC 29167-11:2023), which has been technically revised.

The main change is as follows: Annex E has been updated to reflect changes to the over-the-air protocol.

A list of all parts in the ISO/IEC 29167 series can be found on the ISO and IEC websites.

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 and www.iec.ch/national-committees.

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Information technology — Automatic identification and data capture techniques —

Part 11: Crypto suite PRESENT-80 security services for air interface communications

1 Scope

This document defines the crypto suite for PRESENT-80 for the ISO/IEC 18000 series of air interfaces standards for radio frequency identification (RFID) devices. This document provides a common crypto suite for security for RFID devices for air interface standards and application standards. The crypto suite is defined in alignment with existing air interfaces.

This document specifies basic security services that are use the lightweight block cipher PRESENT-80. The variant of PRESENT that takes 128-bit keys is also considered in this document.

This document defines various methods of use for the cipher.

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 18000 (all parts), *Information technology — Radio frequency identification for item management*

ISO/IEC 19762, *Information technology — Automatic identification and data capture (AIDC) techniques — Vocabulary*

ISO/IEC 29167-1, *Information technology — Automatic identification and data capture techniques — Part 1: Security services for RFID air interfaces*

3 Terms, definitions, symbols and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/IEC 19762 and the following 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/

3.1.1
bit string
ordered sequence of 0's and 1's

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3.1.2
block cipher
family of permutations parameterized by a *cryptographic key* (3.1.3); permutations map *bit strings* (3.1.1) of a fixed length given by the block size to bit strings of the same length

3.1.3
cryptographic key
string of bits of a specified length that is used by the *block cipher* (3.1.2) to transform a *data block* (3.1.4)

3.1.4
data block
string of bits whose length is given by the block size (3.1.3) of the *block cipher* (3.1.2)

3.1.5
PRESENT-*k*-ENC(key, data)
PRESENT encryption of **data**, a 64-bit *data block* (3.1.4), using **key**, a *k*-bit *cryptographic key* (3.1.3)

3.1.6
PRESENT-*k*-DEC(key, data)
PRESENT decryption of **data**, a 64-bit *data block* (3.1.4), using **key**, a *k*-bit *cryptographic key* (3.1.3)

3.1.7
salt
string of bits, typically randomly generated, that is used to diversify a cryptographic computation

3.2 Symbols

$XXXX_2$	Binary notation
$XXXX_h$	Hexadecimal notation
||	Concatenation of syntax elements, transmitted in the order written
∅	Empty string, typically used to indicate a deliberately empty input or omitted field
|A|	Bit-wise length of the string A expressed as an integer
	EXAMPLE 1 $\|0000_2\| = 4$
	EXAMPLE 2 $\|0000_h\| = 16$
	EXAMPLE 3 $\|∅\| = 0$
Field [a:b]	Selection of bits from a string of bits denoted Field
	The selection ranges from bit "a" through to, and including, bit "b" where Field [0] represents the least significant or rightmost bit.
	EXAMPLE 1 Field [2:0] represents the selection of the three least significant bits of Field.
	EXAMPLE 2 Field, without a specified range, indicates the entirety of Field.
	EXAMPLE 3 Field [-1:0] is an alternative representation of the empty string ∅.
Field [~]	Non-empty string constructed from a string of bits denoted Field
Key.KeyID	Cryptographic key identified and indexed by the numerical value KeyID

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