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Radio-frequency identification of animals- — Code structure ultra-high frequency transponders

Identification par radiofréquence des animaux — Structure du code des transpondeurs à ultra haute fréquence

FDIS stage

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Foreword

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This document was prepared by Technical Committee ISO/TC 23, *Tractors and machinery for agriculture and forestry*, Subcommittee SC 19, *Agricultural electronics*.

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.

Introduction

This document does not use EPC coding but ISO coding. To define an ISO 18000--63 transponder as assigned for animal identification only, an Application Family Identifier (AFI) shall be implemented according to ISO 15961. The AFI is used in an ISO 18000-63 transponder to select in the bulk reading process only those transponders programmed for the dedicated application.

This document does not specify the characteristics of the transmission protocols between transponder and transceiver. These characteristics are the subject of ISO 18000-63.

Transponders are in conformance with this ~~part of the International Standard~~document provided they meet ~~clauses 6~~the requirements given in Clauses 5 and ~~7 of this document.~~6.

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Radio-frequency identification of animals — Code structure ultra-high frequency transponders

1 Scope

This document defines the rules for encoding the animal identification code in a specific memory bank known as MB 01 in the memory of an ISO 18000-63 transponder (UHF RFID technology).

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 11784~~:1996~~, Radio frequency identification of animals — Code structure

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
~~UII~~ unique item identifier
UII
96-bit pattern which defines a unique number that contains the *DSFID* ~~(3.2)~~(3.2), the animal identification header, the animal identification code and the 8-bit CRC

Note 1 to entry: If the ISO 18000-63 transponder has more than 96 bits of UII memory, the additional bits are considered UII Trailer bits and shall be set to 0 as default value.

Note 2 to entry: See *DSFID* ~~(3.2)~~(3.2), *animal identification header* ~~(3.3)~~(3.3), *animal identification code* ~~(3.4)~~(3.4), *8-bit CRC* ~~(3.15)~~(3.15) and ISO 18000~~-63 transponder (3.30)~~-63 *transponder* (3.30).

3.2
~~DSFID~~ data storage format identifier
DSFID
8-bit number defined by ISO/IEC 15962 that indicates the application and how the data is structured into the UII memory of the ISO 18000-63 transponder, i.e. the access method and data format.

Note 1 to entry: See *UII* ~~(3.1)~~(3.1) and ISO 18000~~-63 transponder (3.30)~~-63 *transponder* (3.30).

3.3
animal identification header
16-bit code reserved for future use

Note 1 to entry: The animal identification header shall be set to 0 as default.

3.4
animal identification code
64-bit pattern which unequivocally identifies an animal comprising the country code or manufacturer's code, the national identification code and the control bits

Note 1 to entry: The animal identification code is defined by the ISO 11784.

Note 2 to entry: See *country code* ~~(3.5)~~(3.5), *manufacturer's code* ~~(3.6)~~(3.6), *national identification code* ~~(3.7)~~(3.7) and *control bits* ~~(3.8)~~(3.8).

3.5
country code
10-bit pattern to define the country where the transponder was issued or used, according to ISO 3166 ~~standard.~~ 1

3.6
manufacturer's code
10-bit pattern identifying the manufacturer of the transponder

Note 1 to entry: The manufacturer's code is used as alternative to the country code, when no competent authority is available to issue the country code authorization.

Note ~~1~~ 2 to entry: ISO has appointed ~~ICAR~~ (the International Committee for Animal Recording (ICAR) as the registration authority (RA) competent to register and manage manufacturer codes used in the radio frequency identification (RFID) of animals in accordance with ISO 11784 and ISO 11785.

3.7
national identification code
38-bit code field with a unique number within a country, where the code structure and sequence is defined by the ~~Country~~country in charge

3.8
control bits
16-bit code that contains the animal application bit, the retagging counter, the user information field, the reserved field, the RUDI bit and the data block bit.

Note 1 to entry: See *animal application bit* ~~(3.9)~~(3.9), *retagging counter* ~~(3.10)~~(3.10), *user information field* ~~(3.11)~~(3.11), *reserved field* ~~(3.12)~~(3.12), *RUDI-bit* ~~(3.13)~~(3.13) and *data block bit* ~~(3.14)~~(3.14).

3.9
animal application bit
bit which signals whether the transponder is used for animal identification or not

Note 1 to entry: In all animal applications this bit shall be 1.

3.10
retagging counter
three-bit counter for counting the number of retagging

3.11
user information field
five-bit field for additional user information, used only in conjunction with the country code

Note 1 to entry: See *country code* ~~(3.5)~~(3.5).

3.12
reserved field
6-bit code reserved for future use

3.13
RUDI-bit
bit indicating the existence of data in the User Memory (MB11).

Note 1 to entry: The RUDI-bit shall have the same value of the UMI bit. The RUDI-bit and UMI bit shall be encoded with the value 0 if the User Memory is empty or not available.

Note 2 to entry: See *country code* ~~(3.5)~~(3.5) and *UMI* ~~(3.19)~~(3.19).

3.14
data block bit
bit indicating the existence of data in the additional UII memory

3.15
8-bit CRC
8-bit Cyclic Redundancy Check computed over the contents of the UII

Note 1 to entry: The 8-bit CRC protects the information against bit flipping.

3.16
~~MB~~ **memory bank**
MB
designated name of a segmented memory structure

Note 1 to entry: For this document, the memory banks are: 00 (Reserved), 01 (UII memory), 10 (TID), and 11 (User memory) using binary notation.

Note 2 to entry: See ISO 18000 ~~63 transponder (3.30).~~ -63 *transponder* (3.30).

3.17
storedCRC
16-bit CRC automatically generated, computed over the contents of the StoredPC and the UII

Note 1 to entry: The storedCRC does not protect against bit flipping (unintentional change of state of a bit stored in memory).

Note ~~1~~ 2 to entry: See *StoredPC* ~~(3.18)~~(3.18) and *UII* ~~(3.1)~~(3.1).

3.18
storedPC
protocol-control information stored in the UII Memory Bank (MB 01) that contains the Length Indicator, the UMI, the XI, the Toggle Bit and the AFI

Note 1 to entry: See *StoredPC* ~~(3.18)~~,(3.18), *UMI* ~~(3.19)~~,(3.19), *XI* ~~(3.20)~~,(3.20), *toggle bit* ~~(3.21)~~(3.21) and *AFI* ~~(3.22)~~.(3.22).

3.19
~~UMI~~ user memory indicator
UMI
Boolean flag in the UII Memory Bank (MB 01) indicating whether the User Memory Bank (MB 11) is present and contains data

Note 1 to entry: The UMI bit shall have the same value of the RUDI-bit.

Note 2 to entry: See *RUDI-bit* ~~(3.13)~~.(3.13).

3.20
~~XI~~ extended protocol control indicator
XI
bit in the UII Memory Bank (MB 01) indicating whether XPC ~~(see paragraph 5 - Symbols)~~ words are present

3.21
toggle bit
Boolean flag in the UII Memory Bank (MB 01) indicating whether the presence of an Application Family Identifier (AFI~~).~~)

Note 1 to entry: The Toggle bit shall be encoded with the value 1 to indicate the presence of the AFI.

Note 2 to entry: See *AFI* ~~(3.22)~~.(3.22).

3.22
~~AFI~~ application family identifier
AFI
code programmed in the UII Memory Bank (MB 01) used to select a class of RFID tags relevant to an application, or aspect of an application, and to ignore further communications with other classes of RFID tags with different identifiers

Note 1 to entry: This ~~International Standard~~document does not use GS1 EPC coding but ISO coding.

Note 2 to entry: Application Family Identifier is defined in ISO/IEC 15961-3.

3.23
ISO coding
application whose usage denotes an acceptance of ISO standards and policies and where in MB01 an Application Family Identifier as defined in ISO/IEC 15961-3 is encoded

3.24
kill password
32-bit password in the Reserved Memory Bank (MB 00) that ~~shall be~~is presented to the tag in order to complete the mandatory "Kill" command.~~The "Kill" command is used to permanently silence a tag~~

Note 1 to entry: The "Kill" command is used to permanently silence a tag.

Note 2 to entry: For this document, the Kill Command shall not be used.