ISO 28560 and DS/INF 163

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1. Scope

This document summarizes the relations between ISO 28560 RFID in libraries and DS/INF 163 RFID Data Model for Libraries.

2. General

DS/INF 163 corresponds to ISO 28560-1 (Data elements and general guidelines for implementation) and ISO 28560-3 (Fixed Length encoding) – in the following called the ISO-version. Another encoding schema described in ISO 28560-3 (Encoding of RFID data elements based on rules from ISO/IEC 15962) has no relation to DS/INF 163.

The aim has been that an RFID-tag encoded according to DS/INF 163 conforms to the ISO-version too. The main conclusion is that this is fulfilled.

Development of the ISO-version however, has made it necessary to make some clarifications and some minor changes. These clarifications and minor changes are described

 can be summarized as follows.

- AFI. The ISO-version specifies the AFI-values in part 1.
- DSFID. The ISO-version mandates a specific value.
- Data blocks. The ISO-version adds three structured extension blocks to the two specified in DS/INF 163, and adds two fields to the acquisition extension block. The specification of unstructured extension blocks is more detailed in the ISO-version. The 32 bit-option Data block ID specified in DS/INF 163 is not valid in the ISO-version.
- User data elements. The ISO-version defines of a set of user data elements separated from specification of the encoding.

3. AFI (Application Family Identifier)

New values have been assigned in the ISO-version. This is already covered in DS/INF 163 amendment #2 and there is therefore no conflict between DS/INF 163 and the ISO-version.

ISO 28560-1 section 5.2.2 specifies that a library may use the AFI in one of two ways:

- o It may use a single AFI, the value $C2_{HEX}$ assigned under the registration of ISO/IEC 15961-2. This distinguishes library items from all others, and avoids the risk of an RFID reader in another domain reading the RFID tag on a loan item and confusing its encoded content with data in an application outside the library domain. It also enables a library system to reject items that carry a different AFI code, possibly from another domain visited by a client.

- o The AFI may additionally be used as part of an "item security system" where the AFI value $C2_{HEX}$ is written to tags for items that are on loan to a client. When the books are returned, an in-stock AFI (07_{HEX}, as defined in ISO/IEC 15961-3) is written to the tag.

4. DSFID (Data Storage Identifier)

This construct is not mentioned in DS/INF 163. The ISO-version has a DSFID value of 06_{HEX}.

ISO 28560-1 section 5.2.3 specifies a set of values for DSFID as described below:

The DSFID may be present in certain types of tags as a system data element. If the DSFID is hard coded, in other words has a specific memory allocation, then the write-DSFID command in the air interface protocol is usually supported by a lock-DSFID command.

For tags encoded according to ISO 28560-2 the value of DSFID comprise two components:
- o The access method defined in ISO 28560 of 00_{BINARY}
- o The data format of 00110_{BINARY} assigned by the Registration Authority for ISO/IEC 15961-2 (http://iso15961.nen.nl) explicitly for library use

When these are combined, they produce a DSFID value of 06_{HEX} to be used for tags encoded according to ISO 28560-2.

The DSFID value $3E_{HEX}$ is used for tags encoded according to ISO 28560-3.

Two DSFID values ($1E_{HEX}$ and $5E_{HEX}$) may be used for migration purposes for tags not compliant to ISO 28560.

Other DSFID values shall not be used until assigned for use in this part of ISO 28560.

5. Data blocks

ISO 28560-3 and DS/INF 163 has minor terminological differences:

ISO/FDIS 28560	DS/INF 163
Basic block	Mandatory starting block
End block	End data block
Filler data block	Filler data block
Structured extension block	Structured extension block
Unstructured extension block	Unstructured extension block

DS/INF section 3.3.3 describes an optional way to encode the Data block ID using 32 bits in extension blocks. This option is considered as an unnecessary complication, and is not valid in the ISO-version.

Some of the fields in the mandatory starting block are combined in the basic block in the ISO-version.

Apart from this, the data block architecture is identical.

The ISO-version specifies five extension blocks:
- o Library extension block (Data block ID = 1) – same as DS/INF 163
- o Acquisition extension block (Data block ID = 2) – two fields added compared to DS/INF 163
- o Library supplement block (Data block ID = 3) – added compared to DS/INF 163
- o Title block (Data block ID = 4) – added compared to DS/INF 163
- o ILL block (Data block ID = 5) – added compared to DS/INF 163

6. User data elements

ISO 28560-1 section 4 specifies the list of user data elements. DS/INF 163 does not have the concept of data elements. Instead it has fields that can contain information. Any information addressed in DS/INF 163 can be expressed in this list of data elements in the ISO version, but the list also covers information not addressed in DS/INF 163.

ISO 28560-3 section 6 specifies how data elements are mapped to data blocks and fields. Appendix A in this paper gives the mapping from DS/INF 163 fields to ISO data elements.

A few data elements need special remark.

6.1 Primary item identifier

In the ISO-version this mandatory data element can be encoded in two different blocks/fields depending on the size – either in the basic block or the library extension block.

6.2 Set information

In the ISO-version this data element is encoded in one field in the basic block, where DS/INF 163 encodes the information in two fields.

Moreover the number of parts in item may take the value 0, meaning that the actual number is not known.

Likewise the ordinal part number of the first part may be zero, meaning that some parts do not have an RFID tag.

These values are not allowed in DS/INF 163.

6.3 Owner institution (ISIL) and alternative owner institution

The ISO-version operates with two data elements – owner institution (ISIL) and alternative owner institution.

Owner institution (ISIL) can be encoded in one field in the basic block, where DS/INF 163 encodes the information in two consecutive fields. The binary result is the same. But the ISO-version allows any ISIL-prefix of max two characters, where DS/INF 163 only allows country codes.

If the ISIL code cannot fit into the fixed length field of the basic block, it can be encoded in the library extension block.

If the library does not have an ISIL code, the alternative owner institution data element is used. This data element is, depending on the size, encoded in either the basic block or the library extension block.

Appendix A. Mapping of fields to data elements

DS/INF 163 fields	ISO/FDIS 28560 data elements	Remarks
3.2.1.1 Standard version	2. Content parameter	The value "6" must not be used.
3.2.1.2 Type of usage	5. Type of usage	More values added in ISO-version
3.2.1.3 Number of parts in item 3.2.1.4 Ordinal part number	4. Set information	The Set information data element consists of two components: number of parts in item ordinal part number
3.2.1.5 Primary item ID	1. Primary item identifier	
3.2.1.6 CRC		This field is considered as part of the encoding in the ISO-version.
3.2.1.7 Country of owner library 3.2.1.8 Owner library	3. Owner institution (ISIL) 23. Alternative owner institution	In DS/INF 163 the Owner library field may contain ISIL unit identifier as well as non ISIL codes
3.5.1.1 Media format	19. Media format (other)	
3.5.1.2 Alternate item identifier	22. Alternative item identifier 1. Primary item identifier	In DS/INF 163 the Alternate item identifier field may be used for the Primary item identifier data element, if this is too long to fit into the Primary item identifier field.
3.5.1.3 Extended owner library	3. Owner institution (ISIL) 23. Alternative owner institution	In DS/INF 163 the extended owner library field may contain ISIL code as well as non ISIL codes
3.5.2.1 Supplier ID	9. Supplier identifier	
3.5.2.2 Item identification	18. Product identifier local	
3.5.2.3 Order number	10. Order number	
3.5.2.4 Invoice number	21. Supplier invoice number	
	6. Shelf location	Not defined in DS/INF 163
	7. ONIX media format	Not defined in DS/INF 163
	8. MARC media format	Not defined in DS/INF 163
	11. ILL borrowing institution (ISIL)	Not defined in DS/INF 163
	12. ILL borrowing transaction number	Not defined in DS/INF 163
	13. GS1 product identifier	Not defined in DS/INF 163
	14. Alternative unique item identifier	Not defined in DS/INF 163
	15. Local data A	Not defined in DS/INF 163
	16. Local data B	Not defined in DS/INF 163
	17. Title	Not defined in DS/INF 163
	20. Supply chain stage	Not defined in DS/INF 163
	24. Subsidiary of an owner institution	Not defined in DS/INF 163
	25. Alternative ILL borrowing institution	Not defined in DS/INF 163
	26. Local data C	Not defined in DS/INF 163
	27-31. Reserved for future use	Not defined in DS/INF 163