

## Paper for Consideration by TSMAD

## Revision of the ISO8211 Encoding in S-100

<b>Submitted by:</b>	SevenCs GmbH
<b>Executive Summary:</b>	This paper describes a rather small problem in the ISO8211 encoding and proposes some small revisions to fix it.
<b>Related Documents:</b>	S-100 Part 10a ISO/IEC 8211Encoding
<b>Related Projects:</b>	Next version of S-100

**Introduction / Background**

During the revision of the S-101 document I discovered a problem in the ISO/IEC 8211 encoding. The problem is more of a formal nature. Nevertheless we should make the document as consistent as possible. There will be **NO** changes to the content of the data fields, only revisions to the description of the encoding. There will be changes to the Data Descriptive Record and to the directory of some Data Records in the data set file.

**Analysis/Discussion**

For the encapsulation of coordinates 4 fields are used (Array descriptors in brackets):

- C2DI (\*YCOO!XCOO)
- C3DI (VCID\\\*YCOO!XCOO!ZCOO)
- C2DF (\*YCOO!XCOO)
- C3DF (VCID\\\*YCOO!XCOO!ZCOO)

These fields are used in the following records:

**Point record**

```
|
|--PRID (4): Point Record Identifier field
|
|<0..*>-INAS (5\\*5): Information Association field
|
|alternate coordinate representations
|
*--C2DI (2): 2-D Integer Coordinate field
|
*--C3DI (4): 3-D Integer Coordinate field
|
*--C2DF (2): 2-D Floating Point Coordinate field
|
*--C3DF (4): 3-D Floating Point Coordinate field
```

**Multi Point record**

```
|
|--MRID (4): Multi Point Record Identifier field
|
|<0..*>-INAS (5\\*5): Information Association field
|
|<0..1>-COCC (3): Coordinate Control field
|
|alternate coordinate representations
|
```

```

*-<0..*>-C2DI (*2): 2-D Integer Coordinate field
|
*-<0..*>-C3DI (1\\*3): 3-D Integer Coordinate field
|
*-<0..*>-C2DF (*2): 2-D Floating Point Coordinate field
|
*-<0..*>-C3DF (1\\*3): 3-D Floating Point Coordinate field

```

#### Curve record

```

|--CRID (4): Curve Record Identifier field
|
|-<0..*>-INAS (5\\*5): Information Association field
|
|-<0..1>-PTAS (*3): Point Association field
|
|-<0..1>-SECC (3): Segment Control field
|
|-<0..*>-SEGH (1): Segment Header field
|
|   |-<0..1>-COCC (3): Coordinate Control Field
|   |
|   |alternate coordinate representations
|   |
|   *-<0..*>-C2DI (*2): 2-D Integer Coordinate field
|   |
|   *-<0..*>-C3DI (1\\*3): 3-D Integer Coordinate field
|   |
|   *-<0..*>-C2DF (*2): 2-D Floating Point Coordinate field
|   |
|   *-<0..*>-C3DF (1\\*3): 3-D Floating Point Coordinate field

```

Note that for the point record the tree diagram does not match with the array descriptor. In fact it constrains the field, which is the intention. Nevertheless it is some kind of inconsistency which can be cause problems in generic software solutions, checking tools etc. The tree diagrams are only in the documentation but the Array Descriptors are in the Data Descriptive Record (DDR). There can be only one description for a field in the DDR. This allows e.g. Point Records to have more than one coordinate tuple. This is currently legal on the level of ISO/IEC encoding.

#### Proposal

The proposal to overcome the inconsistency is as follows.

- Distinct between fields for one coordinate tuple and fields for a list of coordinate tuples
- Using the appropriate fields in the corresponding records.

This will not require any change to the data itself except changes to the Data Descriptive Record (the first record in an ISO/IEC 8211 file)

Then we have

- |        |                       |   |
|--------|-----------------------|---|
| • C2IT | (YCOO!XCOO)           | 2-D Integer Coordinate Tuple field        |
| • C3IT | (VCID!YCOO!XCOO!ZCOO) | 3-D Integer Coordinate Tuple field        |
| • C2FT | (YCOO!XCOO)           | 2-D Floating Point Coordinate Tuple field |
| • C3FT | (VCID!YCOO!XCOO!ZCOO) | 3-D Integer Coordinate Tuple field        |

And

- |        |              |                                   |
|--------|--------------|-----------------------------------|
| • C2IL | (*YCOO!XCOO) | 2-D Integer Coordinate List field |
|--------|--------------|-----------------------------------|

- C3IL (VCID\\\*YCOO!XCOO!ZCOO) 3-D Integer Coordinate List field
- C2FL (\*YCOO!XCOO) 2-D Floating Point Coordinate List field
- C3FL (VCID\\\*YCOO!XCOO!ZCOO) 3-D Floating Point Coordinate List field

The tree diagrams will then look like:

#### Point record

```

|
|--PRID (4): Point Record Identifier field
|
|-<0..*>-INAS (5\\*5): Information Association field
|
|alternate coordinate representations
|
*--C2IT (2): 2-D Integer Coordinate Tuple field
|
*--C3IT (4): 3-D Integer Coordinate Tuple field
|
*--C2FT (2): 2-D Floating Point Coordinate Tuple field
|
*--C3FT (4): 3-D Floating Point Coordinate Tuple field

```

#### Multi Point record

```

|
|--MRID (4): Multi Point Record Identifier field
|
|-<0..*>-INAS (5\\*5): Information Association field
|
|-<0..1>-COCC (3): Coordinate Control field
|
|alternate coordinate representations
|
*-<0..*>-C2IL (*2): 2-D Integer Coordinate List field
|
*-<0..*>-C3IL (1\\*3): 3-D Integer Coordinate List field
|
*-<0..*>-C2FL (*2): 2-D Floating Point Coordinate List field
|
*-<0..*>-C3FL (1\\*3): 3-D Floating Point Coordinate List field

```

#### Curve record

```

|
|--CRID (4): Curve Record Identifier field
|
|-<0..*>-INAS (5\\*5): Information Association field
|
|-<0..1>-PTAS (*3): Point Association field
|
|-<0..1>-SECC (3): Segment Control field
|
|-<0..*>-SEGH (1): Segment Header field
|
|   |-<0..1>-COCC (3): Coordinate Control Field
|   |
|   |alternate coordinate representations
|   |
|   *-<0..*>-C2IL (*2): 2-D Integer Coordinate List field
|   |
|   *-<0..*>-C3IL (1\\*3): 3-D Integer Coordinate List field
|   |
|

```

\*-<0..\*>-C2FL (\*2): 2-D Floating Point Coordinate List field

|

\*-<0..\*>-C3FL (1\\\*3): 3-D Floating Point Coordinate List field

The appropriate changes have to be made to the S-100 Part 10a document as well as to the S-101 document.