



# **cat008 category specification**

***Release 2014-08-24, 1.2***

## **Monoradar Derived Weather Information**

**2014-08-24**



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**category:** 008

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**PREAMBLE**

Surveillance data exchange.





## DESCRIPTION OF STANDARD DATA ITEMS

### 2.1 I008/000 - Message Type

*Definition:* This Data Item allows for a more convenient handling of the messages at the receiver side by further defining the type of transaction.

*Structure:*

- 8 bits [ . . . . . ]
- values:
  - 1: Polar vector
  - 2: Cartesian vector of start point/ length
  - 3: Contour record
  - 4: Cartesian start point and end point vector
  - 254: SOP message
  - 255: EOP message

### 2.2 I008/010 - Data Source Identifier

*Definition:* Identification of the radar station from which the data are received.

*Structure:*

**SAC** - *System Area Code*

- 8 bits [ . . . . . ]
- raw value

**SIC** - *System Identification code*

- 8 bits [ . . . . . ]
- raw value

**Note:** The defined SACs are on the EUROCONTROL ASTERIX website ([www.eurocontrol.int/asterix](http://www.eurocontrol.int/asterix))

## 2.3 I008/020 - Vector Qualifier

*Definition:* Precipitation intensity level, shading orientation of the vectors representing the precipitation area and coordinate system used.

*Structure:*

Extended item with first part 8 bits long and optional 8 bits extends.

### ORG

- 1 bit [.]
- values:
  - 0: Local Coordinates
  - 1: System Coordinates

### I - Intensity level (range zero to seven)

- 3 bits [...]
- raw value

### S - Shading orientation with respect to North, as follows:

- 3 bits [...]
- values:
  - 0: 0°
  - 1: 22.5°
  - 2: 45°
  - 3: 67.5°
  - 4: 90°
  - 5: 112.5°
  - 6: 135°
  - 7: 157.5°

### (FX)

- extension bit
  - 0: End of data item
  - 1: Extension into next extent

### (spare)

- 5 bits [.....]

### TST

- 1 bit [.]
- values:
  - 0: Default
  - 1: Test vector

### ER

- 1 bit [.]
- values:
  - 0: Default
  - 1: Error condition encountered

### (FX)

- extension bit
  - 0: End of data item
  - 1: Extension into next extent

**Note:** For polar vectors bits-4/2 are meaningless and are set to zero.

## 2.4 I008/034 - Sequence of Polar Vectors in SPF Notation

*Definition:* Sequence of weather vectors in local polar coordinates.

*Structure:*

Repetitive item, repetition factor 8 bits.

### **STR** - *START RANGE*

- 8 bits [ . . . . . ]
- raw value

### **ENDR** - *END RANGE*

- 8 bits [ . . . . . ]
- raw value

### **AZ** - *AZIMUTH*

- 16 bits [ . . . . . ]
- unsigned quantity
- scaling factor: 360
- fractional bits: 16
- unit: "deg"
- $\text{LSB} = 360/2^{16} \text{ deg} = 360/65536 \text{ deg} \approx 0.0054931640625 \text{ deg}$

**Note:** f is a parameter of the SOP message.

## 2.5 I008/036 - Sequence of Cartesian Vectors in SPF Notation

*Definition:* Sequence of weather vectors, in the representation start point/length, in local or in system cartesian coordinates.

*Structure:*

Repetitive item, repetition factor 8 bits.

### **X** - *X-COMPONENT*

- 8 bits [ . . . . . ]
- raw value

### **Y** - *Y-COMPONENT*

- 8 bits [ . . . . . ]
- raw value

### **L** - *LENGTH*

- 8 bits [ . . . . . ]

- raw value

**Note:**

1. LSB of [X, Y, L] is calculated as  $2^{-6+f}$ .
2. f is a parameter of the SOP message.
3. Negative values are expressed in 2's complement form, bit-24 and bit-16 are set to 0 for positive values and 1 for negative values.

## 2.6 I008/038 - Sequence of Weather Vectors in SPF Notation

*Definition:* Sequence of weather vectors, in the representation start point/ end point, in local or in system cartesian coordinates.

*Structure:*

Repetitive item, repetition factor 8 bits.

**X1 - X1 COMPONENT**

- 8 bits [ . . . . . ]
- raw value

**Y1 - Y1 COMPONENT**

- 8 bits [ . . . . . ]
- raw value

**X2 - X2 COMPONENT**

- 8 bits [ . . . . . ]
- raw value

**Y2 - Y2 COMPONENT**

- 8 bits [ . . . . . ]
- raw value

**Note:**

1. LSB of [X1, Y1, X2, Y2] is calculated as  $2^{-6+f}$ .
2. f is a parameter of the SOP message.
3. Negative values are expressed in 2's complement form, bits-32, 24, 16 and 8 are set to 0 for positive values and 1 for negative values.

## 2.7 I008/040 - Contour Identifier

*Definition:* Contour serial number together with the precipitation intensity levels and the coordinates system used.

*Structure:*

**ORG**

- 1 bit [ . ]
- values:
  - 0: Local Coordinates

## 1: System Coordinates

**I** - Intensity level (range zero to seven)

- 3 bits [...]
- raw value

(spare)

- 2 bits [...]

**FST\_LST**

- 2 bits [...]
- values:
  - 0: Intermediate record of a contour
  - 1: Last record of a contour of at least two records
  - 2: First record of a contour of at least two records
  - 3: First and only record, fully defining a contour

**CSN** - Contour Serial Number

- 8 bits [.....]
- raw value

**Note:** The Contour Serial Number provides an unambiguous identification for each contour record. Within one update cycle, a serial number shall never be assigned twice.

## 2.8 I008/050 - Sequence of Contour Points in SPF Notation

*Definition:* Cartesian coordinates of a variable number of points defining a contour.

*Structure:*

Repetitive item, repetition factor 8 bits.

**X1**

- 8 bits [.....]
- raw value

**Y1**

- 8 bits [.....]
- raw value

**Note:**

1. LSB of [X1, Y1] is calculated as  $2^{-6+f}$ .
2. f is a parameter of the SOP message.
3. Negative values are expressed in 2's complement form, bit-16 and bit-8 shall be set to 0 for positive values and 1 for negative values.

## 2.9 I008/090 - Time of Day

*Definition:* Absolute time stamping expressed as Coordinated Universal Time (UTC) time.

*Structure:*

- 24 bits [ . . . . . ]
- unsigned quantity
- scaling factor: 1
- fractional bits: 7
- unit: "s"
- $\text{LSB} = 1/2^7 \text{ s} = 1/128 \text{ s} \approx 0.0078125 \text{ s}$

**Notes:**

1. The time of day value is reset to zero each day at midnight.
2. For time management in radar transmission applications, refer to Part 1, paragraph 5.4 [Ref. 1].

## 2.10 I008/100 - Processing Status

*Definition:* Information concerning the scaling factor currently applied, current reduction step in use, etc.

*Structure:*

Extended item with first part 24 bits long and optional 8 bits extends.

**f** - *Scaling factor*

- 5 bits [ . . . . . ]
- signed quantity
- scaling factor: 1
- fractional bits: 0
- $\text{LSB} = 1$

**R** - *Current reduction stage in use*

- 3 bits [ . . . ]
- raw value

**Q** - *Processing parameters*

- 15 bits [ . . . . . ]
- raw value

(FX)

- extension bit
  - 0: End of data item
  - 1: Extension into next extent

**Note:** f: Scaling factor, negative values are represented in 2's complement form, bit-24 is set to 0 for positive values and 1 for negative values. R: Current reduction stage

in use. Normal operation is indicated by a value of zero. The actual bit signification is application dependent. Q: Processing parameters. The actual bit signification is application dependent.

## 2.11 I008/110 - Station Configuration Status

*Definition:* Information concerning the use and status of some vital hardware components of a radar system .

*Structure:*

Extended item with first part 8 bits long and optional 8 bits extends.

**DATA** - *Unspecified data*

- 7 bits [ . . . . . ]
- raw value

(FX)

- extension bit
  - 0: End of data item
  - 1: Extension into next extent

**Note:** Due to the diversity in hardware design and requirements of present and future radar stations, it is felt impractical to attempt to define individual bits.

## 2.12 I008/120 - Total Number of Items Constituting One Weather Picture

*Definition:* Total number of vectors, respectively contour points, constituting the total weather image, provided with the EOP message.

*Structure:*

- 16 bits [ . . . . . ]
- unsigned integer

## 2.13 I008/RE - Reserved Expansion Field

*Definition:* Expansion

*Structure:*

Explicit item

## 2.14 I008/SP - Special Purpose Field

*Definition:* Special Purpose Field

*Structure:*

Explicit item



## **USER APPLICATION PROFILE FOR CATEGORY 008**

- (1) I008/010 - Data Source Identifier
- (2) I008/000 - Message Type
- (3) I008/020 - Vector Qualifier
- (4) I008/036 - Sequence of Cartesian Vectors in SPF Notation
- (5) I008/034 - Sequence of Polar Vectors in SPF Notation
- (6) I008/040 - Contour Identifier
- (7) I008/050 - Sequence of Contour Points in SPF Notation
- (FX) - Field extension indicator
- (8) I008/090 - Time of Day
- (9) I008/100 - Processing Status
- (10) I008/110 - Station Configuration Status
- (11) I008/120 - Total Number of Items Constituting One Weather Picture
- (12) I008/038 - Sequence of Weather Vectors in SPF Notation
- (13) I008/RE - Reserved Expansion Field
- (14) I008/SP - Special Purpose Field
- (FX) - Field extension indicator



## INDICES AND TABLES

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