

# Asterix category 008 - Monoradar Derived Weather Information

**category:** 008

**edition:** 1.2

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## Preamble

Surveillance data exchange.

## Description of standard data items

### 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

### I008/010 - Data Source Identifier

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

*Structure:*

#### **I008/010/SAC** - *System Area Code*

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

#### **I008/010/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))

## **I008/020 - Vector Qualifier**

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

*Structure:*

Extended item.

### **I008/020/ORG**

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

### **I008/020/I - Intensity Level**

- 3 bits [...]
- unsigned integer

### **I008/020/S - Shading Orientation with Respect to North**

- 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

### **I008/020/(spare)**

- 5 bits [.....]

### **I008/020/TST**

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

### **I008/020/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.

## **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.

### **I008/034/STR - Start Range**

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

### **I008/034/ENDR - End Range**

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

### **I008/034/AZ - Azimuth**

- 16 bits [ . . . . . ]
- unsigned quantity
- scaling factor: 360
- fractional bits: 16
- unit: "°"
- $LSB = 360/2^{16} \text{ }^\circ = 360/65536 \text{ }^\circ \approx 5.4931640625e-3 \text{ }^\circ$

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

## **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.

### **I008/036/X - X-Component**

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

### **I008/036/Y - Y-Component**

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

### **I008/036/LENGTH - 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.

## **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.

### **I008/038/X1 - X1-Component**

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

### **I008/038/Y1 - Y1-Component**

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

### **I008/038/X2 - X2-Component**

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

### **I008/038/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.

## **I008/040 - Contour Identifier**

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

*Structure:*

### **I008/040/ORG**

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

### **I008/040/I - Intensity Level**

- 3 bits [ . . . ]
- raw value

### **I008/040/(spare)**

- 2 bits [ . . ]

### **I008/040/FSTLST**

- 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

#### **I008/040/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.

#### **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.

##### **I008/050/X1**

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

##### **I008/050/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.

#### **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"
- $\text{LSB} = 1/2^7 \text{ s} = 1/128 \text{ s} \approx 7.8125e-3 \text{ s}$

**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].

## **I008/100 - Processing Status**

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

*Structure:*

Extended item.

### **I008/100/F - Scaling Factor**

- 5 bits [ . . . . . ]
- signed quantity
- scaling factor: 1
- fractional bits: 0
- LSB = 1

### **I008/100/R - Current Reduction Stage in Use**

- 3 bits [ . . . ]
- raw value

### **I008/100/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.

## **I008/110 - Station Configuration Status**

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

*Structure:*

Repetitive item with FX extension

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

**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.

## **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

## **I008/SP - Special Purpose Field**

*Definition:* Special Purpose Field

*Structure:*

Explicit item (SP)

## **I008/RFS - Random Field Sequencing**

*Definition:* Random Field Sequencing

*Structure:*

Rfs

## **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/SP - Special Purpose Field
- (14) I008/RFS - Random Field Sequencing
- (FX) - Field extension indicator