

Asterix category 008 - Monoradar Derived Weather Information

category: 008

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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)

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 [.]
 - unsigned quantity
 - unit: "(NM)"
 - $LSB = 1/2^7$ (NM) $\approx 7.81e - 3$ (NM)
- remark** Adjust with scaling factor '100/F'

I008/034/ENDR - End Range

- 8 bits [.]
 - unsigned quantity
 - unit: "(NM)"
 - $LSB = 1/2^7$ (NM) $\approx 7.81e - 3$ (NM)
- remark** Adjust with scaling factor '100/F'

I008/034/AZ - Azimuth

- 16 bits [.]
- unsigned quantity
- unit: "°"
- $LSB = 360/2^{16}$ ° $\approx 5.49e - 3$ °

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 [.]
 - signed quantity
 - unit: "(NM)"
 - $LSB = 1/2^6$ (NM) $\approx 1.56e - 2$ (NM)
- remark** Adjust with scaling factor '100/F'

I008/036/Y - Y-Component

- 8 bits [.]
 - signed quantity
 - unit: "(NM)"
 - $LSB = 1/2^6$ (NM) $\approx 1.56e - 2$ (NM)
- remark** Adjust with scaling factor '100/F'

I008/036/LENGTH - Length

- 8 bits [.]
- unsigned quantity
- unit: "(NM)"
- $LSB = 1/2^6 (NM) \approx 1.56e - 2 (NM)$
remark Adjust with scaling factor '100/F'

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 [.]
- signed quantity
- unit: "(NM)"
- $LSB = 1/2^6 (NM) \approx 1.56e - 2 (NM)$
remark Adjust with scaling factor '100/F'

I008/038/Y1 - Y1-Component

- 8 bits [.]
- signed quantity
- unit: "(NM)"
- $LSB = 1/2^6 (NM) \approx 1.56e - 2 (NM)$
remark Adjust with scaling factor '100/F'

I008/038/X2 - X2-Component

- 8 bits [.]
- signed quantity
- unit: "(NM)"
- $LSB = 1/2^6 (NM) \approx 1.56e - 2 (NM)$
remark Adjust with scaling factor '100/F'

I008/038/Y2 - Y2-Component

- 8 bits [.]
- signed quantity
- unit: "(NM)"
- $LSB = 1/2^6 (NM) \approx 1.56e - 2 (NM)$
remark Adjust with scaling factor '100/F'

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 [.....]
- signed quantity
- unit: "(NM)"
- $LSB = 1/2^6$ (NM) $\approx 1.56e - 2$ (NM)
 - remark** Adjust with scaling factor '100/F'

I008/050/Y1

- 8 bits [.....]
- signed quantity

- unit: "(NM)"
 - $LSB = 1/2^6 (NM) \approx 1.56e - 2 (NM)$
- remark** Adjust with scaling factor '100/F'

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
- unit: "s"
- $LSB = 1/2^7 s \approx 7.81e - 3 s$

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 integer

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