Asterix category 008 - Monoradar Derived Weather Information

category: 008

edition: 1.3

date: 2021-04-01

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 [. . . . . .]
- 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 = $360/2^{16}$ ° = $360/65536$ ° ≈ $5.4931640625e-3$ °

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 [. . . . . .]
- 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"
- LSB = $1/2^7$ s = $1/128$ s $\approx 7.8125e-3$ 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 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 isapplication 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