Asterix category 002 - Transmission of Monoradar Service Messages

category: 002

edition: 1.1

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Preamble

Surveillance data exchange.

Description of standard data items

I002/000 - 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: North marker message
    2: Sector crossing message
    3: South marker message
    8: Activation of blind zone filtering
    9: Stop of blind zone filtering

Notes: 1. In application where transactions of various types are exchanged, the Message Type Data Item facilitates the proper message handling at the receiver side.

2. Message Type values 1-127 are reserved for common standard use, whereas the values 128-255 are application dependent.

I002/010 - Data Source Identifier

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

Structure:

I002/010/SAC - *System Area Code*

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

I002/010/SIC - *System Identification Code*

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

Notes:

1. The defined SACs are listed in Part 1, Table 2 [Ref. 2]
2. The defined SICs are listed in Part 1, Annex B [Ref. 2]

I002/020 - Sector Number

Definition: Eight most significant bits of the antenna azimuth defining a particular azimuth sector.

Structure:

- 8 bits [. . . . .]
- unsigned quantity
- scaling factor: 360
- fractional bits: 8
- unit: ”°”
- LSB = $360/2^8$ ° = $360/256$ ° ≈ 1.40625 °

The use of the antenna azimuth as sector number has the advantage of being independent of the number of sectors implemented.

I002/030 - Time of Day

Definition: Absolute time stamping expressed as 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.2].
3. Data Item I002/030 can have various logical meanings. In a particular message, the logical meaning is implicit from its context (e.g. in a North marker message it represents the antenna North crossing time; in a sector message it represents the antenna sector crossing time).

I002/041 - Antenna Rotation Speed

Definition: Antenna rotation period as measured between two consecutive North crossings or as averaged during a period of time.

Structure:

- 16 bits [. . . . .]
- unsigned quantity
- scaling factor: 1
- fractional bits: 7
- unit: ”s”
- LSB = $1/2^7$ s = $1/128$ s $\approx 7.8125e-3$ s

I002/050 - Station Configuration Status

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

Structure:

Repetitive item with FX extension

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

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

I002/060 - Station Processing Mode

Definition: Details concerning the present status with respect to processing parameters and options.

Structure:

Repetitive item with FX extension

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

NOTES:

1. Typical information conveyed within this Data Item includes inter alia type of polarisation in use, Moving Target Indicator (MTI) in use and/or definition of the range to which MTI is applied, presence of overload conditions and the type of load reduction measures in use.
2. Only the structure of this Data Item is defined, no attempt is made to standardise its contents, in order not to hamper any application or future development.

I002/070 - Plot Count Values

Definition: Plot count values according to various plot categories, either for the last full antenna scan or for the last sector processed.

Structure:

Repetitive item, repetition factor 8 bits.

I002/070/A - *Aerial Identification*

- 1 bit [.]
- values:
  - 0: Counter for antenna 1
  - 1: Counter for antenna 2

I002/070/IDENT

- 5 bits [. . . . .]
- values:
  - 1: Sole primary plots
  - 2: Sole SSR plots
  - 3: Combined plots

I002/070/COUNTER

- 10 bits [. . . . .]
- unsigned integer

I002/080 - Warning/Error Conditions

Definition: Warning/error conditions affecting the functioning of the radar system itself.

Structure:

Repetitive item with FX extension

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

NOTE: Warning/error condition values 1-63 are reserved for common Standard use, whereas the values 64-127 are application dependent.

I002/090 - Collimation Error

Definition: Averaged difference in range and in azimuth for the primary target position with respect to the SSR target position as calculated by the radar station.

Structure:

I002/090/RE - *Range Error*

- 8 bits [. . . . . .]
- signed quantity
- scaling factor: 1
- fractional bits: 7
- unit: ”NM”
- LSB = $1/2^7$ NM = $1/128$ NM $\approx 7.8125e-3$ NM

I002/090/AE - *Azimuth Error*

- 8 bits [. . . . . .]
- signed quantity
- scaling factor: 360
- fractional bits: 14
- unit: ”°”
- LSB = $360/2^{14}$ ° = $360/16384$ ° $\approx 2.197265625e-2$ °

NOTES

1. LSB of RE is calculated as 2^{16-f}.
2. A default quantisation unit of 0.022° and a range between -2.8125° and +2.7905° is obtained for a value of f=2 .

I002/100 - Dynamic Window Type 1

Definition: Signals the activation of a certain selective filtering function and in a polar coordinates system the respective geographical areas.

Structure:

I002/100/RS - *Rho Start*

- 16 bits [. . . . . .]
- unsigned quantity
- scaling factor: 1
- fractional bits: 7
- unit: ”NM”
- LSB = $1/2^7$ NM = $1/128$ NM $\approx 7.8125e-3$ NM
- value < 512 NM

I002/100/RE - *Rho End*

- 16 bits [. . . . . .]
- unsigned quantity
- scaling factor: 1
- fractional bits: 7
- unit: ”NM”
- LSB = $1/2^{7}$ NM = $1/128$ NM $\approx 7.8125e-3$ NM
- value < 512 NM

I002/100/TS - *Theta Start*

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

I002/100/TE - *Theta End*

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

The logical meaning of the polar window is defined by its context, given by the Message Type (Data Item I002/000) in the record concerned.

I002/SP - Special Purpose Field

Definition: Special Purpose Field

Structure:

Explicit item (SP)

I002/RFS - Random Field Sequencing

Definition: Random Field Sequencing

Structure:

Rfs

User Application Profile for Category 002

- (1) `I002/010` - Data Source Identifier
- (2) `I002/000` - Message Type
- (3) `I002/020` - Sector Number
- (4) `I002/030` - Time of Day
- (5) `I002/041` - Antenna Rotation Speed
- (6) `I002/050` - Station Configuration Status
- (7) `I002/060` - Station Processing Mode

- `(FX)` - Field extension indicator
- (8) `I002/070` - Plot Count Values
- (9) `I002/100` - Dynamic Window Type 1
- (10) `I002/090` - Collimation Error
- (11) `I002/080` - Warning/Error Conditions
- (12) `(spare)`
- (13) `I002/SP` - Special Purpose Field
- (14) `I002/RFS` - Random Field Sequencing
- `(FX)` - Field extension indicator