Asterix category 034 - Transmission of Monoradar Service Messages

category: 034

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Preamble

Surveillance data exchange.

Description of standard data items

I034/000 - 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: Geographical filtering message
    4: Jamming strobe message
    5: Solar Storm Message
    6: SSR Jamming Strobe Message
    7: Mode S Jamming Strobe Message

Notes:

1. In applications where transactions of various types are exchanged, the Message Type Data Item facilitates the proper message handling at the receiver side.
2. All Message Type values are reserved for common standard use.
3. The list of items present for the four message types is defined in the following table.
   M stands for mandatory, O for optional, X for never present.
   TODO: message types table

I034/010 - Data Source Identifier

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

Structure:

I034/010/SAC - *System Area Code*

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

I034/010/SIC - *System Identification Code*

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

Note:

- The up-to-date list of SACs is published on the EUROCONTROL Web Site (http://www.eurocontrol.int/asterix).

I034/020 - 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 °

I034/030 - 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:

- The time of day value is reset to zero each day at midnight.

I034/041 - 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

Notes:

- This item represents the antenna rotation period as measured by the radar station between two consecutive North crossings, or a calculated antenna rotation speed as averaged during a period of time, or during a number of antenna rotation scans.

I034/050 - System Configuration and Status

Definition: Information concerning the configuration and status of a System.

Structure:

Compound item (FX)

I034/050/COM - *Common Part*

I034/050/COM/NOGO - *Operational Release Status of the System*

- 1 bit [.]
- values:

  0: System is released for operational use
  1: Operational use of System is inhibited, i.e. the data shall be discarded by an operational SDPS

I034/050/COM/RDPC - *Radar Data Processor Chain Selection Status*

- 1 bit [.]
- values:

  0: RDPC-1 selected
  1: RDPC-2 selected

I034/050/COM/RDPR - *Event to Signal a Reset/restart of the Selected Radar Data Processor Chain, I.e. Expect a New Assignment of Track Numbers*

- 1 bit [.]
- values:

  0: Default situation
  1: Reset of RDPC

I034/050/COM/OVLRDP - *Radar Data Processor Overload Indicator*

- 1 bit [.]
- values:

  0: Default, no overload
  1: Overload in RDP

I034/050/COM/OVLXMT - *Transmission Subsystem Overload Status*

- 1 bit [.]
- values:

  0: Default, no overload
  1: Overload in transmission subsystem

I034/050/COM/MSC - *Monitoring System Connected Status*

- 1 bit [.]
- values:

  0: Monitoring system connected
  1: Monitoring system disconnected

I034/050/COM/TSV - *Time Source Validity*

- 1 bit [.]
- values:

  0: Valid
  1: Invalid

I034/050/COM/(spare)

- 1 bit [.]

(empty subitem)

(empty subitem)

I034/050/PSR - *Specific Status Information for a PSR Sensor*

I034/050/PSR/ANT - *Selected Antenna*

- 1 bit [.]
- values:
  0: Antenna 1
  1: Antenna 2

I034/050/PSR/CHAB - *Channel A/B Selection Status*

- 2 bits [. .]
- values:
  0: No channel selected
  1: Channel A only selected
  2: Channel B only selected
  3: Diversity mode ; Channel A and B selected

I034/050/PSR/OVL - *Overload Condition*

- 1 bit [.]
- values:
  0: No overload
  1: Overload

I034/050/PSR/MSC - *Monitoring System Connected Status*

- 1 bit [.]
- values:
  0: Monitoring system connected
  1: Monitoring system disconnected

I034/050/PSR/(spare)

- 3 bits [. . .]

I034/050/SSR - *Specific Status Information for a SSR Sensor*

I034/050/SSR/ANT - *Selected Antenna*

- 1 bit [.]
- values:
  0: Antenna 1
  1: Antenna 2

I034/050/SSR/CHAB - *Channel A/B Selection Status*

- 2 bits [. .]
- values:
  0: No channel selected
  1: Channel A only selected
  2: Channel B only selected
  3: Invalid combination

I034/050/SSR/OVL - *Overload Condition*

- 1 bit [.]
- values:
  0: No overload
  1: Overload

I034/050/SSR/MSC - *Monitoring System Connected Status:*

- 1 bit [.]
- values:
  0: Monitoring system connected
  1: Monitoring system disconnected

I034/050/SSR/(spare)

- 3 bits [. . .]

I034/050/MDS - *Specific Status Information for a Mode S Sensor*

I034/050/MDS/ANT - *Selected Antenna*

- 1 bit [.]
- values:
  - 0: Antenna 1
  - 1: Antenna 2

I034/050/MDS/CHAB - *Channel A/B Selection Status*

- 2 bits [. .]
- values:
  - 0: No channel selected
  - 1: Channel A only selected
  - 2: Channel B only selected
  - 3: Illegal combination

I034/050/MDS/OVLSUR - *Overload Condition*

- 1 bit [.]
- values:
  - 0: No overload
  - 1: Overload

I034/050/MDS/MSC - *Monitoring System Connected Status:*

- 1 bit [.]
- values:
  - 0: Monitoring system connected
  - 1: Monitoring system disconnected

I034/050/MDS/SCF - *Channel A/B Selection Status for Surveillance Co-ordination Function*

- 1 bit [.]
- values:
  - 0: Channel A in use
  - 1: Channel B in use

I034/050/MDS/DLF - *Channel A/B Selection Status for Data Link Function*

- 1 bit [.]
- values:
  - 0: Channel A in use
  - 1: Channel B in use

I034/050/MDS/OVLSCF - *Overload in Surveillance Co-ordination Function*

- 1 bit [.]
- values:
  - 0: No overload
  - 1: Overload

I034/050/MDS/OVLDLF - *Overload in Data Link Function*

- 1 bit [.]
- values:
  - 0: No overload
  - 1: Overload

I034/050/MDS/(spare)

- 7 bits [. . . . . .]

I034/060 - System Processing Mode

Definition: Status concerning the processing options, in use during the last antenna revolution, for the various Sensors, composing the System.

Structure:

Compound item (FX)

I034/060/COM - *Common Part*

I034/060/COM/(spare)

- 1 bit [.]

I034/060/COM/REDRDP - *Reduction Steps in Use for An Overload of the RDP*

- 3 bits [...]
- values:
  - 0: No reduction active
  - 1: Reduction step 1 active
  - 2: Reduction step 2 active
  - 3: Reduction step 3 active
  - 4: Reduction step 4 active
  - 5: Reduction step 5 active
  - 6: Reduction step 6 active
  - 7: Reduction step 7 active

I034/060/COM/REDXMT - *Reduction Steps in Use for An Overload of the Transmission Subsystem*

- 3 bits [...]
- values:
  - 0: No reduction active
  - 1: Reduction step 1 active
  - 2: Reduction step 2 active
  - 3: Reduction step 3 active
  - 4: Reduction step 4 active
  - 5: Reduction step 5 active
  - 6: Reduction step 6 active
  - 7: Reduction step 7 active

I034/060/COM/(spare)

- 1 bit [.]

(empty subitem)

(empty subitem)

I034/060/PSR - *Specific Processing Mode Information for a PSR Sensor*

I034/060/PSR/POL - *Polarization in Use by PSR*

- 1 bit [.]
- values:
  - 0: Linear polarization
  - 1: Circular polarization

I034/060/PSR/REDRAD - *Reduction Steps in Use as Result of An Overload Within the PSR Subsystem*

- 3 bits [...]
- values:

0: No reduction active
1: Reduction step 1 active
2: Reduction step 2 active
3: Reduction step 3 active
4: Reduction step 4 active
5: Reduction step 5 active
6: Reduction step 6 active
7: Reduction step 7 active

I034/060/PSR/STC - *Sensitivity Time Control Map in Use*

- 2 bits [. .]
- values:

0: STC Map-1
1: STC Map-2
2: STC Map-3
3: STC Map-4

I034/060/PSR/(spare)

- 2 bits [. .]

I034/060/SSR - *Specific Processing Mode Information for a SSR Sensor*

I034/060/SSR/REDRAD - *Reduction Steps in Use as Result of An Overload Within the SSR Subsystem*

- 3 bits [. . .]
- values:

0: No reduction active
1: Reduction step 1 active
2: Reduction step 2 active
3: Reduction step 3 active
4: Reduction step 4 active
5: Reduction step 5 active
6: Reduction step 6 active
7: Reduction step 7 active

I034/060/SSR/(spare)

- 5 bits [. . . . .]

I034/060/MDS - *Specific Processing Mode Information for a Mode S Sensor*

I034/060/MDS/REDRAD - *Reduction Steps in Use as Result of An Overload Within the Mode S Subsystem*

- 3 bits [. . .]
- values:

0: No reduction active
1: Reduction step 1 active
2: Reduction step 2 active
3: Reduction step 3 active
4: Reduction step 4 active
5: Reduction step 5 active
6: Reduction step 6 active
7: Reduction step 7 active

I034/060/MDS/CLU - *Cluster State*

- 1 bit [.]
- values:

0: Autonomous
1: Not autonomous

I034/060/MDS/(spare)

- 4 bits [. . . .]

Notes:

- Applicable to all defined secondary subfields. The actual mapping between the up to seven data reduction steps and their associated data reduction measures is not subject to standardisation.

I034/070 - Message Count Values

Definition: Message Count values, according the various types of messages, for the last completed antenna revolution, counted between two North crossings

Structure:

Repetitive item, repetition factor 8 bits.

I034/070/TYP - *Type of Message Counter*

- 5 bits [. . . . .]
- values:

  0: No detection (number of misses)
  1: Single PSR target reports
  2: Single SSR target reports (Non-Mode S)
  3: SSR+PSR target reports (Non-Mode S)
  4: Single All-Call target reports (Mode S)
  5: Single Roll-Call target reports (Mode S)
  6: All-Call + PSR (Mode S) target reports
  7: Roll-Call + PSR (Mode S) target reports
  8: Filter for Weather data
  9: Filter for Jamming Strobe
  10: Filter for PSR data
  11: Filter for SSR/Mode S data
  12: Filter for SSR/Mode S+PSR data
  13: Filter for Enhanced Surveillance data
  14: Filter for PSR+Enhanced Surveillance
  15: Filter for PSR+Enhanced Surveillance + SSR/Mode S data not in Area of Prime Interest
  16: Filter for PSR+Enhanced Surveillance + all SSR/Mode S data
  17: Re-Interrogations (per sector)
  18: BDS Swap and wrong DF replies(per sector)
  19: Mode A/C FRUIT (per sector)
  20: Mode S FRUIT (per sector)

I034/070/COUNT - *COUNTER*

- 11 bits [. . . . . .]
- unsigned integer

I034/090 - 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:

I034/090/RNG - *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

I034/090/AZM - *Azimuth Error*

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

Notes:

- Negative values are coded in two’s complement form.

I034/100 - Generic Polar Window

Definition: Geographical window defined in polar co-ordinates.

Structure:

I034/100/RHOST - *Rho Start*

- 16 bits [. . . . .]
- unsigned quantity
- scaling factor: 1
- fractional bits: 8
- unit: ”NM”
- LSB = $1/2^{8}$ NM = $1/256$ NM $\approx 3.90625e-3$ NM
- value $<=$ 256 NM

I034/100/RHOEND - *Rho End*

- 16 bits [. . . . .]
- unsigned quantity
- scaling factor: 1
- fractional bits: 8
- unit: ”NM”
- LSB = $1/2^{8}$ NM = $1/256$ NM $\approx 3.90625e-3$ NM
- value $<=$ 256 NM

I034/100/THETAST - *Theta Start*

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

I034/100/THETAEND - *Theta End*

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

I034/110 - Data Filter

Definition: Data Filter, which allows suppression of individual data types.

Structure:

- 8 bits [. . . . .]
- values:

  0: Invalid value
  1: Filter for Weather data
  2: Filter for Jamming Strobe
  3: Filter for PSR data
  4: Filter for SSR/Mode S data
  5: Filter for SSR/Mode S + PSR data
  6: Enhanced Surveillance data
  7: Filter for PSR+Enhanced Surveillance data
  8: Filter for PSR+Enhanced Surveillance + SSR/Mode S data not in Area of Prime Interest
  9: Filter for PSR+Enhanced Surveillance + all SSR/Mode S data

Notes:

1. This Data Item is often used in conjunction with I034/100 and represents a Data Filter for a specific geographical subarea. A Data Source may have zero, one or multiple data filters active at any time.
2. If I034/110 is not accompanied with I034/100, then the Data Filter is valid throughout the total area of coverage.

I034/120 - 3D-Position Of Data Source

Definition: 3D-Position of Data Source in WGS 84 Co-ordinates

Structure:

I034/120/HGT - *Height of Data Source*

- 16 bits [. . . . .]
- unsigned quantity
- scaling factor: 1
- fractional bits: 0
- unit: ”m”
- LSB = 1 m

I034/120/LAT - *Latitude*

- 24 bits [. . . . .]
- signed quantity
- scaling factor: 180
- fractional bits: 23
- unit: ”°”
- LSB = $180/2^{23}$ ° = $180/8388608$ ° $\approx 2.1457672119140625e-5$ °
- value $>= -90$ °
- value $<= 90$ °

I034/120/LON - *Longitude*

- 24 bits [. . . . .]
- signed quantity
- scaling factor: 180

- fractional bits: 23
- unit: "°"
- LSB = $180/2^{23}$ ° = $180/8388608$ ° ≈ $2.1457672119140625e-5$ °
- value >= -180 °
- value <= 180 °

I034/RE - Reserved Expansion Field

Definition: Expansion

Structure:

Explicit item (RE)

I034/SP - Special Purpose Field

Definition: Special Purpose Field

Structure:

Explicit item (SP)

User Application Profile for Category 034

- (1) `I034/010` - Data Source Identifier
- (2) `I034/000` - Message Type
- (3) `I034/030` - Time of Day
- (4) `I034/020` - Sector Number
- (5) `I034/041` - Antenna Rotation Speed
- (6) `I034/050` - System Configuration and Status
- (7) `I034/060` - System Processing Mode
- `(FX)` - Field extension indicator
- (8) `I034/070` - Message Count Values
- (9) `I034/100` - Generic Polar Window
- (10) `I034/110` - Data Filter
- (11) `I034/120` - 3D-Position Of Data Source
- (12) `I034/090` - Collimation Error
- (13) `I034/RE` - Reserved Expansion Field
- (14) `I034/SP` - Special Purpose Field
- `(FX)` - Field extension indicator