

Asterix category 025 - CNS/ATM Ground System Status Reports

category: 025

edition: 1.5

date: 2021-07-01

Preamble

Surveillance data exchange.

Description of standard data items

I025/000 - Report Type

definition: This Data Item allows for a more convenient handling of the reports at the receiver side by further defining the type of transaction.

Group

I025/000/RTYP - Report Type

Element

bit size: 7

Raw Content

I025/000/RG - Report Generation

Element

bit size: 1

Values:

0: Periodic Report

1: Event Driven Report

Notes:

1. In applications where transactions of various types are exchanged, the Report Type Data Item facilitates the proper report handling at the receiver side.
2. All Report Type values are reserved for common standard use.
3. **The following set of Report Types are standardised for Category 025 records:**
 - 001 Service and System Status report (see 4.5.1.1. above)
 - 002 Component Status report (see 4.5.1.2. above)
 - 003 Service Statistics report (see 4.5.1.3. above)
4. The list of items present for the three report types is defined in the following table. M stands for mandatory, O for optional, X for never present.

:

Item	001	002	003
I025/000	M	M	M
I025/010	M	M	M
I025/015	M	X	M
I025/020	O	X	O
I025/070	M	M	M
I025/100	O	X	X
I025/105	O	X	X
I025/120	O	M	X
I025/140	X	X	M

I025/200	0	0	0
I025/600	0 (See Note)	0	X
I025/610	0 (See Note)	0	X

5. With Edition 1.3 of this specification the Encoding Rules for Data Item I025/600 and I025/610 in Message Type 001 have been changed from "Mandatory" to "Optional". Before changing the data source such that the encoding of these Data Items is changed from "included" to "not included" it needs to be ensured that downstream systems do not apply "Mandatory Item Checks". Otherwise this may lead to suppression of the Category 025 Record by the receiving system.

I025/010 - Data Source Identifier

definition: Identification of the Ground System from which the data is received.

Group

I025/010/SAC - System Area Code

Element

bit size: 8

Raw Content

I025/010/SIC - System Identification Code

Element

bit size: 8

Raw Content

Notes:

1. The up-to-date list of SACs is published on the EUROCONTROL Web Site (<http://www.eurocontrol.int/asterix>).
2. The SICs are allocated by the national authority responsible for the surveillance infrastructure.

I025/015 - Service Identification

definition: Identifies the service being reported.

Element

bit size: 8

Raw Content

Note:

- The service identification is allocated by the system.

I025/020 - Service Designator

definition: Designator of the service being reported.

Element

bit size: 48

ICAO string (6-bits per char)

Notes:

1. bits-48/1 Service Designator. Characters 1-8 (coded on 6 Bits each) defining the text readable designator for each Service. Each character of the service designator is encoded as defined below (see ICAO Annex 10, Volume IV, page 3-77, table 3-9): :

.	.	.	.	b6	0	0	1	1
.	.	.	.	b5	0	1	0	1
b4	b3	b2	b1					
0	0	0	0			P	SP	0
0	0	0	1		A	Q		1
0	0	1	0		B	R		2
0	0	1	1		C	S		3
0	1	0	0		D	T		4
0	1	0	1		E	U		5
0	1	1	0		F	V		6
0	1	1	1		G	W		7
1	0	0	0		H	X		8
1	0	0	1		I	Y		9
1	0	1	0		J	Z		
1	0	1	1		K			
1	1	0	0		L			
1	1	0	1		M			
1	1	1	0		N			
1	1	1	1		O			

SP 1 = SPACE code For each character the following bit numbering convention shall be observed:

b6 b5 b4 b3 b2 b1

2. Assignments of Service designators to specific services/systems and interpretation of these fields are implementation dependent.
3. Examples of Service Designators are "1090ADSB", "WAM", "1090TISB", etc.
4. Multiple Service Type Designators may be used to describe a single service where applicable

I025/070 - Time of Day

definition: Absolute time stamping expressed as UTC time.

Element

bit size: 24

Unsigned quantity

LSB = $1/2^7$ s $\approx 7.8125e-3$ s

unit: "s"

Note:

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

I025/100 - System and Service Status

definition: Information concerning the status of the Service Volume.

Extended

I025/100/NOGO

Element

bit size: 1

Values:

0: Data is released for operational use

1: Data must not be used operationally

I025/100/OPS

Element

bit size: 2

Values:

- 0: Operational
- 1: Operational but in Standby
- 2: Maintenance
- 3: Reserved for future use

I025/100/SSTAT

Element

bit size: 4

Values:

- 0: Running
- 1: Failed
- 2: Degraded
- 3: Undefined
- 4: Reserved for future use
- 5: Reserved for future use
- 6: Reserved for future use
- 7: Reserved for future use
- 8: Reserved for future use
- 9: Reserved for future use
- 10: Reserved for future use
- 11: Reserved for future use
- 12: Reserved for future use
- 13: Reserved for future use
- 14: Reserved for future use
- 15: Reserved for future use

(FX) - extension bit

Spare bits: 1

I025/100/SYSTAT

Element

bit size: 3

Values:

- 0: Running / OK
- 1: Failed
- 2: Degraded
- 3: Undefined
- 4: Reserved for future use
- 5: Reserved for future use
- 6: Reserved for future use
- 7: Reserved for future use

I025/100/SESTAT

Element

bit size: 3

Values:

- 0: OK
- 1: Failed
- 2: Degraded
- 3: Undefined
- 4: Reserved for future use
- 5: Reserved for future use
- 6: Reserved for future use
- 7: Reserved for future use

(FX) - extension bit

Notes:

1. Bit 8 (NOGO), when set to "1" indicates that the data transmitted by the system/service is not released for operational use. This indication is independent from the status of the system itself or that of the service. It just indicates that the system or service volume output must not be used

- for operational services but may be used for, e.g. test and validation purposes. The indication GO/NO-GO indicates a mode of the system rather than a status. Usually this bit will be set by operator input.
2. Bit 7/6 (OPS), when set to "1" indicates that the service is running but not operationally used (e.g. for a standby system in a redundant configuration).
 3. Bits 5/2 (SSTAT): This information informs about the state of the overall service volume status. The actual implementation of this field is service dependent and should be described in the system/service specification. However, it is expected that - as far as this information is available - a mapping is performed between the states of individual components as reported in data item I025/120. As an example, if one component fails but the system is still operational (at least partially), the service status should change to "Degraded".
 4. To bit 7 (ERR): This bit set to "1" indicates that the range of the target is beyond the maximum range in data item I048/040. In this case - and this case only - the ERR Data Item in the Reserved Expansion Field shall provide the range value of the Measured Position in Polar Coordinates.
 5. This octet allows to separate reporting of the system and the service status as in particular in distributed systems it is possible that the degraded system state may not have an impact on the service state. For reasons of backwards compatibility (for systems that are not yet capable to decode the first extension), the system and service status shall be propagated to the field SSTAT in the primary part of I025/100, bits 5/2 according to the following table: :

SeSTAT	SySTAT	SSTAT
0	0	0
0	1	1
0	2	2
0	3	1
1	0	1
1	1	1
1	2	1
1	3	1
2	0	2
2	1	1
2	2	2
2	3	1
3	0	1
3	1	1
3	2	1
3	3	1

The value of 3 'Undefined' is assumed to represent that the status cannot be determined. This inherently indicates a failure in system monitoring. Therefore, a value of 3 'Undefined' is equivalent to 1 'Failed', leading to rejection of data and prompting maintenance/operator investigation to occur.

The population of SSTAT is determined to be the worst-case combination of SeSTAT and SySTAT, taking into account Note 1, where the hierarchy of best to worst case is as follows: Running, Degraded, Failed.

I025/105 - System and Service Error Codes

definition: Error Status of the System and the Service.

Repetitive

Regular, 1 byte(s) REP field size.

Element

bit size: 8

Values:

- 0:** No error detected (shall not be sent)
- 1:** Error Code Undefined
- 2:** Time Source Invalid
- 3:** Time Source Coasting
- 4:** Track ID numbering has restarted
- 5:** Data Processor Overload
- 6:** Ground Interface Data Communications Overload
- 7:** System stopped by operator
- 8:** CBIT failed
- 9:** Test Target Failure
- 10:** Reserved for allocation by the AMG
- 11:** Reserved for allocation by the AMG
- 12:** Reserved for allocation by the AMG
- 13:** Reserved for allocation by the AMG
- 14:** Reserved for allocation by the AMG
- 15:** Reserved for allocation by the AMG
- 16:** Reserved for allocation by the AMG
- 17:** Reserved for allocation by the AMG
- 18:** Reserved for allocation by the AMG
- 19:** Reserved for allocation by the AMG
- 20:** Reserved for allocation by the AMG
- 21:** Reserved for allocation by the AMG
- 22:** Reserved for allocation by the AMG
- 23:** Reserved for allocation by the AMG
- 24:** Reserved for allocation by the AMG
- 25:** Reserved for allocation by the AMG
- 26:** Reserved for allocation by the AMG
- 27:** Reserved for allocation by the AMG
- 28:** Reserved for allocation by the AMG
- 29:** Reserved for allocation by the AMG
- 30:** Reserved for allocation by the AMG
- 31:** Reserved for allocation by the AMG
- 32:** Reserved for allocation by system manufacturers
- 33:** Reserved for allocation by system manufacturers
- 34:** Reserved for allocation by system manufacturers
- 35:** Reserved for allocation by system manufacturers
- 36:** Reserved for allocation by system manufacturers
- 37:** Reserved for allocation by system manufacturers
- 38:** Reserved for allocation by system manufacturers
- 39:** Reserved for allocation by system manufacturers
- 40:** Reserved for allocation by system manufacturers
- 41:** Reserved for allocation by system manufacturers
- 42:** Reserved for allocation by system manufacturers
- 43:** Reserved for allocation by system manufacturers
- 44:** Reserved for allocation by system manufacturers
- 45:** Reserved for allocation by system manufacturers
- 46:** Reserved for allocation by system manufacturers
- 47:** Reserved for allocation by system manufacturers
- 48:** Reserved for allocation by system manufacturers
- 49:** Reserved for allocation by system manufacturers
- 50:** Reserved for allocation by system manufacturers
- 51:** Reserved for allocation by system manufacturers
- 52:** Reserved for allocation by system manufacturers
- 53:** Reserved for allocation by system manufacturers
- 54:** Reserved for allocation by system manufacturers
- 55:** Reserved for allocation by system manufacturers
- 56:** Reserved for allocation by system manufacturers
- 57:** Reserved for allocation by system manufacturers

[illegible]

[illegible]

[illegible]

241: Reserved for allocation by system manufacturers
242: Reserved for allocation by system manufacturers
243: Reserved for allocation by system manufacturers
244: Reserved for allocation by system manufacturers
245: Reserved for allocation by system manufacturers
246: Reserved for allocation by system manufacturers
247: Reserved for allocation by system manufacturers
248: Reserved for allocation by system manufacturers
249: Reserved for allocation by system manufacturers
250: Reserved for allocation by system manufacturers
251: Reserved for allocation by system manufacturers
252: Reserved for allocation by system manufacturers
253: Reserved for allocation by system manufacturers
254: Reserved for allocation by system manufacturers
255: Reserved for allocation by system manufacturers

Notes:

1. The Warning & Error codes contain information about the reason why the System and Service State (SSTAT in item I025/100) is different from "running".
2. A time source is considered as valid when either externally synchronised or running on a local oscillator within the required accuracy of UTC.
3. A value of 4 indicates that the allocation of Track-IDs was re-started.
4. Multiple error codes can be transmitted within the same ASTERIX record.
5. Error codes in the range 0 to 31 shall be allocated centrally by the AMG. Error codes in the range from 32 to 255 are available for specification by the system manufacturers. They are not standardised and shall be described in the Interface Control Document (ICD) of the respective system.

I025/120 - Component Status

definition: Indications of status of various system components and, when applicable, error codes.

Repetitive

Regular, 1 byte(s) REP field size.

Group

I025/120/CID - Component ID

Element

bit size: 16

Raw Content

I025/120/ERRC - Error Code

Element

bit size: 6

Values:

- 0:** No Error Detected
- 1:** Error Code Undefined
- 2:** Reserved for allocation by the AMG
- 3:** Reserved for allocation by the AMG
- 4:** Reserved for allocation by the AMG
- 5:** Reserved for allocation by the AMG
- 6:** Reserved for allocation by the AMG
- 7:** Reserved for allocation by the AMG
- 8:** Reserved for allocation by the AMG
- 9:** Reserved for allocation by the AMG
- 10:** Reserved for allocation by the AMG
- 11:** Reserved for allocation by the AMG

12: Reserved for allocation by the AMG
13: Reserved for allocation by the AMG
14: Reserved for allocation by the AMG
15: Reserved for allocation by the AMG
16: Reserved for allocation by system manufacturers
17: Reserved for allocation by system manufacturers
18: Reserved for allocation by system manufacturers
19: Reserved for allocation by system manufacturers
20: Reserved for allocation by system manufacturers
21: Reserved for allocation by system manufacturers
22: Reserved for allocation by system manufacturers
23: Reserved for allocation by system manufacturers
24: Reserved for allocation by system manufacturers
25: Reserved for allocation by system manufacturers
26: Reserved for allocation by system manufacturers
27: Reserved for allocation by system manufacturers
28: Reserved for allocation by system manufacturers
29: Reserved for allocation by system manufacturers
30: Reserved for allocation by system manufacturers
31: Reserved for allocation by system manufacturers
32: Reserved for allocation by system manufacturers
33: Reserved for allocation by system manufacturers
34: Reserved for allocation by system manufacturers
35: Reserved for allocation by system manufacturers
36: Reserved for allocation by system manufacturers
37: Reserved for allocation by system manufacturers
38: Reserved for allocation by system manufacturers
39: Reserved for allocation by system manufacturers
40: Reserved for allocation by system manufacturers
41: Reserved for allocation by system manufacturers
42: Reserved for allocation by system manufacturers
43: Reserved for allocation by system manufacturers
44: Reserved for allocation by system manufacturers
45: Reserved for allocation by system manufacturers
46: Reserved for allocation by system manufacturers
47: Reserved for allocation by system manufacturers
48: Reserved for allocation by system manufacturers
49: Reserved for allocation by system manufacturers
50: Reserved for allocation by system manufacturers
51: Reserved for allocation by system manufacturers
52: Reserved for allocation by system manufacturers
53: Reserved for allocation by system manufacturers
54: Reserved for allocation by system manufacturers
55: Reserved for allocation by system manufacturers
56: Reserved for allocation by system manufacturers
57: Reserved for allocation by system manufacturers
58: Reserved for allocation by system manufacturers
59: Reserved for allocation by system manufacturers
60: Reserved for allocation by system manufacturers
61: Reserved for allocation by system manufacturers
62: Reserved for allocation by system manufacturers
63: Reserved for allocation by system manufacturers

I025/120/CS - Component State/Mode

Element

bit size: 2

Values:

- 0: Running
- 1: Failed
- 2: Maintenance
- 3: Reserved

Note:

- Error codes in the range 2 to 15 shall be allocated centrally by the AMG. Error codes in the range from 16 to 63 are available for specification by the system manufacturers. They are not standardised and shall be described in the Interface Control Document (ICD) of the respective system.

I025/140 - Service Statistics

definition: Statistics concerning the service. Provides counts of various message types that have been received since the report was last sent.

Repetitive

Regular, 1 byte(s) REP field size.

Group

I025/140/TYPE - Type of Report Counter

Element

bit size: 8

Values:

- 0:** Number of unknown messages received
- 1:** Number of too old messages received
- 2:** Number of failed message conversions
- 3:** Total Number of messages received
- 4:** Total number of messages transmitted
- 5:** Reserved for AMG
- 6:** Reserved for AMG
- 7:** Reserved for AMG
- 8:** Reserved for AMG
- 9:** Reserved for AMG
- 10:** Reserved for AMG
- 11:** Reserved for AMG
- 12:** Reserved for AMG
- 13:** Reserved for AMG
- 14:** Reserved for AMG
- 15:** Reserved for AMG
- 16:** Reserved for AMG
- 17:** Reserved for AMG
- 18:** Reserved for AMG
- 19:** Reserved for AMG
- 20:** Implementation specific
- 21:** Implementation specific
- 22:** Implementation specific
- 23:** Implementation specific
- 24:** Implementation specific
- 25:** Implementation specific
- 26:** Implementation specific
- 27:** Implementation specific
- 28:** Implementation specific
- 29:** Implementation specific
- 30:** Implementation specific
- 31:** Implementation specific
- 32:** Implementation specific
- 33:** Implementation specific
- 34:** Implementation specific
- 35:** Implementation specific
- 36:** Implementation specific
- 37:** Implementation specific
- 38:** Implementation specific
- 39:** Implementation specific
- 40:** Implementation specific

41: Implementation specific
42: Implementation specific
43: Implementation specific
44: Implementation specific
45: Implementation specific
46: Implementation specific
47: Implementation specific
48: Implementation specific
49: Implementation specific
50: Implementation specific
51: Implementation specific
52: Implementation specific
53: Implementation specific
54: Implementation specific
55: Implementation specific
56: Implementation specific
57: Implementation specific
58: Implementation specific
59: Implementation specific
60: Implementation specific
61: Implementation specific
62: Implementation specific
63: Implementation specific
64: Implementation specific
65: Implementation specific
66: Implementation specific
67: Implementation specific
68: Implementation specific
69: Implementation specific
70: Implementation specific
71: Implementation specific
72: Implementation specific
73: Implementation specific
74: Implementation specific
75: Implementation specific
76: Implementation specific
77: Implementation specific
78: Implementation specific
79: Implementation specific
80: Implementation specific
81: Implementation specific
82: Implementation specific
83: Implementation specific
84: Implementation specific
85: Implementation specific
86: Implementation specific
87: Implementation specific
88: Implementation specific
89: Implementation specific
90: Implementation specific
91: Implementation specific
92: Implementation specific
93: Implementation specific
94: Implementation specific
95: Implementation specific
96: Implementation specific
97: Implementation specific
98: Implementation specific
99: Implementation specific
100: Implementation specific
101: Implementation specific

102: Implementation specific
103: Implementation specific
104: Implementation specific
105: Implementation specific
106: Implementation specific
107: Implementation specific
108: Implementation specific
109: Implementation specific
110: Implementation specific
111: Implementation specific
112: Implementation specific
113: Implementation specific
114: Implementation specific
115: Implementation specific
116: Implementation specific
117: Implementation specific
118: Implementation specific
119: Implementation specific
120: Implementation specific
121: Implementation specific
122: Implementation specific
123: Implementation specific
124: Implementation specific
125: Implementation specific
126: Implementation specific
127: Implementation specific
128: Implementation specific
129: Implementation specific
130: Implementation specific
131: Implementation specific
132: Implementation specific
133: Implementation specific
134: Implementation specific
135: Implementation specific
136: Implementation specific
137: Implementation specific
138: Implementation specific
139: Implementation specific
140: Implementation specific
141: Implementation specific
142: Implementation specific
143: Implementation specific
144: Implementation specific
145: Implementation specific
146: Implementation specific
147: Implementation specific
148: Implementation specific
149: Implementation specific
150: Implementation specific
151: Implementation specific
152: Implementation specific
153: Implementation specific
154: Implementation specific
155: Implementation specific
156: Implementation specific
157: Implementation specific
158: Implementation specific
159: Implementation specific
160: Implementation specific
161: Implementation specific
162: Implementation specific

163: Implementation specific
164: Implementation specific
165: Implementation specific
166: Implementation specific
167: Implementation specific
168: Implementation specific
169: Implementation specific
170: Implementation specific
171: Implementation specific
172: Implementation specific
173: Implementation specific
174: Implementation specific
175: Implementation specific
176: Implementation specific
177: Implementation specific
178: Implementation specific
179: Implementation specific
180: Implementation specific
181: Implementation specific
182: Implementation specific
183: Implementation specific
184: Implementation specific
185: Implementation specific
186: Implementation specific
187: Implementation specific
188: Implementation specific
189: Implementation specific
190: Implementation specific
191: Implementation specific
192: Implementation specific
193: Implementation specific
194: Implementation specific
195: Implementation specific
196: Implementation specific
197: Implementation specific
198: Implementation specific
199: Implementation specific
200: Implementation specific
201: Implementation specific
202: Implementation specific
203: Implementation specific
204: Implementation specific
205: Implementation specific
206: Implementation specific
207: Implementation specific
208: Implementation specific
209: Implementation specific
210: Implementation specific
211: Implementation specific
212: Implementation specific
213: Implementation specific
214: Implementation specific
215: Implementation specific
216: Implementation specific
217: Implementation specific
218: Implementation specific
219: Implementation specific
220: Implementation specific
221: Implementation specific
222: Implementation specific
223: Implementation specific

224: Implementation specific
 225: Implementation specific
 226: Implementation specific
 227: Implementation specific
 228: Implementation specific
 229: Implementation specific
 230: Implementation specific
 231: Implementation specific
 232: Implementation specific
 233: Implementation specific
 234: Implementation specific
 235: Implementation specific
 236: Implementation specific
 237: Implementation specific
 238: Implementation specific
 239: Implementation specific
 240: Implementation specific
 241: Implementation specific
 242: Implementation specific
 243: Implementation specific
 244: Implementation specific
 245: Implementation specific
 246: Implementation specific
 247: Implementation specific
 248: Implementation specific
 249: Implementation specific
 250: Implementation specific
 251: Implementation specific
 252: Implementation specific
 253: Implementation specific
 254: Implementation specific
 255: Implementation specific

I025/140/REF - Reference from which the Messages Are Counted

Element

bit size: 1

Values:

0: From UTC midnight

1: From the previous report

Spare bits: 7

I025/140/COUNT - Counter Value

Element

bit size: 32

Unsigned integer

Note:

- There is no special significance attributed to the numbering of the TYPE field. However the range from 0 to 19 is intended to cover generic messages which may be applicable to many types of service.

I025/200 - Message Identification

definition: Identification of a unique message.

Element

bit size: 24

Unsigned integer

Notes:

1. The Message Identification Number is to be used to uniquely identify each message. If messages are being sent on redundant links then this number shall be identical for the same message on each link. This will allow the receiver to easily identify and discard duplicate messages.
2. It is not required that Message Identification Numbers be assigned in ascending order by time of message transmission.

I025/600 - Position of the System Reference Point

definition: Position of the reference point in WGS-84 Coordinates.

Group

I025/600/LAT - Latitude

Element

bit size: 32

Signed quantity

LSB = $180/2^{32} \text{ }^\circ \approx 4.1909515857696533203125e - 8 \text{ }^\circ$

unit: "°"

≥ -90.0

< 90.0

I025/600/LON - Longitude

Element

bit size: 32

Signed quantity

LSB = $180/2^{32} \text{ }^\circ \approx 4.1909515857696533203125e - 8 \text{ }^\circ$

unit: "°"

≥ -180.0

< 180.0

Notes:

- Positive longitude indicates East. Positive latitude indicates North.

I025/610 - Height of the System Reference Point

definition: Height of the system reference point in two's complement form. The height shall use mean sea level as the zero reference level.

Element

bit size: 16

Signed quantity

LSB = $1/2^2 \text{ m} \approx 0.25 \text{ m}$

unit: "m"

≥ -8192.0

≤ 8191.75

Notes:

- Item I025/610 shall only be sent together with item I025/600 "Position of the System Reference Point".

I025/SP - Special Purpose Field

definition: Special Purpose Field

Explicit (SpecialPurpose)

User Application Profile

- 1: I025/010 - Data Source Identifier
- 2: I025/000 - Report Type
- 3: I025/200 - Message Identification
- 4: I025/015 - Service Identification
- 5: I025/020 - Service Designator
- 6: I025/070 - Time of Day
- 7: I025/100 - System and Service Status
- (FX) - Field extension indicator
- 8: I025/105 - System and Service Error Codes
- 9: I025/120 - Component Status
- 10: I025/140 - Service Statistics
- 11: I025/SP - Special Purpose Field
- 12: I025/600 - Position of the System Reference Point
- 13: I025/610 - Height of the System Reference Point
- *Spare*
- (FX) - Field extension indicator