



Interface Requirements Specification / Interface Design Description Nautical Radar (Radar Distribution Layer RDL)

Nautical Radar Asterix Cat 240

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1 Scope

1.1 Identification

This document is identified as **IRSIDD.RDL**

1.1.1 RDL

Radar Distribution Layer, abbreviated as RDL, is the name of Rijkswaterstaat's new central distribution system that will distribute nautical radar data obtained from radar sensors in radar video format (CAT240) to customers.

This document contains both the Interface Requirements Specification (IRS) and the Interface Design Description (IDD) for the interface between:

1. The RDL and the radar sensors from which RDL receives data
2. The RDL and connected systems

1.1.2 Purpose of the IRS-IDD

This IRS-IDD describes both the specifications of the interfaces, as well as their design. The IRS-IDD is an adaptation of the J-STD-016 standard for RWS and applies when both the specification and design are prepared by the same party.

1.1.3 Document structure

Chapter 2 contains references to other documents.

Chapters 3 and 4 describe the various interface components. This is broken down into general requirements and requirements specific to the transport medium chosen.

Chapter 4 describes how the various IRSIDDs will be tested.

Chapter 6 traces local requirements to higher-order requirements.

Chapter 7 provides an overview of definitions and abbreviations for the document.

1.1.4 Reader's guide


Requirements for the RDL interface can be identified by the prefix "RDL-".

1.1.5 Security and intellectual property

See the copyright notice stated on the front page.

2 Documents cited

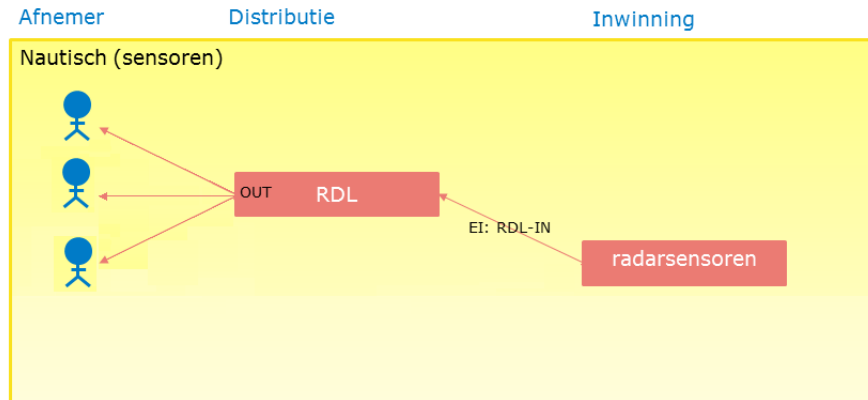
2.1 Normative documents

Reference	Description	
[EUROCONTROL-SPEC-0149-240]	EUROCONTROL Specification for Surveillance Data Exchange ASTERIX Category 240 Radar Video Transmission, version 1.3, 13 May 2015.	 CAT240.pdf

2.2 Informative documents

3 Interfaces (requirements)

3.1 Interface identification and diagrams



[Figure: external interfaces RDL]

EI RDL-IN refers to the interface between the RDL and the radar sensors.

EI RDL-OUT refers to the interface between the RDL and the receiving system of the data receivers.

RDL-INOUT refers to both interfaces.

3.2 RDL-INOUT

3.2.1 Requirements

RDL-INOUT.CAT240.ALGEMEEN VIDEO MESSAGES

The RDL-INOUT interface must use the data items for 002 video messages, as described in [EUROCONTROL-SPEC-0149-240].

Explanation:

001 video summary messages are effectively not used in the RDL-INOUT interface. That means they may be in the CAT240 streams, but their content has no meaning that could be used operationally. These 001 video summary messages can therefore be ignored by the data receivers.

Important definitions in [EUROCONTROL-SPEC-0149-240] include:

Cell: The elementary information of radar video amplitude; each cell is defined by its range, azimuth and amplitude.

Cell range: A slant range polar co-ordinate based on the propagation time of radar signal from the radar site location to the cell (Radar site location serves as the origin of the polar coordinate system).

Cell azimuth: An azimuth polar co-ordinate based on the azimuth of the burst, or the radar recurrence. The reference for the azimuth shall be local geographical north.

Cell amplitude: Based on digital level or digitised analogous signal.

RDL-INOUT.CAT240.MANDATORY

The RDL-INOUT interface must use the required (**Mandatory**) data items for 002 video messages, as described in [EUROCONTROL-SPEC-0149-240], see the table below.

Explanation:

Fields marked as **X** (not used) in [EUROCONTROL-SPEC-0149-240] are obviously not used in RDL-INOUT.

Fields marked as **O** (optional) in [EUROCONTROL-SPEC-0149-240] are specified in requirement RDL-INOUT.CAT240.OPTIONAL.

Type Item	002 Video Message
I240/000 Message Type	M
I240/010 Data Source Identifier	M
I240/020 Video Record Header	M
I240/030 Video Summary	X
I240/040 Video Header Nano	O ¹
I240/041 Video Header Femto	O ¹
I240/048 Video Cells Resolution & Data Compression Indicator	M
I240/049 Video Octets & Video Cells Counters	M
I240/050 Video Block Low Data Volume	O ²
I240/051 Video Block Medium Data Volume	O ²
I240/052 Video Block High Data Volume	O ²
I240/140 Time of Day	O

¹ Either Item I240/040 or I240/041 shall be present in each Video Message

² Either Item I240/050 or I240/051 or I240/052 shall be present in each video message

RDL-INOUT.CAT240.I240/000

The Message Type field must have the value **002**.

Summary

Data Item 1240/010 SAC:004 SIC:000

Data Item 1240/000 MSG_TYPE:VIDEO_MESSAGE

Data Item 1240/020 MSG_INDEX:859875421

Data Item 1240/041 AZ:116.46 116.54 RG:0.00

Data Item 1240/048 RES:8-BITS DCI

Data Item 1240/049 OCTET:292 CELL:3720

Data Item 1240/051 OCTET:320 CELL:320

Data Item 1240/140 TOD:12:25:15.195

0000 F0 01 63 e7 a8 04 00 02 33 40 a8 5d 52 d0 52 e0 ..c.....38.]R.R.
0010 00 00 00 00 01 31 15 95 80 04 01 24 00 0e 88 051.....8....
0020 78 01 ed 56 e9 6e 83 30 0c ce 8b 8c 98 10 72 91 x..V.n.0.....E.
0030 40 39 aa b2 22 a1 d1 45 eb 2e 6d 3f a6 bd ff ab 89..".E..m?....
0040 2c 6d e9 54 81 54 55 aa 4a 3b 86 ff e0 f8 f8 ec /m.T.TU.J.....
0050 d8 91 31 42 7f 83 4c 74 cb 79 86 59 d2 4b 8f 2d ..1B..Lt.y.Y.K.-
0060 e7 4e 46 21 89 19 47 bc 79 7a ac 63 84 4c ba b3 .NF!..G.yz.c.L..
0070 03 2e 67 f7 eb ef af f5 ca 39 9a 99 5d 55 75 6d ..g.....9..]Uum
0080 ed 62 0f 12 65 9a b6 3c 4b 1e 3e 3f de 5f 5f 72 ..b..e.<K>?.._r
0090 64 0a c1 88 2e cb 32 56 5a 16 da e9 f9 de 7e fa d....2VZ.....-
00a0 5e a1 02 52 f9 83 44 d5 8b 14 5f 30 50 e7 12 bc ^..R..D..._0P..
00b0 73 3e 23 32 e8 e0 0c ef 1b 70 15 f2 68 12 aa a7 s>#2.....p..h...
00c0 26 3d c9 51 80 7f ac dc 8c b7 60 ee 26 e2 58 c8 &=Q.....'.6.X.
00d0 54 e5 d4 fc 6d 33 3d e5 53 16 a8 48 79 c0 d9 56 T...m3=.S..Hy..V
00e0 92 e5 10 20 aa 43 77 80 bb c3 86 e3 13 06 5b c7Cw.....[.
00f0 84 68 01 f2 f7 ef d8 82 41 d5 d8 65 61 9b ec 10 ..h.....A...ea..
0100 7c e2 c7 52 01 35 c8 f2 27 c5 ae 5e 42 85 18 4f |..R.S..'.^B..0
0110 ab d5 60 8f a7 78 7b 3e bd bf d4 d0 ce 40 b8 50 ..x|>.....8.P
0120 9e 58 70 70 d0 d4 b8 57 b1 c6 43 c4 b4 2b 9e .Xpp...W.a.C...+.
0130 ef a6 b3 f2 50 08 24 4a b5 ab 2a c9 af 77 c9 1fP.8J..*..W..

Data Item 1240/000 - Message Type

Summary

MSG_TYPE:VIDEO_MESSAGE

Raw Data in Hexadecimal

Octet 1	Octet 16
02	-- -- -- -- -- -- -- -- -- -- -- -- -- -- --

Raw Data in Binary

Octet 1 - 02	Octet 2 - --	Octet 3 - --	Octet 4 - --
0 0 0 0 0 0 0 1 0	- - - - - - - -	- - - - - - - -	- - - - - - - -

References

Check Eurocontrol (www.eurocontrol.int) for more ASTERIX information.

RDL-INOUT.CAT240.I240/010

The SAC code of a connected radar sensor must be **04** (Netherlands).

Summary

Data Item 1240/010 SAC:004 SIC:000

Data Item 1240/000 MSG_TYPE:VIDEO_MESSAGE

Data Item 1240/020 MSG_INDEX:859875421

Data Item 1240/041 AZ:116.46 116.54 RG:0.00

Data Item 1240/048 RES:8-BITS DCI

Data Item 1240/049 OCTET:292 CELL:3720

Data Item 1240/051 OCTET:320 CELL:320

Data Item 1240/140 TOD:12:25:15.195

0000 F0 01 63 e7 a8 04 00 02 33 40 a8 5d 52 d0 52 e0 ..c.....38.]R.R.
0010 00 00 00 00 01 31 15 95 80 04 01 24 00 0e 88 051.....8....
0020 78 01 ed 56 e9 6e 83 30 0c ce 8b 8c 98 10 72 91 x..V.n.0.....E.
0030 40 39 aa b2 22 a1 d1 45 eb 2e 6d 3f a6 bd ff ab 89..".E..m?....
0040 2c 6d e9 54 81 54 55 aa 4a 3b 86 ff e0 f8 f8 ec /m.T.TU.J.....
0050 d8 91 31 42 7f 83 4c 74 cb 79 86 59 d2 4b 8f 2d ..1B..Lt.y.Y.K.-
0060 e7 4e 46 21 89 19 47 bc 79 7a ac 63 84 4c ba b3 .NF!..G.yz.c.L..
0070 03 2e 67 f7 eb ef af f5 ca 39 9a 99 5d 55 75 6d ..g.....9..]Uum
0080 ed 62 0f 12 65 9a b6 3c 4b 1e 3e 3f de 5f 5f 72 ..b..e.<K>?.._r
0090 64 0a c1 88 2e cb 32 56 5a 16 da e9 f9 de 7e fa d....2VZ.....-
00a0 5e a1 02 52 f9 83 44 d5 8b 14 5f 30 50 e7 12 bc ^..R..D..._0P..
00b0 73 3e 23 32 e8 e0 0c ef 1b 70 15 f2 68 12 aa a7 s>#2.....p..h...
00c0 26 3d c9 51 80 7f ac dc 8c b7 60 ee 26 e2 58 c8 &=Q.....'.6.X.
00d0 54 e5 d4 fc 6d 33 3d e5 53 16 a8 48 79 c0 d9 56 T...m3=.S..Hy..V
00e0 92 e5 10 20 aa 43 77 80 bb c3 86 e3 13 06 5b c7Cw.....[.
00f0 84 68 01 f2 f7 ef d8 82 41 d5 d8 65 61 9b ec 10 ..h.....A...ea..
0100 7c e2 c7 52 01 35 c8 f2 27 c5 ae 5e 42 85 18 4f |..R.S..'.^B..0
0110 ab d5 60 8f a7 78 7b 3e bd bf d4 d0 ce 40 b8 50 ..x|>.....8.P
0120 9e 58 70 70 d0 d4 b8 57 b1 c6 43 c4 b4 2b 9e .Xpp...W.a.C...+.
0130 ef a6 b3 f2 50 08 24 4a b5 ab 2a c9 af 77 c9 1fP.8J..*..W..

Data Item 1240/010 - Data Source Identifier

Summary

SAC:004 SIC:000

Raw Data in Binary

Octet 1 - 04	Octet 2 - 00	Octet 3 - --	Octet 4 - --
0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0	- - - - - - - -	- - - - - - - -	- - - - - - - -

Detailed Description

System Area Code (SAC)

Octet	Name	Hex	Dec	Region	Country
Octet[1]	SAC	0x04	004	ECAC	Netherlands [NLD]

System Identification Code (SIC)

Octet	Name	Hex	Dec	Country	System	Type	Manufacturer	Model	Description
Octet[2]	SIC	0x00	000	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown System

References

Check Eurocontrol (www.eurocontrol.int) for more ASTERIX information.

RDL-INOUT.CAT240.I240/020

The Video Record Header must have a consecutive series of numbers that allows the receiving system to detect packet loss.

Explanation:

RDL counts globally and not upon distribution to a receiving system.

Data Item	Summary
▼ Data Block 1	
▼ Data Record 1	
Data Item I240/I00 SAC:004 SIC:000	
Data Item I240/000 MSG_INDEX:859875421	
Data Item I240/041 AZ:116.46-116.54 RG:0.00	
Data Item I240/048 RES:8-BITS DCI	
Data Item I240/049 OCTET:292 CELL:3720	
Data Item I240/051 OCTET:320, CELL:320	
Data Item I240/140 TOD:12:25:15.195	

0000	F0	01	63	e7	a8	04	00	02	33	40	a8	5c	52	d0	52	e0	. . c 3 @ .] R . R .
0010	00	00	00	00	01	31	15	95	80	04	01	24	00	0e	88	05 1 \$
0020	78	01	ed	56	e9	6e	83	30	0c	ce	8b	8c	98	10	72	91	x . V . n . 0 F .
0030	40	39	aa	b2	22	a1	d1	45	eb	2e	6d	3f	ae	b4	bf	af	@9 . " . E . m . T
0040	2c	6d	e9	54	81	54	55	aa	4a	3b	86	ff	e0	f9	f8	bc	. m . T . U . J . f
0050	d8	91	31	42	f7	83	ac	74	cb	79	86	59	42	4b	8f	2d	. i . B . i . l . e . y . v . K . +
0060	e7	4e	46	21	89	19	47	bc	79	7a	ac	63	84	4c	ba	b3	. N F L . . G . yz . c . L . .
0070	03	2e	67	f7	ab	ef	a5	ca	39	9a	59	5d	55	75	6d		. q 9 .) Uum
0080	ed	62	0f	12	65	9a	b6	3c	4b	1e	3e	3f	de	5f	5f	72	. b . e . < K . ? . _ r
0090	64	0a	c1	88	2e	cb	32	5e	54	16	da	e9	f9	de	7e	fa	d 2 V Z
00A0	5e	a1	02	52	f9	83	44	d5	8b	14	5f	30	50	67	12	bc	. ^ . R . D 0 P . s
00B0	73	3e	23	32	e8	00	0c	ef	1b	70	15	f2	68	12	aa	a7	s > H 2 p . h . . .
00C0	26	34	c9	51	80	7f	ac	d0	8c	b7	60	e6	26	e2	58	eb	e . o 1 . f . X .
00D0	54	e5	d4	tc	6d	33	3d	a5	53	16	ad	48	79	c0	d9	56	T . . m 3 = S . Hy . V
00E0	92	e5	10	20	aa	43	77	80	bb	c3	86	e3	13	06	5b	c7	. . . Cw [.
00F0	84	68	01	f2	f7	ef	d8	82	41	d5	d8	65	61	9b	ec	10	. h A . ea . . .
0100	7c	e2	c7	52	01	35	c8	f2	27	c5	ae	5e	42	85	18	4f	. . R . 5 . ' . ' B . O
0110	ab	d5	60	8f	a7	78	7b	3e	bd	bf	d4	d0	ce	40	b8	50	. . . x [> @ . P
0120	9e	58	70	70	d0	d4	b8	57	b1	61	c6	43	c4	b4	2b	9e	. Xpp . . W . a . C . . +
0130	ef	a6	b3	f2	50	08	24	4a	b5	ab	2a	c9	af	77	c9	1f P . S 0 . * . w . .

RDL-INOUT.CAT240.I240/048

Data item I240/048 must indicate that the video data (zlib) is compressed and that the bit resolution depth of the cell amplitude is 8-bits (high resolution).

Data Item	Summary	0000 f0 01 c3 e7 a8 04 00 02 33 a0 a5 52 d0 52 e0 ...c.....38.]R.R.
▼ Data Block 1		0010 00 00 00 00 01 31 15 95 81 0c 01 24 00 0e 88 051.....8....
▼ Data Record 1		0020 78 01 ed 56 e9 6e 83 30 0c ce 8b 8c 98 10 72 91 x..V.n.0.....E.
Data Item I240/010 SAC:004 SIC:000		0030 40 39 aa b2 22 a1 d1 45 eb 2e 6d 3f ae b6 ff ab 09...".E.m?....
Data Item I240/000 MSG_TYPE:VIDEO_MESSAGE		0040 2c 6d e9 54 81 54 55 aa 4a 3b 9e ff e0 f9 fb ec ,m.T.TU.?....
Data Item I240/020 MSG_INDEX:859875421		0050 d8 91 31 42 7f 83 4c 74 cb 79 86 59 d2 4b 8f 2d .1B..L.T.y.Y.K..
Data Item I240/041 A2:11646-11654 RG:00		0060 e7 4e 46 21 89 19 47 bc 79 7a ac 63 84 4c ba b3 .NF!...G.y.z.c.L..
Data Item I240/048 RES:8 BITS DCI		0070 03 2e 67 f7 eb ef af f5 ca 39 9a 99 5d 55 75 6d .g.....9..lUum
Data Item I240/049 OCTET:292 CELL:3720		0080 ed 62 0f 12 65 9a b6 3c 4b 1e 3e 3f de 5f 5f 72 .b..e.<K>?..r
Data Item I240/051 OCTET:320 CELL:320		0090 64 0a c1 88 2e cb 32 56 5a 16 da e9 f9 de 7e fa d.....2VZ.....
Data Item I240/140 TAD:12:25:15.195		00a0 5e a1 02 52 f9 83 44 d5 8b 14 5f 30 50 e7 12 bc ^..R..D.....0B... 00b0 73 3e 23 32 e8 e0 0c ef 1b 70 15 f2 68 12 aa a7 a>#2.....p..h... 00c0 26 3d c9 51 80 7f ac dc 8c b7 0e e6 2e 58 c8 6=Q.....&.X.
		00d0 54 e5 d4 fc 6d 33 3d e5 53 16 a8 48 79 c0 d9 56 T...m3=.S..Hy..V
		00e0 92 e5 10 20 aa 43 77 80 bb c3 86 e3 13 06 5b c7Gw.....l.
		00f0 84 68 01 f2 e7 ef d8 82 41 d5 d8 65 61 9b ec 10 ..h.....&.00...
		0100 7c e2 c7 52 01 35 c8 f2 27 c5 ae 5e 42 85 18 4f ..R.5..".^B.0..
		0110 ab d5 60 8f a7 78 7b 3e bd bf d4 d0 ce 40 b8 50>(>.....0.P
		0120 9e 58 70 70 d0 d4 b8 57 b1 61 c6 43 c4 b4 2b 9e .Xpp...W.a.C.+..
		0130 ef a6 b3 f2 50 08 24 4a b5 ab 2a c9 af 77 c9 1fP.s3.....w..

Data Item I240/048 - Video Cells Resolution & Data Compression Indicator

Summary

RES:8-BITS DCI

Raw Data in Binary

Ocetet 1 - 80	Ocetet 2 - 04	Ocetet 3 - --	Ocetet 4 - --
1 0 0 0 0 0 0 0 0	0 0 0 0 0 0 0 1 0 0	- - - - - - - -	- - - - - - - -

Detaild Description

Bit	Item	Value
Bit[0]	DATA_COMPRESSION_INDICATOR	COMPRESSION
Bit[1-7]	SPARE	--
Bit[8-15]	VIDEO_CELLS_RESOLUTION	HIGH (8-BITS)

References

Check Eurocontrol (www.eurocontrol.int) for more ASTERIX information.

RDL-INOUT.CAT240.I240/049

Data item I240/049 must indicate how many valid octets and valid cells are present in the subsequent data item I240/051.

DataItem	Summary
▼ Data Block 1	
▼ Data Record 1	
Data Item I240/010 SAC:004 SIC:000	
Data Item I240/020 MSG_INDEX:859875421	
Data Item I240/041 AZ:11646-11654 RG:000	
Data Item I240/048 RES:8-BITS DCI	
Data Item I240/049 OCTET:292 CELL:3720	
Data Item I240/051 OCTET:320 CELL:320	
Data Item I240/140 TOD:12:25:15.195	

Data Item I240/049 - Video Octets & Video Cells Counters																	
Summary																	
OCTET:292 CELL:3720																	
Raw Data in Binary																	
<table border="1"> <thead> <tr> <th>Octet 1 - 01</th> <th>Octet 2 - 24</th> <th>Octet 3 - 00</th> <th>Octet 4 - 0E</th> </tr> </thead> <tbody> <tr> <td>0 0 0 0 0 0 0 0 1</td> <td>0 0 1 0 0 0 1 0 0</td> <td>0 0 0 0 0 0 0 0 0</td> <td>0 0 0 0 0 0 1 1 1 0</td> </tr> <tr> <th>Octet 5 - 88</th> <th>Octet 6 - --</th> <th>Octet 7 - --</th> <th>Octet 8 - --</th> </tr> <tr> <td>1 0 0 0 1 0 0 0 0</td> <td>- - - - - - - -</td> <td>- - - - - - - -</td> <td>- - - - - - - -</td> </tr> </tbody> </table>		Octet 1 - 01	Octet 2 - 24	Octet 3 - 00	Octet 4 - 0E	0 0 0 0 0 0 0 0 1	0 0 1 0 0 0 1 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 1 1 1 0	Octet 5 - 88	Octet 6 - --	Octet 7 - --	Octet 8 - --	1 0 0 0 1 0 0 0 0	- - - - - - - -	- - - - - - - -	- - - - - - - -
Octet 1 - 01	Octet 2 - 24	Octet 3 - 00	Octet 4 - 0E														
0 0 0 0 0 0 0 0 1	0 0 1 0 0 0 1 0 0	0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 1 1 1 0														
Octet 5 - 88	Octet 6 - --	Octet 7 - --	Octet 8 - --														
1 0 0 0 1 0 0 0 0	- - - - - - - -	- - - - - - - -	- - - - - - - -														
Detail Description																	
Octet	Item																
Octet[1-2]	NUMBER_VALID_OCTETS 292																
Octet[3-5]	NUMBER_VALID_CELLS 3720																
References																	
Check Eurocontrol (www.eurocontrol.int) for more ASTERIX information.																	

RDL-INOUT.CAT240.OPTIONAL

The RDL-INOUT interface must use the following data items for 002 video messages, as these are described in [EUROCONTROL-SPEC-0149-240] as optional data items; see the table below.

Explanation:

Fields marked as **O** (optional) in [EUROCONTROL-SPEC-0149-240] are effectively changed to **X** (not used) or **M** (mandatory) for this requirement.

Type Item	002 Video Message
I240/000 Message Type	M
I240/010 Data Source Identifier	M
I240/020 Video Record Header	M
I240/030 Video Summary	X
I240/040 Video Header Nano	O¹ -> X
I240/041 Video Header Femto	O¹ -> M
I240/048 Video Cells Resolution & Data Compression Indicator	M
I240/049	M

Video Octets & Video Cells Counters	
I240/050 Video Block Low Data Volume	O² -> X
I240/051 Video Block Medium Data Volume	O² -> M
I240/052 Video Block High Data Volume	O² -> X
I240/140 Time of Day	O -> M

RDL-INOUT.CAT240.I240/041

Data item I240/049 must indicate to which "radial segment" the data item in the subsequent I240/051 data item applies.

The data item must also indicate the range using Cell Duration. The Femto item is used, so Octet 9-12 contains the range of a cell in femtoseconds.

Please note: this concerns the duration of the radar signal back and forth. So divide the number of femtoseconds by 2 and multiply by the speed of light for the length of a cell. Cells are usually 3 or 6 metres.

Dataitem

Summary

Data Block 1

Data Record 1

Data Item I240/010 SAC:004 SIC:000

Data Item I240/000 MSG_TYPE:VIDEO, MESSAGE

Data Item I240/020 MSG_INDEX:859875421

Data Item I240/041 AZ:116.46-116.54 RG:0.00

Data Item I240/048 RES:8-BITS DCI

Data Item I240/049 OCTET:292 CELL:3720

Data Item I240/051 OCTET:320 CELL:320

Data Item I240/140 TOD:12:25:15.195

```

0000 f0 01 63 e7 a8 04 00 02 33 40 a8 5d 00 00 00 00
0010 80 04 01 24 00 06 88 05 .....1.....9....
0020 78 01 ed 56 e9 6e 83 30 0c ce 8b 8c 98 10 72 91 x..V.n.0.....E.
0030 40 39 aa b2 22 a1 d1 45 eb 2e 6d 3f a6 bd ff ab @9..".E..m2....
0040 2c 6d e9 54 81 54 55 aa 4a 3b 86 ff e0 f8 f8 ec ,m.T.U.Jz.....
0050 d8 91 31 42 7f 83 4c 74 cb 79 86 59 d2 4b 8f 2d .1B..Lt.y.Y.K.-
0060 e7 4e 46 21 89 19 47 bc 79 7a ac 63 84 4c ba b3 .Nf1..G.yz.c.L..
0070 03 2e 67 e7 eb ef af f5 ca 39 9a 99 5d 55 75 6d ..g.....9..jUum
0080 ed 62 0f 12 65 9a b6 3c 4b 1e 3a 3f da 5f 5f 72 .b..<K>2...F
0090 64 0a c1 88 2e cb 32 56 5a 16 da e9 f9 da 7e fa d....2VZ.....-
00a0 5e a1 02 52 f9 83 44 d5 8b 14 5f 30 50 e7 12 bc ^..R..D...OP...
00b0 73 3e 23 32 e8 e0 0c ef 1b 70 15 f2 68 12 aa a7 s>#2....p..h...
00c0 26 3d c9 51 80 7f ac dc 8c b7 60 ee 26 e2 58 c8 6=.Q.....'6.X.
00d0 54 e5 d4 Ec 6d 33 3d e5 53 16 a9 48 79 c0 d9 56 T...m3~..S...Hy..V
00e0 92 e5 10 20 aa 43 77 80 bb c3 86 e3 13 06 5b c7 ...<Cw.....[.
00f0 84 68 01 f2 f7 ef d8 82 41 d5 d8 65 61 9b ec 10 .h.....A..ea...
0100 7c e2 c7 52 01 35 c8 f2 27 c5 ae 5e 42 85 18 4f |..R.5..'"B..O
0110 ab d5 60 8f a7 78 7b 3e bd bf d4 d0 ce 40 b8 50 ...x|>.....0.P
0120 9e 58 70 70 d0 d4 b8 57 b1 61 c0 43 c4 b4 2b 9e .Xpp..W.a.C..+.
0130 ef a6 b3 f2 50 08 24 4a b5 ab 2a c9 af 77 c9 1f ....P.$J...*...

```

Data Item I240/041 - Video Header Femto

Summary

AZ:116.46-116.54 RG:0.00

Raw Data in Binary

Octet 1 - 52	Octet 2 - D0	Octet 3 - 52	Octet 4 - E0
0 1 0 1 0 0 0 1 0 1 1 1 0 1 0 0 0 0 0 1 0 1 0 1 0 0 1 0 1 1 1 0 0 0 0 0 0	0 1 0 1 0 1 0 0 0 0 0 0 1 0 1 0 0 1 0 1 1 1 0 0 1 0 0 1 0 1 0 1 0 1 0 1	0 0	0 0
Octet 5 - 00	Octet 6 - 00	Octet 7 - 00	Octet 8 - 00
0 0	0 0	0 0	0 0
Octet 9 - 01	Octet 10 - 31	Octet 11 - 15	Octet 12 - 95
0 0 0 0 0 0 0 0 0 1 0 0 1 1 0 0 0 0 1 0 0 0 1 0 0 1 0 1 1 0 0 1 0 1 0 1	0 0	0 0	0 0

Detaild Description

Octet	Item	Value
Octet[1-2]	START_AZIMUTH LSB=360/2^16 DEG	21200
Octet[1-2]	START_AZIMUTH LSB=DEG	116.46
Octet[3-4]	END_AZIMUTH LSB=360/2^16 DEG	21216
Octet[3-4]	END_AZIMUTH LSB=DEG	116.54
Octet[5-8]	START_RANGE	0
Octet[5-8]	START_RANGE LSB=M	0.00
Octet[9-12]	CELL_DURATION LSB=10^-15SEC	19994005
Octet[9-12]	CELL_DURATION LSB=SEC	0.000000019994005

References

Check Eurocontrol (www.eurocontrol.int) for more ASTERIX information.

RDL-INOUT.CAT240.I240/051

Data item I240/051 must contain the zlib-compressed cell amplitudes for the "radial segment" indicated in the preceding data item I240/041.

Dataitem	Summary	
▼ Data Block 1		
▼ Data Record 1		
Data Item I240/010 SAC:004 SIC:000		
Data Item I240/000 MSG_TYPE:VIDEO_MESSAGE		
Data Item I240/020 MSG_INDEX:859875421		
Data Item I240/041 AZ:116.46-116.54 RG:0.00		
Data Item I240/048 RES:8-BITS DCI		
Data Item I240/049 OCTET:292 CELL:3720		
Data Item I240/051 OCTET:320, CELL:320		
Data Item I240/140 TOD:12:25:15.195		

0010	00	00	00	00	01	31	15	95	80	04	01	24	00	0e	88	031.....\$....
0020	76	01	e6	5d	e5	ee	83	3d	0c	ce	8b	8c	98	10	72	91	x..V.n.0.....r.
0030	40	39	aa	b2	22	a1	d1	45	eb	2e	6d	3f	a6	bd	ff	ak	@9..".E..m?....
0040	2c	6c	e5	54	81	54	55	aa	4a	3b	86	ff	e0	f8	ff	ec	,m.T.TU.J;.....
0050	48	91	31	42	7f	83	4c	74	cb	79	86	59	d2	4b	81	23	..1B..Lt.Y.K.-
0060	e7	4e	4e	21	89	19	47	bc	79	7a	ac	63	84	4c	ba	b3	..NF1..G.yz.c.L.-
0070	03	2e	67	f7	eb	ef	af	f9	ce	39	9a	99	5d	55	75	63	..g.....9..]Uum
0080	ed	62	0f	12	65	9a	b6	3c	4b	1e	3e	3f	d6	5f	5f	72	..b..e..<K>?..r
0090	64	0a	c1	88	2e	cb	32	56	5a	16	da	e9	f9	de	7e	fa	d....2VZ.....~.
00a0	5e	a1	02	52	f9	83	44	d5	8b	14	5f	30	50	e7	12	bc	^..R..D...._OP...
00b0	73	3e	23	32	e8	e0	0c	ef	1b	70	15	f2	68	12	aa	a7	s>#2.....p..h...
00c0	2c	3d	c9	51	80	7f	ac	dc	8c	b7	60	ee	26	e2	58	c8	6=.Q.....`.&X.
00d0	54	e5	d4	fc	6d	33	3d	e5	53	16	a8	48	79	c0	d9	56	T...m3=.S..Hy..V
00e0	92	e5	10	20	aa	43	77	80	bb	c3	86	e3	13	06	5b	e7	...CW.....[.
00f0	84	68	01	f2	f7	ef	d8	82	41	d5	d8	65	61	9b	ec	10	..h.....A..ea...
0100	7c	e2	c7	52	01	35	c8	f2	27	c5	ae	5e	42	85	18	4f	.R.5...'^B..O
0110	ab	d5	60	8f	a7	78	7b	3e	bd	bf	d4	d0	ce	40	b8	50	..`.x(>.....@.P
0120	9e	58	70	d0	d4	b8	57	b1	61	cd	43	c4	b4	2b	9e		.Xpp...W.a.C..+
0130	ef	a6	b3	f2	50	08	24	4a	b5	ab	2a	c9	af	77	c9	1fP.\$J...*.w...
0140	30	29	20	5d	00	00	00	00	00	00	00	00	00	00	00	00	0)].....

Data Item I240/051 - Video Block Medium Data Volume

Summary

OCTET:320, CELL:320

Detaild Description

292 valid (non empty) video cells.

Video resolution is 8-bits.

Number	Range	Amplitude Value	Amplitude Relative
1	0.00	120	46.88%
2	3.00	1	0.39%
3	5.99	237	92.58%
4	8.99	86	33.59%
5	11.99	233	91.02%
6	14.99	110	42.97%
7	17.98	131	51.17%
8	20.98	48	18.75%
9	23.98	12	4.69%
10	26.97	206	80.47%
11	29.97	139	54.30%
12	32.97	140	54.69%
13	35.96	152	59.38%

DataItem	Summary	0010	00	00	00	00	01	31	15	95	80	04	01	24	00	0e	88	091.....\$....
▼ Data Block 1		0020	78	01	ea	5e	e9	ee	83	30	0c	ce	81	8c	98	10	72	91	x..V.n.0.....r.
▼ Data Record 1		0030	40	39	aa	b2	22	a1	d1	45	eb	2e	6a	3f	a6	ba	ff	ak	@9..".E..m?....
	Data Item I240/010 SAC:004 SIC:000	0040	2c	6d	e9	54	81	54	55	aa	4a	3b	86	ff	e0	f8	f9	ec	/m.T.TU.J;.....
	Data Item I240/000 MSG_TYPE:VIDEO_MESSAGE	0050	38	91	31	42	7f	83	4c	74	cb	79	8e	59	d2	4b	81	2d	..1B..Lt.y.Y.K.-
	Data Item I240/020 MSG_INDEX:859875421	0060	e7	4e	4e	21	89	19	47	bc	79	78	ac	63	84	4c	ba	b3	..NF1..G.yz.c.L.-
	Data Item I240/041 AZ:116.46-116.54 RG:0.00	0070	03	2e	67	f7	eb	ef	af	f5	ca	39	9a	99	5d	55	75	6a	..g.....9..]Uum
	Data Item I240/048 RES:8-BITS DCI	0080	ed	62	0f	12	65	9a	b6	3c	4b	1e	3e	3f	de	5f	5f	72	..b..e..<K>?.._f
	Data Item I240/049 OCTET:292 CELL:3720	0090	64	0a	c1	88	2e	cb	32	56	5a	1e	da	e9	f9	de	7e	fa	d.....2VZ....."
	Data Item I240/051 OCTET:320 CELL:320	00a0	5e	a1	02	52	f9	83	44	d5	8b	14	5f	30	50	e7	12	bc	^..R..D..._OP...
	Data Item I240/140 TOD:12:25:15.195	00b0	73	3e	23	32	e8	e0	0c	ef	1b	70	15	f2	68	12	aa	e7	s>#2.....P...h...
		00c0	26	3a	c9	51	80	7f	ac	dc	8c	b7	60	ee	26	e2	58	c8	6=.Q.....".6.X.
		00d0	54	e5	d4	fc	6d	33	3a	e5	53	1e	a8	48	79	c0	d9	56	T...m3=.S..Hy..V
		00e0	92	e5	10	20	aa	43	77	80	bb	c3	9e	e3	13	06	5b	e7	...Cw.....[.
		00f0	84	68	01	f2	f7	ef	d8	82	41	d5	d8	65	61	9b	ec	18	..h.....A...ea...
		0100	7c	e2	07	52	01	35	c5	f2	27	c5	ae	5e	42	85	19	4f	[..R.S..'..^B...O
		0110	ab	d5	60	8f	a7	78	7b	3e	ba	b7	d4	d0	ce	40	b5	56	...'.x{>.....@.P
		0120	9e	58	70	70	d0	d4	b5	57	b1	61	c6	43	c4	b4	2b	9e	..Xpp...W.a.C...+
		0130	ef	a6	b3	f2	50	08	24	4a	b5	ab	2a	c9	ef	77	c5	1fP.\$J.a.*..w..
		0140	30	29	20	5d	00	00	00	00	00	00	00	00	00	00	00	00	0)].....
		242			722.28			213											83.20%
		243			725.28			96											37.50%
		244			728.28			143											55.86%
		245			731.27			167											65.23%
		246			734.27			120											46.88%
		247			737.27			123											48.05%
		248			740.27			62											24.22%
		249			743.26			189											73.83%
		250			746.26			191											74.61%
		251			749.26			212											82.81%
		252			752.25			208											81.25%
		253			755.25			206											80.47%
		254			758.25			64											25.00%
		255			761.24			184											71.88%
		256			764.24			80											31.25%
		257			767.24			158											61.72%
		258			770.24			88											34.38%
		259			773.23			112											43.75%
		260			776.23			112											43.75%
		261			779.23			208											81.25%
		262			782.22			212											82.81%
		263			785.22			184											71.88%
		264			788.22			87											33.98%
		265			791.21			177											69.14%
		266			794.21			97											37.89%
		267			797.21			198											77.34%
		268			800.21			67											26.17%
		269			803.20			196											76.56%
		270			806.20			180											70.31%
		271			809.20			43											16.80%
		272			812.19			158											61.72%
		273			815.19			239											93.36%
		274			818.19			166											64.84%
		275			821.19			179											69.92%
		276			824.18			242											94.53%
		277			827.18			80											31.25%
		278			830.18			8											3.13%
		279			833.17			36											14.06%
		280			836.17			74											28.91%
		281			839.17			181											70.70%
		282			842.16			171											66.80%
		283			845.16			42											16.41%
		284			848.16			201											78.52%
		285			851.16			175											68.36%
		286			854.15			119											46.48%
		287			857.15			201											78.52%
		288			860.15			31											12.11%
		289			863.14			48											18.75%
		290			866.14			41											16.02%
		291			869.14			32											12.50%
		292			872.13			93											36.33%

References

Check Eurocontrol (www.eurocontrol.int) for more ASTERIX information.

References

Check Eurocontrol (www.eurocontrol.int) for more ASTERIX information.

RDL-INOUT.CAT240.I240/140

Data item I240/140 must contain the absolute time since midnight (UTC).

Dataitem	Summary
▼ Data Block 1	
▼ Data Record 1	
Data Item I240/010 SAC:004 SIC:000	
Data Item I240/000 MSG_TYPE:VIDEO_MESSAGE	
Data Item I240/020 MSG_INDEX:859875421	
Data Item I240/041 AZ:116.46-116.54 RG:0.00	
Data Item I240/048 RES:8-BITS DCI	
Data Item I240/049 OCTET:292 CELL:3720	
Data Item I240/051 OCTET:320 CELL:320	
Data Item I240/140 TOD:12:25:15.195	

0030	40	39	aa	b2	22	a1	d1	45	eb	2e	6d	3f	a6	bd	ff	ab	09..".E..m?...
0040	2c	6d	e9	54	81	54	55	aa	4a	3b	86	ff	e0	f8	f8	ec	,m.T.TU.J?.....
0050	d8	91	31	42	7f	83	4c	74	cb	79	86	59	d2	4b	8f	2d	..1B..Lt.y.Y.K.-
0060	e7	4e	46	21	89	19	47	bc	79	7a	ac	63	84	4c	ba	b3	.NF1...G.yz.c.L..
0070	03	2e	67	f7	eb	ef	af	f5	ca	39	9a	99	5d	55	75	6d	..g.....9..]Dum
0080	ed	62	0f	12	65	9a	b6	3c	4b	1e	3e	3f	de	5f	5f	72	.b..e..<K.>?.._f
0090	64	0a	c1	88	2e	cb	32	56	5a	16	da	e9	f9	de	7e	fa	d.....2VZ.....-
00a0	5e	a1	02	52	f9	83	44	d5	8b	14	5f	30	50	e7	12	bc	^..R..D....OP...
00b0	73	3e	23	32	e8	e0	0c	ef	1b	70	15	f2	68	12	aa	a7	a>#2.....p..h...
00c0	26	3d	c9	51	80	7f	ac	dc	8c	b7	60	ee	26	e2	58	c8	&=Q.....4.X.
00d0	54	e5	d4	fc	6d	33	3d	e5	53	16	a8	48	79	c0	d9	56	T...m3=.S..Hy..V
00e0	92	e5	10	20	aa	43	77	80	bb	c3	86	e3	13	06	5b	c7	...Cw.....[.
00f0	84	68	01	f2	f7	ef	d8	82	d1	d5	d8	65	61	9b	ec	10	.h.....A..ea...
0100	7c	e2	c7	52	01	35	c8	f2	27	c5	ae	5e	42	85	18	4f	[..R.5..*^B..LO
0110	ab	d5	60	8f	a7	78	7b	3e	bd	bf	d4	d0	ce	40	b8	50	...x(>.....8.P
0120	9e	58	70	70	d0	d4	b8	57	b1	61	c6	43	c4	b4	2b	9e	.Xpp...W.a.C..+
0130	af	a6	b3	f2	50	08	24	4a	b5	ab	2a	c9	af	77	c9	1fP.8J..*..W...
0140	30	29	20	5d	00	00	00	00	00	00	00	00	00	00	00	00	0) 1.....
0150	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
0160	57	65	03														WU.

Data Item I240/140 - Time of Day

Summary

TOD:12:25:15.195

Raw Data in Binary

Octet 1 - 57	Octet 2 - 55	Octet 3 - 99	Octet 4 - --
0 1 0 1 0 1 0 1 1 1 0 1 0 1 0 1 0 1 1 0 0 1 1 0 0 1 1 0 0 1 1 - - - - -			

Detaild Description

Name	Value
TIME LSB=1/128s	5723545
TIME LSB=1s	44715
HOUR	12
MINUTE	25
SECOND	15
MILLISECOND	195

References

Check Eurocontrol (www.eurocontrol.int) for more ASTERIX information.

3.3 RDL-INOUT**3.3.1 Design****RDL-INOUT. UAP**

The UAP for CAT240 (002 video messages) effectively defined on the basis of the requirements above is summarised in the table below.

CAT240 UAP for 002 Video messages	
I240/010	Data Source Identifier
I240/000	Message Type
I240/020	Video Record Header
I240/041	Video Header Femto
I240/048	Video Cells Resolution & Data Compression Indicator
I240/049	Video Octets & Video Cells Counters
I240/051	Video Block Medium Data Volume FSPEC is 2 octets
I240/140	Time of Day

3.4 RDL-IN

3.4.1 Requirements

RDL-IN. Unicast

The RDL must obtain current nautical radar data through unicast (TCP).

3.5 RDL-OUT

3.5.1 Requirements

RDL-OUT. Unicast

The RDL must be capable of distributing current nautical radar data through unicast (TCP) in the format as specified in Chapter 3.2 RDL-INOUT in requirement RDL-INOUT.CAT240.GENERAL VIDEO MESSAGES ASTERIX et seq.

3.6 Priority and dependence of requirements

Not applicable.

4 Quality determinations

The following quality determinations apply

Name	Qualification
RDL-INOUT.CAT240.ALGEMEEN VIDEO MESSAGES	Analysis
RDL-INOUT.CAT240.MANDATORY	Analysis
RDL-INOUT.CAT240.I240/000	Analysis
RDL-INOUT.CAT240.I240/010	Analysis
RDL-INOUT.CAT240.I240/020	Analysis
RDL-INOUT.CAT240.I240/048	Analysis
RDL-INOUT.CAT240.I240/049	Analysis
RDL-INOUT.CAT240.OPTIONAL	Analysis
RDL-INOUT.CAT240.I240/041	Analysis
RDL-INOUT.CAT240.I240/051	Analysis
RDL-INOUT.CAT240.I240/140	Analysis
RDL-INOUT. UAP	Analysis
RDL-IL. Unicast	Analysis
RDL-OUT. Unicast	Analysis

5 Traceability of requirements

Not applicable.

6 Comments

6.1 Abbreviations and acronyms

IDD	Interface Design Document
IRS	Interface Requirements Specification
NAT	Network Address Translation
RDL	Nautical Radar Distribution (system)
SAC	System Area Code
SIC	System Identification Code

6.2 Terminology

Not applicable.