2.7 SELF-TEST MODES

2.7.1 Specification

Cospas-Sarsat T.007, Clause A.2.1 (h)

2.7.2 Equipment Under Test and Modification State

ULTIMA-DT-06, S/N: KA0040651003 - Modification State 0

2.7.3 Date of Test

17 March 2023 and 27 March 2023

2.7.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.7.5 Laboratory Environmental Conditions

Ambient Temperature 21.5°C
Relative Humidity 40.5%

2.7.6 Test Results

Self-test Mode
Ambient Temperature

Note: Self-Test at ambient temperature was carried out with navigation data applied. The EUT was activated and allowed to obtain a fix. It was then deactivated, and a Self-Test was performed to show the EUT encoded default values. This is shown from the decoded message below

Distress Message with Nav Applied

Message	FFFE2F8C990000000CD0134FA580CFBEA427		
Hex ID	193200000019A02		
Position	50°52'8" N 1°14'40" W		
Parameter	Bit	Data Bits	Decoded Value
Bit synchronization	1-15	111111111111111	111111111111111
Frame synchronization	16-24	000101111	000101111
Format Flag	25	1	1
Protocol Flag	26	0	0
Country Code	27-36	0011001001	Albania (Republic of)
Protocol Code	37-40	1001	ELT(DT) Location Protocol
Type of Beacon Identity	41-42	00	Aircraft 24 Bit Address
Identification Data	43-66	000000000000000000000000	ELT(DT) Location Test Protocol
N/S	67	0	North
Latitude Degrees	68-75	01100110	51
E/W	76	1	West
Longitude Degrees	77-85	000000010	1
BCH Code (21 Bit)	86-106	011010011111010010110	011010011111010010110
Calculated BCH Code (21 Bit)	-	011010011111010010110	011010011111010010110
Means of Activation	107-108	00	Manual Activation by the User
Altitude	109-112	0000	altitude is less than 400 m (1312 ft)
Encoded Location Freshness	113-114	11	Encoded location in message is current
Delta Latitude +/-	115	0	-
Delta Latitude Minutes	116-119	0111	7
Delta Latitude Seconds	120-123	1101	52
Delta Longitude +/-	124	1	+
Delta Longitude Minutes	125-128	1110	14
Delta Longitude Seconds	129-132	1010	40
BCH Code (12 Bit)	133-144	010000100111	010000100111
Calculated BCH Code (12 Bit)	-	010000100111	010000100111

Self-Test Message

Message	FFFED08C990000001FEFFE6E1B0F0452AC6E		
Hex ID	19320000003FDFF		
Position	None - Default Values		
Parameter	Bit	Data Bits	Decoded Value
Bit synchronization	1-15	111111111111111	111111111111111
Frame synchronization	16-24	011010000	011010000
Format Flag	25	1	1
Protocol Flag	26	0	0
Country Code	27-36	0011001001	Albania (Republic of)
Protocol Code	37-40	1001	ELT(DT) Location Protocol
Type of Beacon Identity	41-42	00	Aircraft 24 Bit Address
Identification Data	43-66	000000000000000000000000	ELT(DT) Location Test Protocol
N/S	67	0	Default
Latitude Degrees	68-75	11111111	Default
E/W	76	0	Default
Longitude Degrees	77-85	111111111	Default
BCH Code (21 Bit)	86-106	110011011100001101100	110011011100001101100
Calculated BCH Code (21 Bit)	-	110011011100001101100	110011011100001101100
Means of Activation	107-108	00	Manual Activation by the User
Altitude	109-112	1111	default value if altitude information is not available
Encoded Location Freshness	113-114	00	PDF-2 rotating field indicator
3LD	115-132	000100010100101010	ZLR
BCH Code (12 Bit)	133-144	110001101110	110001101110
Calculated BCH Code (12 Bit)	-	110001101110	110001101110

Table F-E.3: Self-test Mode Actions and Indications

No.	Action/Indication	Time-stamp (HH:MM:SS)	Description of action/indication	Duration of action/indication (sec)	Notes
1	Self-Test mode initiation (distinct action)	00:00:00	Test switch held down for 5 -10 seconds	5-10	
2	Distinct indication of the Self-test initiation	00:00:05	A double Red LED flash (5 seconds after a single flash)	1	
3	Self-test single burst transmission	00:00:32		520ms	Message burst time recorded on TUV test system
4	Self-test message default values				Decoded using TUV test system
5	Distinct indication of RF transmission	00:00:30	A single 50 millisecond red flash at transmission start	50ms	
6	Distinct indication of the Self-test PASS result	00:00:30	A Green LED shows for 3 seconds	3	
7	Distinct indication of the Self-test FAIL result	00:00:30	A Red LED flashes in a sequence	Up to 5 seconds	See manual for error codes
8	Distinct indication of Insufficient Battery Energy	00:00:30	A Red LED flashes 3 + 3 times	4 seconds	
9	Automatic termination of the Self-test mode, irrespectively of the switch position	00:03:10	If the switch is held down a GNSS Self-Test is completed before self terminating.	-	
10	Duration of the Self-test mode	00:00:35	-	-	-

GNSS Self-test mode

General

All duration measurements below include activation method time, i.e. they start from test switch press and include any “hold for x seconds” requirement and they end when all visual and audible activity appeared to cease.

All positional accuracy values below were calculated using the Haversine Formula; the Earth’s radius was taken as 6367 km.

GNSS Self-test Observations

Parameter	Actual	Declared
GNSS Self-test count	60	60
GNSS Self-test maximum duration (s) incl. activation method	190	190
Indication of GNSS Self-test activation/completion	A GNSS self-test is activated by holding the Remote/ELT switch in the TEST position until the LED displays a second rapid burst (which is after 10 seconds) If navigation data is detected, the LED lights up green for 3 seconds and a burst will be transmitted with position data. If no navigation data is detected the LED flashes rapidly at the end of the timeout period and a burst will be transmitted with default data.	
Indication of GNSS Self-test count limit reached	4 + 1 Red LED flashes	

Summary: GNSS Self-test with Valid Navigation Input (3LD)

Protocol	ELT-DT Location Protocol
Temperature (°C)	+22
Frame sync verification	011010000
Format Flag (1 bit)	1
Single Radiated burst (ms)	520.711
Position data	P
Single burst verification	P
Actual duration (s) incl. activation method	36
Position Input Latitude	N 50° 52.142
Position Input Longitude	W 1° 14.680
Position Output Latitude	N 50° 52’ 8”
Position Output Longitude	W 001° 14’ 40”
Position Error (m)	22.3

Summary: GNSS Self-test with Navigation Input from Arinc (3LD)

Protocol	ELT-DT Location Protocol
Temperature (°C)	+22
Frame sync verification	011010000
Format Flag (1 bit)	1
Single Radiated burst (ms)	520.711
Position data	P
Single burst verification	P
Actual duration (s) incl. activation method	190
Position Input Latitude	N 81.5°
Position Input Longitude	W 100.25°
Position Output Latitude	Default
Position Output Longitude	Default
Position Error (m)	N/A

Summary: GNSS Self-test without Valid Navigation Input (3LD)

Protocol	ELT-DT Location Protocol
Temperature (°C)	+22
Frame sync verification	011010000
Format Flag (1 bit)	1
Single Radiated burst (ms)	520.711
Default Position data	P
Single burst verification	P
Actual duration (s) incl. activation method	190

Full Hex Messages	
ELT-DT Location Protocol with Navigation data applied via GNSS simulator	
Ambient	FFFED08C990000000CD0134FA580CFBEA427
ELT-DT Location Protocol with Navigation data applied via ARINC interface	
Ambient	FFFED08C990000001FEFFE6E1B0F61F0FF01
ELT-DT Location Protocol without Navigation data applied	
Ambient	FFFED08C990000001FEFFE6E1B0F61F0FF01

Table F-E.4: GNSS Self-test Mode Actions and Indications

No.	Action/Indication	Time-stamp (HH:MM:SS)	Description of action/indication	Duration of action/indication (sec)	Notes
1	GNSS Self-test mode initiation (distinct action)	00:00:00	Hold down test switch	10	
2	Distinct indication of the GNSS Self-test initiation	00:00:10	Triple Red LED flash (5 seconds after the previous one)	1	
3	GNSS Self-test single burst transmission			520ms	Message burst time recorded on TUV test system
4	GNSS Self-test message position encoding		GNSS self-test message structure and bit values confirmed correct	520ms (with Nav input)	Decoded using TUV test system
5	Distinct indication of the GNSS Self-test PASS result	00:00:36	LED lights up green for 3 seconds	3	
6	Distinct indication of the GNSS Self-test FAIL result	00:03:00	Red LED burst flashes, then displays an error code with red flashes	10	4 + 2 means no GNSS acquisition
7	Distinct indication that the manufacturer-declared limited number of GNSS Self-tests is attained	00:00:15	LED flashes red 4 + 1 times	3	As described in manufacturer's documentation
8	Automatic termination of the Self-test mode, irrespectively of the switch position		If the switch is held in the TEST position, a GNSS ST is performed satisfactorily and then self terminates.	190	
9	Duration of the GNSS Self-test mode	00:03:10	LED turns off		

Summary

The EUT complies with clause A.3.6 of Cospas-Sarsat T.007.

2.8 OPERATING LIFETIME AT MINIMUM TEMPERATURE

2.8.1 Specification

Cospas-Sarsat T.007, Clause A.2.3

2.8.2 Equipment Under Test and Modification State

ULTIMA-DT-06, S/N: KA0040651003 - Modification State 0

2.8.3 Date of Test

14 March 2023 to 16 March 2023

2.8.4 Test Equipment Used

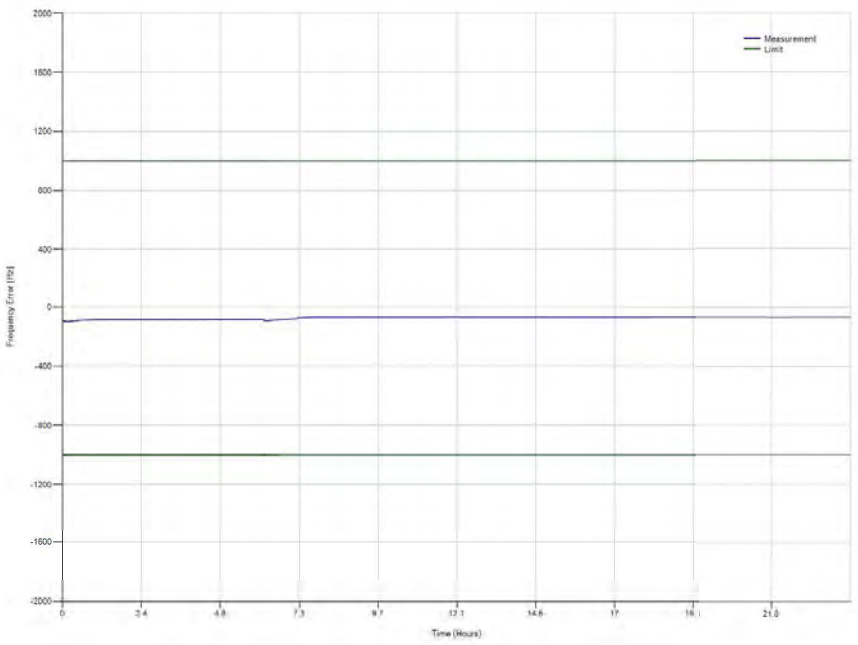
The major items of test equipment used for the above tests are identified in Section 3.1.

2.8.5 Laboratory Environmental Conditions

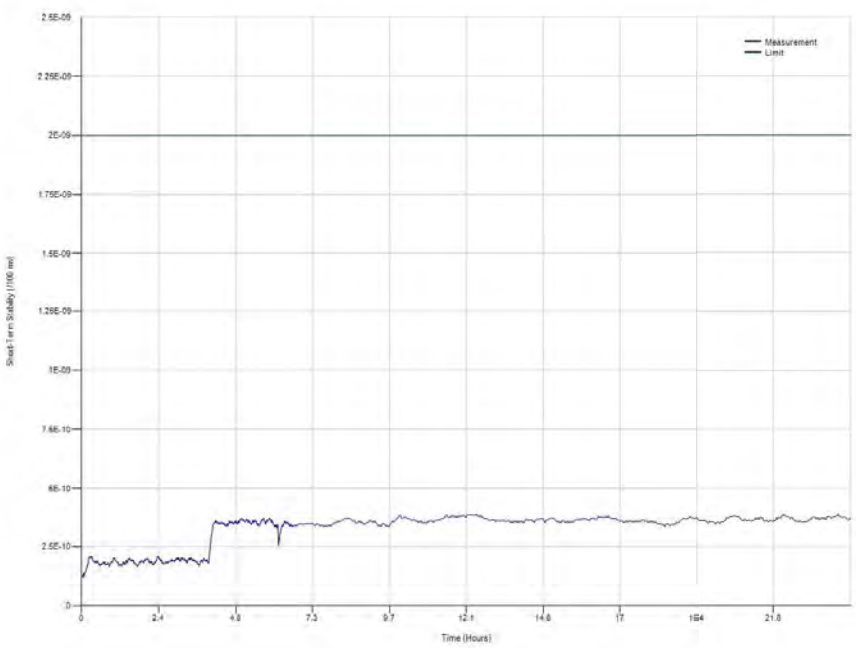
Ambient Temperature 26.8°C
Relative Humidity 24.5%

2.8.6 Test Results

Nominal Frequency



Short Term Stability



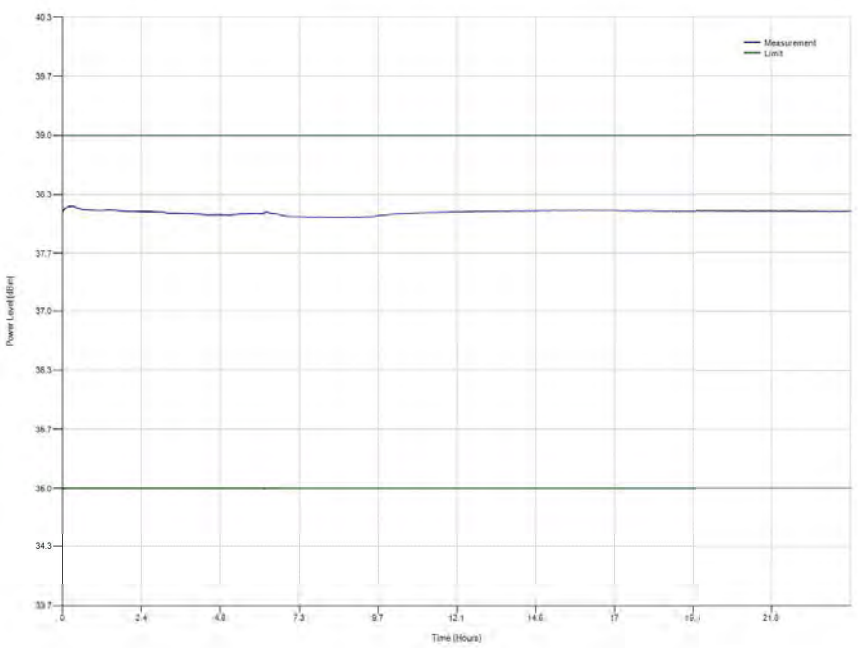
Medium Term Stability, Mean Slope

Not applicable for ELT(DT).

Medium Term Stability, Residual Frequency Variation

Not applicable for ELT(DT).

Output Power



Digital Message

Message 1

Message	FFFE2F8C99000000147648E3D385E00F02FA		
Hex ID	193200000028EC9		
Position	81°30'0" N 100°15'0" W		
Parameter	Bit	Data Bits	Decoded Value
Bit synchronization	1-15	111111111111111	111111111111111
Frame synchronization	16-24	000101111	000101111
Format Flag	25	1	1
Protocol Flag	26	0	0
Country Code	27-36	0011001001	Albania (Republic of)
Protocol Code	37-40	1001	ELT(DT) Location Protocol
Type of Beacon Identity	41-42	00	Aircraft 24 Bit Address
Identification Data	43-66	000000000000000000000000	ELT(DT) Location Test Protocol
N/S	67	0	North
Latitude Degrees	68-75	10100011	81.5
E/W	76	1	West
Longitude Degrees	77-85	011001001	100.5
BCH Code (21 Bit)	86-106	000111000111101001110	000111000111101001110
Calculated BCH Code (21 Bit)	-	000111000111101001110	000111000111101001110
Means of Activation	107-108	00	Manual Activation by the User
Altitude	109-112	0101	altitude is between 2200 m (7218 ft) and 2800 m (9186 ft)
Encoded Location Freshness	113-114	11	Encoded location in message is current
Delta Latitude +/-	115	1	+
Delta Latitude Minutes	116-119	0000	0
Delta Latitude Seconds	120-123	0000	0
Delta Longitude +/-	124	0	-
Delta Longitude Minutes	125-128	1111	15
Delta Longitude Seconds	129-132	0000	0
BCH Code (12 Bit)	133-144	001011111010	001011111010
Calculated BCH Code (12 Bit)	-	001011111010	001011111010

Message 2

Message	FFFE2F8C99000000147648E3D3850452ACF1		
Hex ID	193200000028EC9		
Position	81°30' N 100°30' W		
Parameter	Bit	Data Bits	Decoded Value
Bit synchronization	1-15	111111111111111	111111111111111
Frame synchronization	16-24	000101111	000101111
Format Flag	25	1	1
Protocol Flag	26	0	0
Country Code	27-36	0011001001	Albania (Republic of)
Protocol Code	37-40	1001	ELT(DT) Location Protocol
Type of Beacon Identity	41-42	00	Aircraft 24 Bit Address
Identification Data	43-66	000000000000000000000000	ELT(DT) Location Test Protocol
N/S	67	0	North
Latitude Degrees	68-75	10100011	81.5
E/W	76	1	West
Longitude Degrees	77-85	011001001	100.5
BCH Code (21 Bit)	86-106	000111000111101001110	000111000111101001110
Calculated BCH Code (21 Bit)	-	000111000111101001110	000111000111101001110
Means of Activation	107-108	00	Manual Activation by the User
Altitude	109-112	0101	altitude is between 2200 m (7218 ft) and 2800 m (9186 ft)
Encoded Location Freshness	113-114	00	PDF-2 rotating field indicator
3LD	115-132	000100010100101010	ZLR
BCH Code (12 Bit)	133-144	110011110001	110011110001
Calculated BCH Code (12 Bit)	-	110011110001	110011110001

Message 3

Message	FFFE2F8C99000000147648E3D385A00F09FE		
Hex ID	193200000028EC9		
Position	81°30'0" N 100°15'0" W		
Parameter	Bit	Data Bits	Decoded Value
Bit synchronization	1-15	111111111111111	111111111111111
Frame synchronization	16-24	000101111	000101111
Format Flag	25	1	1
Protocol Flag	26	0	0
Country Code	27-36	0011001001	Albania (Republic of)
Protocol Code	37-40	1001	ELT(DT) Location Protocol
Type of Beacon Identity	41-42	00	Aircraft 24 Bit Address
Identification Data	43-66	000000000000000000000000	ELT(DT) Location Test Protocol
N/S	67	0	North
Latitude Degrees	68-75	10100011	81.5
E/W	76	1	West
Longitude Degrees	77-85	011001001	100.5
BCH Code (21 Bit)	86-106	000111000111101001110	000111000111101001110
Calculated BCH Code (21 Bit)	-	000111000111101001110	000111000111101001110
Means of Activation	107-108	00	Manual Activation by the User
Altitude	109-112	0101	altitude is between 2200 m (7218 ft) and 2800 m (9186 ft)
Encoded Location Freshness	113-114	10	Encoded location in message is greater than 2 seconds and equal to or less than 60 seconds old
Delta Latitude +/-	115	1	+
Delta Latitude Minutes	116-119	0000	0
Delta Latitude Seconds	120-123	0000	0
Delta Longitude +/-	124	0	-
Delta Longitude Minutes	125-128	1111	15
Delta Longitude Seconds	129-132	0000	0
BCH Code (12 Bit)	133-144	100111111110	100111111110
Calculated BCH Code (12 Bit)	-	100111111110	100111111110

Message 4

Message	FFFE2F8C99000000147648E3D385600F01CB		
Hex ID	193200000028EC9		
Position	81°30'0" N 100°15'0" W		
Parameter	Bit	Data Bits	Decoded Value
Bit synchronization	1-15	111111111111111	111111111111111
Frame synchronization	16-24	000101111	000101111
Format Flag	25	1	1
Protocol Flag	26	0	0
Country Code	27-36	0011001001	Albania (Republic of)
Protocol Code	37-40	1001	ELT(DT) Location Protocol
Type of Beacon Identity	41-42	00	Aircraft 24 Bit Address
Identification Data	43-66	000000000000000000000000	ELT(DT) Location Test Protocol
N/S	67	0	North
Latitude Degrees	68-75	10100011	81.5
E/W	76	1	West
Longitude Degrees	77-85	011001001	100.5
BCH Code (21 Bit)	86-106	000111000111101001110	000111000111101001110
Calculated BCH Code (21 Bit)	-	000111000111101001110	000111000111101001110
Means of Activation	107-108	00	Manual Activation by the User
Altitude	109-112	0101	altitude is between 2200 m (7218 ft) and 2800 m (9186 ft)
Encoded Location Freshness	113-114	01	Encoded location in message is more than 60 seconds old
Delta Latitude +/-	115	1	+
Delta Latitude Minutes	116-119	0000	0
Delta Latitude Seconds	120-123	0000	0
Delta Longitude +/-	124	0	-
Delta Longitude Minutes	125-128	1111	15
Delta Longitude Seconds	129-132	0000	0
BCH Code (12 Bit)	133-144	000111001011	000111001011
Calculated BCH Code (12 Bit)	-	000111001011	000111001011

Message 5

Message	FFFE2F8C990000001FEFFE6E1B0F61F0FF01		
Hex ID	19320000003FDFF		
Position	None - Default Values		
Parameter	Bit	Data Bits	Decoded Value
Bit synchronization	1-15	111111111111111	111111111111111
Frame synchronization	16-24	000101111	000101111
Format Flag	25	1	1
Protocol Flag	26	0	0
Country Code	27-36	0011001001	Albania (Republic of)
Protocol Code	37-40	1001	ELT(DT) Location Protocol
Type of Beacon Identity	41-42	00	Aircraft 24 Bit Address
Identification Data	43-66	000000000000000000000000	ELT(DT) Location Test Protocol
N/S	67	0	Default
Latitude Degrees	68-75	11111111	Default
E/W	76	0	Default
Longitude Degrees	77-85	111111111	Default
BCH Code (21 Bit)	86-106	110011011100001101100	110011011100001101100
Calculated BCH Code (21 Bit)	-	110011011100001101100	110011011100001101100
Means of Activation	107-108	00	Manual Activation by the User
Altitude	109-112	1111	default value if altitude information is not available
Encoded Location Freshness	113-114	01	Encoded location in message is more than 60 seconds old
Delta Latitude +/-	115	1	Default
Delta Latitude Minutes	116-119	0000	Default
Delta Latitude Seconds	120-123	1111	Default
Delta Longitude +/-	124	1	Default
Delta Longitude Minutes	125-128	0000	Default
Delta Longitude Seconds	129-132	1111	Default
BCH Code (12 Bit)	133-144	111100000001	111100000001
Calculated BCH Code (12 Bit)	-	111100000001	111100000001

Message 6

Message	FFFE2F8C990000001FEFFE6E1B0F0452AC6E		
Hex ID	19320000003FDFF		
Position	None - Default Values		
Parameter	Bit	Data Bits	Decoded Value
Bit synchronization	1-15	111111111111111	111111111111111
Frame synchronization	16-24	000101111	000101111
Format Flag	25	1	1
Protocol Flag	26	0	0
Country Code	27-36	0011001001	Albania (Republic of)
Protocol Code	37-40	1001	ELT(DT) Location Protocol
Type of Beacon Identity	41-42	00	Aircraft 24 Bit Address
Identification Data	43-66	000000000000000000000000	ELT(DT) Location Test Protocol
N/S	67	0	Default
Latitude Degrees	68-75	11111111	Default
E/W	76	0	Default
Longitude Degrees	77-85	111111111	Default
BCH Code (21 Bit)	86-106	110011011100001101100	110011011100001101100
Calculated BCH Code (21 Bit)	-	110011011100001101100	110011011100001101100
Means of Activation	107-108	00	Manual Activation by the User
Altitude	109-112	1111	default value if altitude information is not available
Encoded Location Freshness	113-114	00	PDF-2 rotating field indicator
3LD	115-132	000100010100101010	ZLR
BCH Code (12 Bit)	133-144	110001101110	110001101110
Calculated BCH Code (12 Bit)	-	110001101110	110001101110

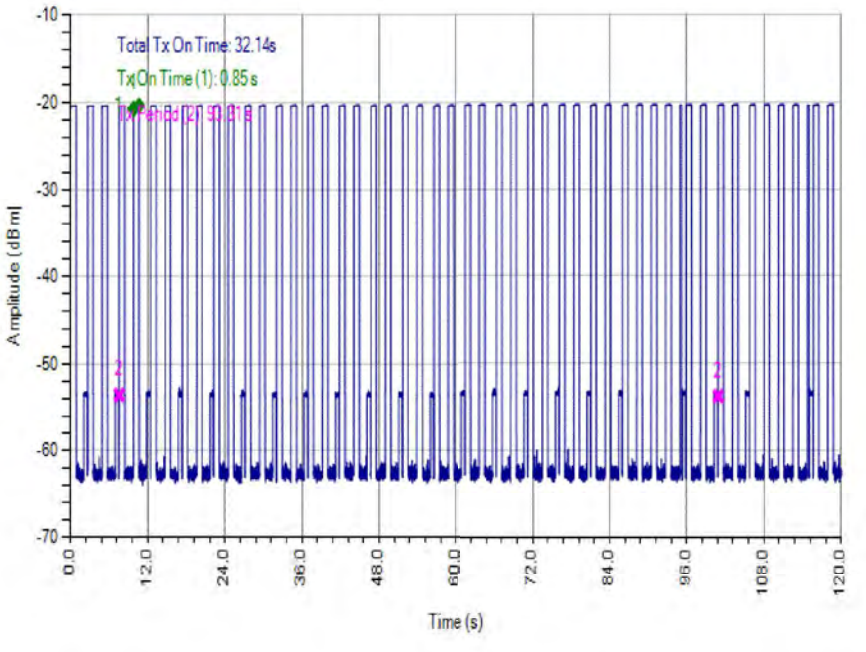
Message 7

Message	FFFE2F8C990000001FEFFE6E1B1F61F0F28E		
Hex ID	19320000003FDFF		
Position	None - Default Values		
Parameter	Bit	Data Bits	Decoded Value
Bit synchronization	1-15	111111111111111	111111111111111
Frame synchronization	16-24	000101111	000101111
Format Flag	25	1	1
Protocol Flag	26	0	0
Country Code	27-36	0011001001	Albania (Republic of)
Protocol Code	37-40	1001	ELT(DT) Location Protocol
Type of Beacon Identity	41-42	00	Aircraft 24 Bit Address
Identification Data	43-66	000000000000000000000000	ELT(DT) Location Test Protocol
N/S	67	0	Default
Latitude Degrees	68-75	11111111	Default
E/W	76	0	Default
Longitude Degrees	77-85	111111111	Default
BCH Code (21 Bit)	86-106	110011011100001101100	110011011100001101100
Calculated BCH Code (21 Bit)	-	110011011100001101100	110011011100001101100
Means of Activation	107-108	01	Automatic Activation by the Beacon
Altitude	109-112	1111	default value if altitude information is not available
Encoded Location Freshness	113-114	01	Encoded location in message is more than 60 seconds old
Delta Latitude +/-	115	1	Default
Delta Latitude Minutes	116-119	0000	Default
Delta Latitude Seconds	120-123	1111	Default
Delta Longitude +/-	124	1	Default
Delta Longitude Minutes	125-128	0000	Default
Delta Longitude Seconds	129-132	1111	Default
BCH Code (12 Bit)	133-144	001010001110	001010001110
Calculated BCH Code (12 Bit)	-	001010001110	001010001110

Message 8

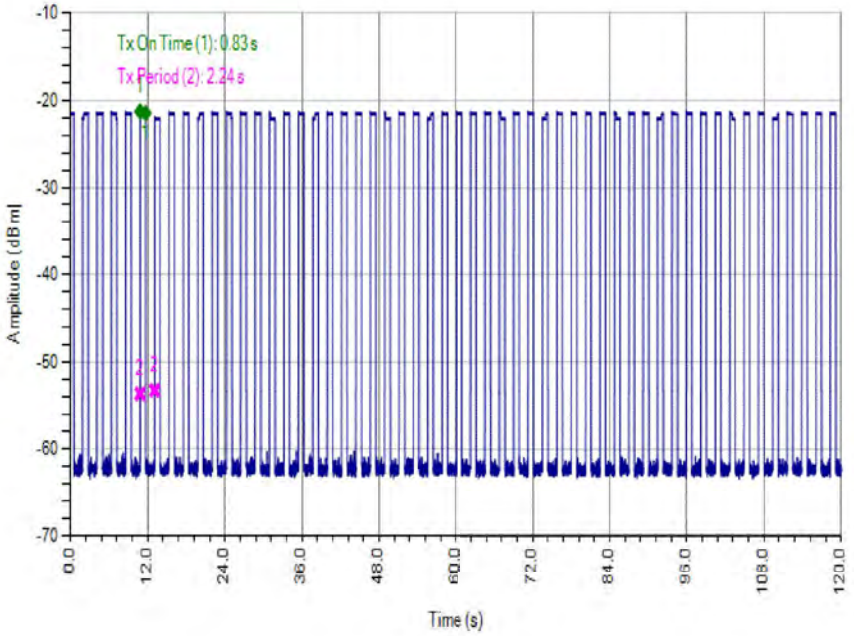
Message	FFFE2F8C990000001FEFFE6E1B1F0452A1E1		
Hex ID	19320000003FDFF		
Position	None - Default Values		
Parameter	Bit	Data Bits	Decoded Value
Bit synchronization	1-15	111111111111111	111111111111111
Frame synchronization	16-24	000101111	000101111
Format Flag	25	1	1
Protocol Flag	26	0	0
Country Code	27-36	0011001001	Albania (Republic of)
Protocol Code	37-40	1001	ELT(DT) Location Protocol
Type of Beacon Identity	41-42	00	Aircraft 24 Bit Address
Identification Data	43-66	000000000000000000000000	ELT(DT) Location Test Protocol
N/S	67	0	Default
Latitude Degrees	68-75	11111111	Default
E/W	76	0	Default
Longitude Degrees	77-85	111111111	Default
BCH Code (21 Bit)	86-106	110011011100001101100	110011011100001101100
Calculated BCH Code (21 Bit)	-	110011011100001101100	110011011100001101100
Means of Activation	107-108	01	Automatic Activation by the Beacon
Altitude	109-112	1111	default value if altitude information is not available
Encoded Location Freshness	113-114	00	PDF-2 rotating field indicator
3LD	115-132	000100010100101010	ZLR
BCH Code (12 Bit)	133-144	000111100001	000111100001
Calculated BCH Code (12 Bit)	-	000111100001	000111100001

121MHz Homing Transmitter - Duty Cycle (Start of Test)



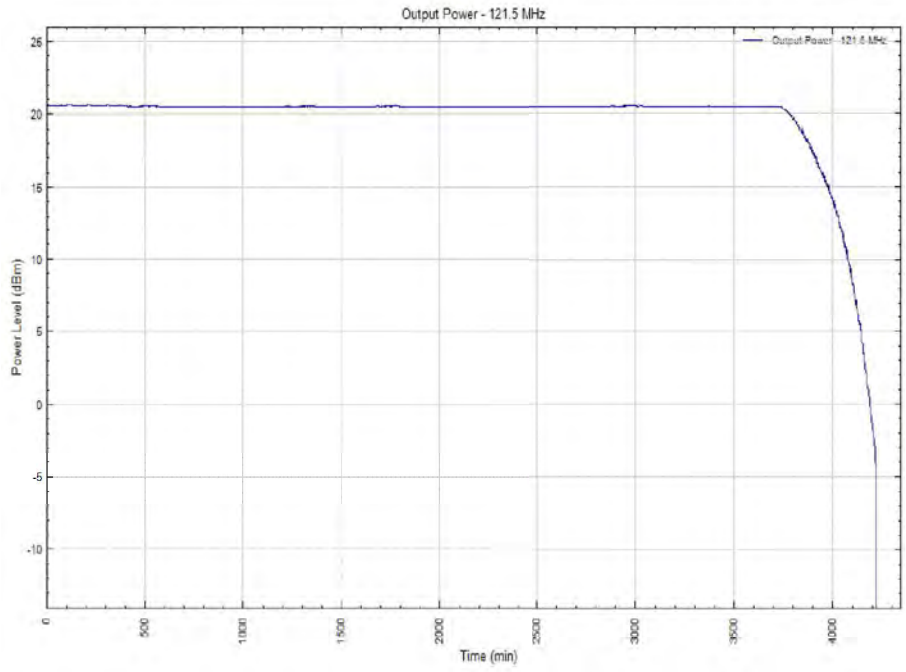
Duty Cycle = 32.139 / (32.139+61.172) = 34.44%

121MHz Homing Transmitter - Duty Cycle (End of Test)

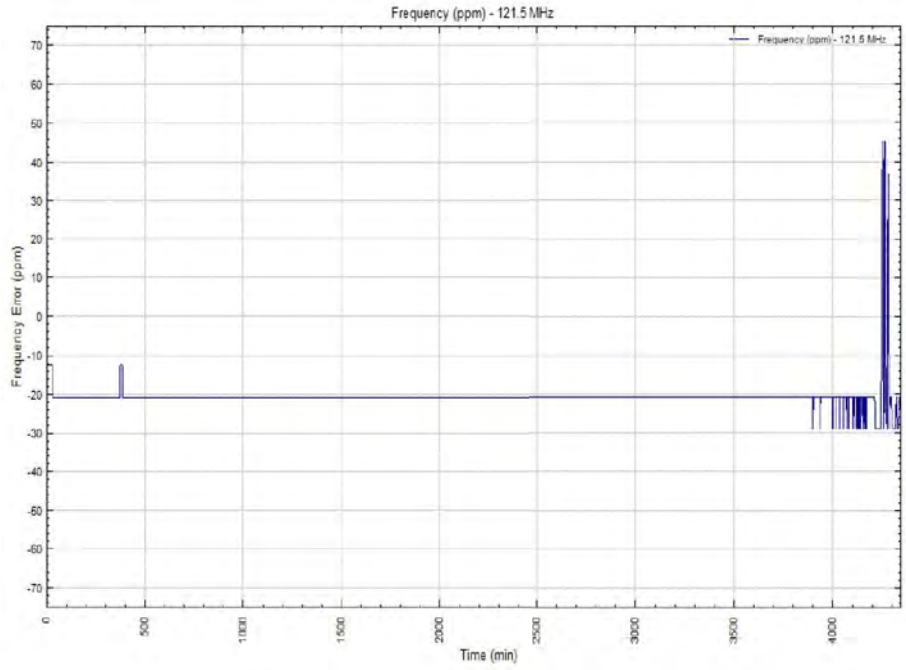


Duty Cycle = 0.835 / (0.835+1.406) = 37.25%

121MHz Homing Transmitter Power



121MHz Homing Transmitter Frequency



Operating Current Measurements and Analysis

System Configurations and Operating Modes

System Configuration/Operating Mode Matrix (SCOMM):

System Configuration →	A
Operational Mode ↓	All Ancillaries Connected: Arinc, 28V supply, Remote Panel, Buzzer
OFF mode	A1
ARMED disabled mode (including EBIT)	A2
ARMED enabled mode	A3
ARMED - Without 28V supply	A4
EUT activation from Activation with Crash Sensor 406MHz + 121,5MHz - NO GNSS SIGNAL	A8
EUT 121,5MHz after 24hours of beacon operation WITH 28V supply - NO GNSS SIGNAL	A9
EUT activation from beacon front panel control 406MHz + 121,5MHz - NO GNSS SIGNAL	A10
EUT activation from Remote Control Panel (RC820) 406MHz + 121,5MHz - NO GNSS SIGNAL	A11
Self-test from beacon from Remote Control Panel (RC820)	A13
GNSS Self-test from beacon front panel control - NO GNSS SIGNAL	A15
GNSS Self-test from beacon front panel control - GNSS SIGNAL	A16
Cancellation message from ARINC429 Interface (label 202) (after EUT activation from ARINC429 Interface (label 202))	A18
EUT activation from beacon front panel control 406MHz + 121,5MHz - NO GNSS SIGNAL and REMOVING 28V just after beacon manual activation	A19

SCOMM Results as per C/S T.007 Table F-E.1:

Beacon Operating Mode	Mode: Manually selectable or Automatic	Measurement interval, sec	Average Current, mA	Peak Current, mA
A1	Manual	1000	-3.672E-08	1.529E-06
A2	Manual	1000	-7.909E-08	8.242E-06
A3	Manual	1000	-4.789E-08	8.702E-06
A4	Manual	1000	9.086E-08	2.281E-06
A8	Autonomous	1000	122.90	899.97
A9	Autonomous	1000	26.18	40.531
A10	Autonomous	1000	121.38	417.504
A11	Automatic	1000	121.49	406.857
A13	Automatic	26.1	62.39	121.073
A15	Manual	179.8	28.41	120.634
A16	Manual	25.8	60.71	119.477
A18	Manual	10.1	141.12	521.500
A19	Manual	1000	122.23	584.405

The sampling interval was a nominal 100 ms.

Worst Case System Configurations / Operating Modes

"Lifetime in service" drains (highest average current):

Standby: A4 – All Ancillaries – No 28V Supply, "ARM" at EUT

Self-test: A13 – All Ancillaries, Self-Test triggered from Remote Control Panel (RC820)

GNSS Self-test (Timeout): A15 – All Ancillaries, GNSS Self-Test triggered from EUT front panel

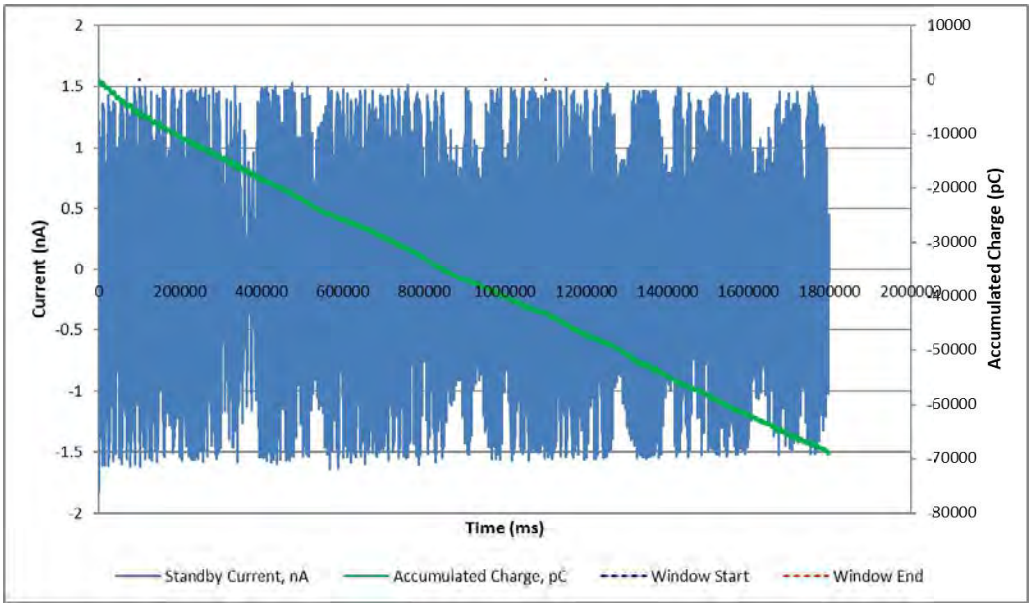
Note: "Worst case" GNSS Self-test is a test which times out because a long message is transmitted regardless of acquisition.

Operating mode during standard tests (highest average current):

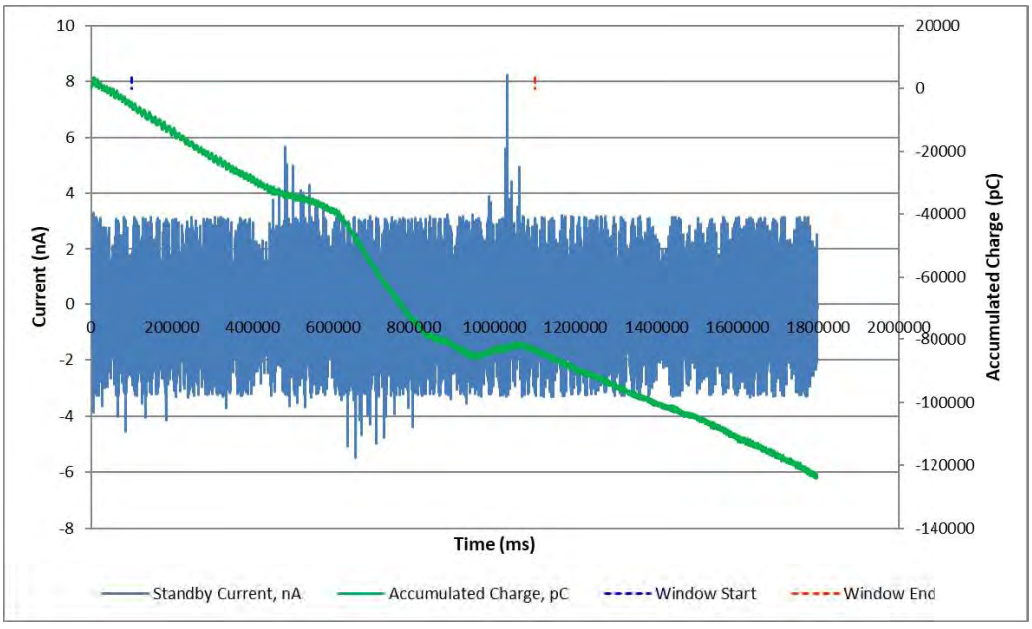
A8 – All Ancillaries, EUT triggered from Crash Sensor

For Operating Lifetime Test – The EUT was triggered from the Remote Panel and then the 28V supply was removed. The EUT was later (after 6 hours and 10 minutes) reactivated via the Crash Sensor. This meant the repetition rate restarted at the higher interval, giving a higher average current draw.

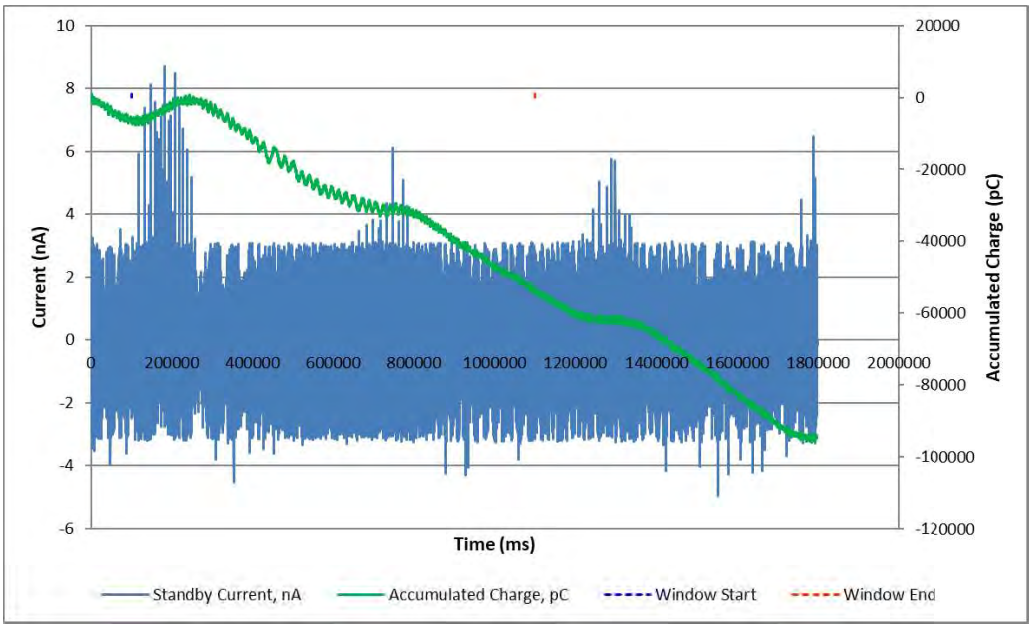
Current Measurement Plots



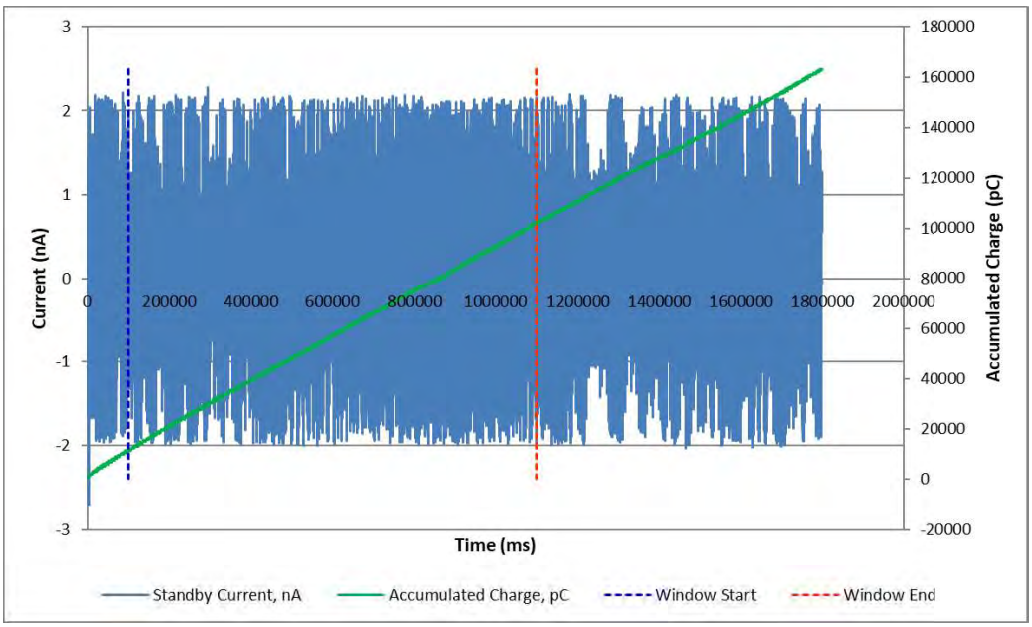
A1: OFF



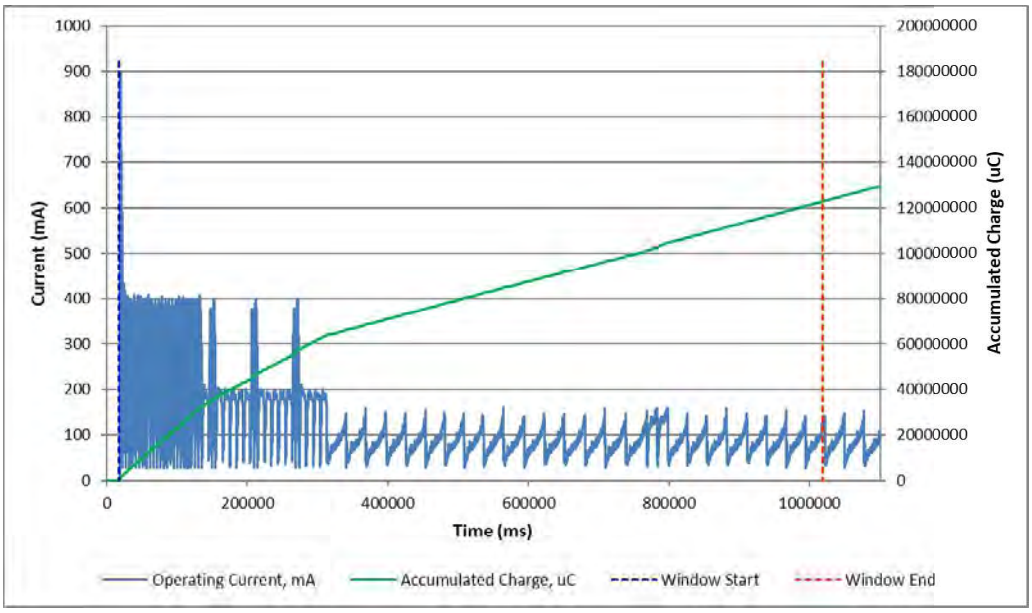
A2: ARMED disabled mode (including periodic EBIT)



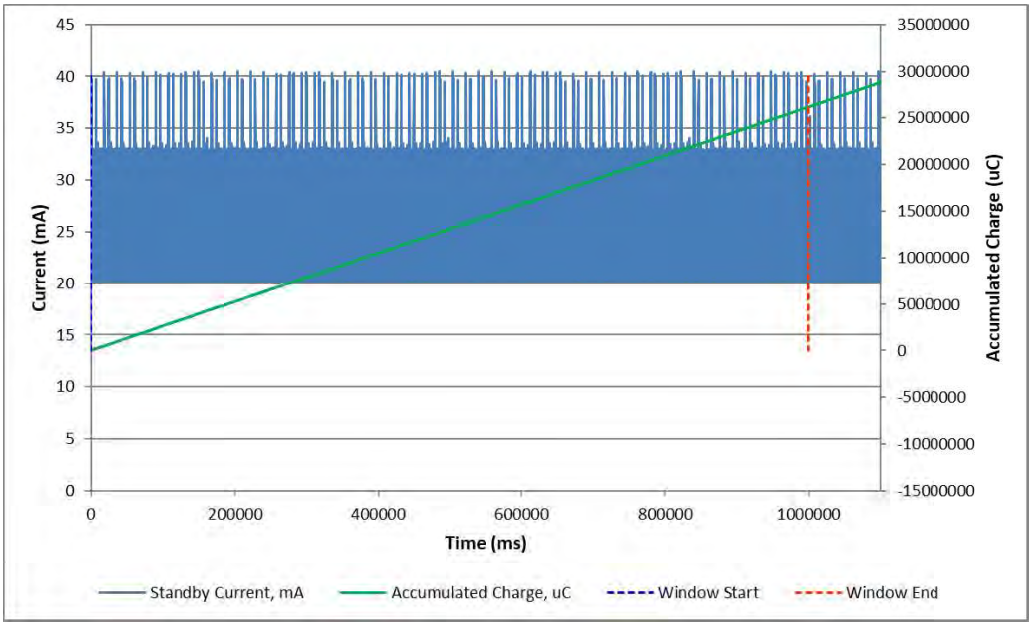
A3: ARMED enabled mode



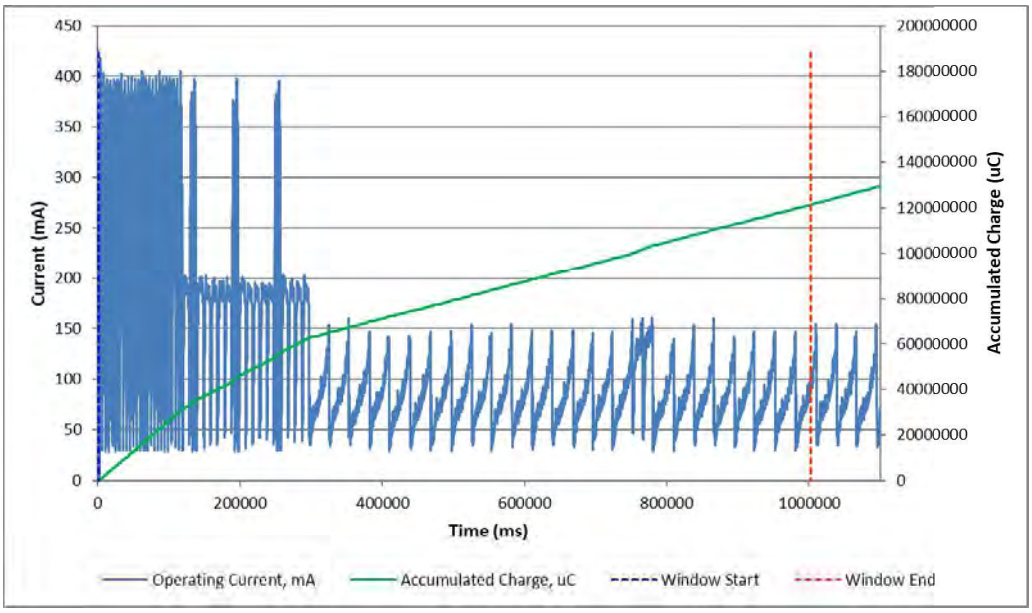
A4: ARMED – WITHOUT 28V supply



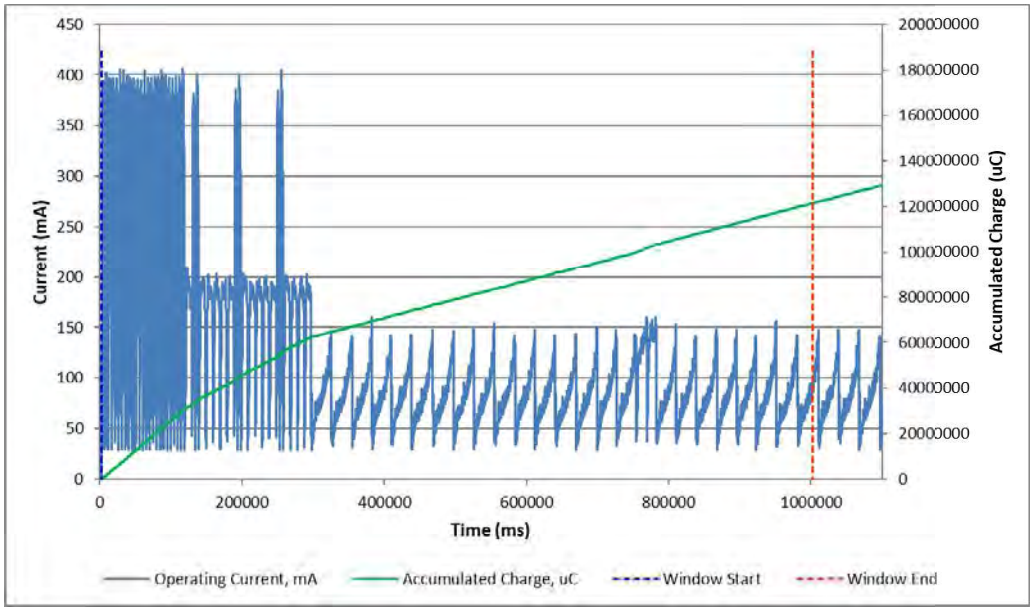
A8: EUT activation from Activation with Crash Sensor 406MHz + 121,5MHz - NO GNSS SIGNAL



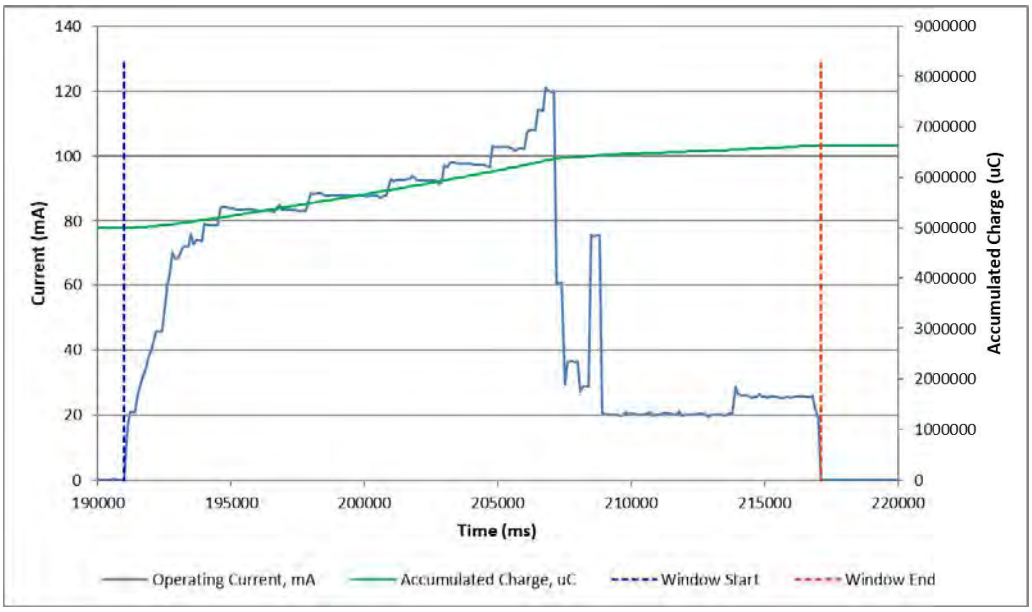
A9: EUT 121,5MHz after 24hours of beacon operation WITH 28V supply - NO GNSS SIGNAL



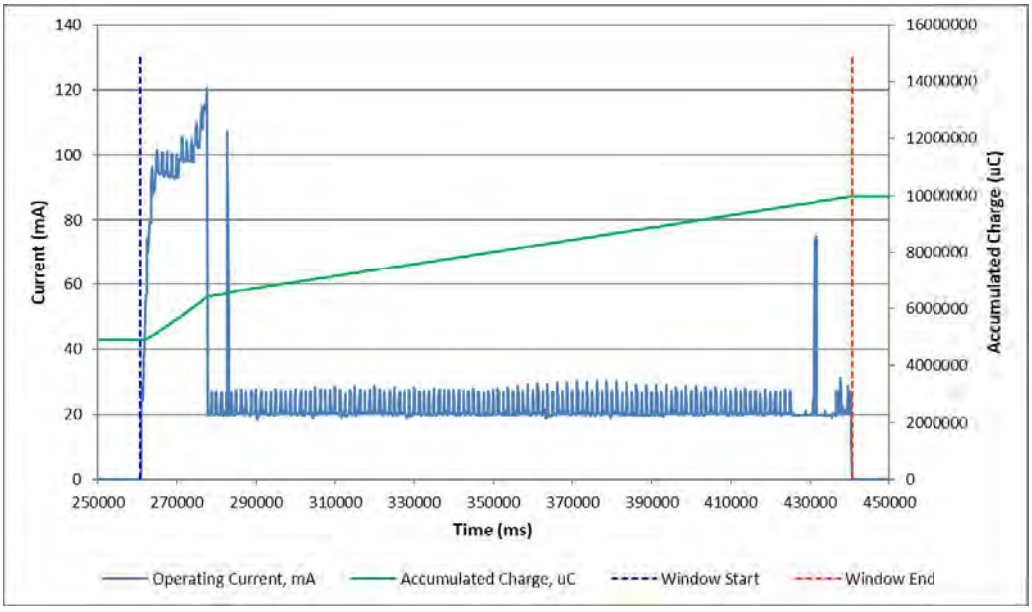
A10: EUT activation from beacon front panel control 406MHz + 121,5MHz - NO GNSS SIGNAL



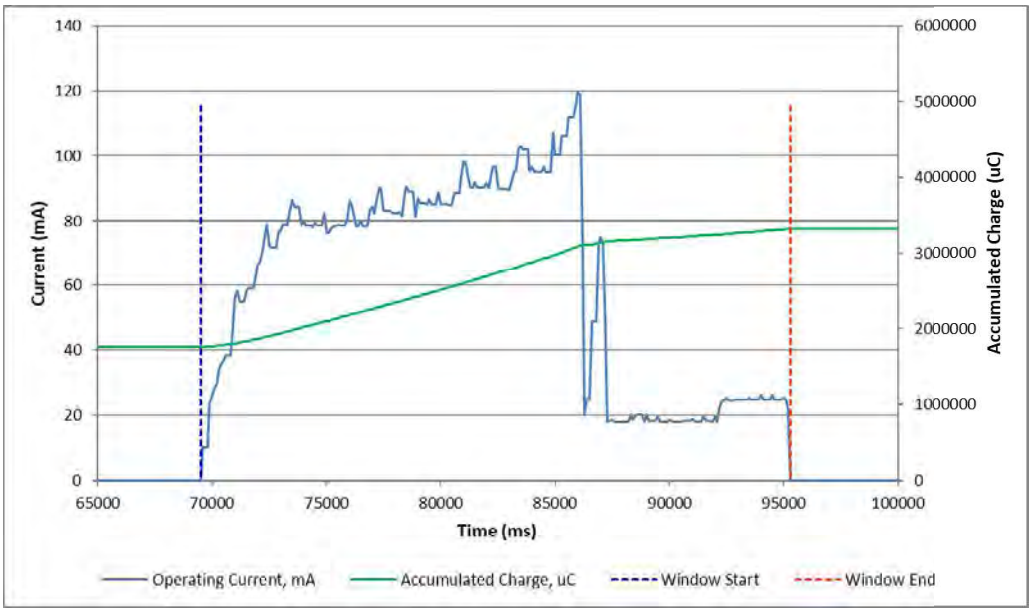
A11: EUT activation from Remote Control Panel (RC820) 406MHz + 121,5MHz - NO GNSS SIGNAL



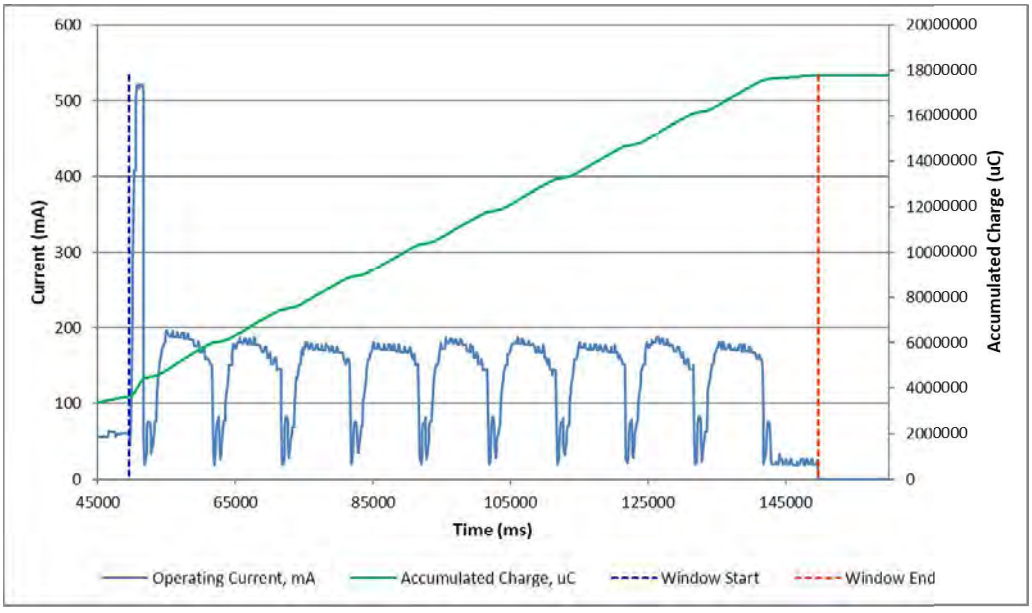
A13: Self-test from beacon from Remote Control Panel (RC820)



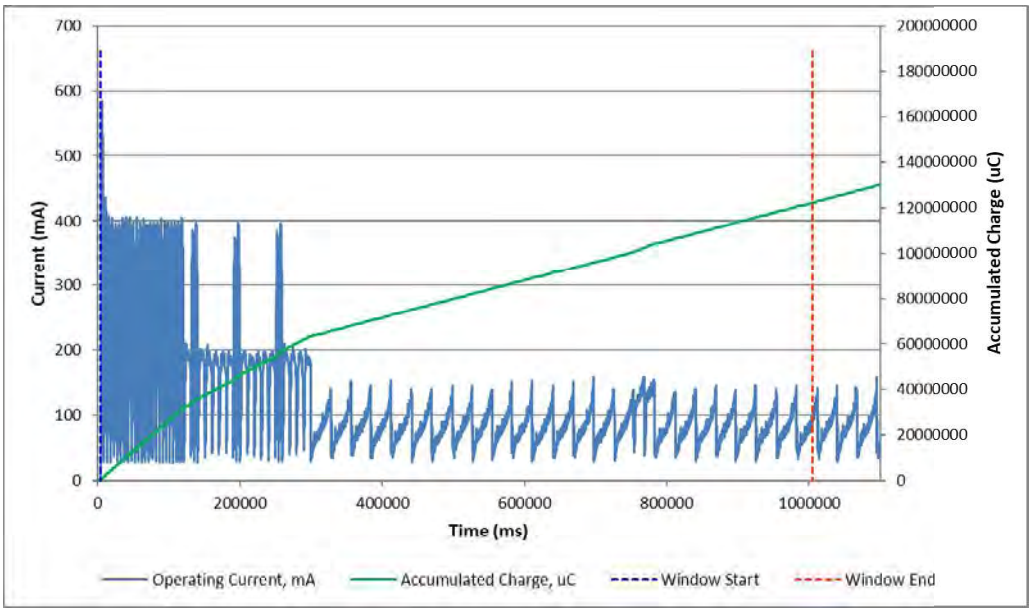
A15: GNSS Self-test from beacon front panel control - NO GNSS SIGNAL



A16: GNSS Self-test from beacon front panel control - GNSS SIGNAL



A18: Cancellation message from ARINC429 Interface (label 202) (after EUT activation from ARINC429 Interface (label 202))



A19: EUT activation from beacon front panel control 406MHz + 121,5MHz - NO GNSS SIGNAL and REMOVING 28V just after beacon manual activation

Battery Conditioning Calculations

As per C/S T.007 Table F-E.2:

Characteristic	Designation	Units	Value	Comments
Beacon manufacturers declared maximum allowed cell shelf-life (from date of cell manufacture to date of battery pack installation in the beacon)	T_{CS} or TCS	Years	4	
Declared beacon battery replacement period (from date of installation in the beacon to expiry date marked on the beacon)	T_{BR} or TBR	Years	5	
Battery pack electrical configuration	-	-		
Cell model and cell chemistry	-	-		
Nominal cell capacity	-	Ah	3	
Nominal battery pack capacity	C_{BN}	Ah	6	
Annual battery cell capacity loss (self-discharge) due to aging, as specified by cell manufacturer at ambient temperature	L_{SDC}	%	2	
Calculated battery pack capacity loss due to self-discharge: $L_{CBN1} = C_{BN} - [C_{BN} * (1 - L_{SDC}/100)^{TBR+TCS}]$	L_{CBN}	Ah	0.1200	
Annual battery cell capacity loss (self-discharge) due to aging, as specified by cell manufacturer at ambient temperature	L_{SDC}	%	1	
Calculated battery pack capacity loss due to self-discharge: $L_{CBN2} = C_{BN} - [C_{BN} * (1 - L_{SDC}/100)^{TBR+TCS}]$	L_{CBN}	Ah	0.4635	
Number of self-tests per year	N_{ST}	-	12	Manufacturer Declared Value
Average battery current during a self-test	I_{ST}	mA	62.39	
Maximum duration of a self-test	T_{ST}	s	26.1	
Calculated battery pack capacity loss due to self-tests during battery replacement period: $L_{ST} = I_{ST} * T_{ST} * T_{BR} * (N_{ST} / 3600)$	L_{ST}	mAh	27.14	
Maximum Number of GNSS self-tests between battery replacements	N_{GST}	-	60	Manufacturer Declared Value
Average battery current during a GNSS self-test of maximum duration	I_{GST}	mA	28.41	
Maximum duration of a GNSS self-test	T_{GST}	s	179.8	
Calculated battery pack capacity loss due to GNSS self-tests during battery replacement period: $L_{GST} = I_{GST} * T_{GST} * (N_{GST} / 3600)$	L_{GST}	mAh	85.1353	
Average stand-by battery pack current	I_{SB}	mA	0.00000009	
Other Capacity Losses	L_{OTH}	mAh	0	None declared
Battery pack capacity loss due to constant operation of circuitry prior to beacon activation: $L_{ISB} = I_{SB} * T_{BR} * 8760$	L_{ISB}	mAh	0.0039	
Calculated value of the battery pack pre-test discharge $L_{CDC} = L_{CBN1} + L_{CBN2} + 1.65((L_{ST} + L_{GST} + L_{ISB})/1000) + (L_{OTH}/1000)$	L_{CDC}	Ah	0.7688	

Battery Conditioning Results

A fresh battery was used for the test; it was discharged across a resistor.

Pre-test discharge (L_{CDC}) [mAh]	=	768.8
Operating mode current [mA]	=	100
Pre-test discharge duration [h]	=	$\frac{768.8}{100}$
Pre-test discharge duration [h]	=	7.688

The actual discharge duration was 7.75 h resulting in a discharge of 775.21 mAh; an over-test of 0.83 %.

Summary

The EUT complies with clause A.2.3 of Cospas-Sarsat T.007.

2.9 SATELLITE QUALITATIVE TESTS

2.9.1 Specification

Cospas-Sarsat T.007, Clause A.2.5

2.9.2 Equipment Under Test and Modification State

ULTIMA-DT-06, S/N: KA0040651003 - Modification State 0

2.9.3 Date of Test

23 March 2023

2.9.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.9.5 Laboratory Environmental Conditions

Ambient Temperature 15.7 - 21.3°C
Relative Humidity 44.0 - 63.4%

2.9.6 Test Results

Navigation Data status during test:

External Navigation Data Input: Applied

GNSS Simulator Navigation Data: Not Applied

EUT System Configuration
As per figure 2 of section 1.3.2
Without the RF splitter and GNSS Simulator replaced with Live Satellites
EUT Operating Mode
As described in section 1.3.3 'Operating (Active)'
Encoded Protocol
ELT DT Location Protocol with 3LD
Test Duration
3 x 20 minutes

Note: Cable loss from EUT to Antenna: 2.81 dB

Actual location of the test beacon:	50.869039
(TÜV Product Service Ltd, Fareham Site, Central)	-1.244664

Notes: Altitude Band 0000 = altitude is between 0 and 400 m
(Test location altitude = 40m above sea level)

Configuration 6

Test 1

Burst No.	Beacon TX Time	15 Hex ID	Complete Beacon Message	Encoded Location reported in the MEOLUT alert			2D Location Error (meters)	Valid altitude Band
				Latitude	Longitude	Altitude Band*		
1	06:25:48	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
2	06:25:53	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
3	06:25:58	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
4	06:26:03	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
5	06:26:08	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
6	06:26:13	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
7	06:26:18	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
8	06:26:23	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
9	06:26:28	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
10	06:26:32	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
11	06:26:37	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
12	06:26:42	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
13	06:26:47	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
14	06:26:52	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
15	06:26:57	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
16	06:27:02	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
17	06:27:07	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
18	06:27:12	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
19	06:27:17	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
20	06:27:21	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
21	06:27:26	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
22	06:27:31	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
23	06:27:36	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
24	06:27:41	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
25	06:27:51	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
26	06:27:56	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
27	06:28:01	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
28	06:28:11	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
29	06:28:21	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
30	06:28:31	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
31	06:28:40	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
32	06:28:50	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
33	06:28:55	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
34	06:29:00	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
35	06:29:10	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
36	06:29:20	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
37	06:29:30	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass

Burst No.	Beacon TX Time	15 Hex ID	Complete Beacon Message	Encoded Location reported in the MEOLUT alert			2D Location Error (meters)	Valid altitude Band
				Latitude	Longitude	Altitude Band*		
38	06:29:40	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
39	06:29:50	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
40	06:29:55	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
41	06:30:00	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
42	06:30:10	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
43	06:30:19	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
44	06:30:29	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
45	06:30:39	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
46	06:31:09	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
47	06:31:37	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
48	06:32:04	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
49	06:32:32	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
50	06:33:02	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
51	06:33:31	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
52	06:34:00	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
53	06:34:29	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
54	06:34:58	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
55	06:35:26	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
56	06:35:55	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
57	06:36:24	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
58	06:36:53	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
59	06:37:20	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
60	06:37:48	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
61	06:38:16	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
62	06:38:31	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
63	06:38:45	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
64	06:39:12	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
65	06:39:42	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
66	06:40:10	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
67	06:40:37	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
68	06:41:05	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
69	06:41:35	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
70	06:42:04	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
71	06:42:33	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
72	06:43:02	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
73	06:43:31	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
74	06:43:59	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
75	06:44:28	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
76	06:44:57	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
77	06:45:26	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass

Measurements highlighted Blue contain 3LD in PDF-2 and may be discarded from the results.
Measurements highlighted Red indicate that the encoded longitude and latitude are incorrect as the 2D Location error is greater than 200m.

Test 1 Summary: MEOLUT alerts with complete beacon message and 15 Hex ID at least 1/min for >90% of total test time: 100% - Pass

Encoded location provided by the MEOLUT accurate in the horizontal plane ≤200m for >90% of the alerts: 100% - Pass

Encoded location provided by the MEOLUT accurate in the vertical plane reported as correct altitude band: 100% Pass

MEO Satellites in view during test

LUT ID	Antenna Id	Sat ID	AOS	LOS
2275	1	426	07:30:00	07:30:26
2275	1	401	01:27:52	08:12:57
2275	1	409	02:05:22	10:25:53
2275	1	405	05:02:52	11:47:51
2275	1	424	05:07:00	14:19:52

Note: The raw results for the Satellite Qualitative test were provided by French MCC. However, as the French MEOLUT has an active antenna with no mechanical tracking they were unable to support the request to provide the starting and ending azimuth and elevation of each MEOSAR satellite tracked during the test.

Test 2

Burst No.	Beacon TX Time	15 Hex ID	Complete Beacon Message	Encoded Location reported in the MEOLUT alert			2D Location Error (meters)	Valid altitude Band
				Latitude	Longitude	Altitude Band*		
1	11:48:56	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
2	11:49:01	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
3	11:49:06	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
4	11:49:11	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
5	11:49:16	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
6	11:49:21	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
7	11:49:26	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
8	11:49:31	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
9	11:49:36	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
10	11:49:41	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
11	11:49:45	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
12	11:49:50	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
13	11:49:55	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
14	11:50:00	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
15	11:50:05	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
16	11:50:10	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
17	11:50:15	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
18	11:50:20	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
19	11:50:25	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
20	11:50:30	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
21	11:50:34	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
22	11:50:39	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
23	11:50:44	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
24	11:50:49	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
25	11:50:59	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
26	11:51:04	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
27	11:51:09	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
28	11:51:19	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
29	11:51:29	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
30	11:51:39	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
31	11:51:49	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
32	11:51:58	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
33	11:52:03	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
34	11:52:08	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
35	11:52:18	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
36	11:52:28	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
37	11:52:38	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
38	11:52:48	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass

Burst No.	Beacon TX Time	15 Hex ID	Complete Beacon Message	Encoded Location reported in the MEOLUT alert			2D Location Error (meters)	Valid altitude Band
				Latitude	Longitude	Altitude Band*		
39	11:52:58	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
40	11:53:03	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
41	11:53:08	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
42	11:53:18	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
43	11:53:28	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
44	11:53:38	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
45	11:53:47	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
46	11:54:17	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
47	11:54:47	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
48	11:55:16	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
49	11:55:45	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
50	11:56:13	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
51	11:56:41	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
52	11:57:09	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
53	11:57:37	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
54	11:58:06	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
55	11:58:33	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
56	11:59:00	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
57	11:59:28	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
58	11:59:56	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
59	12:00:26	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
60	12:00:55	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
61	12:01:23	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
62	12:01:38	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
63	12:01:52	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
64	12:02:20	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
65	12:02:50	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
66	12:03:20	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
67	12:03:49	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
68	12:04:18	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
69	12:04:46	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
70	12:05:14	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
71	12:05:42	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
72	12:06:10	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
73	12:06:39	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
74	12:07:06	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
75	12:07:33	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
76	12:08:01	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
77	12:08:29	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass

Measurements highlighted Blue contain 3LD in PDF-2 and may be discarded from the results.
Measurements highlighted Red indicate that the encoded longitude and latitude are incorrect as the 2D Location error is greater than 200m.

Test 2 Summary: MEOLUT alerts with complete beacon message and 15 Hex ID at least 1/min for >90% of total test time: 100% - Pass

Encoded location provided by the MEOLUT accurate in the horizontal plane ≤200m for 90% of the alerts: 100% - Pass

Encoded location provided by the MEOLUT accurate in the vertical plane reported as correct altitude band: 100% Pass (Test location altitude = 40m above sea level. Reported altitude band = 0000 (altitude is between 0 and 400 m)).

MEO Satellites in view during test

LUT ID	Antenna Id	Sat ID	AOS	LOS
2275	1	403	07:41:30	12:50:21
2275	1	408	10:04:30	13:21:25
2275	1	418	07:46:30	14:20:25
2275	1	424	05:07:00	14:19:52
2275	1	410	09:05:00	15:14:49
2275	1	425	07:40:00	16:45:36
2275	1	402	10:23:30	18:35:24
2275	1	436	11:20:30	19:43:57

Note: The raw results for the Satellite Qualitative test were provided by French MCC. However, as the French MEOLUT has an active antenna with no mechanical tracking they were unable to support the request to provide the starting and ending azimuth and elevation of each MEOSAR satellite tracked during the test.

Test 3

Burst No.	Beacon TX Time	15 Hex ID	Complete Beacon Message	Encoded Location reported in the MEOLUT alert			2D Location Error (meters)	Valid altitude Band
				Latitude	Longitude	Altitude Band*		
1	17:09:24	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
2	17:09:29	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
3	17:09:34	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
4	17:09:38	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
5	17:09:43	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
6	17:09:48	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
7	17:09:53	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
8	17:09:58	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
9	17:10:03	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
10	17:10:08	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
11	17:10:13	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
12	17:10:18	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
13	17:10:23	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
14	17:10:27	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
15	17:10:32	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
16	17:10:37	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
17	17:10:42	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
18	17:10:47	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
19	17:10:52	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
20	17:10:57	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
21	17:11:02	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
22	17:11:07	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
23	17:11:12	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
24	17:11:16	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
25	17:11:26	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
26	17:11:31	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
27	17:11:36	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
28	17:11:46	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
29	17:11:56	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
30	17:12:06	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
31	17:12:16	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
32	17:12:26	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
33	17:12:31	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
34	17:12:36	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
35	17:12:46	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
36	17:12:55	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
37	17:13:05	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
38	17:13:15	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass

Burst No.	Beacon TX Time	15 Hex ID	Complete Beacon Message	Encoded Location reported in the MEOLUT alert			2D Location Error (meters)	Valid altitude Band
				Latitude	Longitude	Altitude Band*		
39	17:13:25	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
40	17:13:30	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
41	17:13:35	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
42	17:13:45	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
43	17:13:55	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
44	17:14:05	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
45	17:14:15	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
46	17:14:42	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
47	17:15:11	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
48	17:15:41	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
49	17:16:10	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
50	17:16:37	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
51	17:17:05	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
52	17:17:33	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
53	17:18:01	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
54	17:18:29	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
55	17:18:58	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
56	17:19:26	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
57	17:19:54	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
58	17:20:22	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
59	17:20:52	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
60	17:21:21	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
61	17:21:50	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
62	17:22:05	19320000003FDFF	FFFE2F8C990000000CD0134FA5900452ABAD					
63	17:22:18	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
64	17:22:48	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
65	17:23:15	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
66	17:23:44	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
67	17:24:14	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
68	17:24:43	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
69	17:25:10	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
70	17:25:38	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
71	17:26:06	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
72	17:26:34	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
73	17:27:02	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
74	17:27:31	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
75	17:27:59	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
76	17:28:27	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass
77	17:28:55	19320000003FDFF	FFFE2F8C990000000CD0134FA590CFBEA9A8	50.869	-1.244	0000	46.8	Pass

Measurements highlighted Blue contain 3LD in PDF-2 and may be discarded from the results.

Test 3 Summary: MEOLUT alerts with complete beacon message and 15 Hex ID at least 1/min for >90% of total test time: 100% - Pass

Encoded location provided by the MEOLUT accurate in the horizontal plane ≤200m for 90% of the alerts: 100% - Pass

Encoded location provided by the MEOLUT accurate in the vertical plane reported as correct altitude band: 100% Pass (Test location altitude = 40m above sea level. Reported altitude band = 0000 (altitude is between 0 and 400 m)).

MEO Satellites in view during test

LUT ID	Antenna Id	Sat ID	AOS	LOS
2275	1	404	16:12:52	17:20:00
2275	1	402	10:23:30	18:35:24
2275	1	436	11:20:30	19:43:57
2275	1	409	16:40:22	19:57:23
2275	1	430	13:21:00	19:57:26
2275	1	405	16:39:30	22:20:00
2275	1	434	13:25:30	22:41:10
2275	1	415	15:56:30	00:55:09

Note: The raw results for the Satellite Qualitative test were provided by French MCC. However, as the French MEOLUT has an active antenna with no mechanical tracking they were unable to support the request to provide the starting and ending azimuth and elevation of each MEOSAR satellite tracked during the test.

Summary

The EUT complies with clause A.2.5 of Cospas-Sarsat T.007.

2.10 METHOD OF ACTIVATION AND CANCELLATION MESSAGE TEST

2.10.1 Specification

Cospas-Sarsat T.007, Clause A.3.9

2.10.2 Equipment Under Test and Modification State

ULTIMA-DT-06, S/N: KA0040651003 - Modification State 0

2.10.3 Date of Test

20 March 2023

2.10.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.10.5 Laboratory Environmental Conditions

Ambient Temperature 21.7°C
Relative Humidity 41.5%

2.10.6 Test Results

Tests Required by C/S T.007, clause A.3.9

Test No.	Control Lines			Message Bits Status		ELT(DT) Status†	Pass/Fail
	Auto Activation by beacon[1]	Auto Activation by external means[2]	Manual Activation[3]	Bit 107	Bit 108		
1	Disabled	Disabled	Disabled	N/A	N/A	ARMED	N/A
2	Disabled	Enabled	Disabled	1	0	ON	Pass
3	Disabled	Enabled	Enabled	0	0	ON	Pass
4	Disabled	Disabled	Enabled	0	0	ON	Pass
5	Disabled	Disabled	Disabled	N/A	N/A	ARMED	Pass
6	Disabled	Enabled	Disabled	1	0	ON	Pass
7	Disabled	Disabled	Disabled	N/A	N/A	ARMED	Pass
8	Disabled	Disabled	Enabled	0	0	ON	Pass
9	Disabled	Enabled	Enabled	1	0	ON	Pass
10	Disabled	Enabled	Disabled	1	0	ON	Pass
11	Disabled	Disabled	Disabled	N/A	N/A	ARMED	Pass
12	Disabled	Disabled	Enabled	0	0	ON	Pass
13	Disabled	Disabled	Disabled	N/A	N/A	ARMED	Pass
14	Enabled	Disabled	Disabled	0	1	ON	Pass
15	Enabled	Disabled	Enabled	0	0	ON	Pass
16	Enabled	Enabled	Enabled	1	0	ON	Pass
17	Enabled	Disabled	Enabled	0	0	ON	Pass
18a	Disabled	Disabled	Disabled	N/A	N/A	ARMED	Pass
18b	Enabled	Disabled	Disabled	0	1	ON	N/A
19	Disabled	Disabled	Disabled	N/A	N/A	ARMED	N/A
20	Enabled	Disabled	Disabled	0	1	ON	Pass
21	Enabled	Enabled	Disabled	1	0	ON	Pass
22	Enabled	Enabled	Enabled	0	0	ON	Pass
23	Enabled	Enabled	Disabled	1	0	ON	Pass
24a	Disabled	Disabled	Disabled	N/A	N/A	ARMED	Pass
24b	Enabled	Disabled	Disabled	0	1	ON	N/A
25	Disabled	Disabled	Disabled	N/A	N/A	ARMED	N/A

For the tests presented in this document, the following activation methods were used where applicable:
[1] EUT activated via Crash Sensor
[2] EUT activated via 28V Loss
[3] EUT activated via Remote panel switch

Bit 107 and Bit 108 that were monitored during testing behaved the same for all combinations of activation methods listed above.

Tests 18b and 24b were not applicable as the beacon doesn't have a separate means of resetting the "automatic activation by the beacon". Therefore tests 19 and 25 were also not applicable as the beacon was already in the ARMED state.

The results tables below show the maximum and minimum values measured over the 10 cancellation bursts in each case.

Cancellation Messages

Test No. 5

A	Nominal Frequency (max/min)	MHz	406.0309658	406.0309621
B	Power (max/min)	dBm	37.96	37.96
C	Digital Message		FFFE2F8C990000003F5FD4BAA3CF1E0F01EE	
D	Modulation Rise Time (max/min)	µs	113.0	110.8
	Modulation Fall Time (max/min)	µs	110.4	108.7
	Phase Deviation + (max/min)	Radians	1.095	1.070
	Phase Deviation - (max/min)	Radians	-1.087	-1.110
	Mod Symmetry		0.03481	
E	First Cancellation message delay	seconds	4.66	
F	Cancellation Message Count		10	
	Cancellation Message Interval (max/min)	seconds	10.018	9.985
G	EUT stops transmitting after 10 cancellation messages	Pass/Fail	Pass	

Test No. 7

A	Nominal Frequency (max/min)	MHz	406.0309687	406.0309664
B	Power (max/min)	dBm	37.96	37.95
C	Digital Message		FFFE2F8C990000003F5FD4BAA3CF1E0F01EE	
D	Modulation Rise Time (max/min)	µs	112.7	110.2
	Modulation Fall Time (max/min)	µs	110.3	108.5
	Phase Deviation + (max/min)	Radians	1.093	1.070
	Phase Deviation - (max/min)	Radians	-1.112	-1.083
	Mod Symmetry		0.03473	
E	First Cancellation message delay	seconds	4.19	
F	Cancellation Message Count		10	
	Cancellation Message Interval (max/min)	seconds	10.011	9.990
G	EUT stops transmitting after 10 cancellation messages	Pass/Fail	Pass	

Test No. 11

A	Nominal Frequency (max/min)	MHz	406.0309704	406.0309685
B	Power (max/min)	dBm	37.94	37.94
C	Digital Message		FFFE2F8C990000003F5FD4BAA3CF1E0F01EE	
D	Modulation Rise Time (max/min)	µs	112.8	111.0
	Modulation Fall Time (max/min)	µs	110.5	108.2
	Phase Deviation + (max/min)	Radians	1.098	1.069
	Phase Deviation - (max/min)	Radians	-1.113	-1.086
	Mod Symmetry		0.03536	
E	First Cancellation message delay	seconds	4.33	
F	Cancellation Message Count		10	
	Cancellation Message Interval (max/min)	seconds	10.018	9.986
G	EUT stops transmitting after 10 cancellation messages	Pass/Fail	Pass	

Test No. 13

A	Nominal Frequency (max/min)	MHz	406.0309714	406.0309688
B	Power (max/min)	dBm	37.94	37.94
C	Digital Message		FFFE2F8C990000003F5FD4BAA3CF1E0F01EE	
D	Modulation Rise Time (max/min)	µs	113.3	110.9
	Modulation Fall Time (max/min)	µs	110.7	108.7
	Phase Deviation + (max/min)	Radians	1.095	1.069
	Phase Deviation - (max/min)	Radians	-1.114	-1.086
	Mod Symmetry		0.03542	
E	First Cancellation message delay	seconds	4.58	
F	Cancellation Message Count		10	
	Cancellation Message Interval (max/min)	seconds	10.014	9.991
G	EUT stops transmitting after 10 cancellation messages	Pass/Fail	Pass	

Test No. 18a

A	Nominal Frequency (max/min)	MHz	406.0309715	406.0309700
B	Power (max/min)	dBm	37.94	37.93
C	Digital Message		FFFE2F8C990000003F5FD4BAA3CF1E0F01EE	
D	Modulation Rise Time (max/min)	µs	113.3	111.0
	Modulation Fall Time (max/min)	µs	111.2	108.4
	Phase Deviation + (max/min)	Radians	1.096	1.069
	Phase Deviation - (max/min)	Radians	-1.111	-1.087
	Mod Symmetry		0.03499	
E	First Cancellation message delay	seconds	4.43	
F	Cancellation Message Count		10	
	Cancellation Message Interval (max/min)	seconds	10.009	9.982
G	EUT stops transmitting after 10 cancellation messages	Pass/Fail	Pass	

Test No. 24a

A	Nominal Frequency (max/min)	MHz	406.0309706	406.0309692
B	Power (max/min)	dBm	37.94	37.93
C	Digital Message		FFFE2F8C990000003F5FD4BAA3CF1E0F01EE	
D	Modulation Rise Time (max/min)	µs	113.2	111.1
	Modulation Fall Time (max/min)	µs	111.1	108.4
	Phase Deviation + (max/min)	Radians	1.098	1.070
	Phase Deviation - (max/min)	Radians	-1.113	-1.087
	Mod Symmetry		0.03526	
E	First Cancellation message delay	seconds	4.22	
F	Cancellation Message Count		10	
	Cancellation Message Interval (max/min)	seconds	10.010	9.984
G	EUT stops transmitting after 10 cancellation messages	Pass/Fail	Pass	

Summary

The EUT complies with clauses A.3.9.1 and A.3.9.2 of C/S T.007

A.3.9.3 Reactivation Tests

The EUT was activated via the remote panel. It was then cancelled from the remote panel causing the cancellation procedure to commence. After approximately 50 seconds the EUT was reactivated by the remote panel. Distress alerts were transmitted within 5 seconds of reactivation:

Message	Rep Rate
FFFE2F8C99000000147648E3D385E00F02FA	4.899
FFFE2F8C99000000147648E3D385E00F02FA	4.908
FFFE2F8C990000003F5FD4BAA3CF1E0F01EE	5.09
FFFE2F8C990000003F5FD4BAA3CF1E0F01EE	10.008
FFFE2F8C990000003F5FD4BAA3CF1E0F01EE	9.998
FFFE2F8C990000003F5FD4BAA3CF1E0F01EE	9.985
FFFE2F8C990000003F5FD4BAA3CF1E0F01EE	10.016
FFFE2F8C99000000147648E3D385E00F02FA	9.954*
FFFE2F8C99000000147648E3D3850452ACF1	4.889
FFFE2F8C99000000147648E3D385E00F02FA	4.904
FFFE2F8C99000000147648E3D385E00F02FA	4.917
FFFE2F8C99000000147648E3D385E00F02FA	4.899

* Note: The EUT was reactivated approximately 5 seconds after the previous burst. Therefore, distress transmissions restarted after approximately 9.954 - 5 = 4.954 seconds.

Summary

The EUT complies with clause A.3.9.3 of C/S T.007

SECTION 3

TEST EQUIPMENT USED

3.1 TEST EQUIPMENT

List of absolute measuring and other principal items of test equipment..

Note: some tests took place over one or more days and consequently it may appear that some of the test equipment could have been outside of the valid calibration period at the time of testing. However, we confirm that all equipment held a valid and in-date calibration when used, and we hold this information on record.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Expiry Date
Section 2.1 to 2.4 Beacons - Constant Temperature Tests					
Dual Power Supply Unit	Hewlett Packard	6253A	271	-	O/P Mon
Hygrometer	Rotronic	I-1000	2829	12	19-Apr-2023
Rubidium Frequency Standard	Symmetricom	8040C	3490	12	20-Jun-2023
Cable (18 GHz)	Rosenberger	LU7-036-1000	5025	-	O/P MI thion
Cable (18 GHz)	Rosenberger	LU7-036-1000	5027	-	O/P Mon
USB Power Sensor	Boonton	RTP5318	5185	12	10-Feb-2024
RF distribution box	TUV SUD		5626	12	Class 1 (Int)
MXA Spectrum Analyser	Keysight Technologies	N9020B-ATO-43105	5743	24	10-Feb-2024
Section 2.5 Beacons - Spurious Emissions					
Dual Power Supply Unit	Hewlett Packard	6253A	271	-	O/P Mon
Hygrometer	Rotronic	I-1000	2829	12	19-Apr-2023
Rubidium Frequency Standard	Symmetricom	8040C	3490	12	20-Jun-2023
Cable (18 GHz)	Rosenberger	LU7-036-1000	5025	-	O/P Mon
Cable (18 GHz)	Rosenberger	LU7-036-1000	5027	-	O/P Mon
RF distribution box	TUV SUD		5626	12	Class 1 (Int)
MXA Spectrum Analyser	Keysight Technologies	N9020B-ATO-43105	5743	24	10-Feb-2024
Section 2.6 Beacons - VSWR					
Dual Power Supply Unit	Hewlett Packard	6253A	271	-	O/P Mon
Hygrometer	Rotronic	I-1000	2829	12	19-Apr-2023
Termination (50ohm, 15W)	Diamond Antenna	DL-30N	3098	12	13-Oct-2023
Short Circuit	TUV SUD	Short Cicuit	3272	-	TU
Rubidium Frequency Standard	Symmetricom	8040C	3490	12	20-Jun-2023
Cable (18 GHz)	Rosenberger	LU7-036-1000	5025	-	O/P Mon
Cable (18 GHz)	Rosenberger	LU7-036-1000	5027	-	O/P Mon
USB Power Sensor	Boonton	RTP5318	5185	12	10-Feb-2024
RF distribution box	TUV SUD		5626	12	Class 1 (Int)
MXA Spectrum Analyser	Keysight Technologies	N9020B-ATO-43105	5743	24	10-Feb-2024
50 ohm Termination Load (10 Watt)	Telegartner	N/A	5905	6	12-Apr-2023

Section 2.7 Beacons - Self Test					
Dual Power Supply Unit	Hewlett Packard	6253A	271	-	O/P Mon
Hygrometer	Rotronic	I-1000	2829	12	19-Apr-2023
Rubidium Frequency Standard	Symmetricom	8040C	3490	12	20-Jun-2023
Cable (18 GHz)	Rosenberger	LU7-036-1000	5025	-	O/P Mon
Cable (18 GHz)	Rosenberger	LU7-036-1000	5027	-	O/P Mon
USB Power Sensor	Boonton	RTP5318	5185	12	10-Feb-2024
RF distribution box	TUV SUD		5626	12	Class 1 (Int)
MXA Spectrum Analyser	Keysight Technologies	N9020B-ATO-43105	5743	24	10-Feb-2024
Signal Generator 1RF	Spirent	GSS7000	6312	12	26-Jan-2024
Section 2.7 Beacons - GNSS Self-test					
Dual Power Supply Unit	Hewlett Packard	6253A	271	-	O/P Mon
Hygrometer	Rotronic	I-1000	2829	12	19-Apr-2023
Rubidium Frequency Standard	Symmetricom	8040C	3490	12	20-Jun-2023
Cable (18 GHz)	Rosenberger	LU7-036-1000	5025	-	O/P Mon
Cable (18 GHz)	Rosenberger	LU7-036-1000	5027	-	O/P Mon
USB Power Sensor	Boonton	RTP5318	5185	12	10-Feb-2024
RF distribution box	TUV SUD		5626	12	Class 1 (Int)
MXA Spectrum Analyser	Keysight Technologies	N9020B-ATO-43105	5743	24	10-Feb-2024
Signal Generator 1RF	Spirent	GSS7000	6312	12	26-Jan-2024
Section 2.8 Beacons - Battery Current Measurements					
Dual Power Supply Unit	Hewlett Packard	6253A	271	-	O/P Mon
Multimeter	Fluke	8840A	930	12	24-Aug-2023
Power Supply Unit	Weinschel	WEIR 413	2105	-	TU
Hygrometer	Rotronic	I-1000	2829	12	19-Apr-2023
Variable Resistive Load	TUV SUD	n/a	5057	12	13-Feb-2024
High resolution data logger	Pico Technology Ltd	PicoLog ADC20	5594	12	31-Aug-2023
50 ohm Termination Load (10 Watt)	Telegartner	N/A	5910	6	12-Apr-2023
Section 2.8 Beacons - Operating Lifetime					
Hygrometer	Rotronic	I-1000	2829	12	19-Apr-2023
Rubidium Frequency Standard	Symmetricom	8040C	3490	12	20-Jun-2023
Power Meter	Rohde & Schwarz	NRP	3491	12	13-Jan-2024
Wideband Power Sensor, 50MHz - 18GHz	Rohde & Schwarz	NRP-Z81	3492	12	13-Jan-2024
Cable (18 GHz)	Rosenberger	LU7-036-1000	5025	-	O/P Mon
Cable (18 GHz)	Rosenberger	LU7-036-1000	5027	-	O/P Mon
USB Power Sensor	Boonton	RTP5318	5185	12	10-Feb-2024
RF distribution box	TUV SUD		5626	12	Class 1 (Int)
Thermocouple Data Logger	Pico Technology Ltd	TC-08 + Type T Thermocouple	5740	12	9-Mar-2024
MXA Spectrum Analyser	Keysight Technologies	N9020B-ATO-43105	5742	12	8-Feb-2024
MXA Spectrum Analyser	Keysight Technologies	N9020B-ATO-43105	5743	24	10-Feb-2024
Cable (N to N 2m)	Amphenol RF	N/A	5953	12	15-May-2023
Section 2.9 Beacons - Satellite Qualitative Test					
Dual Power Supply Unit	Hewlett Packard	6253A	271	-	O/P Mon
Hygrometer	Rotronic	I-1000	2829	12	19-Apr-2023
Tester (Beacon)	WS Technologies	BT200-1100Y	5394	-	TU

Section 2.10 Beacons - Method of Activation and Cancellation Message Test					
Dual Power Supply Unit	Hewlett Packard	6253A	271	-	O/P Mon
Hygrometer	Rotronic	I-1000	2829	12	19-Apr-2023
Rubidium Frequency Standard	Symmetricom	8040C	3490	12	20-Jun-2023
Cable (18 GHz)	Rosenberger	LU7-036-1000	5025	-	O/P MI thion
Cable (18 GHz)	Rosenberger	LU7-036-1000	5027	-	O/P Mon
USB Power Sensor	Boonton	RTP5318	5185	12	10-Feb-2024
RF distribution box	TUV SUD		5626	12	Class 1 (Int)
MXA Spectrum Analyser	Keysight Technologies	N9020B-ATO-43105	5743	24	10-Feb-2024

TU – Traceability Unscheduled
OP MON – Output Monitored with Calibrated Equipment

3.2 MEASUREMENT UNCERTAINTY

Table Values

The following table shows the measurement uncertainties for two signal analysers that are supported by DBT1.

Parameter	R&S FPL	Keysight MXA	C/S T.008 Requirement	Unit of Measurement
Repetition Time	1.134	1.134	± 10.0	ms
Total Transmission Time	0.012	0.009	± 1.0	ms
Fist Burst Delay	1.134	1.134	± 10.0	ms
CW Preamble	0.001	0.009	± 1.0	ms
Bit Rate	0.010	0.100	± 0.6	bps
Nominal frequency	34.00	1.70	± 100.0	Hz
Frequency stability	0.05	0.05	< 0.1	ppb
Transmitted Power	0.26	0.26	± 0.5	dB
Spurious Power Level	1.17	0.92	± 2.0	dB
Power Output Rise time	0.012	0.009	± 0.2	ms
Power Level 1 ms before Burst	1.17	0.92	± 2.0	dB
Modulation Rise	0.924	9.238	± 25.0	µs
Modulation Symmetry	0.005	0.002	< 0.01	-
Phase Modulation	0.004	0.006	± 0.04	rad

Parameter	Height	Distance (d)	C/S T.008 Requirement	Unit of Measurement
EIRP Antenna Setup Measurement Distances	0.6	0.2	± 1	%

Parameter	R&S FPL	Keysight MXA	C/S T.008 Requirement	Unit of Measurement
First Burst Delay (automatic activation)	1.134	1.134	± 10.0	ms

Parameter	R&S FPL	Keysight MXA	C/S T.008 Requirement	Unit of Measurement
Internal Navigation Timing	85.1	85.1	Up to 1 hour ±1 sec	ms
Internal Navigation Timing	340.2	340.2	> 1 hour ±10 sec	ms

Parameter	Fluke 51 Digital Thermometer	C/S T.008 Requirement	Unit of Measurement
Temperature (near beacon)	0.84	± 2°C	°C

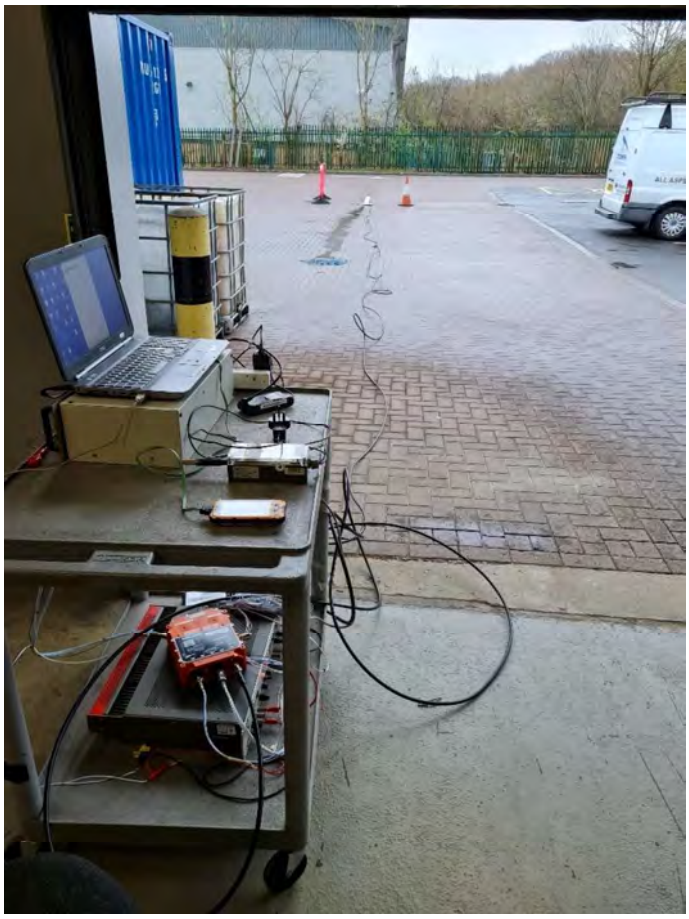
All uncertainty calculations were carried out in accordance with UKAS M3003.

SECTION 4

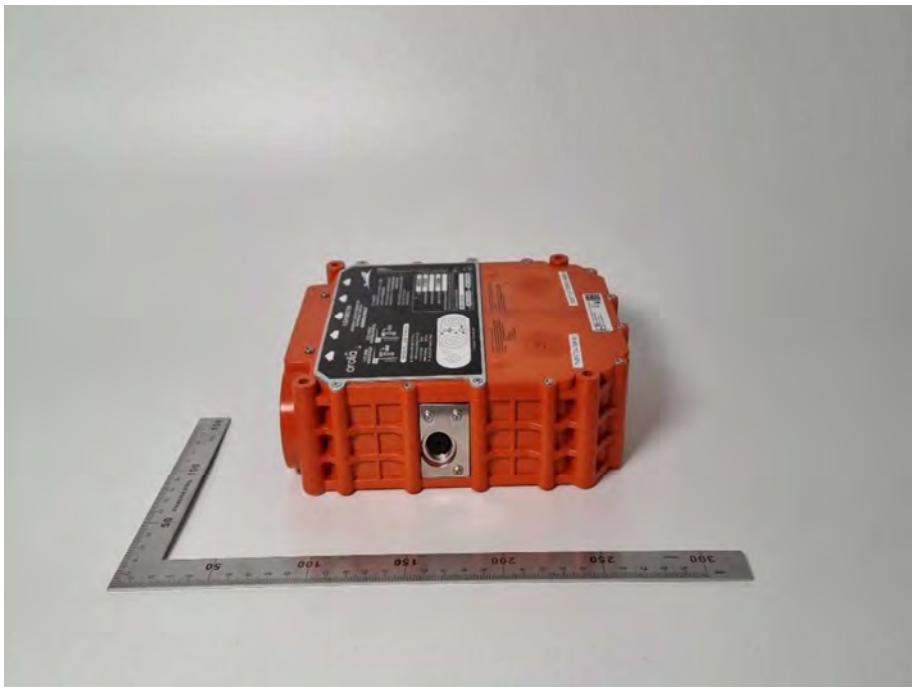
PHOTOGRAPHS

4.1 PHOTOGRAPHS OF EQUIPMENT UNDER TEST (EUT)

Satellite Qualitative Test (Antenna) – Configuration 6

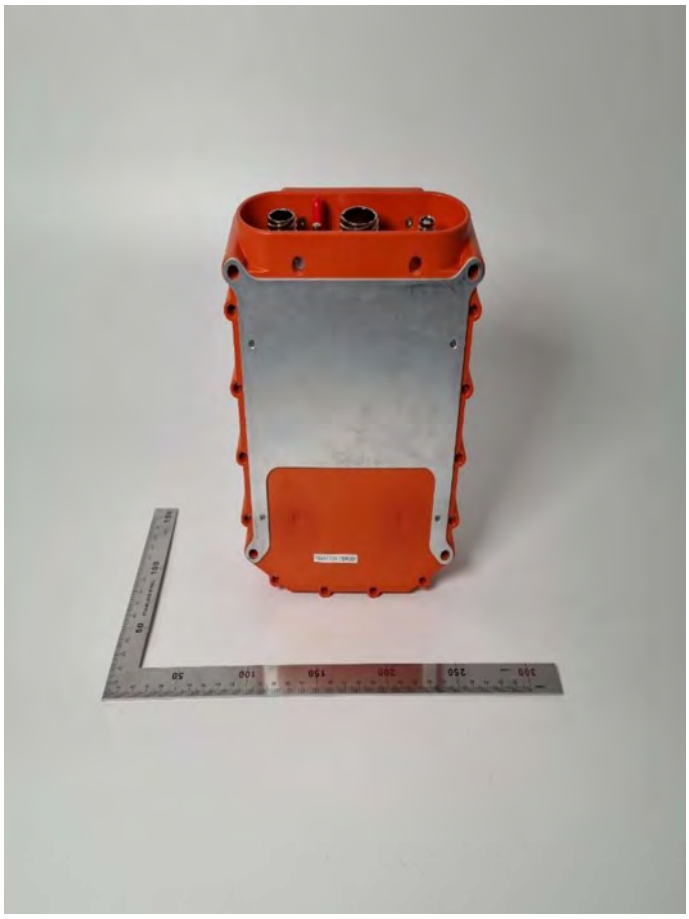


Satellite Qualitative Test (EUT and Test Bench) – Configuration 6



ULTIMA-DT-06 Side View

ULTIMA-DT-06 Top View

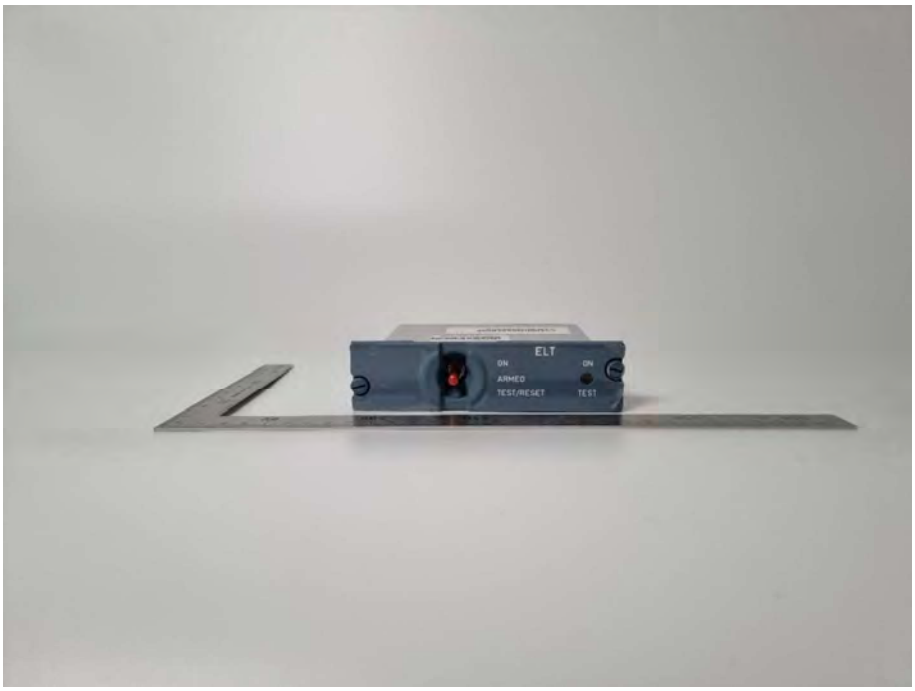


ULTIMA-DT-06 Bottom View

Test Configuration for Conducted RF Tests

Test Configuration for Conducted RF Tests (EUT, RCP and Buzzer placed in Climatic Chamber for temperature tests)

Test Bench



Remote Switch

ELT DT Location Protocol with 3LD Programming Dongle

Buzzer

EUT Antenna Side View

EUT Antenna Bottom View

SECTION 5

ACCREDITATION, DISCLAIMERS AND COPYRIGHT

5.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited).