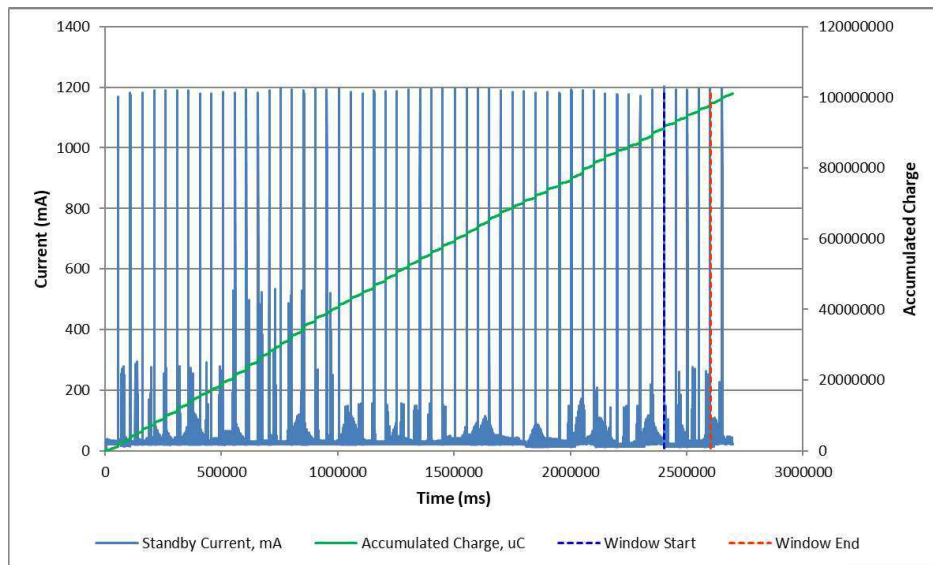
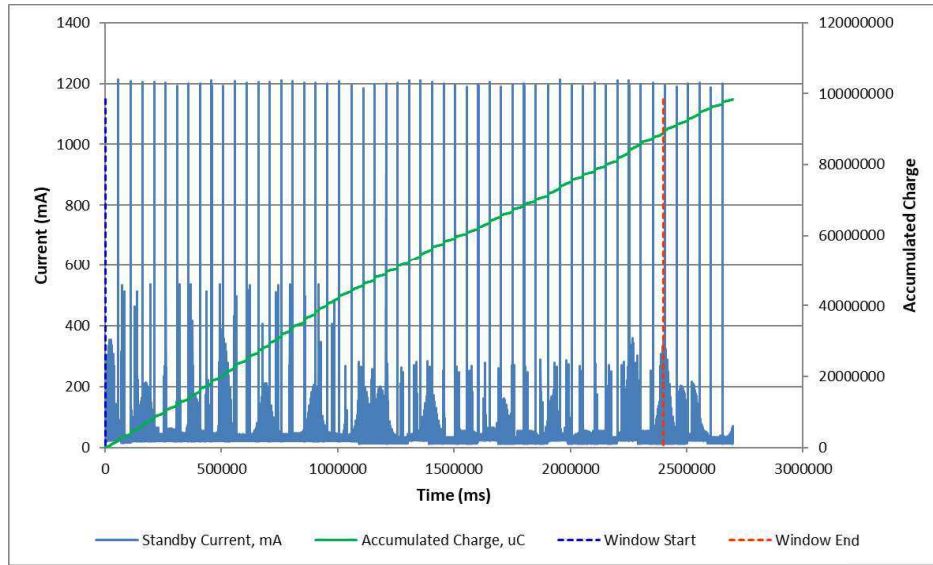


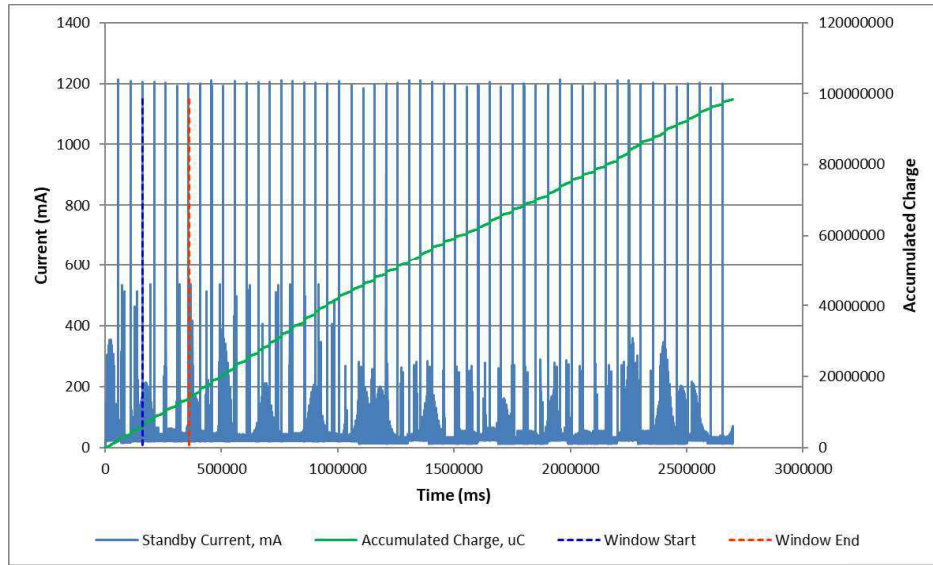
Worst Case On at EUT (GNSS Search): B3



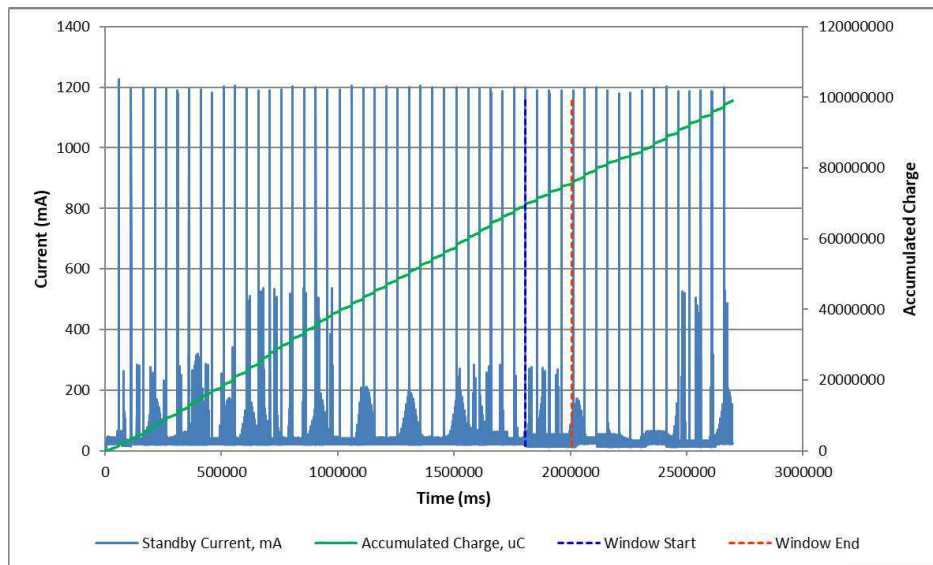
Worst Case On at EUT (GNSS Sleep): B4



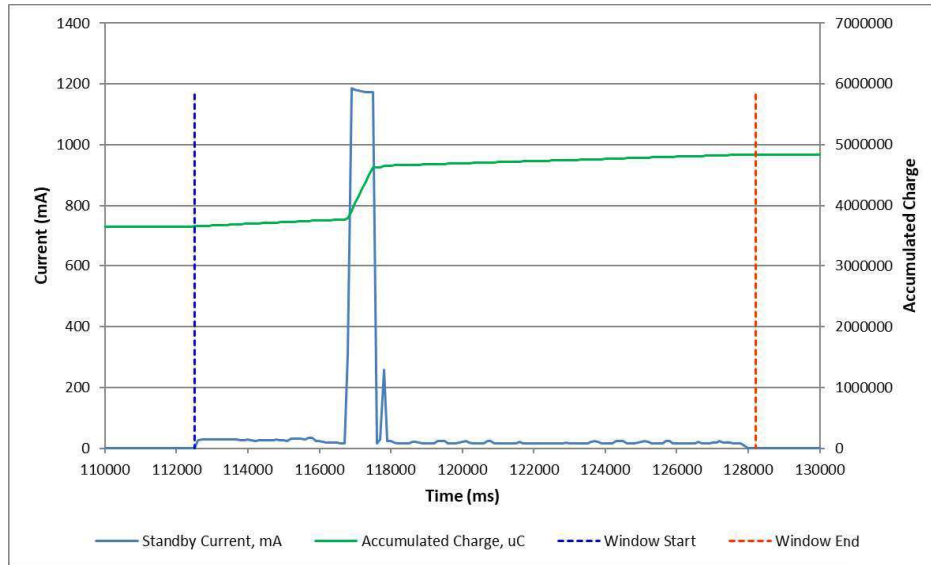
Worst Case On at EUT Water Contacts Average: A5



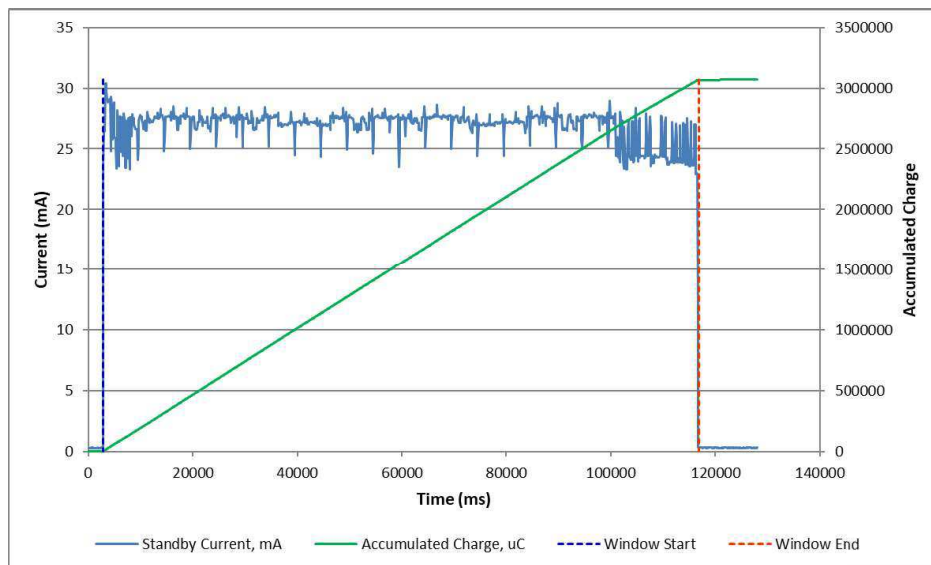
Worst Case On at EUT Water Contacts (GNSS Search): A6



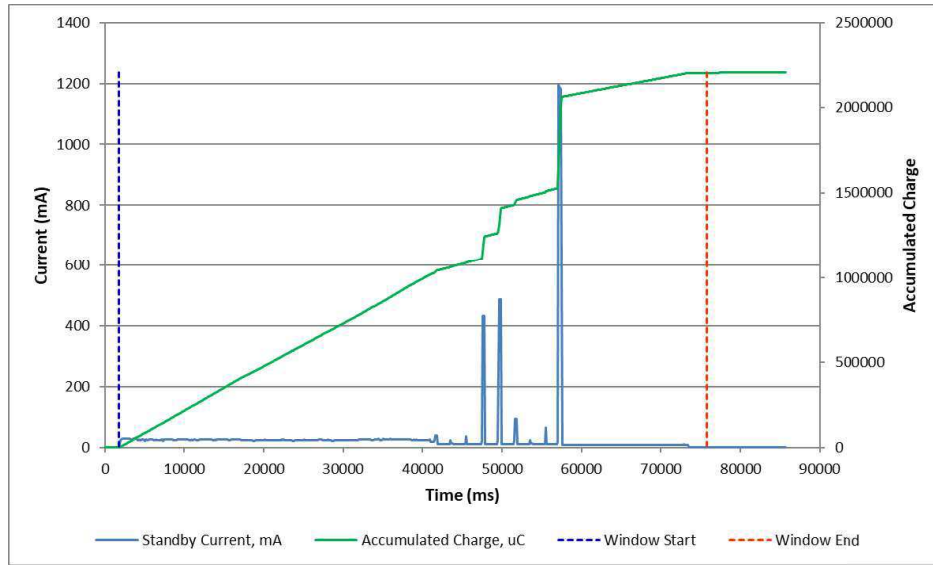
Worst Case On at EUT Water Contacts (GNSS Sleep): B7



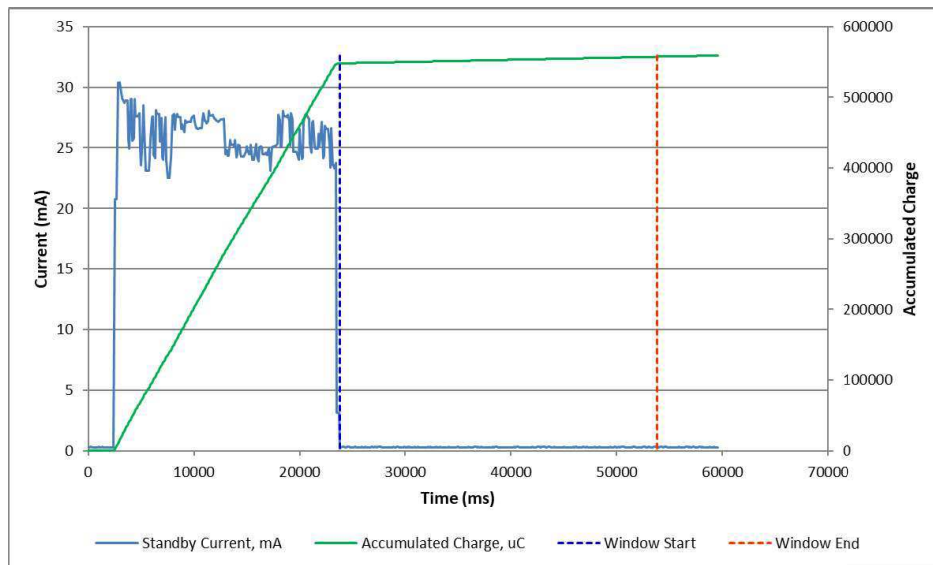
Worst Case Self-test: D8



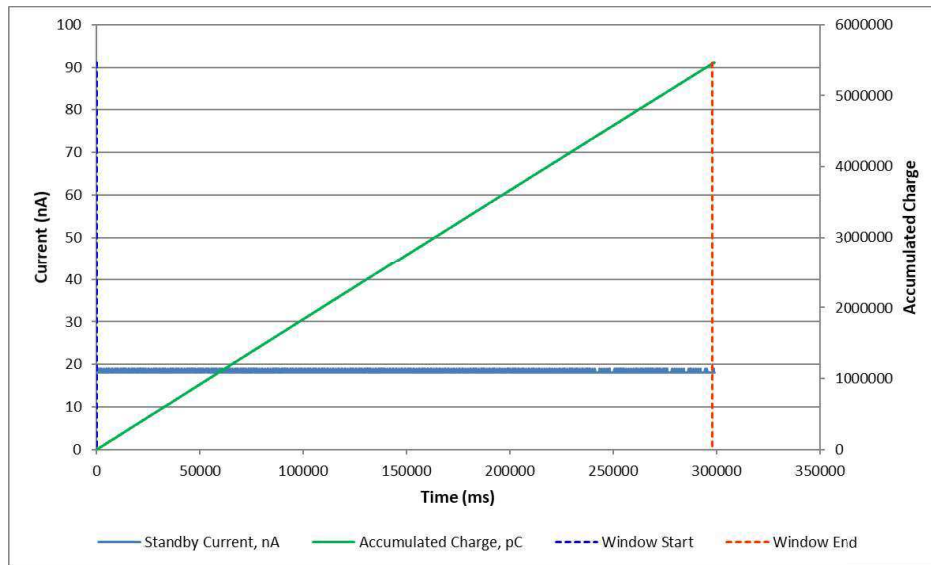
Worst Case GNSS Self-test (Timeout): A9



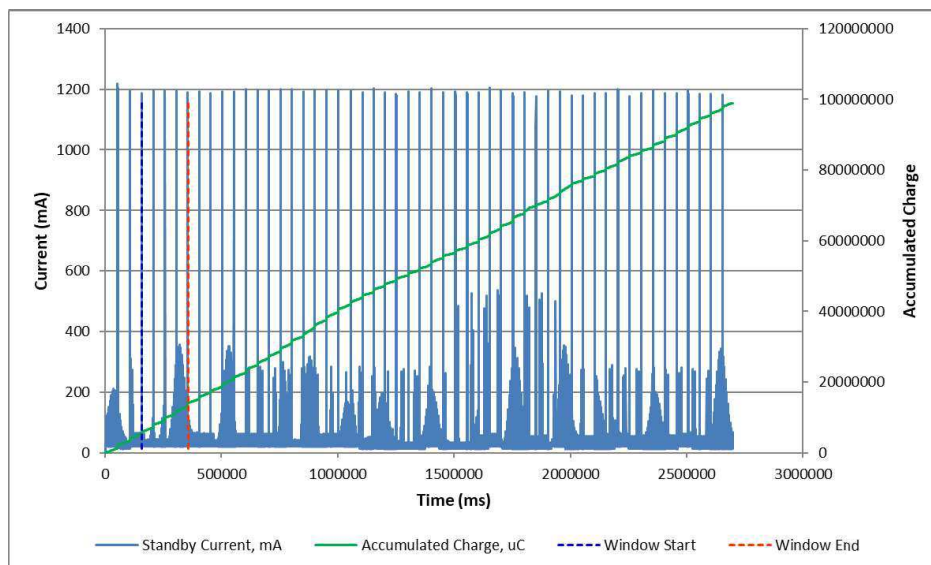
Worst Case GNSS Self-test (Burst): D10



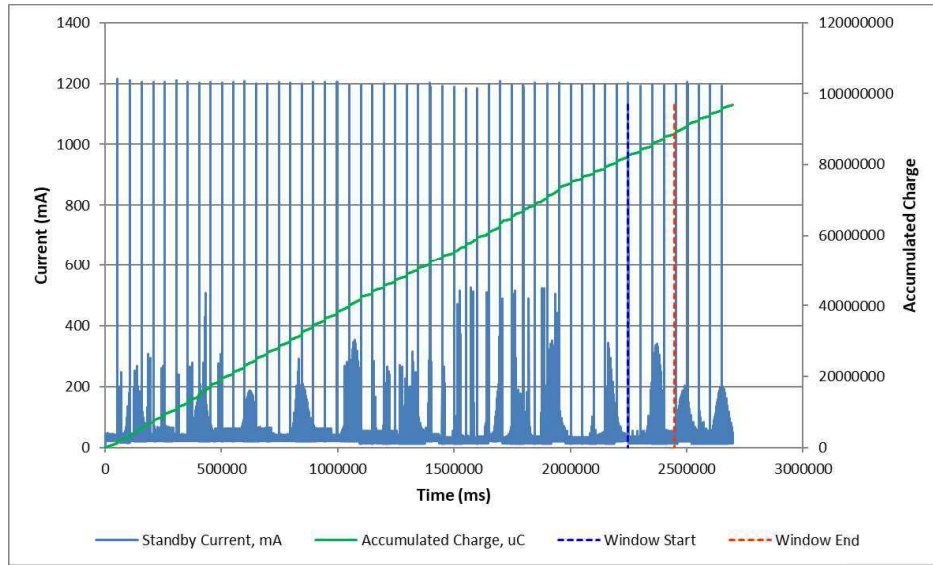
Self-test Held: A11



Worst Case NFC Interrogation: D12



Worst Case On at EUT (GNSS fix, waiting RLM acknowledgement): B13



Worst Case On at EUT (GNSS fix, RLM acknowledgement received): C14



## 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 <sub>CS</sub> or TCS	Years	2	
Declared beacon battery replacement period (from date of installation in the beacon to expiry date marked on the beacon)	T <sub>BR</sub> or TBR	Years	10.5	
Battery pack electrical configuration	-	-	3 series packs of 2 cells in series	
Cell model and cell chemistry	-	-	Li/FeS2	
Nominal cell capacity	-	Ah	3.5	
Nominal battery pack capacity	C <sub>BN</sub>	Ah	3.5	
Annual battery cell capacity loss (self-discharge) due to aging, as specified by cell manufacturer at ambient temperature	L <sub>SDC</sub>	%	0.36	
Calculated battery pack capacity loss due to self-discharge: $L_{CBN} = C_{BN} - [C_{BN} * (1 - L_{SDC} / 100)^{TBR+TCS}]$	L <sub>CBN</sub>	Ah	0.1543	
Number of self-tests per year	N <sub>ST</sub>	-	12	Manufacturer Declared Value
Average battery current during a self-test	I <sub>ST</sub>	mA	75.03	
Maximum duration of a self-test	T <sub>ST</sub>	s	16	Manufacturer Declared Value
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 <sub>ST</sub>	mAh	42.02	
Maximum Number of GNSS self-tests between battery replacements	N <sub>GST</sub>	-	60	Manufacturer Declared Value
Average battery current during a GNSS self-test of maximum duration	I <sub>GST1</sub>	mA	26.88	GNSS Timeout (No nav data present)
Maximum duration of a GNSS self-test	T <sub>GST1</sub>	s	114.1	TUV measured value
Average battery current during a GNSS self-test of maximum duration	I <sub>GST2</sub>	mA	29.8	GNSS Burst (Nav data applied)
Maximum duration of a GNSS self-test	T <sub>GST2</sub>	s	140	Manufacturer Declared Worst Case Value
Calculated battery pack capacity loss due to GNSS self-tests during battery replacement period: $L_{GST} = I_{GST2} * T_{GST2} * (N_{GST} / 3600)$	L <sub>GST</sub>	mAh	69.53333333	This was calculated using the following values: IGST2 = 29.8 TGST2 = 140 NGST = 60
Average stand-by battery pack current	I <sub>SB</sub>	mA	0.00001901	
Other Capacity Losses	L <sub>OTH</sub>	mAh	0	
Battery pack capacity loss due to constant operation of circuitry prior to beacon activation: $L_{ISB} = I_{SB} * T_{BR} * 8760$	L <sub>ISB</sub>	mAh	1.7485	
Calculated value of the battery pack pre-test discharge  $L_{CDC} = L_{CBN} + 1.65((L_{ST} + L_{GST} + L_{ISB})/1000) + (L_{OTH}/1000)$	L <sub>CDC</sub>	Ah	0.3412	





### Battery Conditioning Results

A fresh battery was used for the test; it was discharged by connection to a resistive load for the pre-test discharge duration calculated as follows:

$$\begin{array}{rcl} \text{Pre-test discharge (L}_{\text{CDC}}) \text{ [mAh]} & = & 341.2 \\ \text{Constant current [mA]} & = & 38.5 \\ \text{Pre-test discharge duration [h]} & = & \frac{341.2}{38.5} \\ & & 8.86 \end{array}$$

The actual discharge performed on the battery equated to 488.6 mAh. This was to meet the requirements of RTCM 11000.5 and the discharge defined in this standard is considered an over test to the requirements of Cospas Sarsat T.007.

### Summary

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



## 2.11 FREQUENCY STABILITY TEST WITH TEMPERATURE GRADIENT

### 2.11.1 Specification

Cospas-Sarsat T.007, Clause A.2.4

### 2.11.2 Equipment Under Test and Modification State

RLB-44 S/N: TA000022 - Modification State 2

### 2.11.3 Date of Test

08 April 2022

### 2.11.4 Test Equipment Used

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

### 2.11.5 Laboratory Environmental Conditions

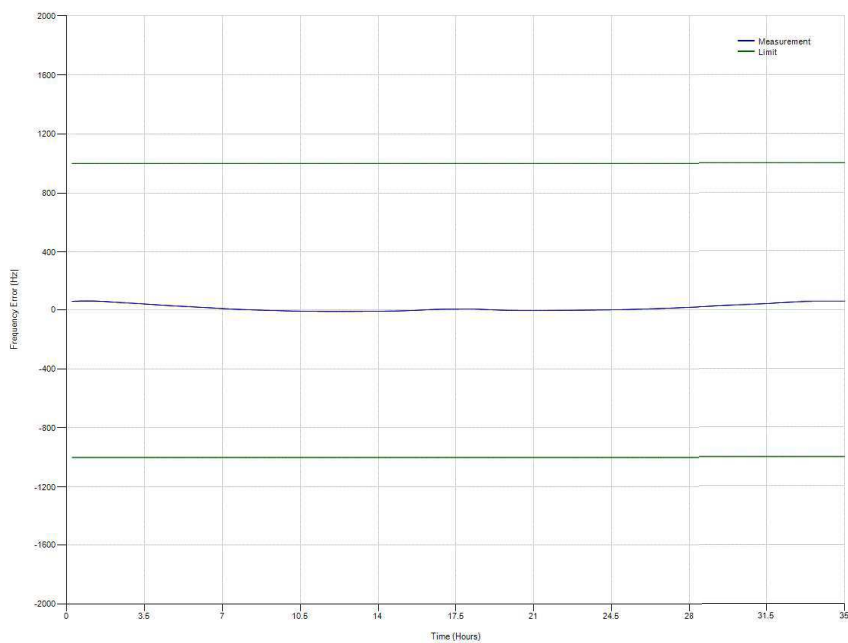
Ambient Temperature 26.2°C

Relative Humidity 22.1%

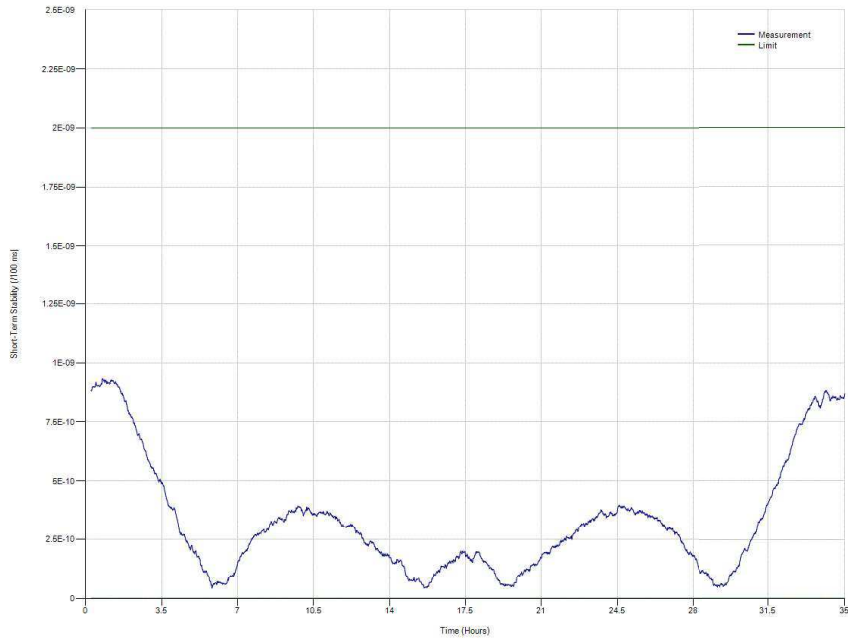
### 2.11.6 Test Results

#### Full Test

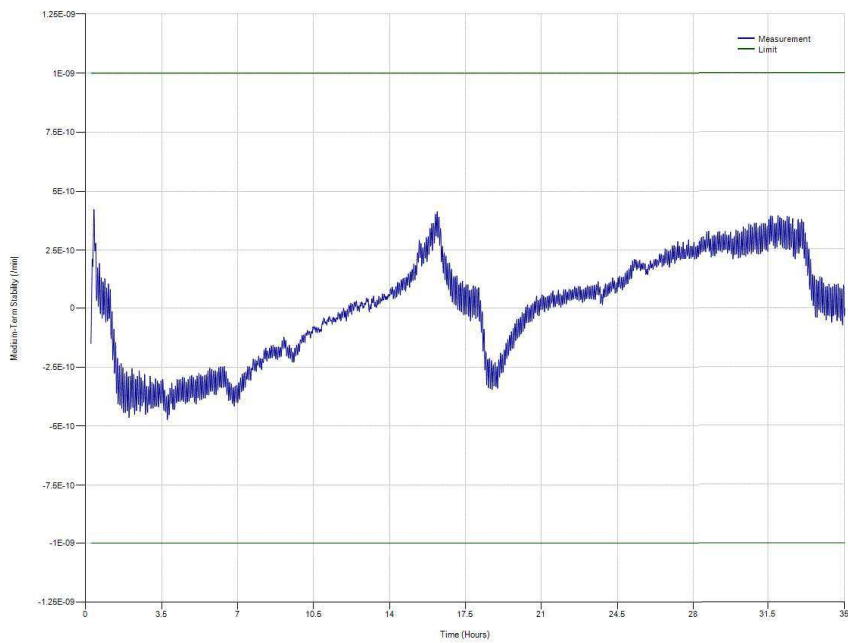
#### Nominal Frequency



### Short Term Stability

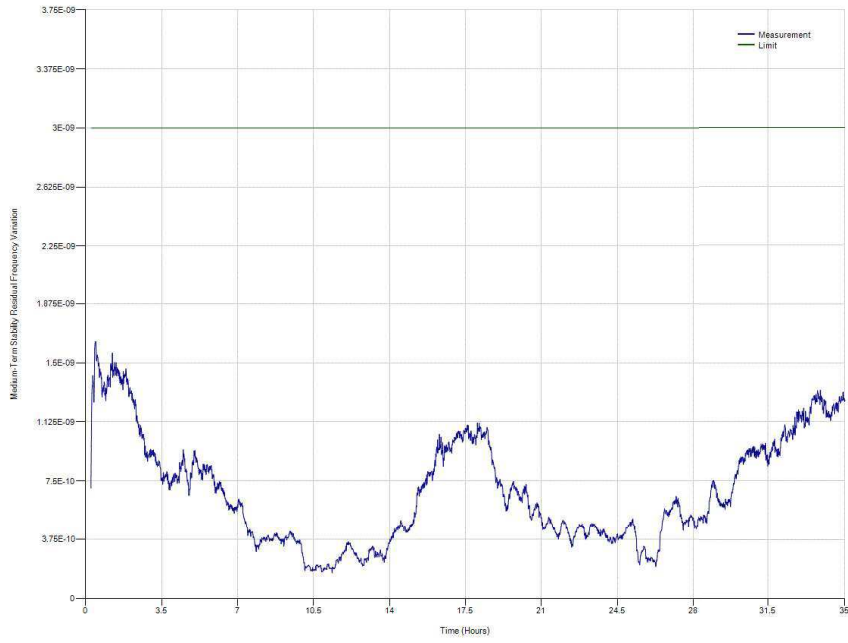


### Medium Term Stability, Mean Slope

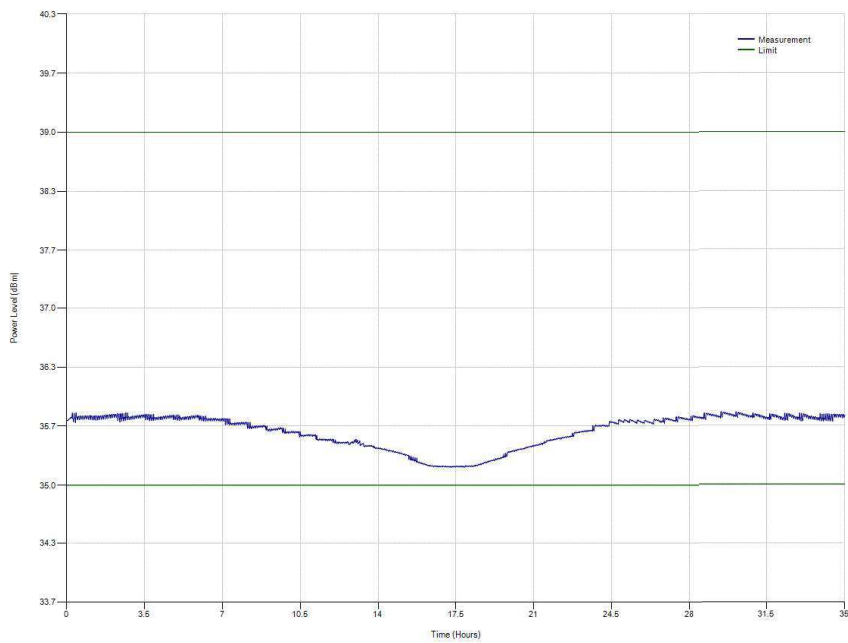




### Medium Term Stability, Residual Frequency Variation



### Output Power





## Digital Message

### Burst 1 Decoded Beacon Message

Hexadecimal code: **FFFE2F8C9DFE7018DFE7F8129DF861F0FABE**

The code consists of 36 hexadecimal characters representing a first generation beacon message with the format flag set to Long including bit and frame synchronization pattern prefix (24 bits) as defined by T.001 Issue 4 - Rev.6.

Unique identifier:  
193BFCE031BFDFF

Binary Range	Binary Content	Field Name	Decoded Value
1-15	1111111111 11111	Bit-synchronization pattern consisting of "1"s shall occupy the first 15-bit positions	True
16-24	000101111	Frame Synchronization Pattern	Normal beacon operation
25	1	Format Flag	Long Message
26	0	Protocol Flag	Location, further information provided in "Protocol Code"
27-36	0011001001	Country code:  For associated SAR Points of Contact (SFOC) related to Albania - 201 :	Albania - 201  <a href="#">Search Contact list here</a>
37-40	1101	Protocol Code	RLS Location Protocol
41-42	11	Beacon type	RLS Test Location
43-46	1111	Identification type	RLS protocol coded with MMSI last 6 digits
47-66	1001110000 0001100011	Last 6 digits MMSI	639075
67-75	011111111	Latitude	Default - no location (Default - no location)
76-85	0111111111	Longitude	Default - no location (Default - no location)
86-106	000001001 0100111011 1	BCH-1 error correcting code	BCH-1 code in message matches the recalculated BCH-1 from the PDF-1 field
107	1	Encoded position source	Encoded position data is provided by an internal navigation device
108	1	121.5 Mhz Homing Device	Included in beacon
109	1	Beacon capability to process and automatically generated RLM Type-1	Capable to process an automatically generated RLM Type-1
110	0	Beacon capability to process a manually generated RLM Type-1 RLM Type-2	Not capable to process a manually generated RLM Type-2
111	0	Beacon Feedback on receipt of RLM Type-1	RLM Type-1 (automatic) not received by this beacon
112	0	Beacon Feedback on receipt of RLM Type-2	RLM Type-2 (manual) not received by this beacon
113-114	01	RLS Provider Identification	GALILEO Return Link Service Provider
115-123	100001111	Latitude offset	Default value
124-132	100001111	Longitude offset	Default value
133-144	1010101111 10	BCH-2 error correcting code	BCH-2 code in message matches the recalculated BCH-2 from the PDF-2 field



Interim ICXO Procedure - Complete Test

TCXO Part Number\*: E6907

TCXO S/N\*: 7868

\* As advised by the Manufacturer

**Table A-2: Point-By-Point Analysis**

MTS Characteristic	Time (h)	Temp. (°C)	tot	osc	beacon_wc	MAX-OSC	beacon_max	Ageing factor	beacon_5 year	Limit	Result
Residual	0.46	-20.0	1.635E-09	5.331E-10	1.546E-09	2.00E-09	2.528E-09	2.00E-10	2.728E-09	3.0E-09	Pass
Static Positive Mean Slope	0.38	-20.0	4.227E-10	-9.441E-12	4.228E-10	7.00E-10	8.178E-10	1.00E-10	9.178E-10	1.0E-09	Pass
Static Negative Mean Slope	0.24	-20.0	-1.507E-10	3.436E-11	-1.546E-10	-7.00E-10	-7.169E-10	-1.00E-10	-8.169E-10	-1.0E-09	Pass
Gradient Positive Mean Slope	16.21	55.0	4.137E-10	6.565E-11	4.085E-10	1.70E-09	1.748E-09	1.00E-10	1.848E-09	2.0E-09	Pass
Gradient Negative Mean Slope	3.76	-6.4	-4.725E-10	1.044E-11	-4.726E-10	-1.70E-09	-1.764E-09	-1.00E-10	-1.864E-09	-2.0E-09	Pass

Summary

The EUT complies with clause A.2.4 of Cospas-Sarsat T.007.



## **2.12 NAVIGATION SYSTEM TEST**

### **2.12.1 Specification**

Cospas-Sarsat T.007, Clause A.2.7

### **2.12.2 Equipment Under Test and Modification State**

RLB-44 S/N: TA000006 - Modification State 1 (RLS A.3.8.1, A.3.8.6 and A.3.8.3 Short)

RLB-44 S/N: TA000006 - Modification State 2 (RLS A.3.8.4 and A.3.8.3 Long)

RLB-44 S/N: TA000006 - Modification State 1 (SLP A.3.8.1, A.3.8.4, A.3.8.6 and A.3.8.3 Short and Long)

RLB-44 S/N: TA000007 - Modification State 1 (RLS and SLP A.3.8.2)

### **2.12.3 Date of Test**

01 March 2022, 05 March 2022, 20 March 2022, 25 March 2022, 29 March 2022, 30 March 2022, 31 March 2022 and 06 April 2022

### **2.12.4 Test Equipment Used**

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

### **2.12.5 Laboratory Environmental Conditions**

Ambient Temperature 11.3°C

Relative Humidity 91.9%

### **2.12.6 Test Results**



RLS Protocol

Position Data Default Values (C/S T.007 A.3.8.1):

No position data was provided for > 4 hours before the test started. The beacon was activated and operated for 30 minutes without providing data. Message content was checked for all bursts during this period.

36 Hex Message	Message Count
FFFE2F8C9DFE7018DFEFF8129DF861F0FABE	37

Position Acquisition Time and Position Accuracy (C/S T.007 A.3.8.2)

Locations:

A.3.8.2.1:	50° 52.1423' N	1° 14.6799' W	①
A.3.8.2.2:	50° 48.8584' N	1° 12.1056' W	①

The appropriate position was applied, the EUT activated and time to first message containing valid position data timed.

Configuration as per C/S T.007	C/S T.007 Section A.3.8.2.1		C/S T.007 Section A.3.8.2.2	
	Time to Acquire Position (sec)	Location Error in metres	Time to Acquire Position (sec)	Location Error in metres
Configuration 5	53.15	22.48	54.33	35.88
Configuration 7	49.68	22.82	54.14	35.53
Configuration 8	54.89	22.82	54.83	35.53

Positional accuracy was calculated using the Haversine Formula, The Earth's radius was taken as 6367 km.

① GPS Site Survey – Live Location

Encoded Position Data Update Interval (C/S T.007 A.3.8.3) – Short Test:

Location:	N 51° 22.583' W 1° 49.833' ①	
Data Acquired at	12:51:36	FFFE2F8C9DFE7018CCF024AD44F84ECA2A3C
Location:	N 50° 48.683' W 1° 37.417' ①	
Data Updated at	13:04:05	FFFE2F8C9DFE7018CCD01C855BB856976D56
Data Update Interval	12:29	

① Input from GPS simulator. Position 2 was applied after the EUT received position 1, this was verified on a beacon tester.





Encoded Position Data Update Interval (C/S T.007 A.3.8.3) – Long Test:

Locations: N 45.25752° W 73.5913° (Start location). N 45.73752° W 73.5913° (Location 2) N 45.73752° W 73.5513° (Location 3) N 45.25752° W 73.5513° (Location 4) ①		
Parameter	Update interval	Limit
0 h to 2 h – Minimum	04:08*	≥ 05:00
0 h to 2 h – Maximum	05:04	≤ 30:00
2 h to 6 h – Minimum	04:07*	≥ 05:00
2 h to 6 h – Maximum	05:04	≤ 30:00
6 h to 48 h – Minimum	04:03*	≥ 05:00
6 h to 48 h – Maximum	05:04	≤ 60:00
Assessment	Result	Limit
Results indicate that data changes as per C/S T.001 4.5.5.4 (Y/N)	N	
Results indicate that data changes as per manufacturer's update scheme (Y/N)	Y	

① Input from GPS simulator

Locations cycled through 1 to 4 continuously with an update interval of 02:00. Scenario moves in 2.225 km steps between locations 1 to 2 and 3 to 4. Steps size 3.105 km between locations 2 to 3 and 4 to 1.

\*NOTES: Refer to manufacturer document 921S-04094 Cospas-Sarsat Beacon Update rate.

Position Clearance After Deactivation (C/S T.007 A.3.8.4)

Following the Encoded Position Data Update Interval test, the beacon was deactivated and reactivated without providing navigation data. The Digital Message output was encoded with the default position data.

Position Data Input Update Interval (C/S T.007 A.3.8.5)

The EUT does not accept navigation data prior to activation so A.3.8.5 is not applicable.

Last Valid Position (C/S T.007 A.3.8.6)

Location: N 50° 52.142' W 1° 14.68' ①		
Data Acquired at	09:27:18	FFFE2F8C9DFE7018CCD0153323784FBEA8E5
GPS Signal Navigation Data Removed		
Last Message with Encoded Data	13:26:49	FFFE2F8C9DFE7018CCD0153323784FBEA8E5
Data Updated at	13:27:39	FFFE2F8C9DFE7018DFEFF8129DF861F0FABE
Last Valid Position Held	240 min 21 s	
Return to Default Position	✓	

① Input from GPS simulator



Standard Location Protocol

Position Data Default Values (C/S T.007 A.3.8.1):

No position data was provided for > 4 hours before the test started. The beacon was activated and operated for 30 minutes without providing data. Message content was checked for all bursts during this period.

36 Hex Message	Message Count
FFFE2F8C9EF9C0637FDFF83D15B783E0F66C	37

Position Acquisition Time and Position Accuracy (C/S T.007 A.3.8.2)

Locations:

- A.3.8.2.1:            50° 52.1423' N        1° 14.6799' W        ①  
 A.3.8.2.2:            50° 48.8584' N        1° 12.1056' W        ①

The appropriate position was applied, the EUT activated and time to first message containing valid position data timed.

Configuration as per C/S T.007	C/S T.007 Section A.3.8.2.1		C/S T.007 Section A.3.8.2.2	
	Time to Acquire Position (sec)	Location Error in metres	Time to Acquire Position (sec)	Location Error in metres
Configuration 5	52.63	22.82	53.47	35.53
Configuration 7	52.05	22.82	52.76	35.53
Configuration 8	55.06	22.82	53.27	35.53

Positional accuracy was calculated using the Haversine Formula, The Earth's radius was taken as 6367 km.

- ① GPS Site Survey – Live Location

Encoded Position Data Update Interval (C/S T.007 A.3.8.3) – Short Test:

Location:	N 51° 22.583' W 1° 49.833' ①	
Data Acquired at	11:26:34	FFFE2F8C9EF9C06333A03ECA66771DA4D4D0
Location:	N 50° 48.683' W 1° 37.417' ①	
Data Updated at	11:39:56	FFFE2F8C9EF9C06332E0311EC7778EA76951
Data Update Interval	13min 22s	

- ① Input from GPS simulator. Position 2 was applied after the EUT received position 1, this was verified on a beacon tester.



Encoded Position Data Update Interval (C/S T.007 A.3.8.3) – Long Test:

Locations: N 45.25752° W 73.5913° (Start location). N 45.73752° W 73.5913° (Location 2) N 45.73752° W 73.5513° (Location 3) N 45.25752° W 73.5513° (Location 4) ①		
Parameter	Update interval	Limit
0 h to 2 h – Minimum	04:07*	≥ 05:00
0 h to 2 h – Maximum	05:05	≤ 30:00
2 h to 6 h – Minimum	04:08*	≥ 05:00
2 h to 6 h – Maximum	05:03	≤ 30:00
Assessment	Result	Limit
Results indicate that data changes as per C/S T.001 4.5.5.4 (Y/N)	N	
Results indicate that data changes as per manufacturer's update scheme (Y/N)	Y	

① Input from GPS simulator

Locations cycled through 1 to 4 continuously with an update interval of 02:00. Scenario moves in 2.225 km steps between locations 1 to 2 and 3 to 4. Steps size 3.105 km between locations 2 to 3 and 4 to 1.

\*NOTES: Refer to manufacturer document 921S-04094 Cospas-Sarsat Beacon Update rate.

Position Clearance After Deactivation (C/S T.007 A.3.8.4)

Following the Encoded Position Data Update Interval test, the beacon was deactivated and reactivated without providing navigation data. The Digital Message output was encoded with the default position data.

Position Data Input Update Interval (C/S T.007 A.3.8.5)

The EUT does not accept navigation data prior to activation so A.3.8.5 is not applicable.

Last Valid Position (C/S T.007 A.3.8.6)

Location: N 50° 52.142' W 1° 14.68' ①		
Data Acquired at	11:37:42	FFFE2F8C9EF9C06332E02BC44E379C010D39
GPS Signal Navigation Data Removed		
Last Message with Encoded Data	15:36:45	FFFE2F8C9EF9C06332E02BC44E379C010D39
Data Updated at	15:37:36	FFFE2F8C9EF9C0637DFF83D15B783E0F66C
Last Valid Position Held	239 min 54 s	
Return to Default Position	✓	

① Input from GPS simulator



### Summary

The EUT fails to comply\* with clause A.2.7 of Cospas-Sarsat T.007.

\*A.3.8.3: the minimum update interval is outside of the limits stated in Cospas-Sarsat T.007 clause A.3.8.3. Refer to manufacturer document 921S-04094 Cospas-Sarsat Beacon Update rate.



## **2.13 BEACON ANTENNA TEST**

### **2.13.1 Specification**

Cospas-Sarsat T.007, Clause A.2.6

### **2.13.2 Equipment Under Test and Modification State**

RLB-44 S/N: TA000007 - Modification State 0

### **2.13.3 Date of Test**

07 January 2022 & 14 January 2022

### **2.13.4 Test Equipment Used**

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

### **2.13.5 Laboratory Environmental Conditions**

Ambient Temperature 7.4 – 10.6°C  
Relative Humidity 53.6 – 89.3%

### **2.13.6 Test Results**



Configuration 1

Legend: **Strikeout** Under-range Over-range Vv-Vh < 10 dB

Azimuth Angle (Degrees)	Elevation Angle (degrees)									
	10		20		30		40		50	
	EIRP dBm	Ant dBi	EIRP dBm	Ant dBi	EIRP dBm	Ant dBi	EIRP dBm	Ant dBi	EIRP dBm	Ant dBi
0	39.9	4.0	41.5	5.5	42.0	6.0	40.5	4.5	34.6	-1.3
30	40.1	4.1	41.5	5.6	41.9	6.0	40.5	4.6	35.0	-1.0
60	40.3	4.3	42.0	6.0	41.9	5.9	40.5	4.5	34.4	-1.5
90	40.5	4.6	42.0	6.0	41.7	5.8	40.3	4.3	34.0	-2.0
120	40.5	4.6	42.0	6.0	41.9	6.0	40.3	4.4	34.0	-2.0
150	40.2	4.3	42.1	6.2	41.9	6.0	40.6	4.7	33.7	-2.2
180	40.2	4.2	42.0	6.1	42.1	6.1	40.8	4.8	33.4	-2.5
210	40.3	4.4	41.9	6.0	41.7	5.7	40.6	4.7	34.0	-1.9
240	40.5	4.6	41.9	6.0	41.7	5.7	40.0	4.1	33.9	-2.1
270	40.5	4.6	41.9	6.0	41.6	5.6	39.9	4.0	34.0	-2.0
300	40.2	4.3	41.6	5.7	41.6	5.6	40.2	4.3	34.4	-1.5
330	40.0	4.0	41.5	5.6	41.8	5.8	40.7	4.7	34.9	-1.1

Azimuth Angle (Degrees)	Elevation Angle (degrees)									
	10		20		30		40		50	
	Vv	Vh	Vv	Vh	Vv	Vh	Vv	Vh	Vv	Vh
0	108.0	81.6	109.1	85.3	109.0	81.1	106.4	74.9	98.8	85.5
30	108.2	80.4	109.2	84.8	108.9	76.8	106.5	79.6	99.2	84.8
60	108.4	78.3	109.7	83.8	108.9	71.6	106.4	84.1	98.7	82.4
90	108.6	79.6	109.6	84.6	108.7	73.4	106.1	85.7	98.3	82.0
120	108.6	75.2	109.6	84.8	108.9	78.2	106.2	85.7	98.3	80.3
150	108.3	74.6	109.8	83.6	108.9	73.9	106.5	83.8	98.1	81.2
180	108.3	74.3	109.7	85.3	109.0	77.0	106.7	79.6	97.7	83.2
210	108.4	72.9	109.6	86.6	108.6	82.2	106.5	78.3	98.2	85.6
240	108.6	76.8	109.6	87.1	108.6	84.6	105.9	79.7	97.9	86.6
270	108.6	78.6	109.6	87.4	108.5	85.5	105.8	80.9	98.0	87.4
300	108.3	80.3	109.3	88.2	108.5	85.1	106.1	79.7	98.5	86.7
330	108.1	76.5	109.2	86.9	108.8	82.9	106.6	79.3	99.0	86.3
Min (Vv-Vh)	26.5		21.1		23.0		20.5		10.6	

$$EIRP_{LOSS} = P_{t_{ambient}} - P_{t_{EOL}} = 35.94 - 35.95 = -0.01 \text{ dB}$$

$$EIRP_{maxEOL} = \text{Max}[EIRP_{max}, (EIRP_{max} - EIRP_{LOSS})] = \text{Max}[ 42.1, 42.1 ] = 42.1 \text{ dBm}$$

$$EIRP_{minEOL} = \text{Min}[EIRP_{min}, (EIRP_{min} - EIRP_{LOSS})] = \text{Min}[ 33.4, 33.4 ] = 33.4 \text{ dBm}$$



Configuration 4

Legend: **Strikeout** **Under-range** **Over-range** **Vv-Vh < 10 dB**

Azimuth Angle (Degrees)	Elevation Angle (degrees)									
	10		20		30		40		50	
	EIRP dBm	Ant dBi	EIRP dBm	Ant dBi	EIRP dBm	Ant dBi	EIRP dBm	Ant dBi	EIRP dBm	Ant dBi
0	38.8	2.8	40.7	4.8	39.6	3.6	37.2	1.3	32.9	-3.0
90	38.6	2.6	40.8	4.9	39.2	3.3	36.8	0.9	31.9	-4.0
180	38.4	2.5	40.5	4.6	38.6	2.6	35.6	-0.3	<del>28.6</del>	-7.4
270	38.7	2.8	40.9	4.9	39.1	3.2	36.6	0.6	30.7	-5.3

$$EIRP_{LOSS} = P_{t_{ambient}} - P_{t_{EOL}} = 35.94 - 35.95 = -0.01 \text{ dB}$$

$$EIRP_{maxEOL} = \text{Max}[EIRP_{max}, (EIRP_{max} - EIRP_{LOSS})] = \text{Max}[ 40.9, 40.9 ] = 40.9 \text{ dBm}$$

$$EIRP_{minEOL} = \text{Min}[EIRP_{min}, (EIRP_{min} - EIRP_{LOSS})] = \text{Min}[ 30.7, 30.7 ] = 30.7 \text{ dBm}$$

Summary

The EUT complies with clause A.2.6 of Cospas-Sarsat T.007.



## **2.14 BEACON CODING SOFTWARE**

### **2.14.1 Specification**

Cospas-Sarsat T.007, Clause A.2.8

Refer to Manufacturer document: 921S-04214- RLB-44\_EPIRB3 Pro\_EPIRB3 - Nav. System, Beacon and Msg. Coding\_01.03





## 2.15 RLM RECEPTION VERIFICATION

### 2.15.1 Specification

Cospas-Sarsat T.007, Clause A.3.8.8

### 2.15.2 Equipment Under Test and Modification State

RLB-44 S/N: TA000008 - Modification State 1

### 2.15.3 Date of Test

30 March 2022 & 31 March 2022

### 2.15.4 Test Equipment Used

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

### 2.15.5 Laboratory Environmental Conditions

Ambient Temperature 11.9°C  
Relative Humidity 31.0%

### 2.15.6 Test Results

#### RLS Indication Test

Requirement	Comments
Description of RLS indication as observed during the test	When requesting RLS, the EUT's LED will flash Magenta 5 times. If the EUT has a location fix, then the LED will flash Blue 5 times.
Description of RLM indication as observed during the test	Once RLM has been received, the EUT's LED will change from flashing Red to flashing Blue, this flashes every 2.5s.
Description of message encoding used to demonstrate that the RLS indication remain inactive at all times when the beacon is encoded with any protocol other than the RLS Location Protocol or RLS Location Test Protocol.	The EPRIB3 Pro is a RLS beacon which will also be used with Standard Location Protocol. A description of the message encoding is supplied in the manufacturer supplied beacon coding software.



Moffset – Configuration 8

Action	Timestamp (hh:mm:ss UTC)	Comments
Timestamp of the beacon activation	13:07:42	
Timestamp of the first message with RLS request	13:08:35	
Timestamp of RLS indication	13:08:36	
RLS request – 36 HEX with bit 111 set to 0 and a decode of this message <sup>1</sup>	-	FFFE2F8C9DFFD08FCCD012092FF84FBEA8E5
Timestamp of the internal GNSS activation	13:07:42	GNSS receiver activates at beacon start up.
Timestamp of UTC	13:07:51	
Timestamp of the navigation data sent to the beacon from the internal GNSS	13:08:32	
Timestamp of the beacon message with navigation data encoded	13:08:35	
Timestamp when the RLM was received	13:09:14	
Timestamp of the RLM indication	13:09:15	
Timestamp with the beacon message with bit 111 reverted to 1, beacon message content in 36-HEX and a decode of this message <sup>2</sup>	13:09:27	FFFE2F8C9DFFD08FCCD012092FFA4FBEA421
Timestamp when the beacon was de-activated	13:30:13	



## 1 Message Decode

### Decoded Beacon Message

Hexadecimal code: **FFFE2F8C9DFFD08FCCD012092FF84FB8A8E5**

The code consists of 36 hexadecimal characters representing a first generation beacon message with the format flag set to Long including bit and frame synchronization pattern prefix (24 bits) as defined by T.001 Issue 4 - Rev.6.

Unique identifier:

193BFFA11FBDFDF

Binary Range	Binary Content	Field Name	Decoded Value
1-15	1111111111111111 111111	Bit-synchronization pattern consisting of "1"s shall occupy the first 15-bit positions	True
16-24	0001011111	Frame Synchronization Pattern	Normal beacon operation
25	1	Format Flag	Long Message
26	0	Protocol Flag	Location, further information provided in "Protocol Code"
27-36	0011001001	Country code:  For associated SAR Points of Contact (SPOC) related to Albania - 201 :	Albania - 201  <a href="#">Search Contact list here</a>
37-40	1101	Protocol Code	RLS Location Protocol
41-42	11	Beacon type	RLS Test Location
43-46	1111	Identification type	RLS protocol coded with MMSI last 6 digits
47-66	1111010000 1000111111	Last 6 digits MMSI	999999
67-75	001100110	Latitude	51.0 Degrees North (51.0)
76-85	100000010	Longitude	1.0 Degrees West (-1.0)
86-106	0100000100 1001011111 1	BCH-1 error correcting code	BCH-1 code in message matches the recalculated BCH-1 from the PDF-1 field
107	1	Encoded position source	Encoded position data is provided by an internal navigation device
108	1	121.5 Mhz Homing Device	Included in beacon
109	1	Beacon capability to process and automatically generated RLM Type-1	Capable to process an automatically generated RLM Type-1
110	0	Beacon capability to process a manually generated RLM Type-1 RLM Type-2	Not capable to process a manually generated RLM Type-2
111	0	Beacon Feedback on receipt of RLM Type-1	RLM Type-1 (automatic) not received by this beacon
112	0	Beacon Feedback on receipt of RLM Type-2	RLM Type-2 (manual) not received by this beacon
113-114	01	RLS Provider Identification	GALILEO Return Link Service Provider
115-123	001111101	Latitude offset	7.0 minutes 52.0 seconds (negative)
124-132	111101010	Longitude offset	14.0 minutes 40.0 seconds (positive)
133-144	1000111001 01	BCH-2 error correcting code	BCH-2 code in message matches the recalculated BCH-2 from the PDF-2 field
Composite location			50.869 -1.244



## 2Message Decode

### Decoded Beacon Message

Hexadecimal code: **FFFE2F8C9DFFD08FCCD012092FFA4FBEA421**

The code consists of 36 hexadecimal characters representing a first generation beacon message with the format flag set to Long including bit and frame synchronization pattern prefix (24 bits) as defined by T.001 Issue 4 - Rev.6.

Unique identifier:

193BFFA11FBFDFF

Binary Range	Binary Content	Field Name	Decoded Value
1-15	1111111111111111 111111	Bit-synchronization pattern consisting of "1"s shall occupy the first 15-bit positions	True
16-24	0001011111	Frame Synchronization Pattern	Normal beacon operation
25	1	Format Flag	Long Message
26	0	Protocol Flag	Location, further information provided in "Protocol Code"
27-36	0011001001	Country code:  For associated SAR Points of Contact (SPOC) related to Albania - 201 :	Albania - 201  <a href="#">Search Contact list here</a>
37-40	1101	Protocol Code	RLS Location Protocol
41-42	11	Beacon type	RLS Test Location
43-46	1111	Identification type	RLS protocol coded with MMSI last 6 digits
47-66	1111010000 1000111111	Last 6 digits MMSI	999999
67-75	001100110	Latitude	51.0 Degrees North (51.0)
76-85	1000000010	Longitude	1.0 Degrees West (-1.0)
86-106	0100000100 1001011111 1	BCH-1 error correcting code	BCH-1 code in message matches the recalculated BCH-1 from the PDF-1 field
107	1	Encoded position source	Encoded position data is provided by an internal navigation device
108	1	121.5 Mhz Homing Device	Included in beacon
109	1	Beacon capability to process and automatically generated RLM Type-1	Capable to process an automatically generated RLM Type-1
110	0	Beacon capability to process a manually generated RLM Type-1 RLM Type-2	Not capable to process a manually generated RLM Type-2
111	1	Beacon Feedback on receipt of RLM Type-1	RLM Type-1 (automatic) received by this beacon
112	0	Beacon Feedback on receipt of RLM Type-2	RLM Type-2 (manual) not received by this beacon
113-114	01	RLS Provider Identification	GALILEO Return Link Service Provider
115-123	0011111101	Latitude offset	7.0 minutes 52.0 seconds (negative)
124-132	111101010	Longitude offset	14.0 minutes 40.0 seconds (positive)
133-144	0100001000 01	BCH-2 error correcting code	BCH-2 code in message matches the recalculated BCH-2 from the PDF-2 field
Composite location			50.869 -1.244



UTC – Configuration 8

Action	Timestamp (hh:mm:ss UTC)	Comments
Timestamp of the beacon activation	08:05:30	
Timestamp of the first message with RLS request	08:06:26	
Timestamp of RLS indication	08:06:27	
RLS request – 36 HEX with bit 111 set to 0 and a decode of this message <sup>1</sup>	-	FFFE2F8C9DFFD08FCCD012092FF84FBEA8E5
Timestamp of the internal GNSS activation	08:05:30	GNSS receiver activates at beacon start up.
Timestamp of UTC	08:05:40	
Timestamp of the navigation data sent to the beacon from the internal GNSS	08:06:10	
Timestamp when the navigation signal was denied	08:06:21	
Duration of GNSS receiver stayed active since turn on	00:30:04	GNSS Sleep at 08:35:34
Timestamp when navigation signal was allowed	10:01:14	
Timestamp when RLM was received	10:03:59	
Timestamp of the RLM indication	10:04:00	
Timestamp with the beacon message with bit 111 reverted to 1, beacon message content in 36-HEX format and a decode of this message <sup>2</sup>	10:04:00	FFFE2F8C9DFFD08FCCD012092FFA4FBEA421
Timestamp when the beacon was de-activated	10:15:39	



## 1Message Decode

### Decoded Beacon Message

Hexadecimal code: **FFFE2F8C9DFFD08FCCD012092FF84FB8A8E5**

The code consists of 36 hexadecimal characters representing a first generation beacon message with the format flag set to Long including bit and frame synchronization pattern prefix (24 bits) as defined by T.001 Issue 4 - Rev.6.

Unique identifier:

193BFFA11FBDFDF

Binary Range	Binary Content	Field Name	Decoded Value
1-15	1111111111111111 11111	Bit-synchronization pattern consisting of "1"s shall occupy the first 15-bit positions	True
16-24	000101111	Frame Synchronization Pattern	Normal beacon operation
25	1	Format Flag	Long Message
26	0	Protocol Flag	Location, further information provided in "Protocol Code"
27-36	0011001001	Country code:  For associated SAR Points of Contact (SPOC) related to Albania - 201 :	Albania - 201  <a href="#">Search Contact list here</a>
37-40	1101	Protocol Code	RLS Location Protocol
41-42	11	Beacon type	RLS Test Location
43-46	1111	Identification type	RLS protocol coded with MMSI last 6 digits
47-66	1111010000 1000111111	Last 6 digits MMSI	999999
67-75	001100110	Latitude	51.0 Degrees North (51.0)
76-85	100000010	Longitude	1.0 Degrees West (-1.0)
86-106	0100000100 1001011111 1	BCH-1 error correcting code	BCH-1 code in message matches the recalculated BCH-1 from the PDF-1 field
107	1	Encoded position source	Encoded position data is provided by an internal navigation device
108	1	121.5 Mhz Homing Device	Included in beacon
109	1	Beacon capability to process and automatically generated RLM Type-1	Capable to process an automatically generated RLM Type-1
110	0	Beacon capability to process a manually generated RLM Type-1 RLM Type-2	Not capable to process a manually generated RLM Type-2
111	0	Beacon Feedback on receipt of RLM Type-1	RLM Type-1 (automatic) not received by this beacon
112	0	Beacon Feedback on receipt of RLM Type-2	RLM Type-2 (manual) not received by this beacon
113-114	01	RLS Provider Identification	GALILEO Return Link Service Provider
115-123	001111101	Latitude offset	7.0 minutes 52.0 seconds (negative)
124-132	111101010	Longitude offset	14.0 minutes 40.0 seconds (positive)
133-144	1000111001 01	BCH-2 error correcting code	BCH-2 code in message matches the recalculated BCH-2 from the PDF-2 field
Composite location			50.869 -1.244



## 2Message Decode

### Decoded Beacon Message

Hexadecimal code: **FFFE2F8C9DFFD08FCCD012092FFA4FBEA421**

The code consists of 36 hexadecimal characters representing a first generation beacon message with the format flag set to Long including bit and frame synchronization pattern prefix (24 bits) as defined by T.001 Issue 4 - Rev 6.

Unique identifier:

193BFFA11FBDFDF

Binary Range	Binary Content	Field Name	Decoded Value
1-15	1111111111111111 11111	Bit-synchronization pattern consisting of "1"s shall occupy the first 15-bit positions	True
16-24	000101111	Frame Synchronization Pattern	Normal beacon operation
25	1	Format Flag	Long Message
26	0	Protocol Flag	Location, further information provided in "Protocol Code"
27-36	0011001001	Country code:  For associated SAR Points of Contact (SPOC) related to Albania - 201 :	Albania - 201  <a href="#">Search Contact list here</a>
37-40	1101	Protocol Code	RLS Location Protocol
41-42	11	Beacon type	RLS Test Location
43-46	1111	Identification type	RLS protocol coded with MMSI last 6 digits
47-66	1111010000 1000111111	Last 6 digits MMSI	999999
67-75	001100110	Latitude	51.0 Degrees North (51.0)
76-85	1000000010	Longitude	1.0 Degrees West (-1.0)
86-106	0100000100 1001011111 1	BCH-1 error correcting code	BCH-1 code in message matches the recalculated BCH-1 from the PDF-1 field
107	1	Encoded position source	Encoded position data is provided by an internal navigation device.
108	1	121.5 Mhz Homing Device	Included in beacon
109	1	Beacon capability to process and automatically generated RLM Type-1	Capable to process an automatically generated RLM Type-1
110	0	Beacon capability to process a manually generated RLM Type-1 RLM Type-2	Not capable to process a manually generated RLM Type-2
111	1	Beacon Feedback on receipt of RLM Type-1	RLM Type-1 (automatic) received by this beacon
112	0	Beacon Feedback on receipt of RLM Type-2	RLM Type-2 (manual) not received by this beacon
113-114	01	RLS Provider Identification	GALILEO Return Link Service Provider
115-123	0011111101	Latitude offset	7.0 minutes 52.0 seconds (negative)
124-132	111101010	Longitude offset	14.0 minutes 40.0 seconds (positive)
133-144	0100001000 01	BCH-2 error correcting code	BCH-2 code in message matches the recalculated BCH-2 from the PDF-2 field
Composite location			50.869 -1.244



Cospas-Sarsat T.007, Clause A.3.8.8.4 RLS GNSS Receiver Satellite Tracking refer to  
Manufacturer document : 921S-04238 Issue 01.00 RLB-44 +RLB-45 + RLB-43 AIS - RLS  
GNSS Receiver Satellite Tracking.pdf.

### Summary

The EUT complies with clause A.3.8.8 of Cospas-Sarsat T.007.





## **2.16 TESTING OF OPERATOR CONTROLS**

### **2.16.1 Specification**

Cospas-Sarsat T.007, Clause A.3.10

Test not carried out at request of the Manufacturer: refer to variant model (TUV SUD document 75952867 Report 01).



### **SECTION 3**

#### **TEST EQUIPMENT USED**



### 3.1 TEST EQUIPMENT

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

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Expiry Date
<b>Section 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7 Beacons - Constant Temperature Tests</b>					
Signal Generator	Marconi	2031	53	12	23-Dec-2022
Load (50ohm/30W)	Weinschel	50T-054	285	12	26-Jul-2022
Attenuator (20dB, 10W)	Weinschel	37-20-34	482	12	17-Jan-2023
Signal Generator (100kHz to 2.6GHz)	Hewlett Packard	8663A	1063	12	19-Jan-2023
Distress Beacon RF Unit	TUV SUD	-	2445	-	TU
Spectrum Analyser	Rohde & Schwarz	FSU26	2747	12	11-Mar-2023
Hygromer	Rotronic	I-1000	2829	12	6-Apr-2022
Termination (50ohm, 6W)	Micronde	R404613	3074	12	2-Dec-2022
Termination (50ohm, 1W)	Suhner	50ohm 1W	3080	12	10-May-2022
Attenuator (20dB, 10W)	Aeroflex / Weinschel	23-20-34	3160	12	19-Aug-2022
Time Interval Analyser	Yokogawa	TA720 704510	3253	12	23-Nov-2022
Short Circuit	TUV SUD	Short Circuit	3272	-	TU
ESA-E Series Spectrum Analyser	Agilent Technologies	E4402B	3348	12	12-Jan-2023
Rubidium Frequency Standard	Symmetricom	8040C	3490	12	27-May-2022
Power Meter	Rohde & Schwarz	NRP	3491	12	29-Nov-2022
Wideband Power Sensor, 50MHz - 18GHz	Rohde & Schwarz	NRP-Z81	3492	12	29-Nov-2022
Termination (50ohm)	Meca	405-1	3518	-	TU
1 metre N-Type Cable	Florida Labs	NMS-235SP-39.4-NMS	4510	12	24-Jan-2023
Oscilloscope	Yokogawa	DL750	4552	12	7-Apr-2022
Multi-GNSS Simulator (GPS)	Spirent	GSS6700	4596	12	20-Aug-2022
Bandpass Filter (1MHz)	KR Electronics	3219-SMA	4601	12	7-Sep-2022
Type T PFA Insulated Thermocouple	TC Limited	Type-T	4739	12	26-Jul-2022
Cable (18 GHz)	Rosenberger	LU7-036-1000	5027	-	O/P Mon
Cable (18 GHz)	Rosenberger	LU7-036-2000	5035	-	O/P Mon
Cable (18 GHz)	Rosenberger	LU7-036-2000	5037	-	O/P Mon
Wideband Power Sensor	Rohde & Schwarz	NRP-Z81	5357	12	18-Jan-2023
Climatic Chamber	Rotronic	DY110C	5448	-	O/P Mon
Digital Timer	Radio Spares	RS Pro	5602	12	26-Aug-2022
RF distribution box	TUV SUD		5626	12	Class 1 (Int)
Thermocouple Data Logger	Pico Technology Ltd	TC-08 + Type T Thermocouple	5740	12	4-Mar-2023
Signal Analyzer	Keysight Technologies	N9020B-ATO-43105	5743	24	10-Feb-2024
Humidity & Temperature meter	Rotronic	HP31 HygroPalm	5902	12	17-Feb-2023
<b>Section 2.8 Beacons - Thermal Shock</b>					
Attenuator (20dB, 10W)	Weinschel	37-20-34	482	12	17-Jan-2023
Signal Generator (100kHz to 2.6GHz)	Hewlett Packard	8663A	1063	12	19-Jan-2023
Distress Beacon RF Unit	TUV SUD	-	2445	-	TU
Hygromer	Rotronic	I-1000	2829	12	6-Apr-2022
Termination (50ohm, 1W)	Suhner	50ohm 1W	3080	12	10-May-2022



Attenuator (20dB, 10W)	Aeroflex / Weinschel	23-20-34	3160	12	19-Aug-2022
Time Interval Analyser	Yokogawa	TA720 704510	3253	12	23-Nov-2022
Rubidium Frequency Standard	Symmetricom	8040C	3490	12	27-May-2022
Power Meter	Rohde & Schwarz	NRP	3491	12	29-Nov-2022
Wideband Power Sensor, 50MHz - 18GHz	Rohde & Schwarz	NRP-Z81	3492	12	29-Nov-2022
Oscilloscope	Yokogawa	DL750	4552	12	7-Apr-2022
Multi-GNSS Simulator (GPS)	Spirent	GSS6700	4596	12	20-Aug-2022
Bandpass Filter (1MHz)	KR Electronics	3219-SMA	4601	12	7-Sep-2022
Type T PFA Insulated Thermocouple	TC Limited	Type-T	4739	12	26-Jul-2022
Cable (18 GHz)	Rosenberger	LU7-036-1000	5027	-	O/P Mon
Cable (18 GHz)	Rosenberger	LU7-036-2000	5035	-	O/P Mon
Climatic Chamber	Rotronic	DY110C	5448	-	O/P Mon
Digital Timer	Radio Spares	RS Pro	5602	12	26-Aug-2022
<b>Section 2.9 Beacons – Satellite Qualitative</b>					
Copper GRP	TUV SUD	27cm Diameter	3538	-	TU
Non Conductive Standoff Box	TUV SUD	Non Conductive Standoff Box	4966	-	TU
Tester (Beacon)	WS Technologies	BT200-1100Y	5394	-	TU
Tester (Beacon)	WS Technologies	BT200-1100Y	5395	-	TU
Humidity & Temperature meter	Rotronic	HP31 HygroPalm	5902	12	17-Feb-2023
<b>Section 2.10 Beacons - Operating Lifetime and Battery Current Measurements</b>					
Load (50ohm/30W)	Weinschel	50T-054	285	12	26-Jul-2022
Hygrometer	Rotronic	I-1000	2891	12	4-Nov-2022
GPS Simulator	Spirent	GSS7000	4978	12	21-Jul-2022
Tester (Beacon)	WS Technologies	BT200-1100Y	5394	-	TU
High resolution data logger	Pico Technology Ltd	PicoLog ADC20	5594	12	23-Aug-2022
Variable Resistive Load	TUV SUD	N/A	5876	12	22-Feb-2023
<b>Section 2.11 Beacons - Temperature Gradient Combined</b>					
Attenuator (20dB, 10W)	Weinschel	37-20-34	482	12	17-Jan-2023
Distress Beacon RF Unit	TUV SUD	-	2445	-	TU
Hygrometer	Rotronic	I-1000	2891	12	4-Nov-2022
Termination (50ohm, 1W)	Suhner	50ohm 1W	3080	12	10-May-2022
Attenuator (20dB, 10W)	Aeroflex / Weinschel	23-20-34	3160	12	19-Aug-2022
Rubidium Frequency Standard	Symmetricom	8040C	3490	12	27-May-2022
Power Meter	Rohde & Schwarz	NRP	3491	12	29-Nov-2022
Wideband Power Sensor, 50MHz - 18GHz	Rohde & Schwarz	NRP-Z81	3492	12	29-Nov-2022
Multi-GNSS Simulator (GPS)	Spirent	GSS6700	4596	12	20-Aug-2022
Vector Signal Generator	Keysight Technologies	ESG E4438C	4731	12	10-Feb-2023
Type T PFA Insulated Thermocouple	TC Limited	Type-T	4739	12	26-Jul-2022
Cable (18 GHz)	Rosenberger	LU7-036-1000	5027	-	O/P Mon
Cable (18 GHz)	Rosenberger	LU7-036-2000	5035	-	O/P Mon
Wideband Power Sensor	Rohde & Schwarz	NRP-Z81	5357	12	18-Jan-2023
Climatic Chamber	Rotronic	DY110C	5448	-	O/P Mon
Digital Timer	Radio Spares	RS Pro	5602	12	26-Aug-2022
RF distribution box	TUV SUD		5626	12	Class 1 (Int)
<b>Section 2.12 Beacons - Navigation System</b>					



Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	35	12	1-Apr-2022
RF Shielded Enclosure	Rittal	AE1380	162	-	TU
Termination (50ohm)	Meca	405-1	364	12	15-Dec-2022
Termination	Meca	405-1	374	12	Class 1 (Int)
Attenuator (10dB, 10W)	Weinschel	23-10-34	470	12	17-Feb-2023
Directional Coupler	Narda	3022	1323	12	8-Jul-2022
Hygrometer	Rotronic	I-1000	1897	12	26-Nov-2022
Attenuator (20dB, 10W)	Aeroflex / Weinschel	23-20-34	3159	12	19-Apr-2022
ESA-E Series Spectrum Analyser	Agilent Technologies	E4402B	3348	12	12-Jan-2023
Termination (50ohm)	Meca	405-1	3518	-	TU
Copper GRP	TUV SUD	27cm Diameter	3538	-	TU
'N' - 'N' RF Cable (1m)	Rhophase	NPS-1803-1000-NPS	3701	12	5-Aug-2022
Multi-GNSS Simulator (GPS)	Spirent	GSS6700	4596	12	20-Aug-2022
Non Conductive Standoff Box	TUV SUD	Non Conductive Standoff Box	4966	-	TU
Cable (18 GHz)	Rosenberger	LU7-036-2000	5039	12	20-Oct-2022
Cable (18 GHz)	Rosenberger	LU7-071-1000	5096	12	20-Oct-2022
Tester (Beacon)	WS Technologies	BT200-1100Y	5394	-	TU
Tester (Beacon)	WS Technologies	BT200-1100Y	5395	-	TU
Desktop Stopwatch	Radio Spares	RS Pro	5571	12	16-Jul-2022
Humidity & Temperature meter	Rotronic	HP31 HygroPalm	5902	12	17-Feb-2023
<b>Section 2.13 Beacons - Antenna Characteristics</b>					
Roberts Antenna 406MHz	Compliance Design		1860	24	13-Jul-2022
Hygrometer	Rotronic	HP21	3718	0	14-Apr-2022
Inclinometer, Digital	Radio Spares	01-900-020003 (RS 667-3916)	4125	12	16-Nov-2022
30m LMR-300-DB COAXIAL CABLE	IntelliConnect Limited	C-NPNP-LMR300DB-30M	5588	12	07-Jul-2023
Signal Analyzer	Keysight Technologies	N9020B-ATO-43105	5743	24	3-Feb-2022
<b>Section 2.15 Beacons – RLM Reception Verification</b>					
Non Conductive Standoff Box	TUV SUD	Non Conductive Standoff Box	4966	-	TU
Tester (Beacon)	WS Technologies	BT200-1100Y	5395	-	TU
Humidity & Temperature meter	Rotronic	HP31 HygroPalm	5902	12	17-Feb-2023

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.

TU – Traceability Unscheduled

OP MON – Output Monitored with Calibrated Equipment



### 3.2 MEASUREMENT UNCERTAINTY

#### Summary of Uncertainty Values

Measured Parameter	C/S Required Uncertainty	Calculated Lab Uncertainty
Repetition Time	± 0.01 seconds	± 0.0006 seconds CL 95%
Total Transmission Time	± 1.0 ms	± 0.062 ms CL 95%
CW Preamble	± 1.0 ms	± 0.062 ms CL 95%
Bit Rate	± 0.6 bps	± 0.0014 bps CL 95%
Nominal frequency	± 100 Hz	± 1.24 Hz CL 95%
Short-Term Stability	± 1 * 10 <sup>-10</sup>	± 0.79 * 10 <sup>-10</sup> CL 95%
Medium-Term Stability – MS	± 1 * 10 <sup>-10</sup>	± 2.04 * 10 <sup>-11</sup> CL 95%
Medium-Term Stability – RFV	± 1 * 10 <sup>-10</sup>	± 3.34 * 10 <sup>-11</sup> CL 95%
Conducted Transmitted Power	± 0.5 dB	± 0.49 dB CL 95%
Carrier Power Rise Time	± 0.5 ms	± 0.051 ms CL 95%
Modulation Rise / Fall Time	± 25 µs	± 4.32 µs CL 95%
Modulation Symmetry	± 0.01	± 0.0014 CL 95%
Modulation Phase Deviation	± 0.04 radians	± 0.0384 radians CL 95%

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



## **SECTION 4**

### **PHOTOGRAPHS**

4.1 PHOTOGRAPHS OF EQUIPMENT UNDER TEST (EUT)



RLB-44 EPIRB – Radiated Sample

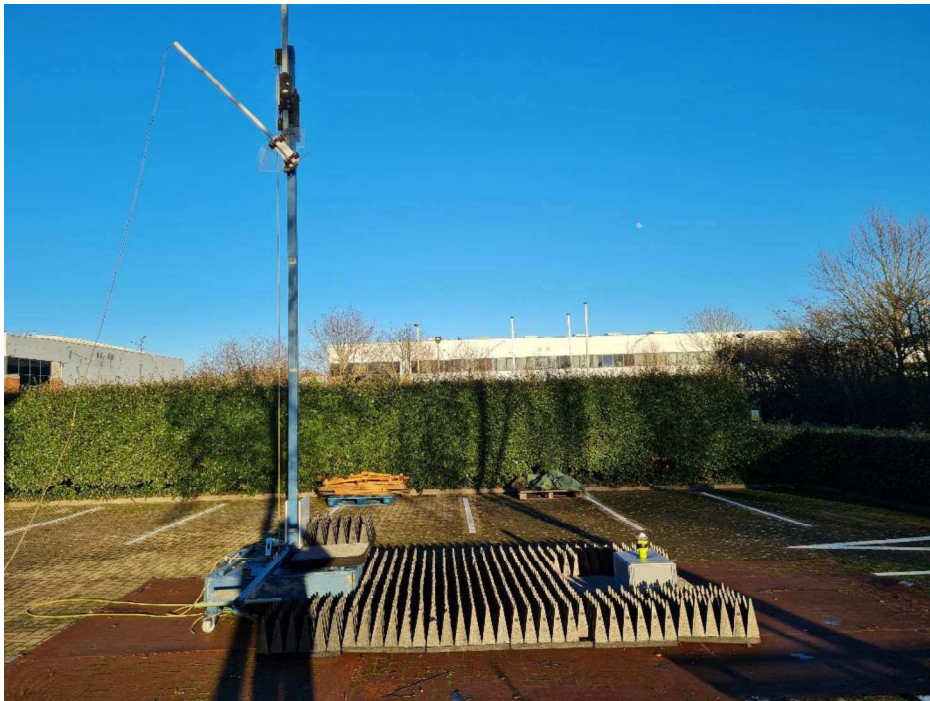




RLB-44 EPIRB – Conducted Sample



Antenna Characteristics – Configuration 1



Antenna Characteristics – Configuration 4