



AEROMARINE SRT Ltd.
SAFETY SOLUTIONS

ELT Tester i406 Mini w/Wi-Fi
Technical description and operation manual

To buy, sell, or trade in this product please click on the link below:

<https://www.avionteq.com/ICARUS-ELTT-124M-ELT-Testers>

AvionTEq
□ □ □ □ □ □ □ □ □ □

www.avionteq.com

ELT Tester i406 Mini w/Wi-Fi

**Technical description and
operation manual**

V1.51

11.2017



Contents

Item	Page
1. Application	3 - 4
2. General description and specification	5 - 6
3. Complete set	7
4. Installation	8 - 19
4.1 Control and connection tools	8
4.2 Turning ON	9
4.3 WEB-interface description	9 - 11
4.4 Begin measurement	12 - 16
4.5 Operation with saved results of testing	17 - 19
5. ELT test procedure	20
6. Tester calibration	21
7. Operating instructions	22
8. Safety precautions	23
9. Storage rules	24
Attachments:	
Attachment 1. Unit conversion table <dBm to W>	25
Attachment 2. Audio and visual indication description	26 - 27
Attachment 3. Examples of test reports	28



1. APPLICATION

- 1.1 The ELT Tester i406 Mini w/Wi-Fi is designed to check the aviation emergency locator transmitters (ELT) operating via COSPAS-SARSAT system. Tests can be carried out in volume of annual test requirements or in volume of maintenance requirements or for fast check after ELT's encoding or installation. Tester can receive the messages from any 406 MHz COSPAS-SARSAT transmitting either in test mode or in real alert emergency mode. The signal can be received through the broadcast by means of antenna or the tester can be connected directly by means of cable through a suitable attenuator. Tester's main view is shown on the fig. 1-1.

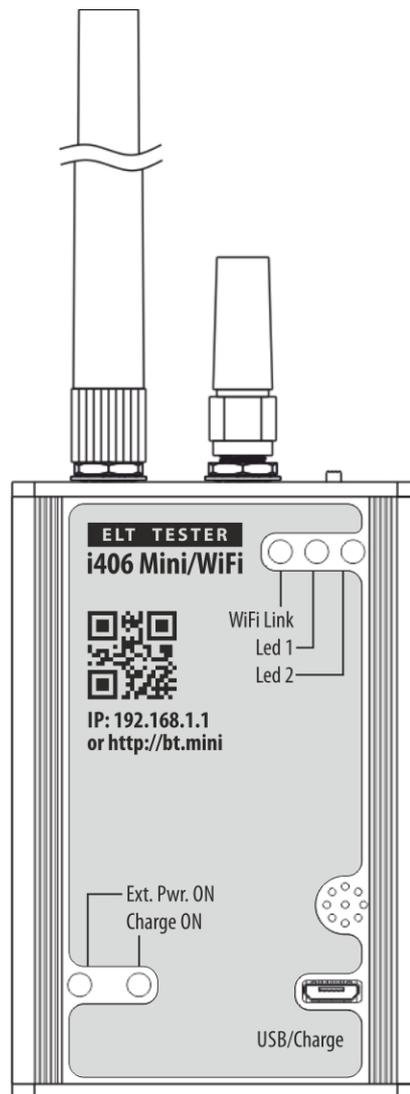


Fig.1-1. Tester's front view



Tester is designed to operate with mobile devices, such as mobile telephone, laptop, tablet that have Wi-Fi connection.

You don't need to install any special program on your mobile device, all you need is browser.

Tester can effectively check any Cospas-Sarsat beacon: EPIRB, ELT, PLB.

1.2 Tester allows to perform:

- reception, demodulation and decoding of the emergency information transmitted on channel 406MHz;
- frequency measurement of 406MHz signal;
- frequency measurement of 121.5MHz signal;
- frequency measurement of 243MHz signal;
- audio-control of the sweep 121.5MHz signal presence;
- audio-control of the sweep 243MHz signal presence;
- power level measurement on 406MHz channel;
- power level measurement on 121.5MHz channel;
- power level measurement on 243MHz channel;
- measurement of total transmission time of 406MHz signal;
- measurement of unmodulated carrier duration of 406MHz signal;
- estimation of the equivalent radiated power of 406MHz signal through broadcast.

1.3 The tester is designed to operate at the temperature range from 0°C to +45°C and relative air humidity should be no more than 95%.

1.4 The tester power supply is performed by accumulator battery, as well as by external DC source with voltage 4.5...7V and load current no less than 300mA. The tester is power supplied by USB cable when connected to computer or to USB power adapter.



2. GENERAL DESCRIPTION AND SPECIFICATION

- 2.1 Tester provides carrier measurement on a frequency of 406MHz with accuracy to $\pm 300\text{Hz}$.
- 2.2 Tester provides carrier measurement on a frequency of 121.5MHz with accuracy to $\pm 500\text{Hz}$.
- 2.3 Tester provides carrier measurement on a frequency of 243MHz with accuracy to $\pm 800\text{Hz}$.
- 2.4 The tester provides audio-control of the sweep signal presence on a frequency of $121500 \pm 10\text{kHz}$.
- 2.5 The tester provides reception, demodulation and decoding of the emergency information and displays on your choice the HEX-code (15 Hex ID or the message 1-112 bit) as well as all decoded information in text view with all measured parameters. Besides, the BCH code is calculated and compared with received one, and the result is displayed.
- 2.6 The tester provides measurement of positive/negative phase deviation value of modulated signal with accuracy to $\pm 2.8\sigma$.
- 2.7 The tester provides measurement of total transmission time of the message with accuracy to $\pm 0.2\%$ and time of preamble duration with accuracy to $\pm 0.2\%$.
- 2.8 The tester provides measurement of received signal level on a frequency of 406MHz within the range 12 – 40dBm or 0.01W - 10W by means of attenuator and within the range -40...-12dBm by means of antenna, with accuracy to
 - $\pm 3.0\text{dB}$ by means of antenna;
 - $\pm 0.9\text{dB}$ by means of attenuator.
- 2.9 The tester provides measurement of received signal level on a frequency of 121.5MHz and 243MHz within the range 10 – 25dBm or 10 – 316mW by means of attenuator and within the range with -40...-10dBm by means of antenna, with accuracy to
 - $\pm 3.0\text{dB}$ by means of antenna;
 - $\pm 0.9\text{dB}$ by means of attenuator.
- 2.10 The tester allows to perform the measurement of beacon parameters by means of standard external antenna (from 2 to 15 meters), as well as via RF-cable and attenuator connection. Calibration test of the power meter is performed for 3 meters distance.
- 2.11 Tester RF-input resistance is about $50 \pm 1.5\text{Ohm}$.



ATTENTION!!!

Peak signal level which is supplied to the tester RF-input should be not more than 1.0W (mean square value) or 20mW.

Direct connection of the beacon to the tester's input without attenuator leads to the irreparable DAMAGES of the tester!

- 2.12 Tester allows to save up to 500 measuring results in non-volatile memory.
- 2.13 Single measurement circle time is not more than 2 min.
- 2.14 The tester can be power supplied by accumulator battery, as well as by external direct current source with approximate voltage 4.5...7V and load current no less than 400mA connected to micro-USB input of the tester by means of standard USB connector (of PC USB connector or network USB adaptor).
- 2.15 Tester's current drain consumption:
 - in standby mode - no more than 120mA;
 - in measure mode - no more than 320mA.
- 2.16 Approximate continuous operation time of the tester from the internal power supply elements is about 6 hours.
- 2.17 Tester emits warning signal if it has no Wi-Fi connection more than 5min (Tester is in passive mode).
- 2.18 Tester indicates the voltage of the internal power supply elements with accuracy to $\pm 5\%$.



3. COMPLETE SET

3.1. Complete set of the tester corresponds to the following table 3-1.

No.	Item	Quantity	Notice
1	ELT Tester i406 Mini	1	
2	Antenna 406/121MHz	1	
3	Antenna Wi-Fi	1	
4	Power cable (USB A – micro USB 1.5m)	1	
5	USB Power adapter	1	
6	Technical description and operation manual	1	
7	Attenuator - ATT ELT406 MINI	1	optional
8	RF cable SMA/SMA 0.5m RG316	1	optional
9	RF cable SMA/SMA 1m RG316	1	optional
10	RF adapter SMA/BNC	1	optional
11	RF adapter SMA/TNC	1	optional
12	Package	1	

Tab. 3-1



4. INSTALLATION

4.1 Control and connection tools

4.1.1 On the front panel of the tester there are LEDs and micro-USB input for accumulator charging (Fig. 4-1).

4.1.2 On the top there is ON/OFF switcher and two RF-connectors: for 406/121.5 antenna and for Wi-Fi antenna (Fig. 4-1).

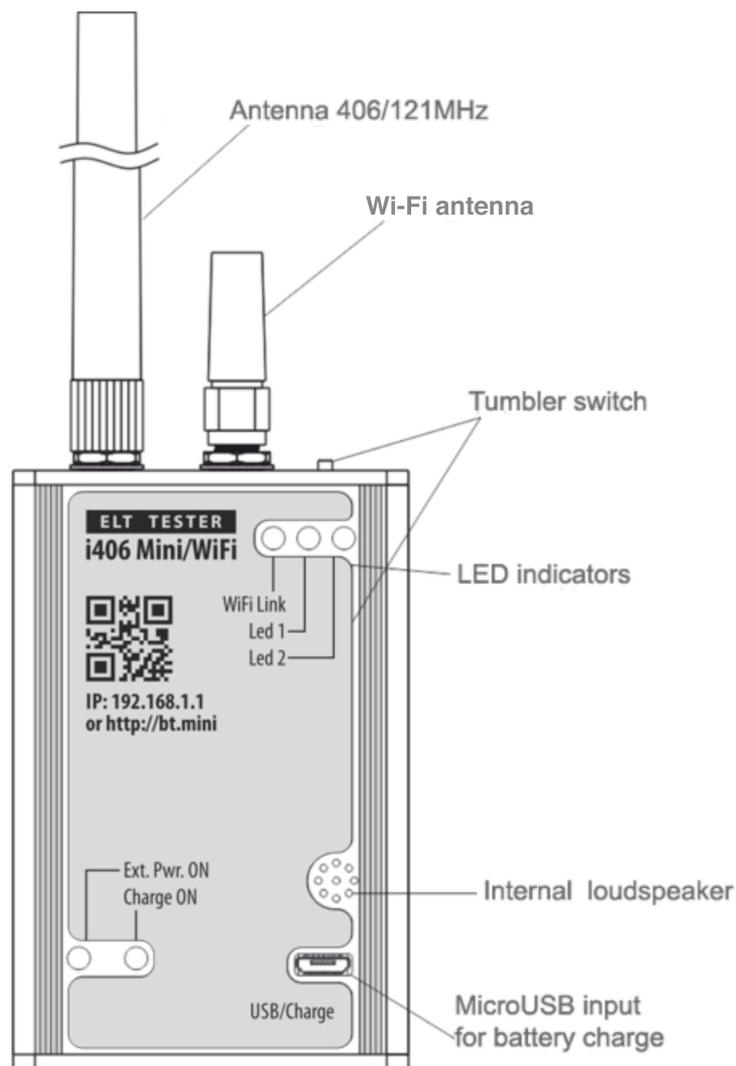


Fig. 4-1 Operation and indication tools



4.2 Turning ON

To turn device on, move switcher to position “ON”. After start up two short audio signals and a “welcome” signal will be given.

While operating in normal mode blue light shines periodically (Led 1) – it signalize that device is ready and can be Wi-Fi connected.

Device works in “Access Point” and after start up creates Wi-Fi module with unique SSID (*Service Set Identifier*) name: “BTmini_XXXXXX”, where XXXXXX – serial number of device, for example BTmini_140002.

Then Wi-Fi connection of PC or mobile device with this network needs to be established.

All necessary parameters of network will be set up automatically, you don’t need to set them up manually. Green light “Wi-Fi Link” signalizes successful connection.

*Possible problems:

- No audio signal when turning on – maybe battery is low.
- After turning on, there are three short audio signals and red light strobes (Led 2) – device is running up boot loader (more information in “SOFTWARE”). Perhaps you drop here by accident. Try to turn off and then turn on the device. If it doesn’t help maybe there is a problem with software.
- Wi-Fi network cannot be found or connected to – check if blue light (“Led 1”) strobes. Maybe there’s problem with host-device that assumes the connection. Try to establish Wi-Fi connection from another device. Don’t take host-device to far, maybe the signal is weak.

4.3 WEB-interface description

After successful Wi-Fi network connection, open browser on the host device and go to <http://bt.mini> (or tape to address panel: 192.168.1.1) After this, home page will be loaded.



Fig. 4-2 Main menu view

*Notice:

JavaScript should be turned on in browser, otherwise web-interface can operate not correctly!
We recommend using actual versions of browsers Firefox, Google Chrome, IE11 on desktop-devices. And please use standard browsers on mobile devices Safari, Android Web-browser. **Don’t use browsers that operate only under Internet connection, such as Opera Mini.**

4.3.1 General settings (page: /settings)

When first running of device, the basic settings should be set up (such as date, time, user identification). To make it, one needs to open tab “Settings” or input address panel: <http://bt.mini/settings>



Fig. 4-3 Tab Settings

4.3.1.1 User information input.

This Tester can keep information of several users if device is used by several persons. Information of user will be attached to measurements provided by this user and will be figured out in generated reports of measurements.

For each input only 50 symbols are acceptable, ANSI-symbols are preferred, other character encoding can be figured out incorrectly.

Details of Users

Vadim B. ▾

Company name:

Company address:

Telephone/Fax:

Radioengineer:

Setting the date & time

Current time:
2016 May 30, 13:45

Short date:
05-30-2016

Hours Minutes Days Mounth Years

mm.dd.yyyy ▾

Reports

Universal ▾

Fig. 4-4 Input menu of information about company

After given input fulfilled, you press «SAVE», to record data in the internal memory.

To change active user – you need to mouse over it and select the necessary user from the falling list. (see Fig. 4-6).

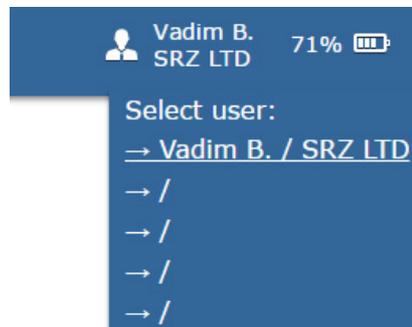


Fig. 4-5 Select user menu

4.3.1.2 Date and time set up

Date format presets the order of numbers of year, month, days display. This setting will form date displaying in generated reports and in menu of saved texts.

Setting the date & time

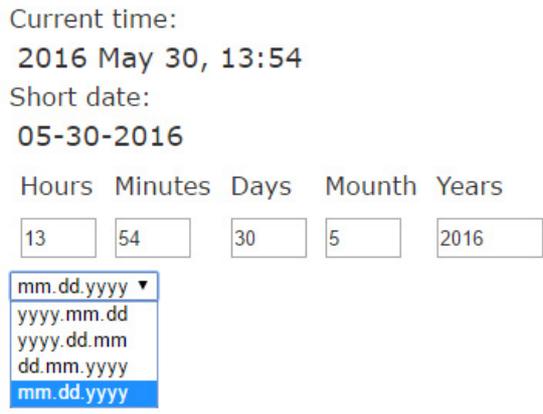


Fig. 4-7 Settings the date and time

For date and time adjustment you need to set current values in each field and press «Set date».

4.3.1.3 Device memory cleaning

To clean internal device memory - press button “Clear memory”.

Attention! This action will remove all saved results non-recoverable.

Memory

CLEAR MEMORY

Battery

Charge level: 70%

Supply: 3.91(V)

Fig. 5-8 “Battery” and “Memory” menu

Also on this page, one can find information about battery: current voltage and charge level.



4.4 Begin measurement (page: /test)

To start measurements select necessary channel and pass to according tab:

TEST 406MHz – provides testing on 406MHz channel that includes receive and decoding of messages, frequency and power of signal measurement in current channel.

TEST 121.5MHz – provides testing on 121.5Mhz channel in volume of frequency and signal power measurement and also audio-control of received sweep-signal.

Test 243 MHz channel – provides testing on 243Mhz channel, including frequency and power of signal, and also audio-control of received sweep-signal.

Then please press button “START NEW TEST”, which is in left column:

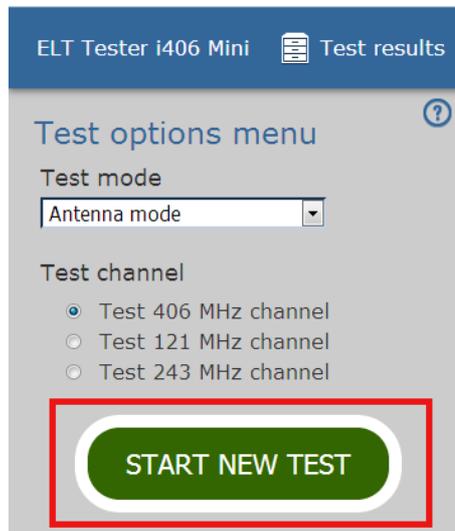


Fig. 4-9 Tab Perform Test

4.4.1 406MHz channel testing

Before measurement start you should turn the ELT in self-test mode, then press “START NEW TEST”. Red light (Led 2) will signalize the beginning of measurements. Wait the results of measurements up to 1minute, depending on beacon’s construction features.

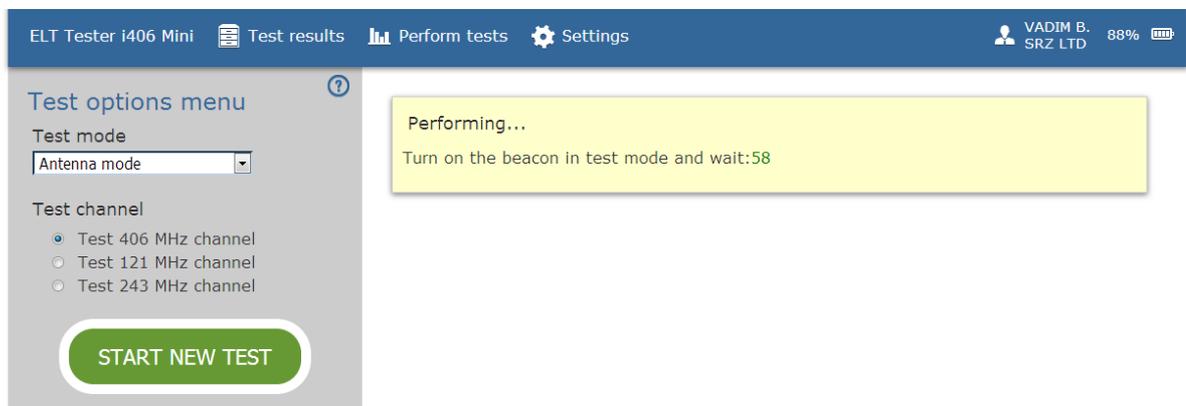


Fig. 4-10 TEST 406MHz



Attention! Don't update and don't close the page, after measurement beginning. This can provoke Tester PO error for some time and loss of measurement results. For detailed instruction, please, click "View the instruction".

Below here is an example with measurement results:

The screenshot shows the web interface of the ELT Tester i406 Mini. The top navigation bar includes 'Test results', 'Perform tests', and 'Settings'. The user is identified as 'VADIM B. SRZ LTD' with an 87% battery level. On the left, the 'Test options menu' allows selecting 'Antenna mode' and 'Test channel' (406 MHz, 121 MHz, or 243 MHz). A 'START NEW TEST' button is visible. The main area displays 'Results' with a list of actions: '406 MHz - DONE', '121.5 MHz - START', '243 MHz - START', 'Add details', 'Save results', and 'Start new test'. Below this, '406MHz channel test results' are shown in a table format.

406MHz channel test results	
Frequency:	406027.611 kHz
Power:	38.22 dBm
Hex:	FFED09002EB1B897FDFFF5CC4B7
15 Hex ID:	2005D63712FFBFF
Country code	(256) Malta
Mode:	Self-test
BCH1 / BCH2	OK / BAD
Message format	Long format
Protocol	Standard Location
Type of location protocol	EPIRB - MMSI
MMSI	963000
Specific Beacon	9
Latitude data	Default

Fig. 4-11 406 channel testing. **Example of results**

To save measurement results one should press button "SAVE MEASURE". Here you can also add supplementary information (ADD DETAILS)



Perform tests Settings Vadim B. SRZ LTD 80%

ADD DETAILS

Vessel

Name:

Beacon Details

Model

S/N

Manufacturer

Issue date:

Hydrostat

Model

Next replacement date:

Additional information

Sweep tone:

Flash:

Waterproof Integrity:

State of marking:

Test/Replacement battery date

Date of testing: 2000-01-01

Next testing date:

Battery replacement date:

SAVE MEASURE

Fig. 4-12 Menu of supplementary information about beacon under testing

This information can be necessary for reports forming. It can be saved with results of testing (button "SAVE MEASURE"). In case when supplementary information wasn't entered, or was entered with mistakes, it can be corrected in menu "Test results" of saved result of testing (look closer Test results).

Attention! Text fields are maximum 40 symbols. For correct displaying use only ANSI-symbols. If entered information will appear incorrect (for example, date), it will be highlighted with red when you will try to close, and saving will not be assured. Be attentive!



4.4.2 121.5MHz channel testing (page: /121)

In this mode, frequency and power of signal on 121.5 channel can be measured. Audio-signal follows testing to assure the process.

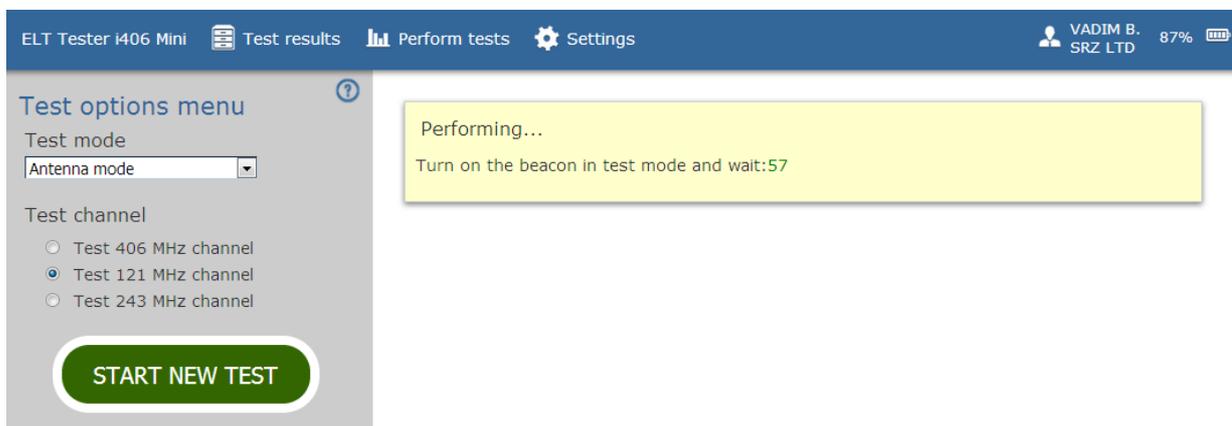


Fig. 4-13 121MHz channel testing

To begin measurements select option 121MHz and press button «START NEW TEST». During several seconds measurements will be carried out, followed by audio-signal. Measurement will continue until the signal is received but not more than 1 minute.



Fig. 4-14 121.5MHz channel testing. Example of results

These results can be saved independently. Measurement on channel 406MHz can be added to this memory cell.

4.4.3 243MHz channel testing

Use this mode to measure frequency and power of signal on 243MHz channel. Audio-signal follows testing to assure the process.

To start measurements select option «Test 243MHz channel» and press button «START NEW TEST». During several seconds measurements will be carried out, followed by audio-signal. Measurement will continue until the signal is received but not more than 1 minute

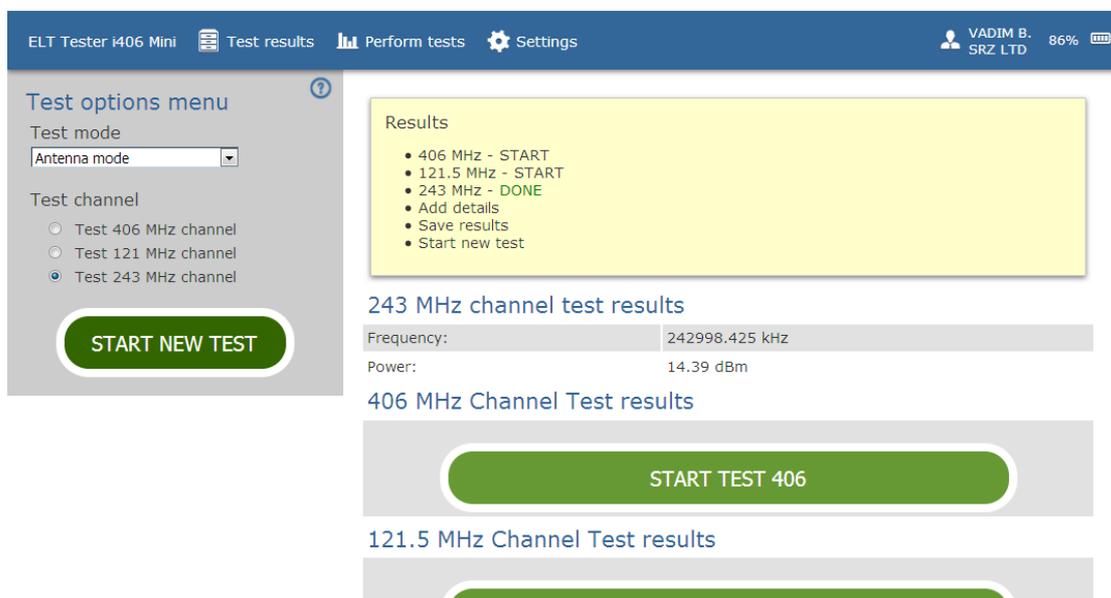
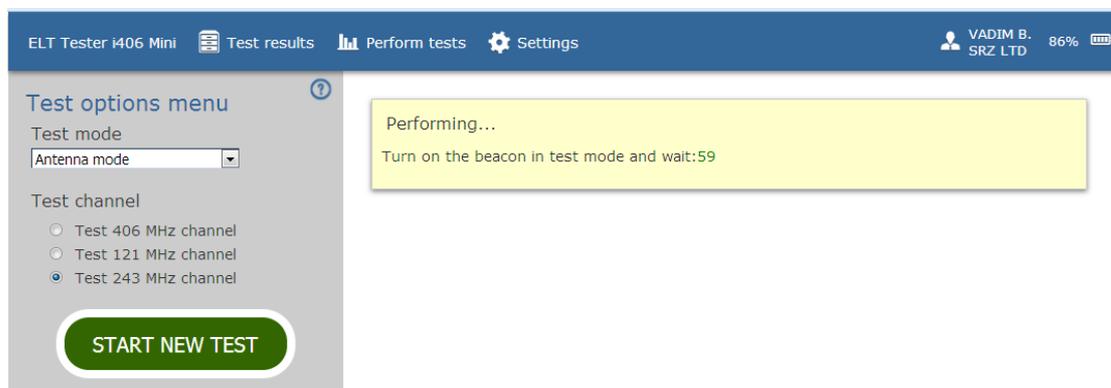


Fig. 4-15 Test 243 MHz and example of results

These results can be saved independently. Measurements on 406MHz and 121.5MHz can be added to this memory cell.

4.5 Operation with saved results of testing (page: /index)

All saved results of testing are accessible on menu «Test results», or on home page of device (address <http://bt.mini/>).

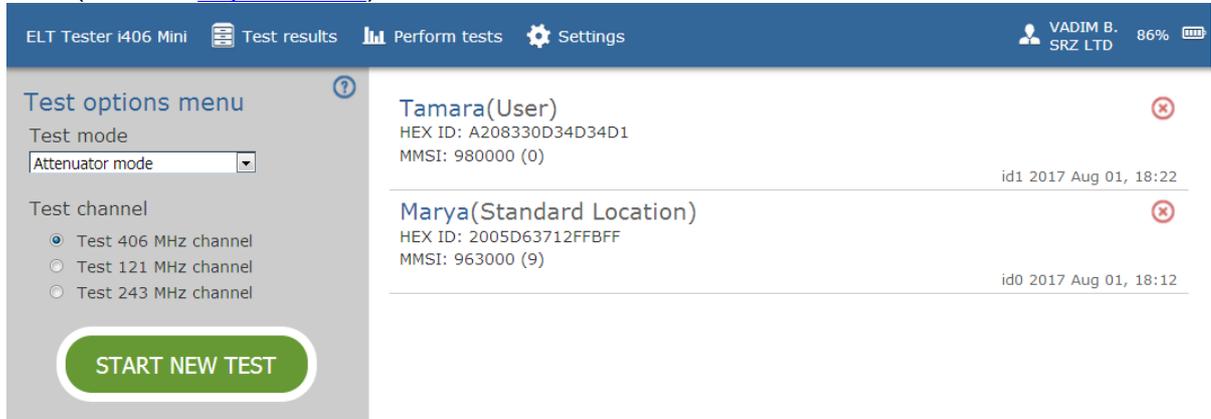


Fig. 4-16 Menu «Test results», with saved results of testing (page: /index)

To delete several results, please press red cross stich on the right (Image 5-17)

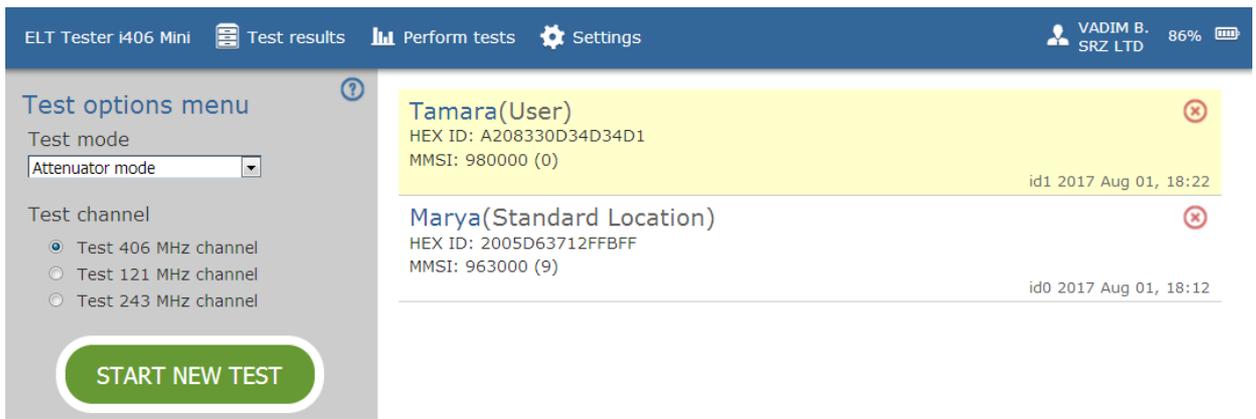
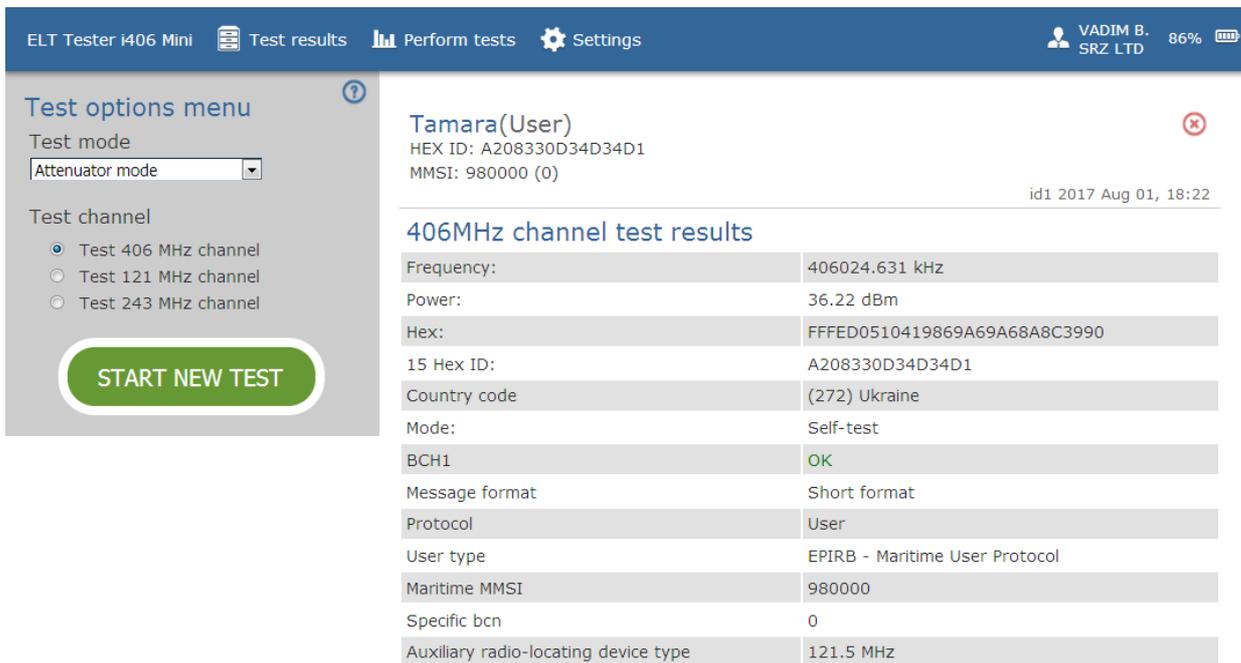


Fig. 4-17 Test results delete (page: /index)

All saved results of test are displayed as a table, with short basic information. To see details of testing, and reports, please, press on link of that measurement.



ELT Tester i406 Mini | Test results | Perform tests | Settings | VADIM B. SRZ LTD | 86%

Test options menu

Test mode
Attenuator mode

Test channel

- Test 406 MHz channel
- Test 121 MHz channel
- Test 243 MHz channel

START NEW TEST

Tamara(User)

HEX ID: A208330D34D34D1
MMSI: 980000 (0)

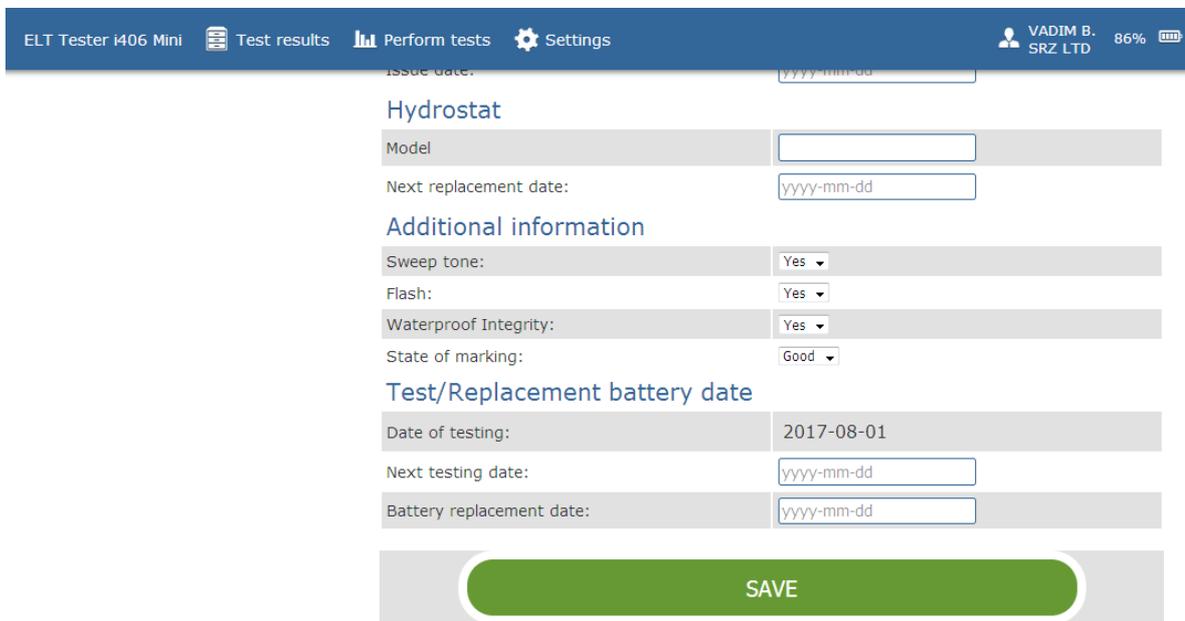
id1 2017 Aug 01, 18:22

406MHz channel test results

Frequency:	406024.631 kHz
Power:	36.22 dBm
Hex:	FFED0510419869A69A68A8C3990
15 Hex ID:	A208330D34D34D1
Country code	(272) Ukraine
Mode:	Self-test
BCH1	OK
Message format	Short format
Protocol	User
User type	EPIRB - Maritime User Protocol
Maritime MMSI	980000
Specific bcn	0
Auxiliary radio-locating device type	121.5 MHz

Fig. 4-18 Link for detailed information (page: /index)

Here you can find all saved information of provided measurement. To edit supplementary information about device under test, you should simply add new data in corresponding fields and press button "SAVE" (Fig. 4-19)



ELT Tester i406 Mini | Test results | Perform tests | Settings | VADIM B. SRZ LTD | 86%

Issue date:

Hydrostat

Model:

Next replacement date:

Additional information

Sweep tone:

Flash:

Waterproof Integrity:

State of marking:

Test/Replacement battery date

Date of testing: 2017-08-01

Next testing date:

Battery replacement date:

SAVE

Fig. 4-19 Tab "Details" (page: /details)

To create measurement reports – select required report link. (Fig. 4-20)

html rtf

REPORT
 of 406 MHz BEACON testing

Report date: 2015-01-20
Date of testing: 2014-12-04

BEACON IDENTIFICATION	
BEACON Model:	PRO-5
BEACON Manufacturer name:	Uranis
BEACON Serial No:	U00118
BEACON Issue date:	2016-03-01

BEACON MESSAGE CONTENTS	Country code: (431) Japan Message format: Short format Protocol: User Serial Type: ELTs with serial identification number Serial Number: 777321 Bits 64-73: All 0s C/S Certificate flag: Yes
-------------------------	--

Fig. 5-20 Testing report fragment

Web-page of report can be printed or saved in “rtf” format or as html-page, using buttons “SAVE” and “PRINT”, accordingly. In initial reports these buttons will be hidden.

NOTE:

To change html-page with report in “pdf” format use exterior programs (for example «doPDF» for Windows).

Some device versions support format changing. Tab “Settings” (page /settings), menu item “Reports”.



5. ELT TEST PROCEDURE

5.1 General comment according to the beacon test procedure.

ATTENTION!!!

On checking and technical maintenance of the emergency locator transmitter pay the strong attention to avoid transmission of the false emergency signal!

The test procedure via antenna *in real operating mode of the ELT* (with distress signal) should be carried out in shielded room, which provides radio frequency signal attenuation not less than 80dB (under recommendation of COSPAS-SARSAT Committee).

The present tester has advanced receive path sensitivity that allows to receive signal from distance up to 15...20 meters. At the same time, the required minimal distance to beacon (ELT, PLB) under test should be not less than 1 meter to avoid receiver's overload! Power detector is calibrated at distance of 3 meters.

5.2 Test procedure in ELT test mode (Self test)

5.2.1 Prepare the ELT and the tester for the test procedure under this manual instructions and instruction of ELT operations manual for self test mode.

6.2.2 If the ELT is connected to the tester via the RF-cable - use the manufacturer optional-supplied RF-attenuator (nominal fading 52dB).

Direct output connection of the beacon to the tester's input without attenuator leads to the irreparable damages of the testing device!

6.2.3 Please pay your attention:

For the signal level measurement on the channels 121.5MHz and 243MHz the most types of the beacons should operate in real operation mode what can cause false distress signal emission on the frequency of 406MHz as well as on 121.5MHz and 243MHz. That's why this test procedure must be carried out in special shielded box (see 6.1) or by means of attenuator and cables.



6. TESTER CALIBRATION

Tester is a complex special-use electronic device. Thus it should be calibrated only by manufacturer or approved representative by means of corresponding equipment.

Tester calibration should be done once in two years.



7. OPERATING INSTRUCTIONS

It is necessary to keep the device in package not less than for two hours at normal conditions when it was at high temperature deviation.

Keep it in the package in at normal condition within 12 hours after storage of the tester in conditions of high humidity.



8. SAFETY PRECAUTIONS

One can operate the tester only after detailed manual and technical description examination and also after particular safety inductions.



9. Storage rules

This hardware product in manufacturer package is to storage in warehouse and should be protected from residue, acid fumes, alkalis and other corrodent additions influence.

In a warehouse there should be appropriate temperature – from 278K (5°C) to 313K (40°C) and relative air humidity no more than 80%.



ATTACHMENT 1
Unit conversion (dBm to W).

dBm	0	0,1	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,9
10	0,010	0,010	0,010	0,011	0,011	0,011	0,011	0,012	0,012	0,012
11	0,013	0,013	0,013	0,013	0,014	0,014	0,014	0,015	0,015	0,015
12	0,016	0,016	0,017	0,017	0,017	0,018	0,018	0,019	0,019	0,019
13	0,020	0,020	0,021	0,021	0,022	0,022	0,023	0,023	0,024	0,025
14	0,025	0,026	0,026	0,027	0,028	0,028	0,029	0,030	0,030	0,031
15	0,032	0,032	0,033	0,034	0,035	0,035	0,036	0,037	0,038	0,039
16	0,040	0,041	0,042	0,043	0,044	0,045	0,046	0,047	0,048	0,049
17	0,050	0,051	0,052	0,054	0,055	0,056	0,058	0,059	0,060	0,062
18	0,063	0,065	0,066	0,068	0,069	0,071	0,072	0,074	0,076	0,078
19	0,079	0,081	0,083	0,085	0,087	0,089	0,091	0,093	0,095	0,098
20	0,100	0,102	0,105	0,107	0,110	0,112	0,115	0,117	0,120	0,123
21	0,126	0,129	0,132	0,135	0,138	0,141	0,145	0,148	0,151	0,155
22	0,158	0,162	0,166	0,170	0,174	0,178	0,182	0,186	0,191	0,195
23	0,200	0,204	0,209	0,214	0,219	0,224	0,229	0,234	0,240	0,245
24	0,251	0,257	0,263	0,269	0,275	0,282	0,288	0,295	0,302	0,309
25	0,316	0,324	0,331	0,339	0,347	0,355	0,363	0,372	0,380	0,389
26	0,398	0,407	0,417	0,427	0,437	0,447	0,457	0,468	0,479	0,490
27	0,501	0,513	0,525	0,537	0,550	0,562	0,575	0,589	0,603	0,617
28	0,631	0,646	0,661	0,676	0,692	0,708	0,724	0,741	0,759	0,776
29	0,794	0,813	0,832	0,851	0,871	0,891	0,912	0,933	0,955	0,977
30	1,00	1,02	1,05	1,07	1,10	1,12	1,15	1,17	1,20	1,23
31	1,26	1,29	1,32	1,35	1,38	1,41	1,45	1,48	1,51	1,55
32	1,58	1,62	1,66	1,70	1,74	1,78	1,82	1,86	1,91	1,95
33	2,00	2,04	2,09	2,14	2,19	2,24	2,29	2,34	2,40	2,45
34	2,51	2,57	2,63	2,69	2,75	2,82	2,88	2,95	3,02	3,09
35	3,16	3,24	3,31	3,39	3,47	3,55	3,63	3,72	3,80	3,89
36	3,98	4,07	4,17	4,27	4,37	4,47	4,57	4,68	4,79	4,90
37	5,01	5,13	5,25	5,37	5,50	5,62	5,75	5,89	6,03	6,17
38	6,31	6,46	6,61	6,76	6,92	7,08	7,24	7,41	7,59	7,76
39	7,94	8,13	8,32	8,51	8,71	8,91	9,12	9,33	9,55	9,77
40	10,00	10,23	10,47	10,72	10,96	11,22	11,48	11,75	12,02	12,30
41	12,59	12,88	13,18	13,49	13,80	14,13	14,45	14,79	15,14	15,49
42	15,85	16,22	16,60	16,98	17,38	17,78	18,20	18,62	19,05	19,50
43	19,95	20,42	20,89	21,38	21,88	22,39	22,91	23,44	23,99	24,55
44	25,12	25,70	26,30	26,92	27,54	28,18	28,84	29,51	30,20	30,90
45	31,62	32,36	33,11	33,88	34,67	35,48	36,31	37,15	38,02	38,90
46	39,81	40,74	41,69	42,66	43,65	44,67	45,71	46,77	47,86	48,98
47	50,12	51,29	52,48	53,70	54,95	56,23	57,54	58,88	60,26	61,66
48	63,10	64,57	66,07	67,61	69,18	70,79	72,44	74,13	75,86	77,62
49	79,43	81,28	83,18	85,11	87,10	89,13	91,20	93,33	95,50	97,72

Example:
The power level 37.4dBm is equal to 5.5W.

The recalculation is carried out by equation:

$$P[W] = 10^{0.1 * P[dBm] - 3}$$

The back calculation is carried out under:

$$P[dBm] = 10 * (\log P[W] + 3)$$



ATTACHMENT 2

Audio and visual indication description

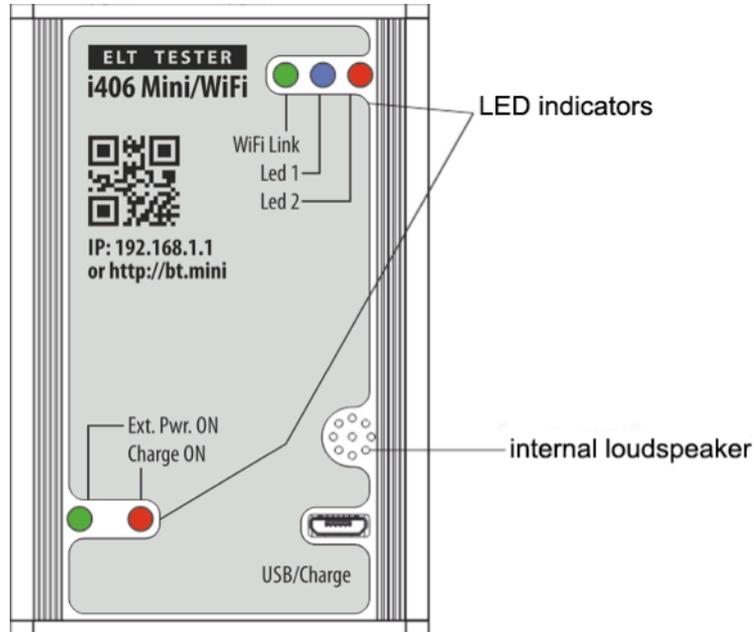


Fig. 11-1 Device physical configuration

LED list:

- Wi-Fi Link (green) – Wi-Fi network condition indicator
- LED 1 (blue)– Wi-Fi connection indicator
- LED 2 (red) – operating mode indicator, supplementary indication
- Ext.pow. On (green) – external power source is connected.
- Charge On (red) – charging is on, indicates charge level together with Ext.pow. LED. If charging is over, it turns out.

LED indication

WiFi Link (Green LED)

Displays Wi-Fi network condition or error in Wi-Fi module functioning.

Flashes often – initialization of Wi-Fi network is in progress (connection is unable).

Is alight – Wi-Fi-network is created and accessible, normal operating mode.

Flashes rarely – error in Wi-Fi module functioning.

Not alight – Wi-Fi module is inaccessible.

LED 1 (Blue LED)

Not alight – Wi-Fi network connection is missed.

Flashes – Wi-Fi network connection is made.



LED 2 (Red LED)

Is alight – measurements are providing, RF-part is enabled.

Audio indication

Internal speaker is necessary for audio signaling during measurements in channel 121.5MHz.

Informational audio signals:

- Welcome signal – in case of normal running on of device and successful firmware upgrade by broadcast.
- Single short signal – successful operation.
- Short signals – Wi-Fi connected/disconnected.
- Short signals – device is not active (Wi-Fi connection is missed more than 5 minutes)
- Repeated (every 30 sec.) long and short signals – battery is low.



ATTACHMENT 3

Example of generated report of measurements

General report of 406 MHz beacon

Beacon information:

Aircraft ID:	AUI1234
Beacon Manufacturer:	ACR Electronics Inc
Model:	Artex ELT-3000
Beacon serial number:	2321
Issue date:	02-09-2016

Measurement:

Frequency of 406 MHz channel (kHz):	406040.000
RF level in 406 MHz channel (dBm):	36.77
Frequency of 121.5 MHz channel (kHz):	121499.885
RF level in 121.5 MHz channel (dBm):	19.68
Frequency of 243 MHz channel (kHz):	242999.957
RF level in 243 MHz channel (dBm):	17.23
Total transmission time, ms:	520.69
Unmodulated carrier time, ms:	160.42
Status:	BCH1 / BCH2:OK / OK

Message decoding:

Hex message:	FFFE2F952444198F7FDFFA86787403C0F96E
15 Hex id:	2A4888331EFFBFF

Message information

Message format:	Long format
Protocol:	Standard Location
Country code:	(338) United States of America
Type of location protocol:	ELT - serial number
Cospas-Sarsat certificate number:	272
Serial Number:	6543
Latitude data:	Default
Longitude data:	Default
Encoded position data source:	External navigation device
Aux Device(121.5 MHz):	No
Latitude Offset Sign:	-
Latitude Offset Minutes:	0
Latitude Offset Seconds:	15
Longitude Offset Sign:	-
Longitude Offset Minutes:	0
Longitude Offset Seconds:	15

Date of testing: 09-07-2017 10:43 *Reference: USA (FAA Part 91.207), Canada (CAR 571 Appendix G), Europe (CAA/EuroCAE)*

Company: _____ Tested by: _____

Test equipment: ELT Tester Mini S/N151023