

## Test Report

<b>Product</b>	Initialization Device for logger of seismic data		
<b>Name and address of the applicant</b>	Stryde Ltd. Halkin Building, SE1 7ND London, United Kingdom		
<b>Name and address of the manufacturer</b>	Stryde Ltd. Halkin Building, SE1 7ND London, United Kingdom		
<b>Model</b>	Initialization Device		
<b>Rating</b>	Internal Battery 3.6V		
<b>Trademark</b>	Stryde		
<b>Serial number</b>	SN: 2101001000 and 2101001001 PN: 103152186		
<b>Additional information</b>	Bluetooth Low Energy		
<b>Tested according to</b>	<b>FCC Part 15, subpart B</b> Other Class B Digital Device <b>ISED Canada ICES-003, Issue 6</b> ITE Device		
<b>Order number</b>	401291		
<b>Tested in period</b>	2018-12-18 to 2019-01-31		
<b>Issue date</b>	2020-11-04		
<b>Name and address of the testing laboratory</b>	 Instituttveien 6 Kjeller, Norway	CAB Number: FCC: NO0001 ISED: NO0470  TEL: +47 22 96 03 30 FAX: +47 22 96 05 50	 
<b>An accredited technical test executed under the Norwegian accreditation scheme</b>			
 Prepared by [Jan G Eriksen]		 Approved by [G. Suhanthakumar]	
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# 1 INFORMATION

## 1.1 Test Item

Name	Initialization Device for logger of seismic data
FCC ID	2AV78-INITV4
Model/version	103152186
Serial number	2101001000 and/or 2101001001
Hardware identity and/or version	103152186 v2
Software identity and/or version	InitDeviceAppRevC-20181212-131952 and InitDeviceBtldRevC-20181212-131952
Operating Modes	Normal with BlueTooth module transmitting in
Type of Power Supply	Internal Battery
Antenna Connector	N/A
Desktop Charger	InitDevice Charger (103053489)
BlueTooth Low Energy module	FCC ID: S9NSPBTLERF

### Description of Test Item

The tested device is a "initialization device" for a Western Geco seismic logger. Before deployment of the logger the tested device is held on top of it, followed by initialization of the logger.

The tested device has a Bluetooth Low Energy communication link for communication with a handheld device where initialization information is contained. Initialization information is transferred to the tested device via Bluetooth Low Energy, then the initialization of the seismic logger is performed over an infrared link.

The device contains an approved Bluetooth Low Energy Module with **FCC ID: S9NSPBTLERF**.

## 1.2 Test Conditions

Temperature:	21.1 – 22.1 °C
Relative humidity:	41 - 50 %
Normal test voltage:	N/A – the device is battery powered with internal battery

The values are the limit registered during the test period.

## 1.3 Test Engineer(s)

Jan G Eriksen

## 1.4 Test Equipment

See list of test equipment in clause 4.

## 1.5 Comments

All ports were populated during spurious emission measurements.

## 2 TEST REPORT SUMMARY

### 2.1 General

All measurements are traceable to national standards.

The tests were conducted for the purpose of demonstrating compliance with FCC CFR 47 Part 15B.

Tests were performed in accordance with ANSI C63.4-2014.

Radiated tests were made in a semi-anechoic chamber at measuring distances of 3m and 10m.

A description of the test facility is on file with the FCC and Industry Canada.

New Submission

Production Unit

Class II Permissive Change

Pre-production Unit

**JAB** Equipment Code

Family Listing



#### **THIS TEST REPORT APPLIES ONLY TO THE ITEM(S) AND CONFIGURATIONS TESTED.**

Deviations from, additions to, or exclusions from the test specifications are described in "Summary of Test Data".

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## 2.2 Test Summary

Name of test	FCC Part 15 reference	Result
Supply Voltage Variations	15.31(e)	N/A 1)
Power Line Conducted Emission	15.107(a)	N/A 1)
The field strength of radiated emissions	15.109	Pass

- 1) The device is battery operated only with internal battery

### 3 TEST RESULTS

#### 3.1 Field strength of radiated emissions

##### Radiated emission 30 – 1000 MHz.

Detector: Quasi-Peak

Measuring distance 3 meters.

Tested in TX mode with BLE Module operating

##### Measurement Data:

Frequency (MHz)	Measured (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Meas. Time (ms)	Bandw. (kHz)	Height (cm)	Pol	Azimuth (deg)
30-1000	All measurement values with peak detector more than 10 dB below limit							

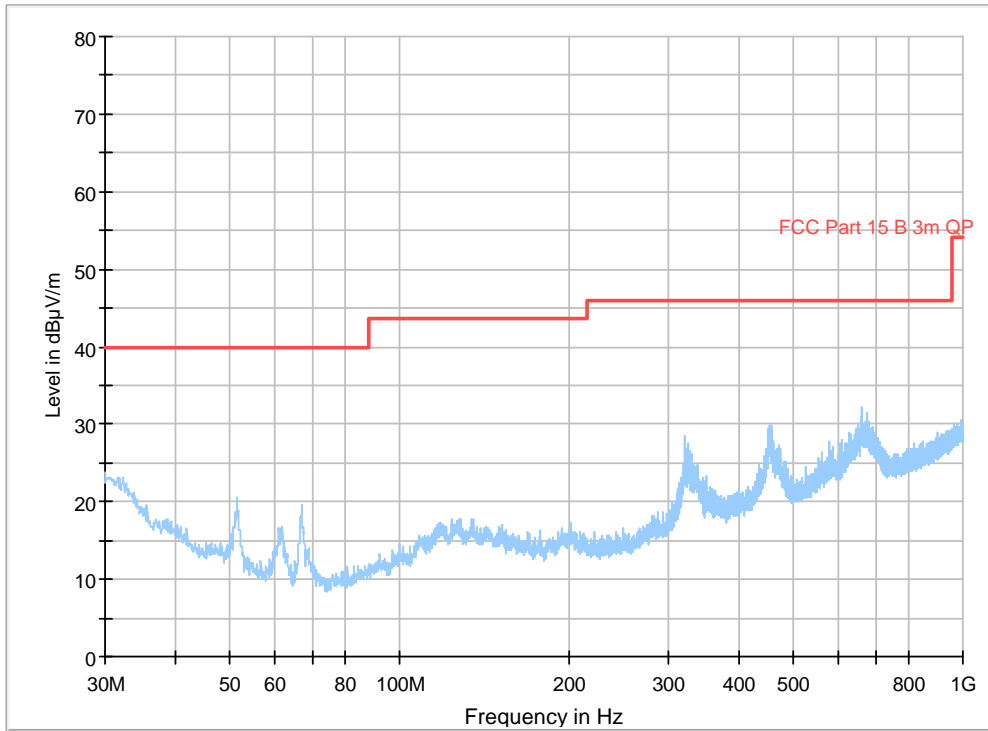
See attached plots

##### Requirements/Limit

<b>FCC</b>	Part 15.209 @ frequencies defined in §15.205	
<b>ISED</b>	RSS-GEN Issue 5, Clause 8.9 @ frequencies defined in clause 8.10	
	<b>Radiated emission limit @3 meters</b>	
<b>Frequency (MHz)</b>	<b>Quasi Peak (<math>\mu</math>V/m)</b>	<b>Quasi Peak (dB<math>\mu</math>V/m)</b>
<b>30 – 88</b>	100	40.0
<b>88 – 216</b>	150	43.5
<b>216 – 960</b>	200	46.0
<b>960 – 1000</b>	500	54.0
<b>Above 1000</b>	500	54.0 (utilizing an average detector)

The limit above 1000 MHz is specified for Average Detector, when the measurement is performed with a Peak Detector a Duty-Cycle Correction Factor has to be calculated to find the corresponding Average Detector value.

Full Spectrum



**30-1000 MHz: Worst case of VP and HP Polarisation, 0-360 deg, 1-4 meters height**

**Radiated emission 1000 – 26000 MHz.**

Detector: Peak and Average

Measuring distance 3 meters (1-18 GHz). 18 – 26 GHz prescan at 20 cm distance.

Tested in TX mode with BLE Module operating

**Measurement Data utilizing Peak Detector:**

Frequency	RF channel	Dist. corr. factor	Field strength, Detector, 3m	Duty cycle corr. factor	Peak Limit	Average Limit	Margin Peak	Margin Average
GHz	L,M,H	dB	dBµV/m	dB	dBµV/m	dBµV/m	dB	dB
1-3	L,M,H	0	< 54 *) Peak	NA	74	54	> 20	> 0
2 <sup>nd</sup> Harm	L,M,H	0	< 40 Peak	NA	74	54	> 14	> 34
3 <sup>rd</sup> Harm	L,M,H	0	< 40 Peak	NA	74	54	> 14	> 34
4 <sup>th</sup> Harm	L,M,H	0	< 40 Peak	NA	74	54	> 14	> 34
5 <sup>th</sup> Harm	L,M,H	0	< 50 Peak	NA	74	54	> 4	> 24
6 <sup>th</sup> Harm	L,M,H	0	< 50 Peak	NA	74	54	> 4	> 24
Others 12-18	L,M,H	0	< 60 Peak	NA	74	54	-	> 14
Others 12-18	L,M,H	0	< 50 Avg	NA	74	54	> 4	> 24
18-26	L,M,H	0	< 46 Peak	NA	74	54	> 8	> 28

NOTE: \*) Except for carrier levels, the measured noise level is slightly high during this measurement. However, there are no signs of unwanted spurious emissions in this frequency range.

Duty Cycle Correction Factor not applied (NA). Maximum allowed Duty Cycle Correction: 20 dB

Antenna factor, amplifier gain and cable loss are included in spectrum analyzer "Transducer factor".

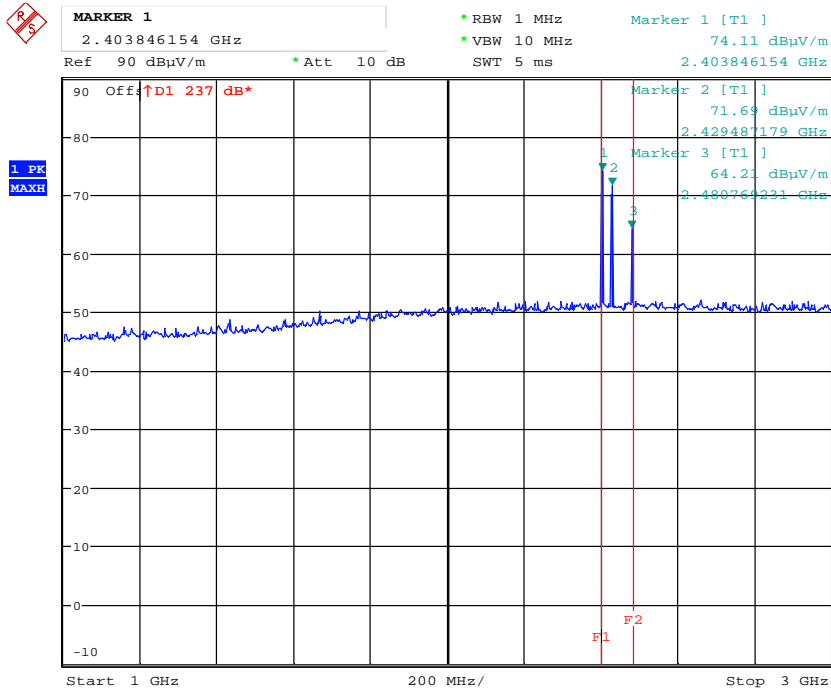
See attached plots below

**Requirements/Limit**

<b>FCC</b>	Part 15.209 @ frequencies defined in §15.205	
<b>ISED</b>	RSS-GEN Issue 5, Clause 8.9 @ frequencies defined in clause 8.10	
<b>Radiated emission limit @3 meters</b>		
<b>Frequency (MHz)</b>	<b>Quasi Peak (µV/m)</b>	<b>Quasi Peak (dBµV/m)</b>
<b>Above 1000</b>	500	54.0 (utilizing an average detector)

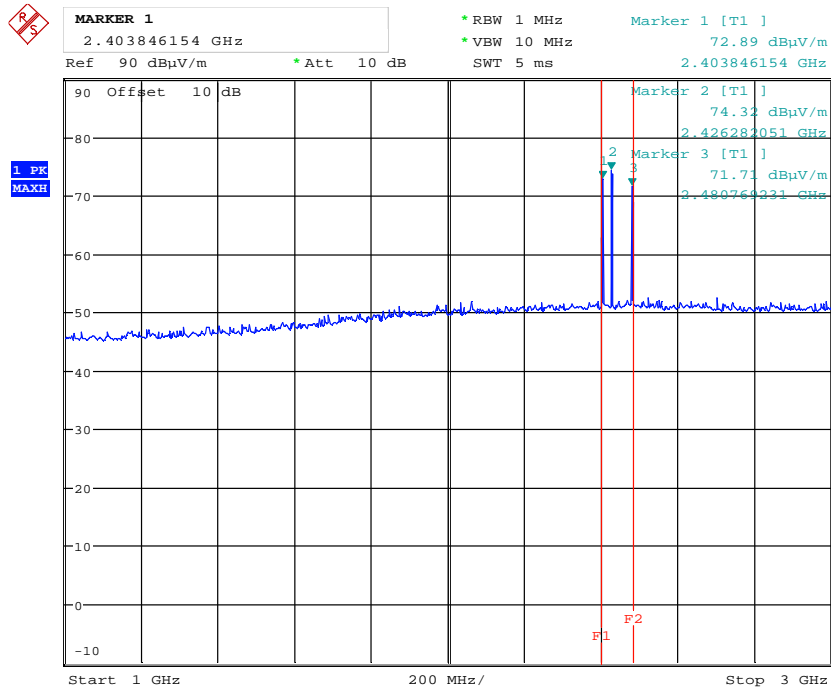
The limit above 1000 MHz is specified for Average Detector, when the measurement is performed with a Peak Detector a Duty-Cycle Correction Factor has to be calculated to find the corresponding Average Detector value.





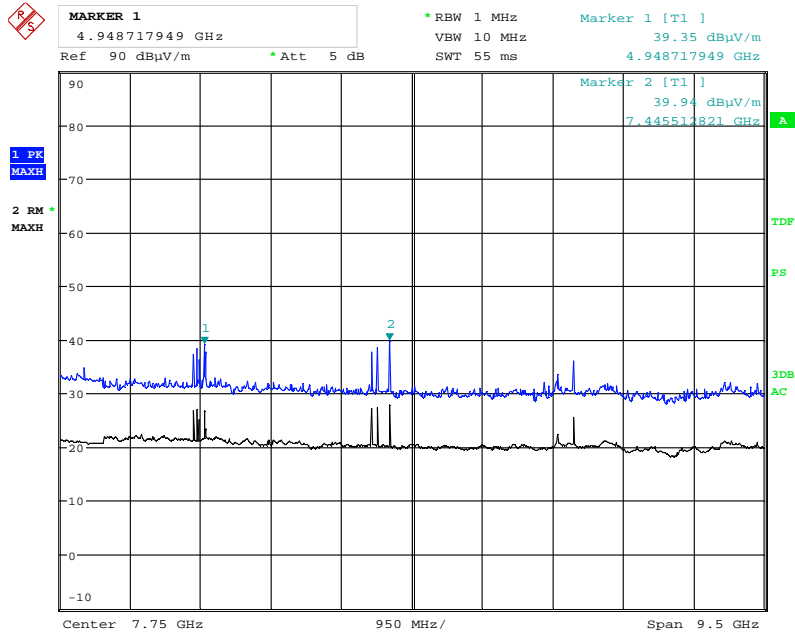
Date: 18.DEC.2018 11:20:07

1-3 GHz HP Peak detector



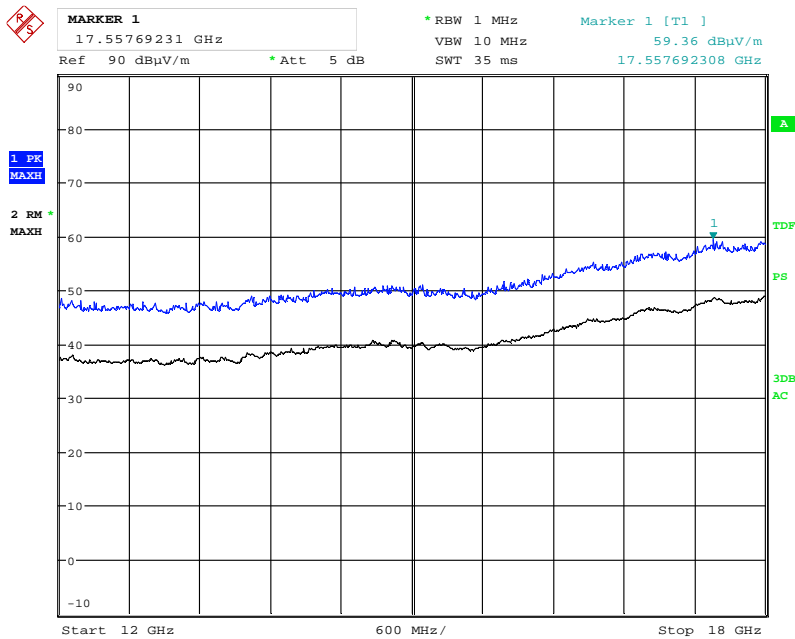
Date: 18.DEC.2018 11:22:03

1-3 GHz VP Peak detector



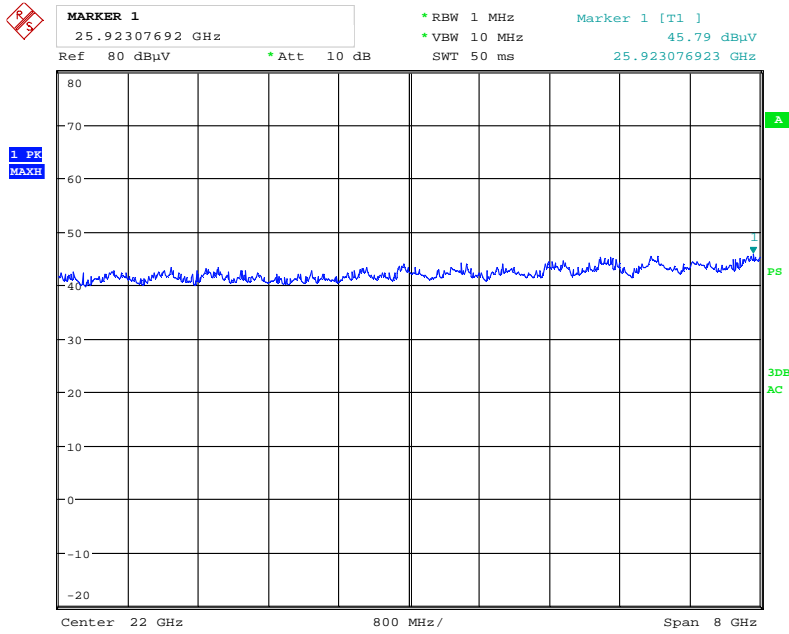
Date: 18.DEC.2018 10:42:57

3-12 GHz HP & VP Peak and Average detector



Date: 18.DEC.2018 10:47:26

12-18 GHz HP & VP Peak and Average detector



Date: 18.DEC.2018 11:25:16

18-26 GHz HP & VP prescan Peak and Average detector

## 4 Measurement Uncertainties

Measurement Uncertainty Values		
Test Item		Uncertainty
Spurious Emissions, Radiated	< 1 GHz	±2.5 dB
	> 1 GHz	±2.2 dB
Power Line Conducted Emissions		+2.9 / -4.1 dB
Temperature Uncertainty		±1 °C

All uncertainty values are expanded standard uncertainty to give a confidence level of 95%, based on coverage factor k=2

## 5 LIST OF TEST EQUIPMENT

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment and ancillaries are identified (numbered) by the Test Laboratory.

No.	Model number	Description	Manufacturer	Ref. no.	Cal. date	Cal. Due
1	ESU40	Measuring Receiver	Rohde & Schwarz	LR 1639	2019.01	2020.01
2	JB3	BiLog Antenna	Sunol Sciences	N-4525	11/2017	11/2019
3	310N	Preamplifier	Sonoma	LR-1686	07/2018	07/2019

The software listed below has been used for one or more tests.

No.	Manufacturer	Name	Version	Comment
1	Rohde & Schwarz	EMC32	10.40.10	Power Line Conducted test software
2	Rohde & Schwarz	EMC32	10.40.10	Radiated Emission test software
3	Rohde & Schwarz	GPIBShot	2.7	Screenshots from R&S Spectrum Analyzers
4				

### Revision history

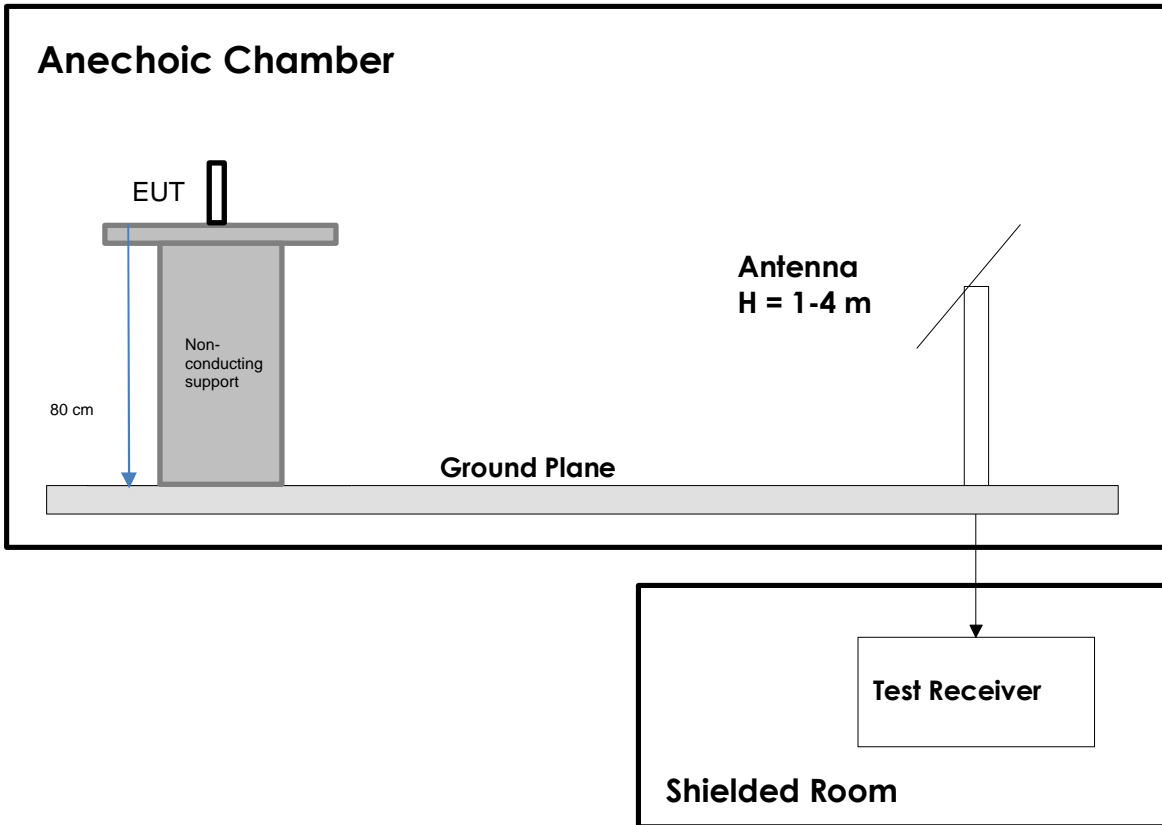
Revision	Date	Comment	Sign
00	2019-09-24	First version	JGE
01	2020-09-30	Included measurements 1-26 GHz	JGE
02	2020-11-04	Changed applicant to Stryde	FS

## 6 BLOCK DIAGRAM

### 6.1 Power Line Conducted Emission

Power line measurements are not applicable for this device as it is battery powered with internal battery.

### 6.2 Test Site Radiated Emission



This test setup is used for all radiated emissions tests. For frequencies below 1000 MHz the measuring distance is 10m, for frequencies above 1 GHz measuring distance is 3m (except in the case where a prescan has been performed at higher frequencies).

Emissions above 1 GHz are measured with a Spectrum Analyzer and Horn Antenna and with the preamplifier after the antenna. Tests above 1GHz were performed with the floor between the EUT and the measuring antenna covered by floor absorbers.