

RR051-18-105689-3-A Ed. 0

Certification test report

According to the standard:

CFR 47 FCC PART 15

Equipment under test:

Handeld Portable Reader Lite
HPR Lite

FCC ID: NQY-30019

Company:

ALLFLEX USA, Inc

DISTRIBUTION: Mr LANGOUET

(Company: ALLFLEX USA, Inc)

Number of pages: 23 with 4 annexes

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			Name and Function	Visa
0	5-Nov-18	Creation	M. DUMESNIL, Radio Technical Manager	

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DESIGNATION OF PRODUCT: Handheld Portable Reader Lite - HPR Lite

Serial number (S/N): DP0000

Reference / model (P/N): 30019-xA0

Software version: 1.03.00

MANUFACTURER: ALLFLEX USA, Inc

COMPANY SUBMITTING THE PRODUCT:

Company: ALLFLEX USA, Inc

Address: 2805 East 14th Street
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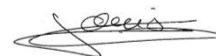
Responsible: Mr LANGOUET

DATE OF TEST: From 25-OCT-2018 to 26-OCT-2018

TESTING LOCATION: EMITECH ANGERS laboratory at JUIGNE SUR LOIRE (49) FRANCE
FCC Accredited under US-EU MRA Designation Number: FR0009
Test Firm Registration Number: 873677

TESTED BY: S. LOUIS

VISA:



WRITTEN BY: S. LOUIS

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1. INTRODUCTION

This document presents the result of RADIO test carried out on the following equipment: **Handeld Portable Reader Lite - HPR Lite**, in accordance with normative reference.

The device under test integrates a 134.2 kHz RFID function.

The host device of certified module(s) shall be properly labeled to identify the module(s) within.

2. PRODUCT DESCRIPTION

Class:	B
Utilization:	Handheld control terminals
Antenna type and gain:	Integral antenna, gain unknown
Frequency tested:	134.2kHz
Number of channels:	1
Channel spacing:	Not concerned
Frequency generation:	A microcontroller with its 24 MHz crystal and an oscillator circuitry with a 17.1776 MHz crystal
Power source:	7.4 Vdc Ni-MH batteries

The applicant declares that the equipment can't emit during the recharge of batteries.

The applicant declares that the highest local oscillator used is 24MHz.

Power level, frequency range and channels characteristics are not user adjustable.

The details pictures of the product and the circuit boards are joined with this file.

3. **NORMATIVE REFERENCE**

The standards and testing methods related throughout this report are those listed below. They are applied on the whole test report even though the extensions (version, date and amendment) are not repeated.

CFR 47 FCC Part 15 (2018) Radio Frequency Devices

ANSI C63.4 2014
Methods of measurement of Radio-Noise
Emissions from low-voltage Electrical and Electronic Equipment in the Range
of 9 kHz to 40 GHz.

ANSI C63.10 2013
Testing Unlicensed Wireless Devices.

447498 D01 General RF RF Exposure procedures and equipment authorization policies for mobile and
Exposure Guidance v06 portable equipment

4. **TEST METHODOLOGY**

Radio performance tests procedures given in CFR 47 part 15:

Subpart A –General

Paragraph 19: labelling requirements
Paragraph 21: information to user

Subpart B –Unintentional Radiators

Paragraph 105: information to the user
Paragraph 107: Conducted limits
Paragraph 109: Radiated emission limits

Subpart C – Intentional Radiators

Paragraph 203: Antenna requirement
Paragraph 205: Restricted bands of operation
Paragraph 207: Conducted limits
Paragraph 209: Radiated emission limits; general requirements

5. TEST EQUIPMENT CALIBRATION DATES

Emitech Number	Model	Type	Last verification	Next verification	Validity
0000	BAT-EMC V3.16.0.64	Software	/	/	/
7190	R&S HL223	Antenna	15/03/2016	3	15/03/2019
7240	Emco 3110	Biconical antenna	15/03/2016	3	15/03/2019
7566	Testo 608-H1	Meteo station	24/09/2018	2	24/09/2020
8578	2GHz	Cable	29/03/2018	2	29/03/2020
8707	R&S ESI7	Test receiver	13/02/2018	1	13/02/2019
8732	Emitech	OATS	11/10/2016	3	11/10/2019
8749	La Crosse Technology WS-9232	Meteo station	23/09/2016	2	23/09/2018
8864	Champ libre Juigné. V3.4	Software	/	/	/
8896	ACQUISYS GPS8	Satellite synchronized frequency standard	/	/	/
10730	Mini-circuit ZFL-1000LN	Low-noise amplifier	12/02/2018	1	12/02/2019
10759	SIDT Cage 3	Anechoic chamber	/	/	/
14302	SUCOFLEX N-1m	cable	28/11/2016	2	28/11/2018
14303	SUCOFLEX N-2m	cable	28/11/2016	2	28/11/2018
14304	SUCOFLEX N-2.5m	cable	28/11/2016	2	28/11/2018
14305	SUCOFLEX N-4m	cable	28/11/2016	2	28/11/2018
14831	Fluke 177	Multimeter	12/01/2018	2	12/01/2020
15666	R&S FSV40	Spectrum Analyzer	19/07/2018	1	19/07/2019

6. TESTS RESULTS SUMMARY

6.1 general (subpart A)

Test procedure	Description of test	Respected criteria?				Comment
		Yes	No	NAp	NAs	
FCC Part 15.19	LABELLING REQUIREMENTS	X				See certification documents
FCC Part 15.21	INFORMATION TO USER	X				See certification documents

NAp: Not Applicable

NAs: Not Asked

6.2 unintentional radiator (subpart B)

Test procedure	Description of test	Respected criteria?				Comment
		Yes	No	NAp	NAs	
FCC Part 15.105	INFORMATION TO THE USER	X				See certification documents
FCC Part 15.107	CONDUCTED LIMITS			X		Note 1
FCC Part 15.109	RADIATED EMISSION LIMITS			X		Note 2
FCC Part 15.111	ANTENNA POWER CONDUCTED LIMITS FOR RECEIVER			X		

NAp: Not Applicable

NAs: Not Asked

Note 1: The applicant declares that the equipment does not emit during charge of batteries.

Note 2: Refer FCC Part 15.209

6.3 intentional radiator (subpart C)

Test procedure	Description of test	Criteria respected ?				Comment
		Yes	No	NAp	NAs	
FCC Part 15.203	ANTENNA REQUIREMENTS	X				Note 1
FCC Part 15.205	RESTRICTED BANDS OF OPERATION	X				
FCC Part 15.207	CONDUCTED LIMITS			X		Note 2
FCC Part 15.209	RADIATED EMISSION LIMITS; GENERAL REQUIREMENTS	X				

NAp: Not Applicable

NAs: Not Asked

Note 1: Integral antenna.

Note 2: The applicant declares that the equipment does not emit during charge of batteries.

RF EXPOSURE:

In accordance with KDB 447498 D01 General RF Exposure Guidance v06, Paragraph 4.3.1.

The product must respect the exclusion limit for 10-g extremity SAR and a separation distances less than 50mm:

Maximum measured power = 79.99 dBμV/m = 33.3x 10⁻⁶ mW at 134.2kHz

with $P = (E \times d)^2 / (30 \times G_p)$ with $d = 10$ m and $G_p = 1$

The power threshold determined by the equation in 4.3.1.c) 1) for 50 mm and 100 MHz is multiplied by ½

According this formula:

Power threshold, mW = $[[[(50 \times 7.5) / \sqrt{(0.100)}] + (50 - 50) \times (100 / 150)] \times [1 + \log(100 / 0.1342)]] \times \frac{1}{2}$

Power threshold, mW = 2295.96 mW

The equipment fulfils the requirements on maximum conducted or equivalent isotropically radiated power (e.i.r.p) for general population/uncontrolled exposure and therefore fulfils the requirements of 47 CFR §1.1310

7. MEASUREMENT UNCERTAINTY

To declare, or not, the compliance with the specifications, it was not explicitly taken into account of uncertainty associated with the result(s)

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for normal distribution corresponds to a coverage probability of approximately 95%.

Parameter	Emitech Uncertainty
RF power, conducted	$\pm 0.75\text{dB}$
Radiated emission valid to 26 GHz	
F < 62.5 MHz:	$\pm 5.14\text{ dB}$
62.5 MHz < F < 1 GHz:	$\pm 5.13\text{ dB}$
1 GHz < F < 26 GHz:	$\pm 5.16\text{ dB}$
AC Power Lines conducted emissions	$\pm 3.38\text{ dB}$
Temperature	$\pm 1\text{ }^{\circ}\text{C}$
Humidity	$\pm 5\%$

8. RADIATED EMISSION LIMITS; GENERAL REQUIREMENTS**Temperature (°C) :** 20**Humidity (%HR):** 39**Date :** October 26, 2018**Technician :** S. LOUIS**Standard:** FCC Part 15**Test procedure:** paragraph 209**Test set up:**

First an exploratory radiated measurement was performed.

During this phase the product is oriented in three orthogonal planes.

Then the final measurement is realized with the product on the most critical orientation.

The measure is realized on open area test site, the EUT is placed on a rotating table, 0.8m from a ground plane.

Zero degree azimuths correspond to the front of the device under test.

See photos in appendix 2.

Frequency range: From 9 kHz to 1GHz (the highest local oscillator frequency used is 24MHz)

Detection mode: Quasi-peak ($F < 1$ GHz)

Except for the frequency bands 9-90kHz, 110-490kHz. Radiated emission limits in these three bands are based on measurements employing an average detector

Bandwidth: 200Hz ($9 \text{ kHz} < F < 150\text{kHz}$)
9 kHz ($150 \text{ kHz} < F < 30\text{MHz}$)
120 kHz ($30 \text{ MHz} < F < 1 \text{ GHz}$)

Distance of antenna: 10 meters (in open area test site)

Antenna height: 1 to 4 meters (in open area test site)

Antenna polarization: vertical and horizontal (only the highest level is recorded)

Equipment under test operating condition:

The equipment under test is blocked in continuous modulated transmission mode, at the highest output power level at which the transmitter is intended to operate.

Power source: We used for power source the internal batteries of the equipment fully charged

Results:

Sample N° 1: Carrier

Frequencies (kHz)	Detector P: Peak Av: Average	Field strength at 10 meters dB μ V/m ⁽¹⁾	Field strength at 300 meters dB μ V/m ⁽²⁾	Limits 300m dB μ V/m	Margin (dB)
134.2	P	81.99	22.91	45	22.09
134.2	Av	79.99	20.91	25	4.09

With antenna height: 100 cm; Azimuth: 0°; Polarization antenna: Parallel° - Position 1

(1) Field strength measured at 10 meters

(2) Field strength extrapolated at 300 meters using 40dB/decade fall off

Sample 1: Harmonics:

Frequencies (kHz)	Detector P: Peak Av: Average	Field strength at 10 meters dB μ V/m ⁽¹⁾	Field strength at 300 meters dB μ V/m ⁽²⁾	Limits 300m dB μ V/m	Margin (dB)
268.4	P	40.0	-19.08	39	58.08
268.4	Av	35.0	-24.08	19	43.08
402.7	P	41.3	-17.78	35.5	53.28
402.7	Av	36.3	-22.78	15.5	38.28

(1) Field strength measured at 10 meters

(2) Field strength extrapolated at 300 meters using 40dB/decade fall off

Frequencies (kHz)	Detector QP: Q-Peak	Field strength at 10 meters dB μ V/m ⁽¹⁾	Field strength at 30 meters dB μ V/m ⁽²⁾	Limits 30m dB μ V/m	Margin (dB)
537	QP	34.73	15.65	33	17.35
672	QP	34.27	15.19	31	15.81

(1) Field strength measured at 10 meters

(2) Field strength extrapolated at 300 meters using 40dB/decade fall off

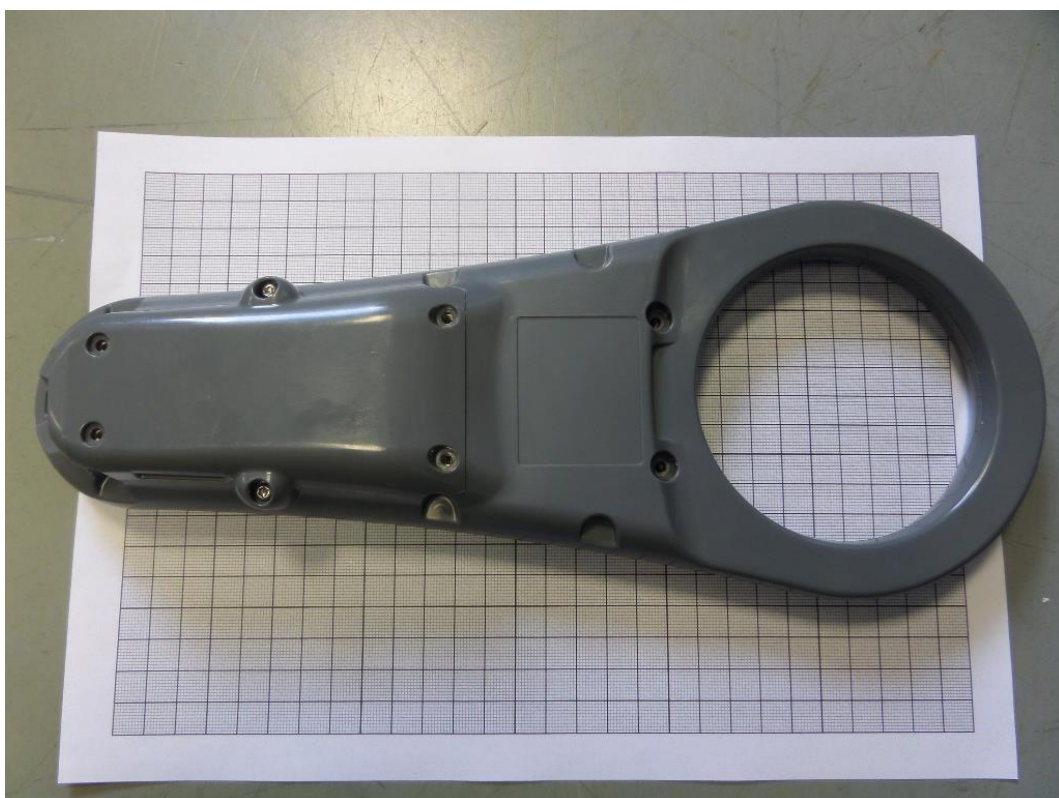
Applicable limits:	for 9 kHz \leq F \leq 490 kHz :	2400/F(kHz) at 300 meters
	for 490 kHz < F \leq 1.705 MHz :	24000/F(kHz) at 30 meters
	for 1.705 MHz < F \leq 30 MHz :	29.5 dB μ V/m at 30 meters
	for 30 MHz < F \leq 88 MHz :	40 dB μ V/m at 3 meters
	for 88 MHz < F \leq 216 MHz :	43.5 dB μ V/m at 3 meters
	for 216 MHz < F \leq 960 MHz :	46 dB μ V/m at 3 meters
	Above 960 MHz :	54 dB μ V/m at 3 meters

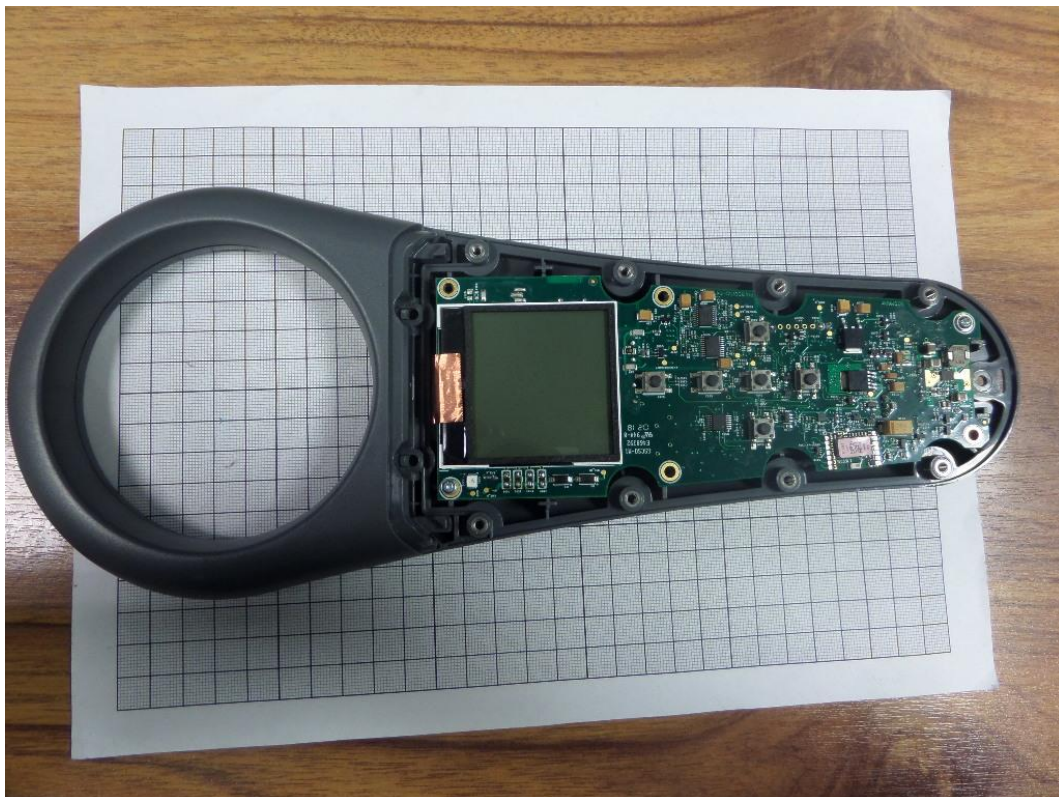
Test conclusion:

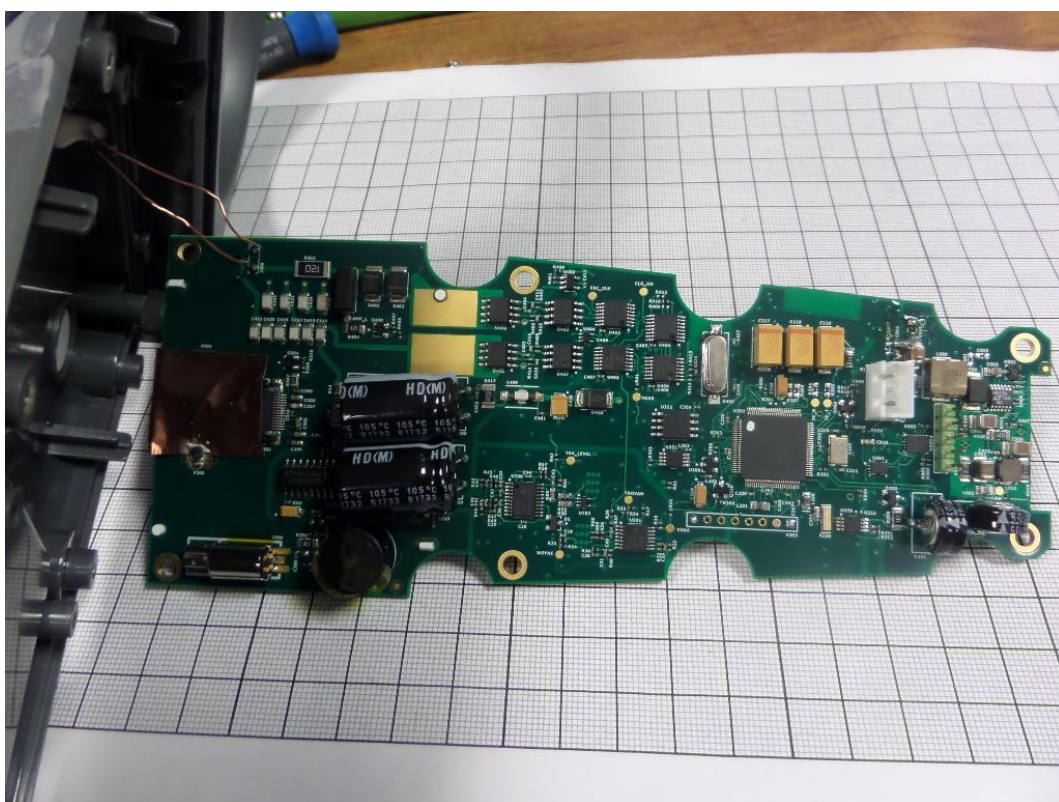
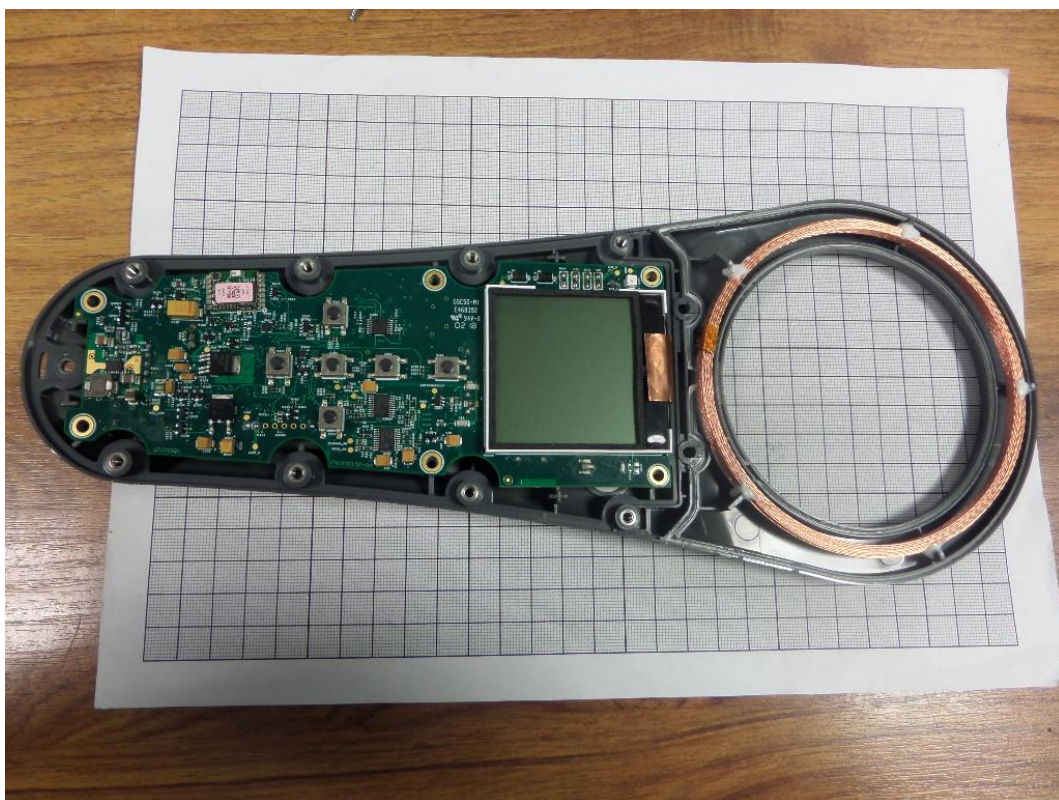
RESPECTED STANDARD

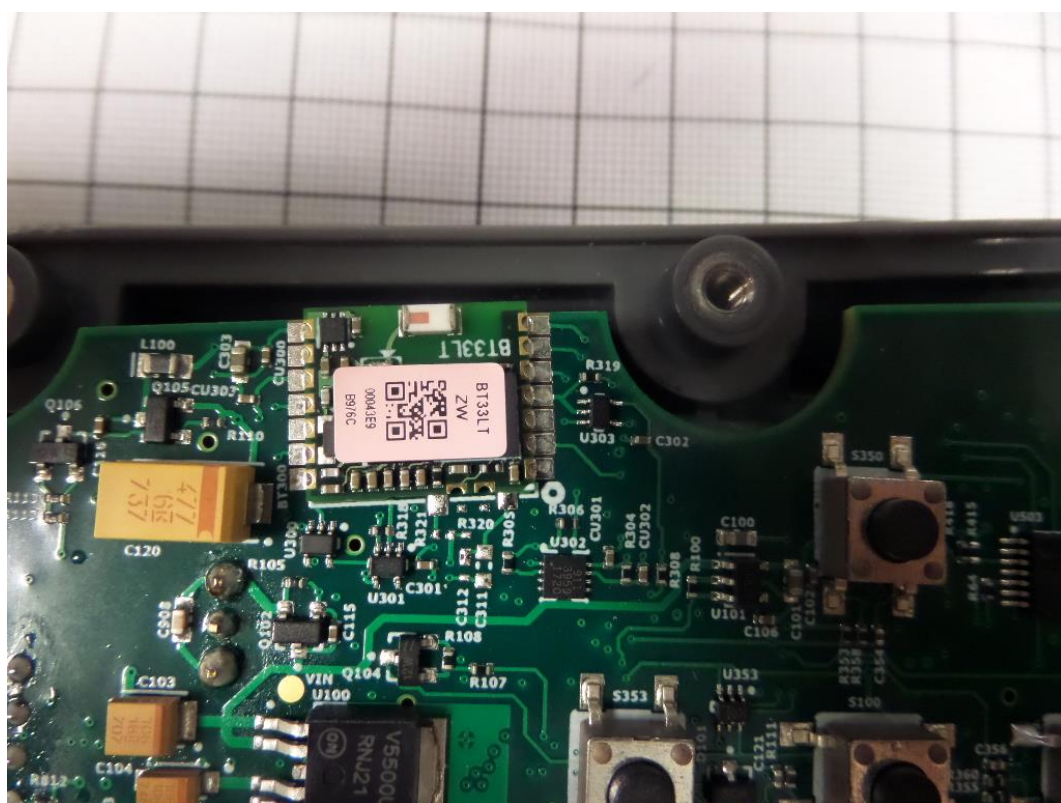
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APPENDIX 1: Photos of the equipment under test



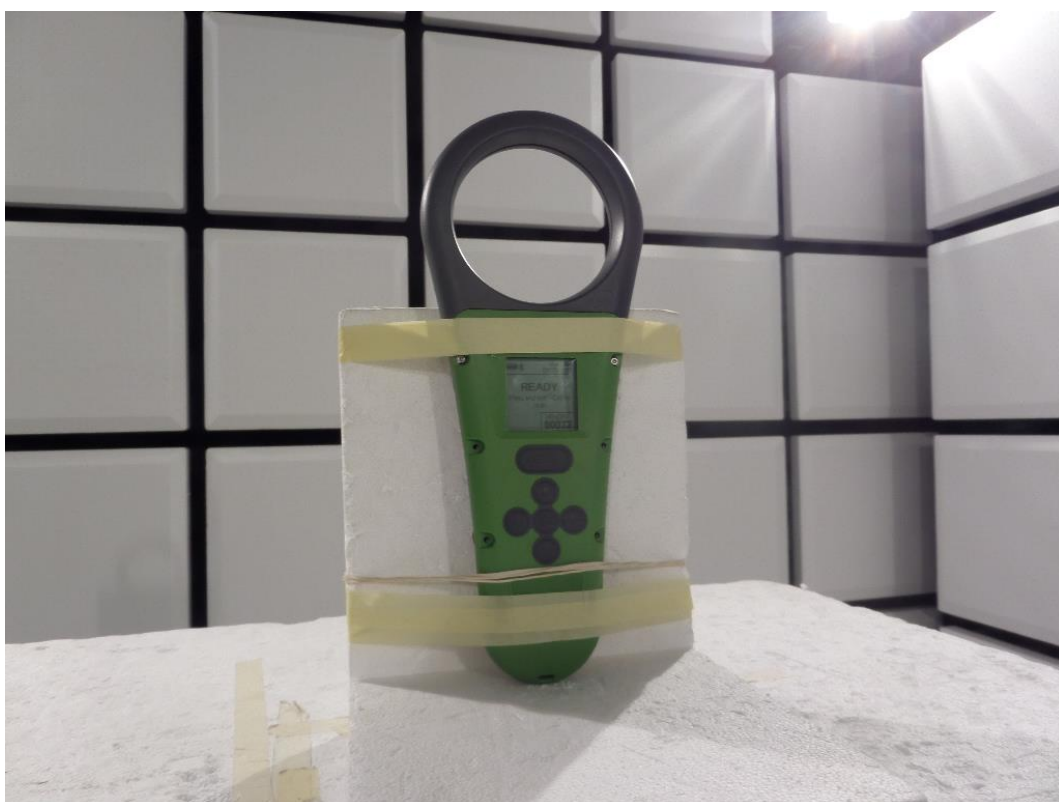




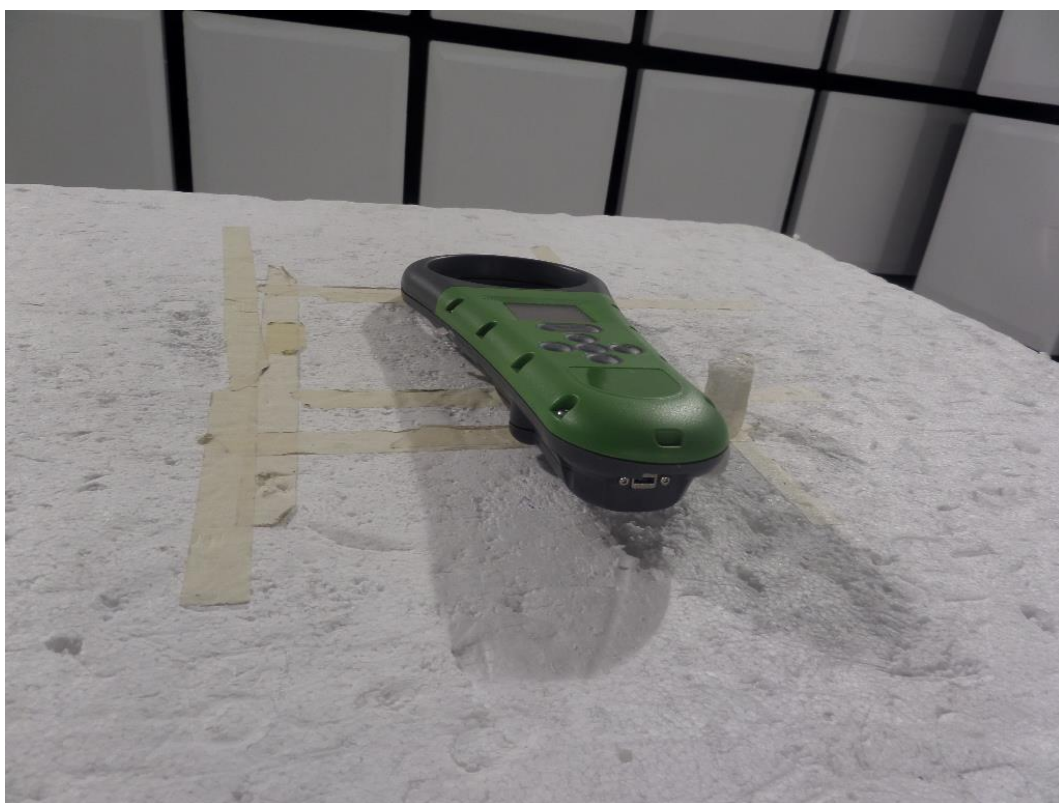


APPENDIX 2: Test set up

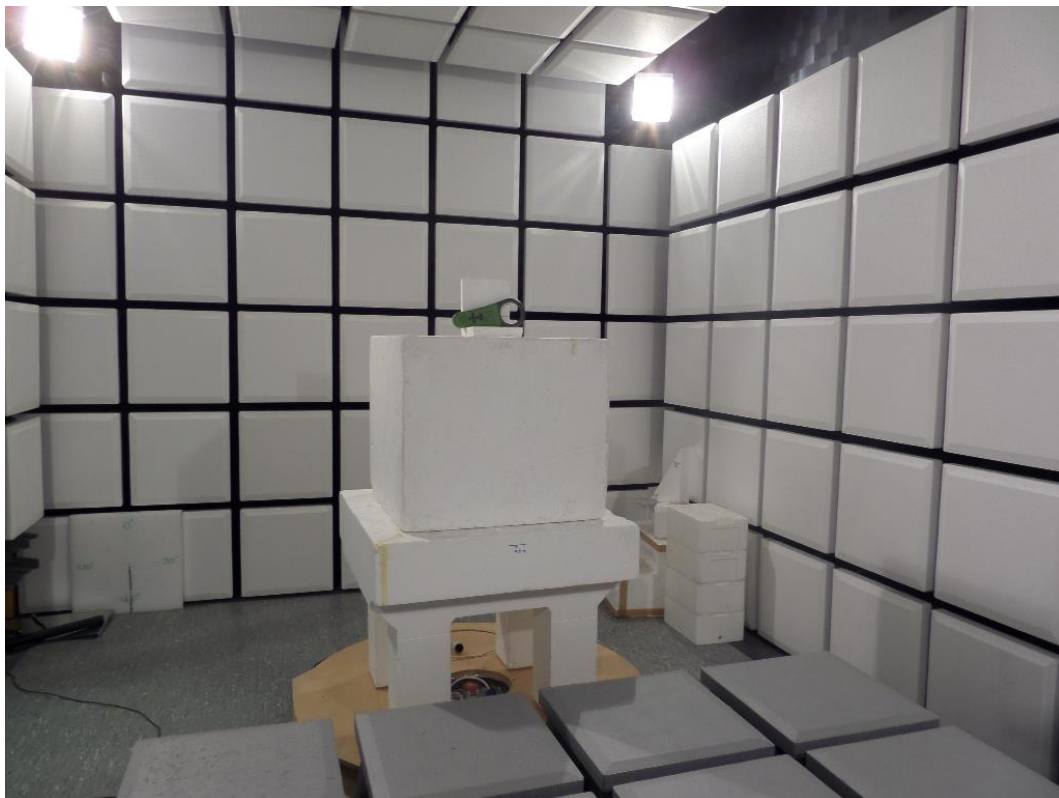
Anechoic room – Position 1 supplied by battery



Anechoic room – Position 2 supplied by battery



Anechoic room – Position 3 supplied by battery



Open test area - Position 1 supplied by battery



Open test area - Position 2 supplied by battery



Open test area - Position 3 supplied by battery



APPENDIX 3: Test equipment list

Radiated emission limits, general requirements

TYPE	MANUFACTURER	EMITECH NUMBER
Open test site	EMITECH	8732
Full anechoic chamber	EMITECH	10759
Satellite synchronized frequency standard GPS8	ACQUISYS	8896
Test receiver ESI7	Rohde & Schwarz	8707
Spectrum Analyzer FSV40	Rohde & Schwarz	15666
Loop antenna 6502	EMCO	1406
Biconical antenna 3110	Emco	7240
Log periodic antenna HL223	Rohde & Schwarz	7190
Low-noise amplifier ZFL-1000LN	Mini-circuit	10730
Cable open area test site	—	8578
N cable 1m	SUCOFLEX	14302
N cable 2m	SUCOFLEX	14303
N cable 2.5m	SUCOFLEX	14304
N cable 4m	SUCOFLEX	14305
Multimeter 177	FLUKE	14831
Meteo station	Testo 608-H1	7566
Meteo station WS-9232	La Crosse Technology	8749
Software	Champ libre Juigné. V3.4	8864

APPENDIX 4: 99% OCCUPIED BANDWIDTH

