

RR051-17-102757-1-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-30012**

**Company:**

ALLFLEX USA, Inc

**DISTRIBUTION:** Mr LANGOUET

**(Company:** ALLFLEX USA, Inc)

**Number of pages:** 28 with 4 annexes

Ed.	Date	Modified Page(s)	Technical Verification and Quality Approval	
			Name and Function	Visa
0	12-Sep-17	Creation	M. DUMESNIL, Radio Technical Manager	

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This document is the result of testing a specimen or a sample of the product submitted. It does not imply an assessment of the conformity of the whole manufactured products of the tested sample.



**DESIGNATION OF PRODUCT:** Handheld Portable Reader Lite - HPR Lite

**Serial number (S/N):** C139 00001

**Reference / model (P/N):** 30012-0A0

**Software version:** 0.96.00

**MANUFACTURER:** BIOMARK

**COMPANY SUBMITTING THE PRODUCT:**

**Company:** ALLFLEX USA, Inc

**Address:** 2805 East 14th Street  
P.O. Box 612266  
75261-2266 Dallas/Ft Worth Airport  
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USA

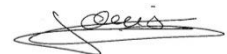
**Responsible:** Mr LANGOUET

**DATE OF TEST:** 16-MAY-2017

**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:	7.2 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 (2017)	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 Exposure Guidance v06	RF Exposure procedures and equipment authorization policies for mobile and 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 207: Conducted limits
- Paragraph 209: Radiated emission limits; general requirements

**5. TEST EQUIPMENT CALIBRATION DATES**

Emitech Number	Model	Type	Last verification	Next verification	Validity
0	BAT-EMC V3.6.0.32	Software	/	/	/
1406	EMCO 6502	Loop antenna	13/04/2017	13/04/2019	13/06/2019
4088	R&S FSP40	Spectrum Analyzer	29/10/2015	29/10/2017	29/12/2017
7190	R&S HL223	Antenna	15/03/2016	15/03/2019	15/05/2019
7240	Emco 3110	Biconical antenna	15/03/2016	15/03/2019	15/11/2019
8508	California instruments 1251RP	Power source	12/12/2016	12/12/2017	12/02/2018
8528	Schwarzbeck VHA 9103	Biconical antenna	15/03/2016	15/03/2019	15/05/2019
8635	R&S EZ-25	High-pass filter	27/10/2016	27/10/2018	27/12/2018
8671	HUGER	Meteo station	23/09/2016	23/09/2018	23/11/2018
8676	ISOTECH IDM106N	Multimeter	21/05/2015	21/05/2017	21/07/2017
8707	R&S ESI7	Test receiver	07/06/2016	07/06/2018	07/08/2018
8719	Thurbly Thandar Instruments 1600	LISN	06/04/2016	06/04/2018	06/06/2018
8732	Emitech	OATS	11/10/2016	11/10/2019	11/12/2019
8749	La Crosse Technology WS-9232	Meteo station	23/09/2016	23/09/2018	23/11/2018
8750	La Crosse Technology WS-9232	Meteo station	23/09/2016	23/09/2018	23/11/2018
8864	Champ libre Juigné. V3.4	Software	/	/	/
8893	Emitech	Outside room Hors cage	/	/	/
8896	ACQUISYS GPS8	Satellite synchronized frequency standard	/	/	/
9403	R&S ESU8	Spectrum Analyzer	11/08/2016	11/08/2018	11/10/2018
9489	Absorber sheath current	Emitech	21/04/2016	21/04/2018	21/06/2018
10730	ZFL-1000LN	Mini-circuit	21/11/2016	21/11/2017	21/01/2018
10759	SIDT Cage 3	Anechoic chamber	/	/	/

<b>6. TESTS RESULTS SUMMARY</b>
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**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				Class B
FCC Part 15.109	RADIATED EMISSION LIMITS	X				Class B
FCC Part 15.111	ANTENNA POWER CONDUCTED LIMITS FOR RECEIVER			X		

NAp: Not Applicable

NAs: Not Asked

**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 = 71.55 dBµV/m = 12.6 x 10<sup>-6</sup> mW at 134.2kHz**

with  $P = (E \times d)^2 / (30 \times G_p)$  with  $d = 10\text{ m}$  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. CONDUCTED LIMITS**

**Standard:** FCC Part 15

**Test procedure:** Paragraph 15.107

**Limits:** Class B

**Software used:** BAT-EMC V3.6.0.32

**Test set up:**

The EUT is isolated and placed on a wooden table, 0.8 m over an horizontal reference plane and 0.4 m from a vertical reference plane. It is powered by an artificial main network placed on the ground reference plane. The equipment is powered via an AC / DC adapter which is supplied by an external power source (120 V / 60 Hz).

See photos in appendix 2

**Frequency range:** 150 kHz - 30 MHz

**Detection mode:** Peak / Average

**Bandwidth:** 10 kHz / 9 kHz

**Equipment under test operating condition:**

The equipment is blocked in charging mode.

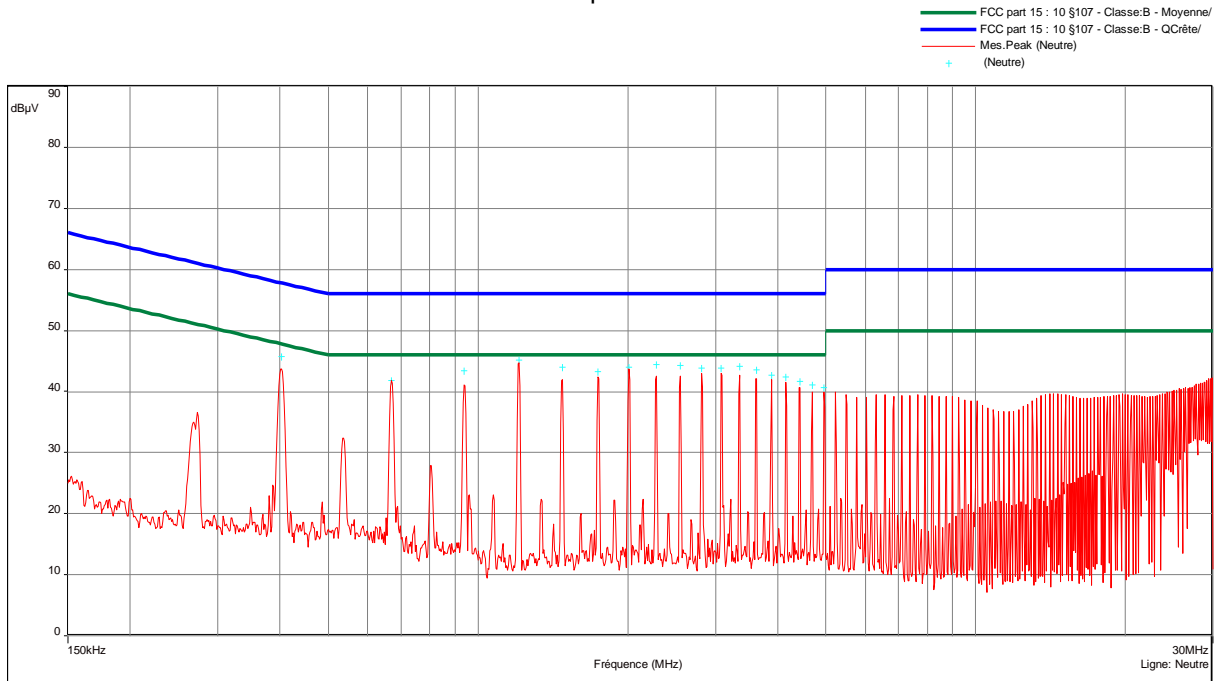
Ambient temperature (°C):	19.4
Relative humidity (%):	47

**Results:**

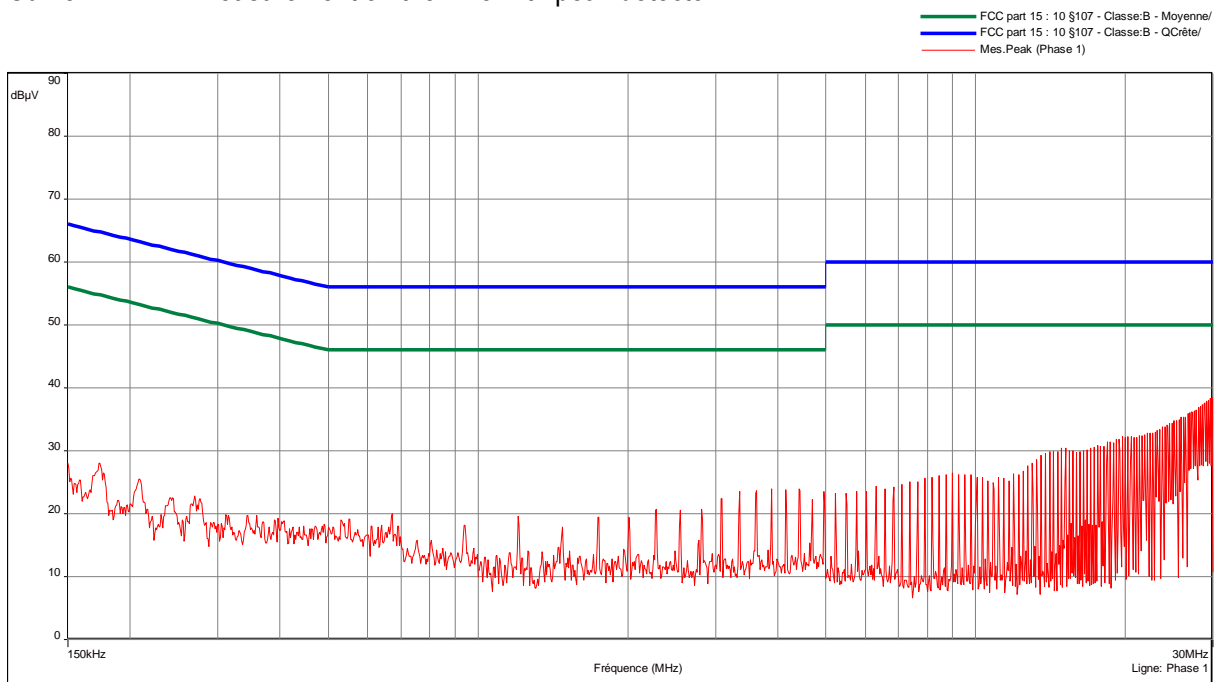
**Sample N° 1: Measurement on the mains power supply:**

The measurement is first realized with Peak detector.

Curve N° 1: measurement on the Neutral with peak detector



Curve N° 2: measurement on the Line with peak detector



The frequencies which are not 6 dB under the Average limit are then analyzed with Average detector and Quasi-peak detector.

Table N° 1: average measurement on the Neutral, for the frequency range:

Frequency (MHz)	Quasi-peak (dB $\mu$ V)	QP Limit (dB $\mu$ V)	QP margin (dB)	Frequency (MHz)	Average (dB $\mu$ V)	Average Limit (dB $\mu$ V)	Average margin (dB)
0.40279	43.04	57.796	14.756	0.40279	40.64	47.796	7.156
0.670455	40.27	56.000	15.730	0.670455	38.5	46.000	7.500
0.93965	40.63	56.000	15.370	0.93965	38.51	46.000	7.490
1.2079	41.25	56.000	14.750	1.2079	39.560	46.000	6.440
1.4761	41.65	56.000	14.350	1.4761	39.940	46.000	6.060
1.7434	41.88	56.000	14.120	1.7434	40.650	46.000	5.350
2.0125	42.71	56.000	13.290	2.0125	40.95	46.000	5.050
2.2816	42.39	56.000	13.610	2.2816	40.72	46.000	5.280
2.5489	42.12	56.000	13.880	2.5489	40.48	46.000	5.520
2.818	42.62	56.000	13.380	2.818	40.99	46.000	5.010
3.0871	42.52	56.000	13.480	3.0871	40.89	46.000	5.110
3.3553	42.36	56.000	13.640	3.3553	40.73	46.000	5.270
3.6235	41.9	56.000	14.100	3.6235	40.28	46.000	5.720
3.8926	41.38	56.000	14.620	3.8926	39.78	46.000	6.220
4.1599	41.19	56.000	14.810	4.1599	39.57	46.000	6.430
4.429	40.26	56.000	15.740	4.429	38.97	46.000	7.030
4.6972	39.58	56.000	16.420	4.6972	37.97	46.000	8.030
4.9654	39.46	56.000	16.540	4.9654	38.22	46.000	7.780

**Test conclusion:**

RESPECTED STANDARD

**8. RADIATED EMISSION LIMITS**

**Standard:** FCC Part 15

**Test procedure:** paragraph 109

**Limit class:** Class B

**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 30MHz to 1 GHz (the highest local oscillator frequency used is 24MHz)

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

**Bandwidth:** 120 kHz (F < 1 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 is blocked in charging mode.

Ambient temperature (°C):	21.4
Relative humidity (%):	40

**Results:**

Power source: AC/DC Adapter by an external power source regulated to 120VAC/60Hz.

Position of the product: Position 1 with AC/DC adapter. (Worst case measurement in low frequencies).

Sample N° 1

FREQUENCIES (MHz)	Detector P: Peak QP: Quasi-Peak	Antenna height (cm)	Azimuth (degree)	Polarization H: Horizontal V: Vertical	Field strength measured at 10 m (dB $\mu$ V/m)	Field strength correlated at 3m (dB $\mu$ V/m)	Limits at 3m (dB $\mu$ V/m)	Margin (dB)
37.14	QP	100	59	V	29.11	39.51	40	0.89
81.75	QP	162	162	V	29.51	39.91	40	0.09
83	QP	100	100	V	29.48	39.88	46	0.12
285	QP	100	100	V	26.96	37.36	40	8.64

Applicable limits: for 30 MHz $\leq$ F $\leq$ 88 MHz :	40 dB $\mu$ V/m at 3 meters
for 88 MHz < F $\leq$ 216 MHz :	43.5 dB $\mu$ V/m at 3 meters
for 216 MHz < F $\leq$ 960 MHz :	46 dB $\mu$ V/m at 3 meters
Above 960 MHz :	54 dB $\mu$ V/m at 3 meters

**Test conclusion:**

RESPECTED STANDARD

**9. RADIATED EMISSION LIMITS; GENERAL REQUIREMENTS**

**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 ( $30 \text{ MHz} < F < 1 \text{ GHz}$ )  
1 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.

Ambient temperature (°C):	21.4
Relative humidity (%):	37

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 $\mu$ V/m <sup>(1)</sup>	Field strength at 300 meters dB $\mu$ V/m <sup>(2)</sup>	Limits 300m dB $\mu$ V/m	Margin (dB)
134.2	P	71.55	12.47	45	32.53
134.2	Av	69.53	10.45	25	14.55

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 $\mu$ V/m <sup>(3)</sup>	Field strength at 300 meters dB $\mu$ V/m <sup>(4)</sup>	Limits 300m dB $\mu$ V/m	Margin (dB)
402.7	P	40	-19.80	35.5	55.30
402.7	Av	37.8	-21.28	15.5	36.78

(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 $\mu$ V/m <sup>(5)</sup>	Field strength at 30 meters dB $\mu$ V/m <sup>(6)</sup>	Limits 30m dB $\mu$ V/m	Margin (dB)
537	QP	33.30	14.22	33	18.78
672	QP	34.70	15.62	31	15.38

(1) Field strength measured at 10 meters

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

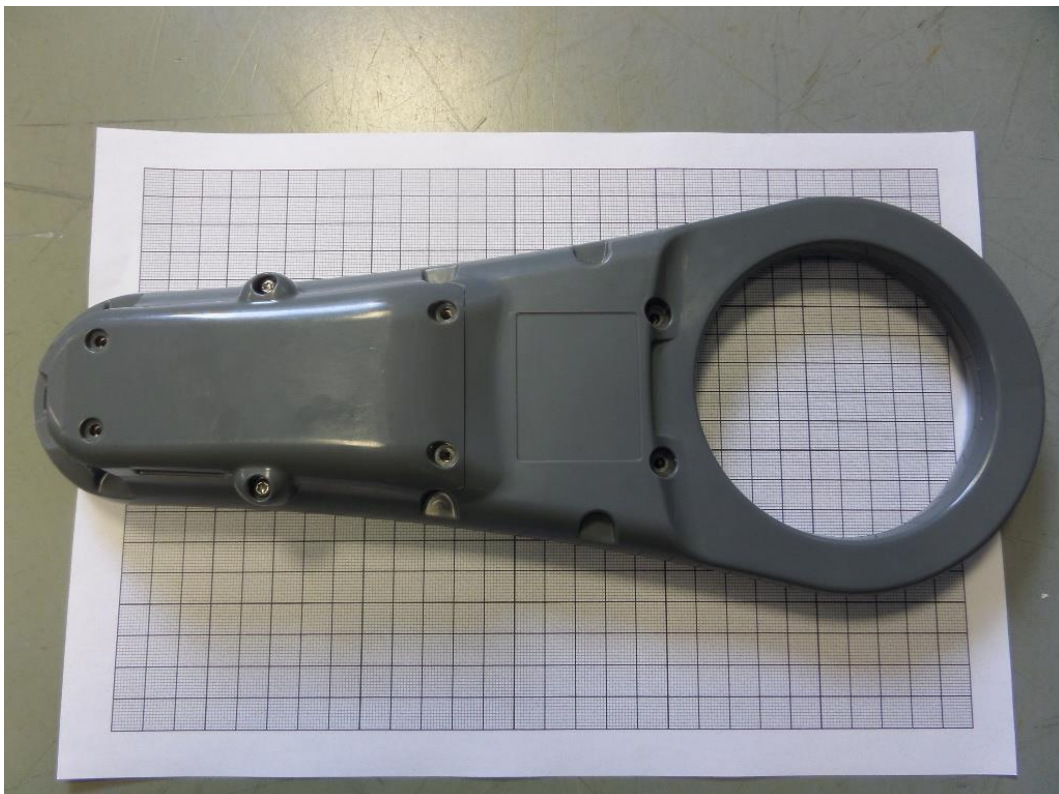
Applicable limits:	for 9 kHz $\leq$ F $\leq$ 490 kHz :	2400/F(kHz) at 300 meters
	for 490 kHz < F $\leq$ 1.705 MHz :	24000/F(kHz) at 30 meters
	for 1.705 MHz < F $\leq$ 30 MHz :	29.5 dB $\mu$ V/m at 30 meters
	for 30 MHz < F $\leq$ 88 MHz :	40 dB $\mu$ V/m at 3 meters
	for 88 MHz < F $\leq$ 216 MHz :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

**Test conclusion:**

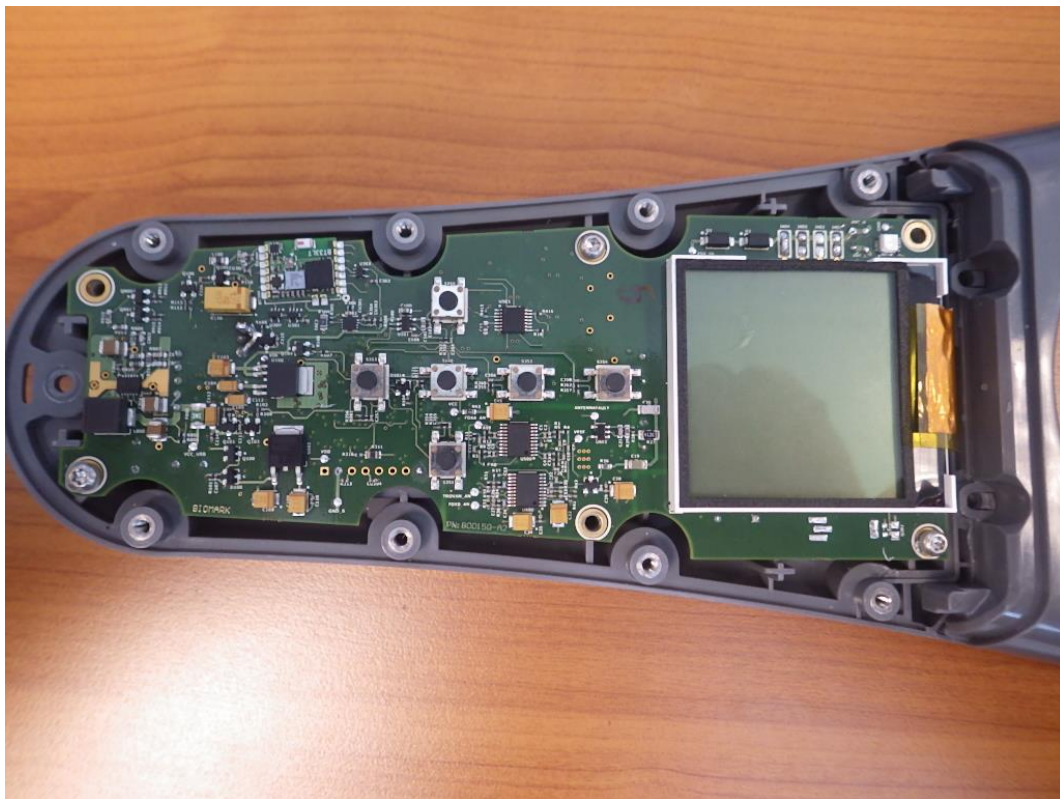
RESPECTED STANDARD

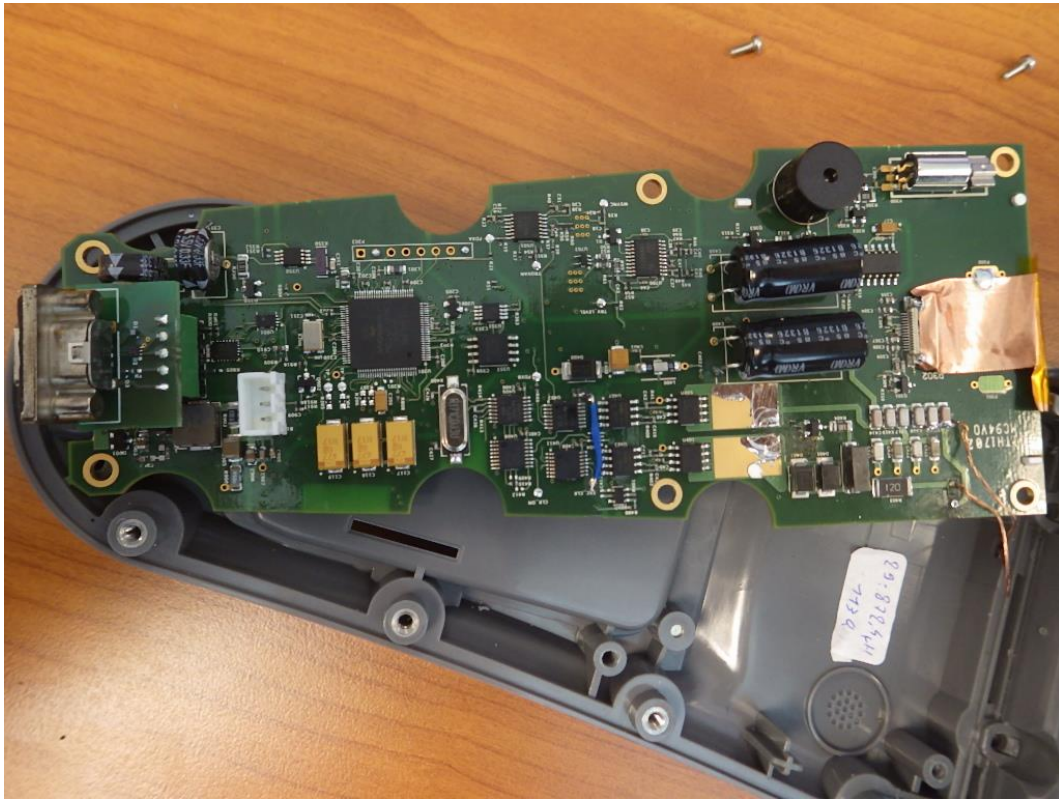
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**APPENDIX 1: Photos of the equipment under test**



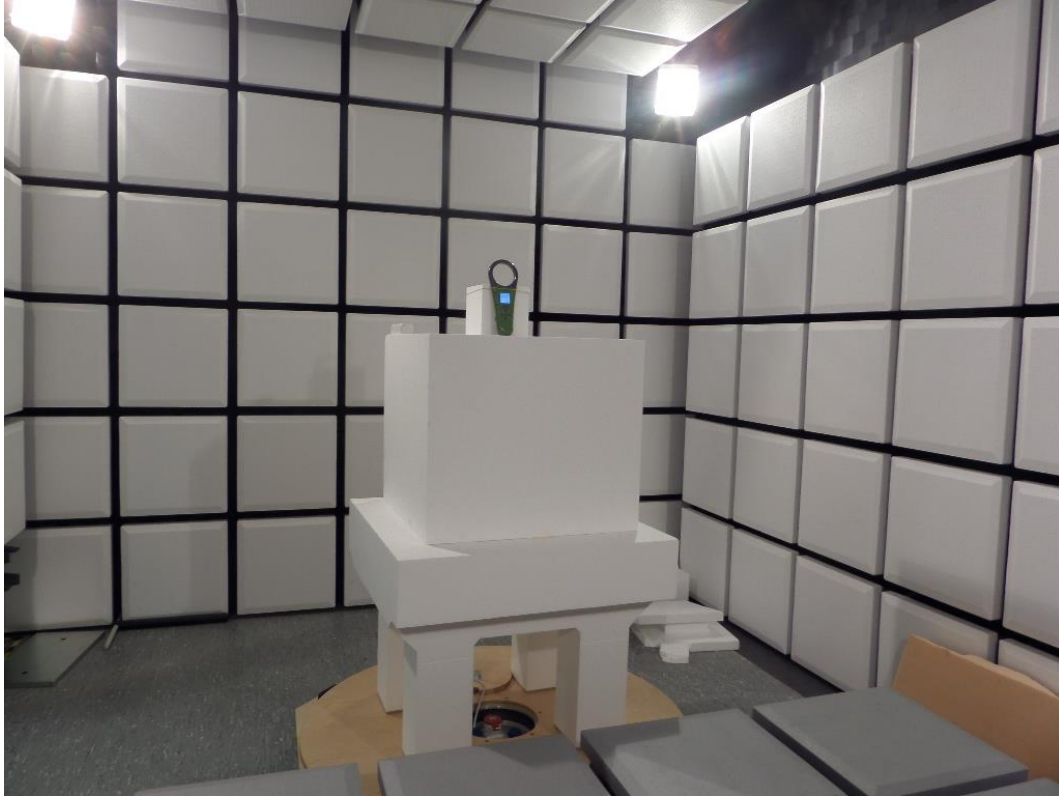






**APPENDIX 2: Test set up**

Anechoic room – Position 1 supplied by battery



Anechoic room – Position 2 supplied by battery



Open test area – Position 1 – Tx Mode



Open test area – Position 2 – Tx Mode



Open test area – Position 1 – Charging mode by AC/DC Adapter

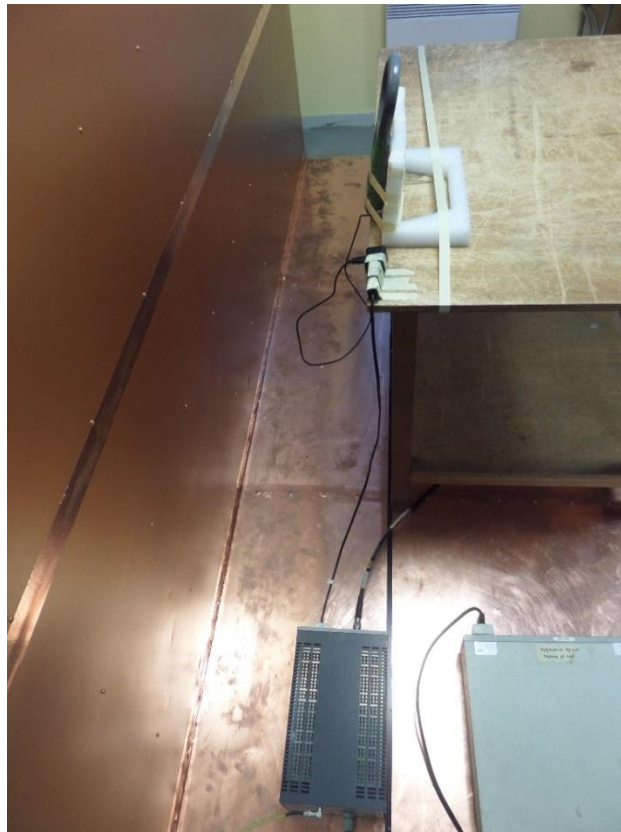


Open test area – Position 2 – Charging mode by AC/DC Adapter





Conducted tests – Charging Mode



### APPENDIX 3: Test equipment list

#### Conducted limits

TYPE	MANUFACTURER	EMITECH NUMBER
Outside room Hors cage	Emitech	8893
Satellite synchronized frequency standard GPS8	ACQUISYS	8896
Spectrum Analyzer ESU8	Rohde & Schwarz	9403
LISN 1600	Thurbly Thandar Instruments	8719
High-pass filter EZ25	R&S	8635
Absorber sheath current	Emitech	9489
Power source 1251RP	California instruments	8508
Multimeter IDM106N	ISOTECH	8676
Meteo station	HUGER	8671
Software	BAT-EMC V3.6.0.32	0000

#### Radiated emission limits

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 FSP40	Rohde & Schwarz	4088
Loop antenna 6502	EMCO	1406
Biconical antenna 3110	Emco	7240
Biconical antenna VHA 9103	Schwarzbeck	8528
Log periodic antenna HL223	Rohde & Schwarz	7190
Low-noise amplifier ZFL-1000LN	Mini-circuit	10730
Multimeter MN5102B	AOIP	8676
Meteo station WS-9232	La Crosse Technology	8749
Meteo station WS-9232	La Crosse Technology	8750
Software	BAT-EMC V3.6.0.32	0000
Software	Champ libre Juigné. V3.4	8864

**Radiated emission limits, general requirements**

<b>TYPE</b>	<b>MANUFACTURER</b>	<b>EMITECH NUMBER</b>
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 FSP40	Rohde & Schwarz	4088
Loop antenna 6502	EMCO	1406
Multimeter MN5102B	AOIP	8676
Meteo station WS-9232	La Crosse Technology	8749
Meteo station WS-9232	La Crosse Technology	8750
Software	BAT-EMC V3.6.0.32	0000

**APPENDIX 4: 99% OCCUPIED BANDWIDTH**

