RR051-15-106740-1-A Ed. 0

Certification test report

According to the standard:
CFR 47 FCC PART 15

Equipment under test:
LIVESTOCK POCKET READER LPR

FCC ID: NQY-30007

Company:
ALLFLEX EUROPE SAS

DISTRIBUTION: Mr LANGOUET **(Company: ALLFLEX EUROPE SAS)**

Number of pages: 24 with 4 appendixes

Ed.	Date	Modified pages	Written by Name	Written by Visa	Technical Verification and Quality Approval Name	Technical Verification and Quality Approval Visa
0	20-JAN-2016	Creation	S. LOUIS	SL	T. LEDRESSEUR	

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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:	**LIVESTOCK POCKET READER**
Serial number (S/N):	C12900006
Part No:	30007-2A2
Model:	Livestock pocket reader
Software version:	—
MANUFACTURER:	ALLFLEX EUROPE SAS

COMPANY SUBMITTING THE PRODUCT:

Company:	ALLFLEX EUROPE SAS
Address:	Route des Eaux BP 90219 35502 VITRE Cedex FRANCE
Responsible:	Mr LANGOUET
DATES OF TEST:	From 18-JAN-2016 to 20-JAN-2016
TESTING LOCATION:	EMITECH ANGERS laboratory at JUIGNE SUR LOIRE (49) FRANCE 21 rue de la Fuye 49610 Juigne sur Loire France FCC Accredited under US-EU MRA Designation Number: FR0009 Test Firm Registration Number: 873677
TESTED BY:	S. LOUIS

CONTENTS

1. INTRODUCTION

This report presents the results of radio test carried out on the following equipment: **Livestock Pocket Reader LPR**, in accordance with normative reference.

The device under test integrates a 134.2 kHz RFID module.

2. PRODUCT DESCRIPTION

Class:	B
Utilization:	RFID Handheld control terminals
Antenna type and gain:	Integral antenna, gain unknown
Operating frequency:	134.2 kHz
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 (2015)	Radio Frequency Devices
ANSI C63.4	2009 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	2009 Testing Unlicensed Wireless Devices.

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 209: Radiated emission limits; general requirements
- Paragraph 215: Additional provisions to the general radiated emission limitations

5. TEST EQUIPMENT CALIBRATION DATES

Equipment	Model	Type	Last verification	Next verification	Validity
0000	BAT-EMC V3.6.0.32	Software	/	/	/
1406	EMCO 6502	Loop antenna	27/01/2015	27/01/2017	27/03/2017
8508	California instruments 1251RP	Power source	12/10/2015	12/10/2016	12/12/2016
8524	Hewlett Packard HP 8591EM	Test receiver	10/09/2015	10/09/2017	10/11/2017
8526	Schwarzbeck VHBB 9124	Biconical antenna	12/06/2015	12/06/2018	12/08/2018
8528	Schwarzbeck VHA 9103	Biconical antenna	24/09/2013	24/09/2017	24/11/2017
8543	Schwarzbeck UHALP 9108A	Log periodic antenna	12/06/2015	12/06/2018	12/08/2018
8635	R&S EZ-25	High-pass filter	05/08/2014	05/08/2016	05/10/2016
8671	HUGER	Meteo station	04/09/2014	04/09/2016	04/11/2016
8676	ISOTECH IDM106N	Multimeter	21/05/2015	21/05/2017	21/07/2017
8707	R&S ESI7	Test receiver	11/12/2014	11/12/2016	11/02/2017
8719	Thurbly Thandar Instruments 1600	LISN	23/06/2014	23/06/2016	23/08/2016
8732	Emitech	OATS	23/08/2013	23/08/2016	23/10/2016
8749	La Crosse Technology WS-9232	Meteo station	03/09/2014	03/09/2016	03/11/2016
8864	Champ libre Juigné. V3.4	Software	/	/	/
8893	Emitech	Outside room Hors cage	/	/	/
8896	ACQUISYS GPS8	Satellite synchronized frequency standard	/	/	/
10651	Absorber sheath current	Emitech	16/12/2015	16/12/2017	16/02/2018

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

LABEL SHALL CONTAIN

The label shall be located in a conspicuous location on the device
The label shall not be a stick-on, paper label. The label on these products shall be permanently affixed to the product and shall be readily visible to the purchaser at the time of purchase

§15.19: (can be placed in the user manual if the product is too small)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

USER NOTICE SHALL CONTAIN

The user notice, not provided during tests, shall include the following informations:

§15.21:

Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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

USER NOTICE SHALL CONTAIN

The user notice, not provided during tests, shall include the following informations:

§ 15.105:

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference's by one or more of the following measures:
-Reorient or relocate the receiving antenna.
-Increase the separation between the equipment and the receiver.
-Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
-Consult the dealer or an experienced radio/TV technician for help.

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 15.207	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 recharge of batteries.

RF EXPOSURE:

Maximum measured power = 0.010 mW at 134.2kHz

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:

$$P(mW) < \frac{\frac{7.5 * 50(\text{mm})}{\sqrt{0.1}(GHz)} * \left(1 + \log\left(\frac{100}{F(MHz)}\right)\right)}{2}$$

$$P(mW) < \frac{\frac{7.5 * 50(\text{mm})}{\sqrt{0.1}(GHz)} * \left(1 + \log\left(\frac{100}{0.1342}\right)\right)}{2}$$

P(mW) < 2295.95mW

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 / Quasi-peak / Average

Bandwidth: 10 kHz / 9 kHz

Equipment under test operating condition:

The equipment is blocked in reception mode.

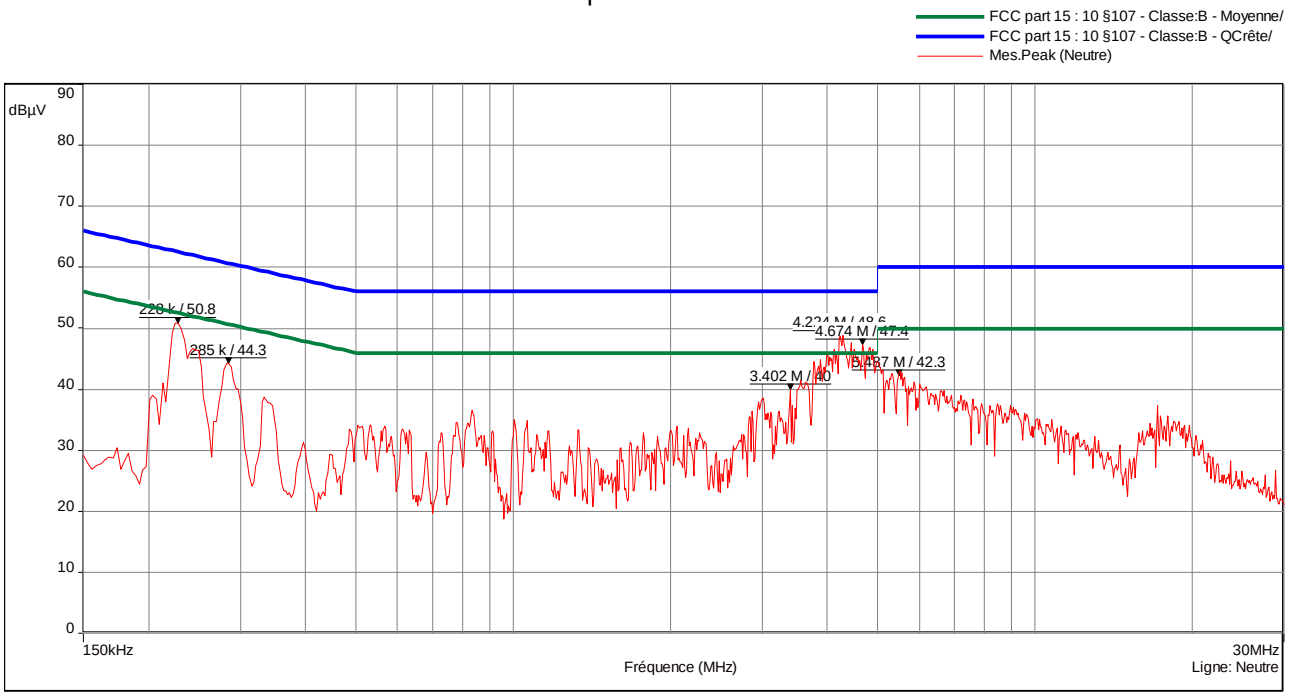
Results:

Ambient temperature (°C):	20.5
Relative humidity (%):	30

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

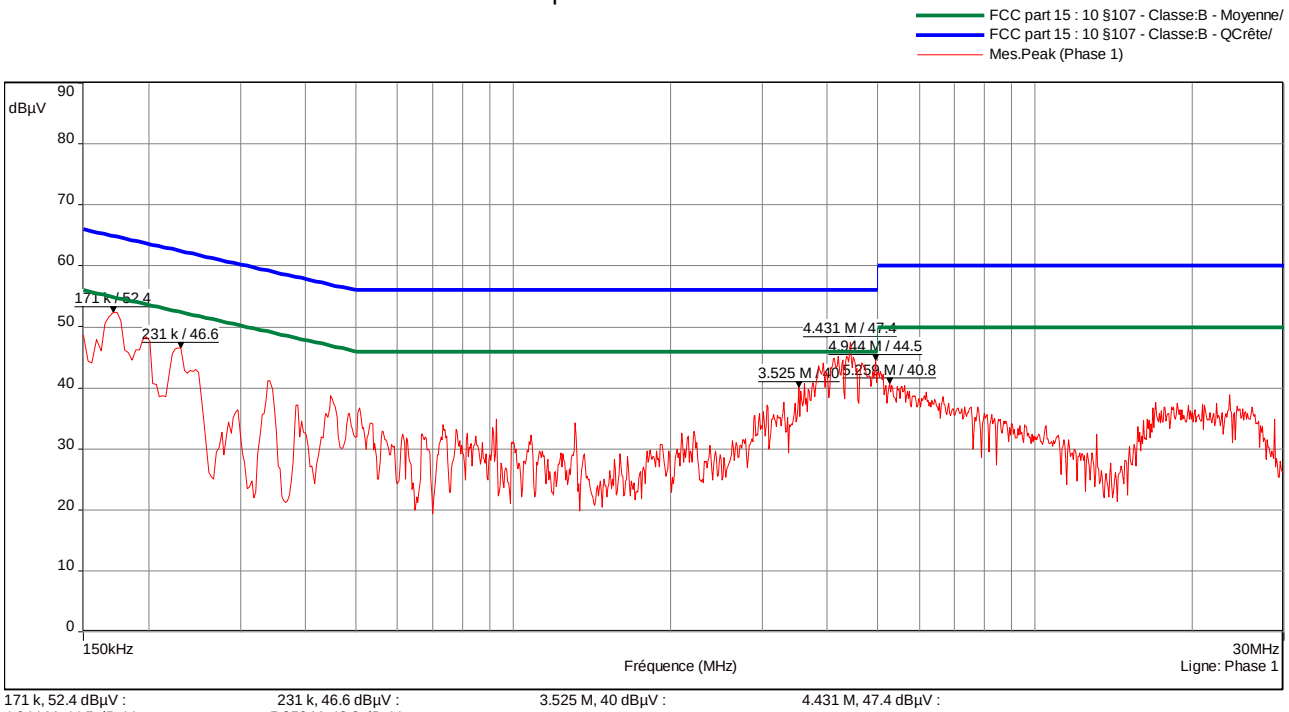
The measurement is first realized with Peak detector.

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



228 k, 50.8 dBµV :
285 k, 44.3 dBµV :
3.402 M, 40 dBµV :
4.224 M, 48.6 dBµV :
4.674 M, 47.4 dBµV :
5.487 M, 42.3 dBµV :

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

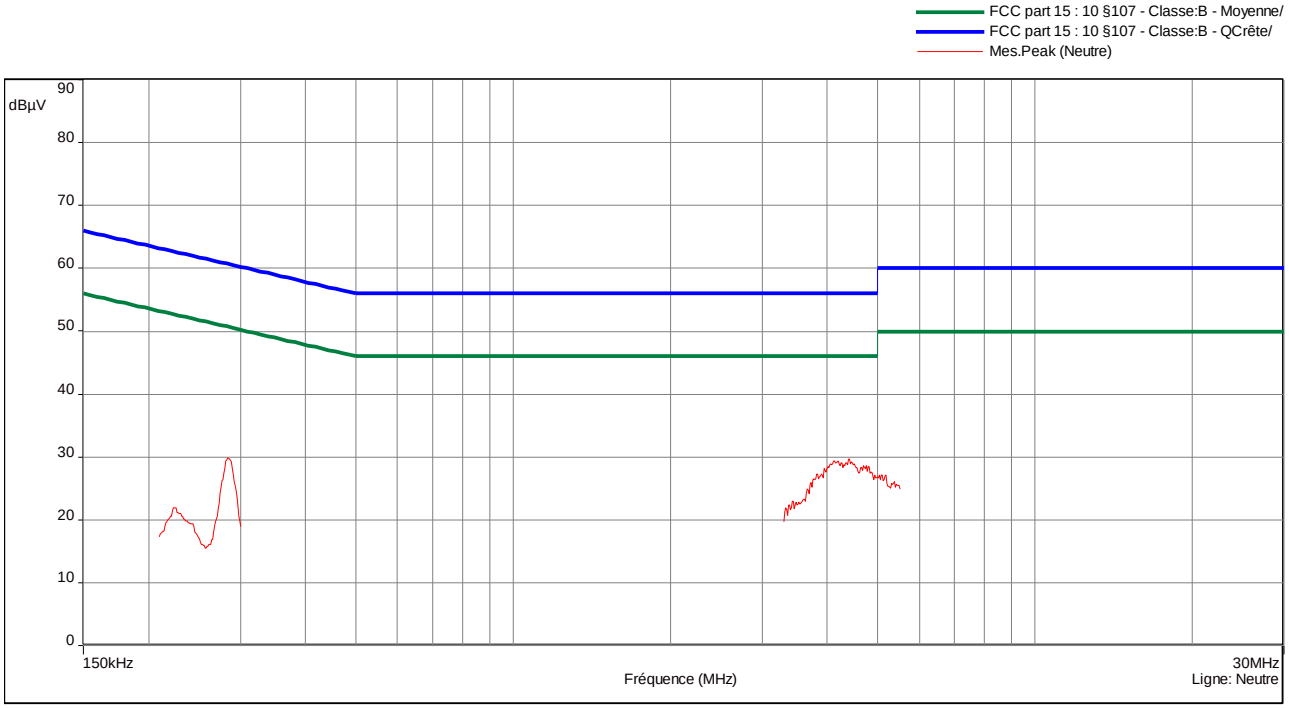


171 k, 52.4 dBµV :
231 k, 46.6 dBµV :
3.525 M, 40 dBµV :
4.431 M, 47.4 dBµV :
4.944 M, 44.5 dBµV :
5.259 M, 40.8 dBµV :

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

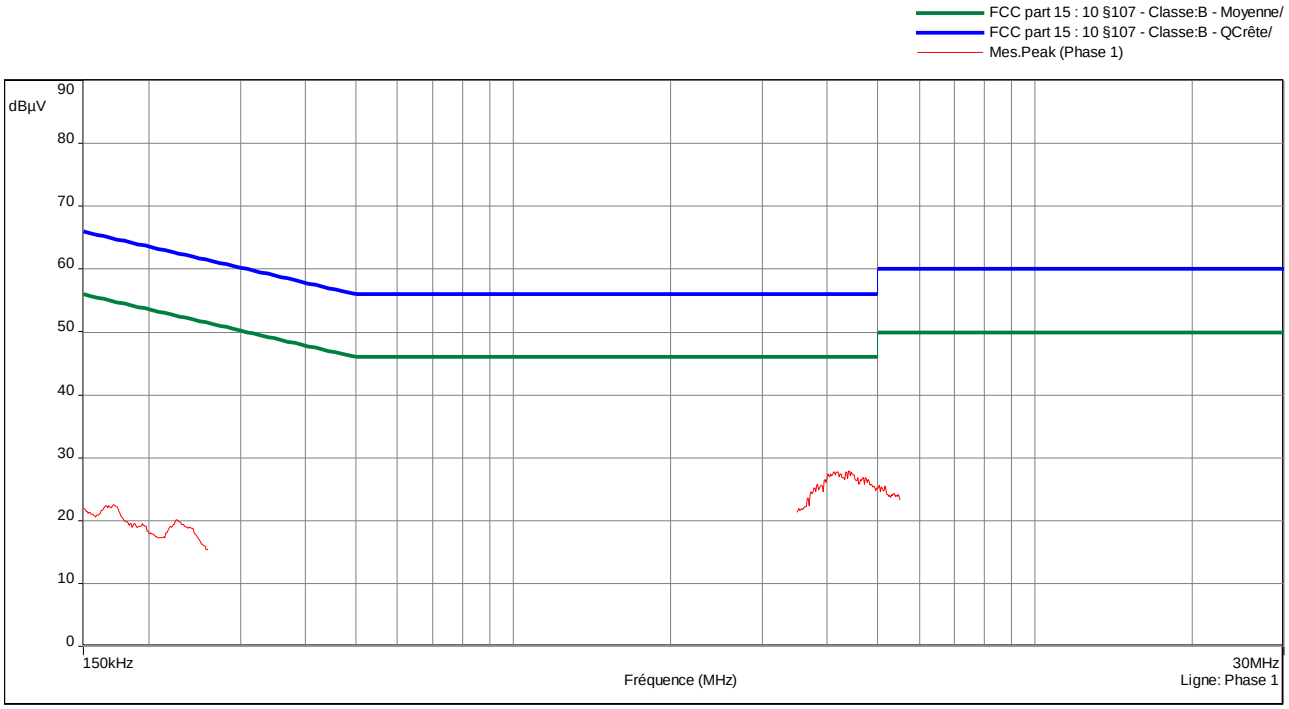
Curve N° 3: average measurement on the Neutral, for the frequency range:

- 210kHz to 300kHz and 3.3MHz to 5.5MHz



Curve N° 4: average measurement on the Line, for the frequency range:

- 150kHz to 260kHz and 3.3MHz to 5.5MHz



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 reception mode.

Results:

Ambient temperature (°C): 22.4
Relative humidity (%): 32

Power source: The equipment is powered via an AC / DC adapter which is supplied by an external power source (120 V / 60 Hz).

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 (dBµV/m)	Field strength correlated at 3m (dBµV/m)	Limits at 3m (dBµV/m)	Margin (dB)
111.8	QP	134	172	V	25.3	35.5	43.5	8
170.5	QP	110	329	V	31.7	42.1	43.5	1.4
174.6	QP	—	—	V	27.1	37.5	43.5	6
258.9	QP	400	0	H	29.5	39.9	46	6.1

Applicable limits: for 30 MHz ≤ F ≤ 88 MHz : 40 dBµV/m at 3 meters
for 88 MHz < F ≤ 216 MHz : 43.5 dBµV/m at 3 meters
for 216 MHz < F ≤ 960 MHz : 46 dBµV/m at 3 meters
Above 960 MHz : 54 dBµV/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 kHz < F < 150kHz)
9 kHz (150 kHz < F < 30MHz)
120 kHz (30 MHz < F < 1 GHz)
1 MHz (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 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):	20.4
Relative humidity (%):	42

Results:

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

Sample N° 1: Carrier

Frequencies (kHz)	Detector P: Peak Av: Average	Field strength at 10 meters dBµV/m (1)	Field strength at 300 meters dBµV/m (2)	Limits 300m dBµV/m	Margin (dB)
134.2	P	64.6	5.5	45	39.5
134.2	Av	64.6	5.5	25	19.5

With antenna height: 100 cm; Azimuth: 269°; Polarization antenna: Parallel

(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 dBµV/m (3)	Field strength at 300 meters dBµV/m (4)	Limits 300m dBµV/m	Margin (dB)
268.4 (3)	P	51.9	-7.2	39	46.2
268.4(3)	Av	51.5	-7.6	19	26.6
402.7 (3)	P	50.7	-8.4	35.5	43.9
402.7 (3)	Av	50.3	-8.8	15.5	24.3

(1) Field strength measured at 10 meters
(2) Field strength extrapolated at 300 meters using 40dB/decade fall off
(3) Noise floor

Frequencies (kHz)	Detector QP: Q-Peak	Field strength at 10 meters dBµV/m (5)	Field strength at 30 meters dBµV/m (6)	Limits 30m dBµV/m	Margin (dB)
537 (6)	QP	41.1	22	33	11
672 (6)	QP	39.0	19.9	31	11.1

(4) Field strength measured at 10 meters
(5) Field strength extrapolated at 30 meters using 40dB/decade fall off
(6) Noise floor

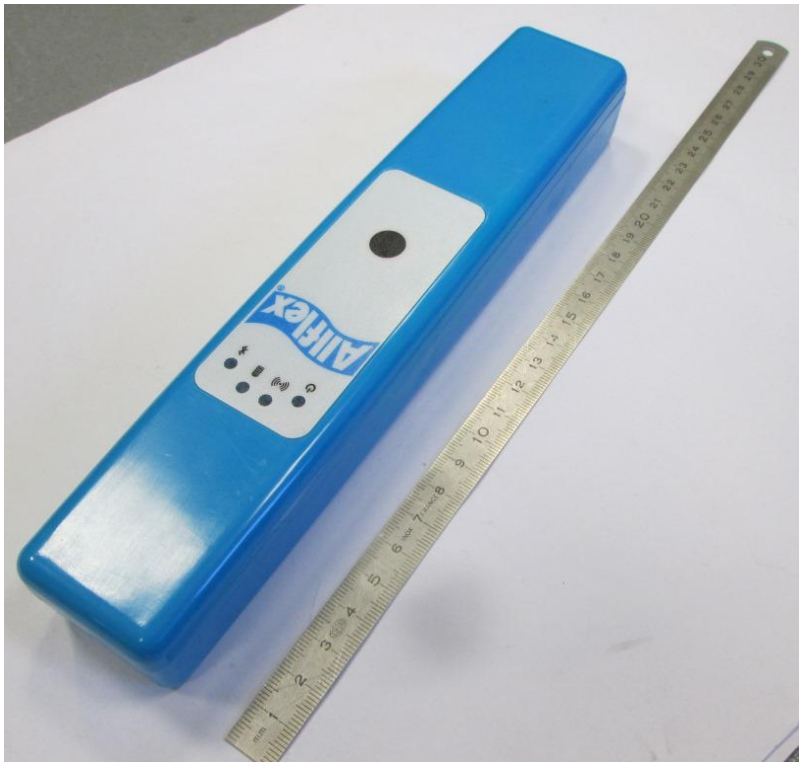
Applicable limits:	for 9 kHz ≤ F ≤ 490 kHz :	2400/F(kHz) at 300 meters
	for 490 kHz < F ≤ 1.705 MHz :	24000/F(kHz) at 30 meters
	for 1.705 MHz < F ≤ 30 MHz :	29.5 dBµV/m at 30 meters
	for 30 MHz < F ≤ 88 MHz :	40 dBµV/m at 3 meters
	for 88 MHz < F ≤ 216 MHz :	43.5 dBµV/m at 3 meters
	for 216 MHz < F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

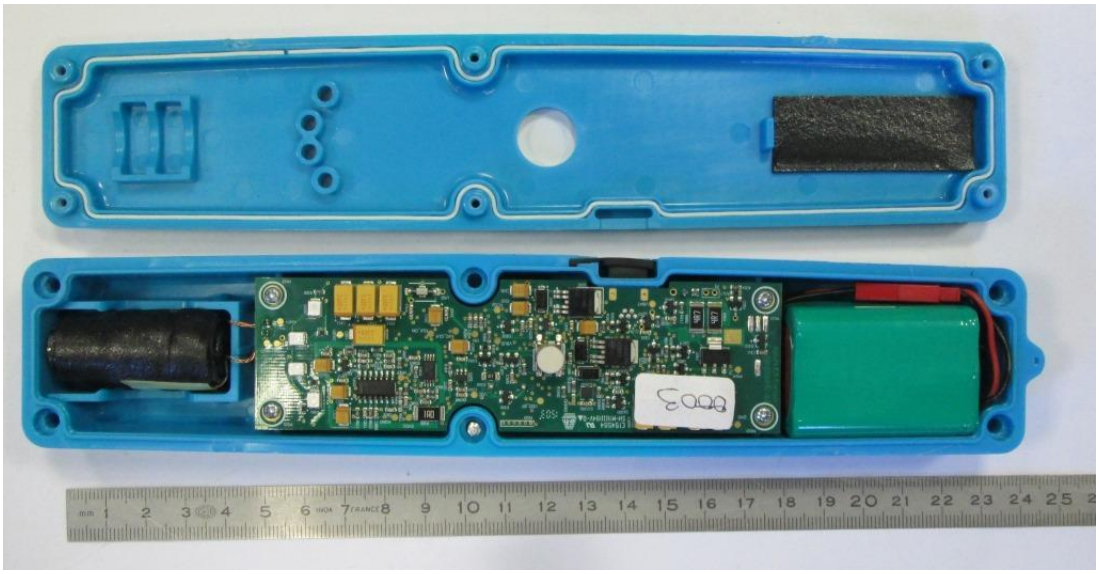
Test conclusion:

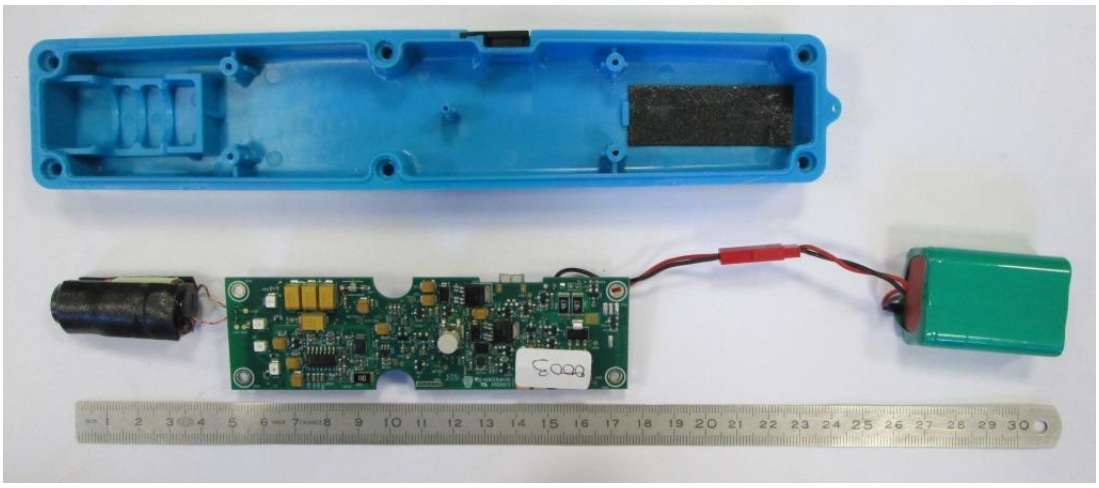
RESPECTED STANDARD

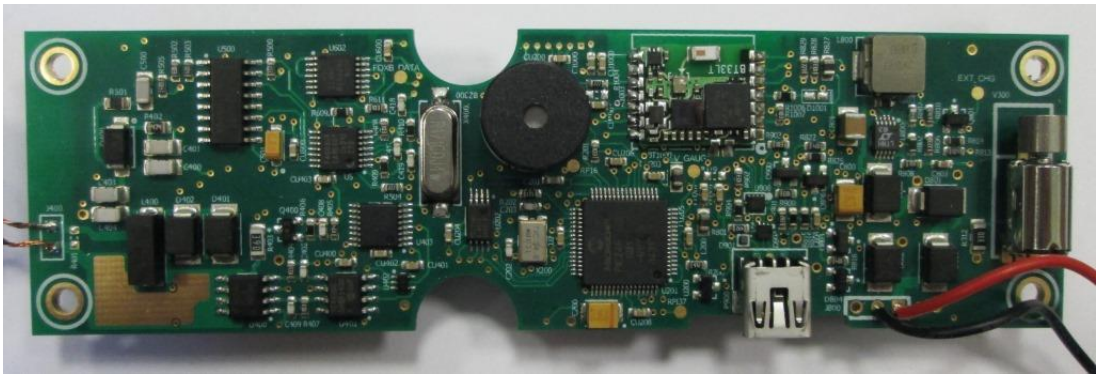
□□□ End of report, 4 appendixes to be forwarded □□□

APPENDIX 1: Photos of the equipment under test







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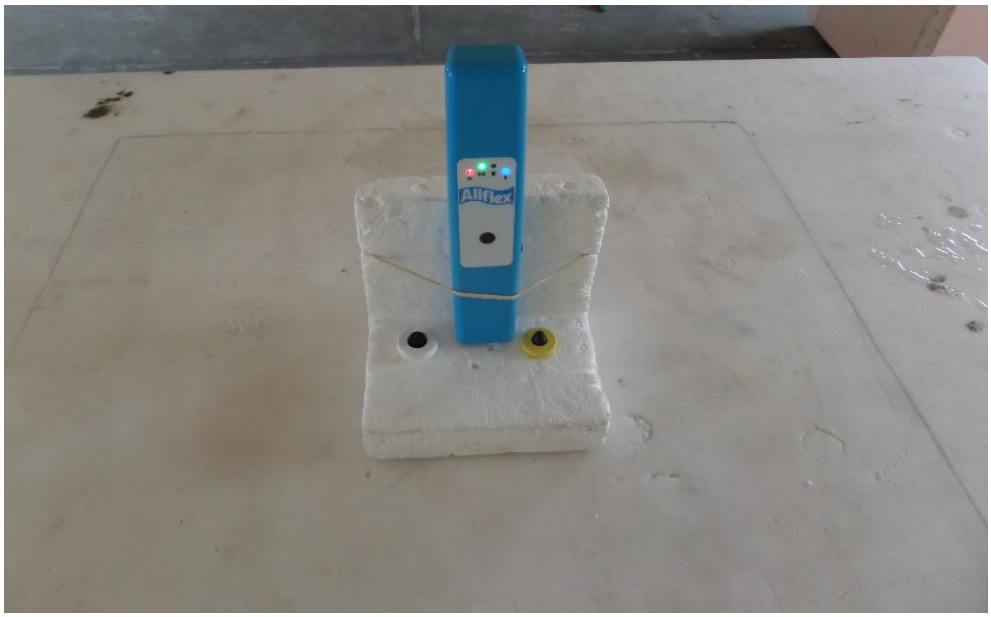
APPENDIX 2: Test set up

Open Area Test Site – TX mode



Open Area Test Site – RX mode

Conducted tests – RX 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
Test receiver HP 8591EM	Hewlett Packard	8524
LISN 1600	Thurbly Thandar Instruments	8719
High-pass filter EZ25	R&S	8635
Absorber sheath current	Emitech	10651
Power source 1251RP	California instruments	8508
Multimeter IDM106N	ISOTECH	8676
Meteo station	HUGER	8671
Software	BAT-EMC V3.6.0.32	0000

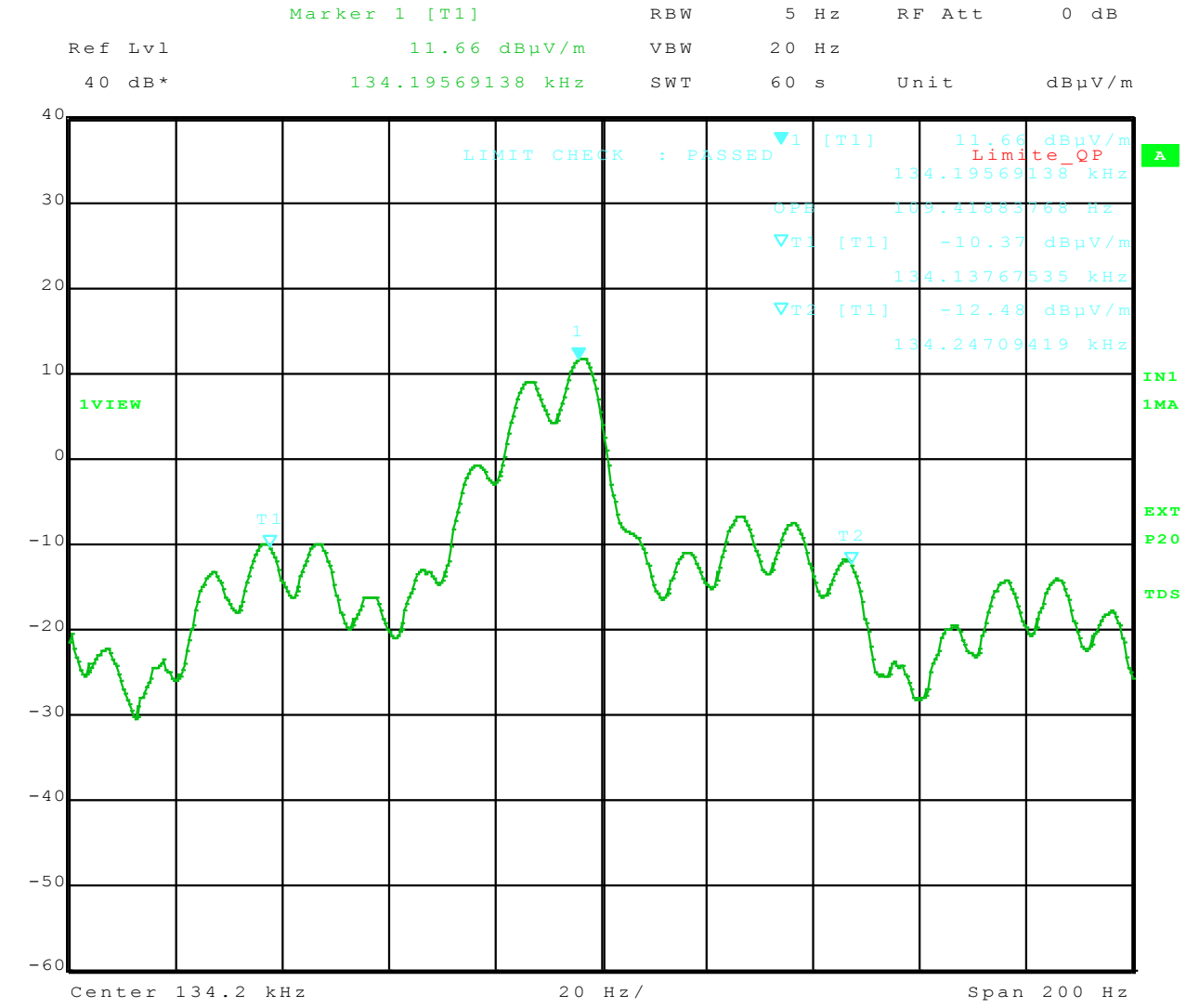
Radiated emission limits

TYPE	MANUFACTURER	EMITECH NUMBER
Open test site	EMITECH	8732
Satellite synchronized frequency standard GPS8	ACQUISYS	8896
Test receiver ESI7	Rohde & Schwarz	8707
Biconical antenna VHBB 9124	Schwarzbeck	8526
Biconical antenna VHA 9103	Schwarzbeck	8528
Log periodic antenna UHALP 9108A	Schwarzbeck	8543
Power source 1251RP	California instruments	8508
Multimeter IDM106N	ISOTECH	8676
Meteo station WS-9232	La Crosse Technology	8749
Software	Champ libre Juigné. V3.4	8864

Radiated emission limits; general requirements

TYPE	MANUFACTURER	EMITECH NUMBER
Open test site	EMITECH	8732
Satellite synchronized frequency standard GPS8	ACQUISYS	8896
Test receiver ESI7	Rohde & Schwarz	8707
Loop antenna 6502	EMCO	1406
Biconical antenna VHBB 9124	Schwarzbeck	8526
Biconical antenna VHA 9103	Schwarzbeck	8528
Log periodic antenna UHALP 9108A	Schwarzbeck	8543
Multimeter IDM106N	ISOTECH	8676
Meteo station WS-9232	La Crosse Technology	8749
Software	Champ libre Juigné. V3.4	8864

APPENDIX 4: 99% OCCUPIED BANDWIDTH



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