EMITECH GROUPE

RR-032-PTE-15-101520-1-A

"This report cancels and replaces the test report N°RR-032-PTE-15-101520-1-A Edition 0"

Radio Tests Report

According to the standard:

FCC 47 CFR PART 15 : 2015 (§15.247)

Equipment under test:

Industrial battery controller
with connection ZIGBEE (2.4 GHz)
(FCC ID: WT54C6567426F78)

Company:

ENERSYS

FCC accredited: FR0004

DISTRIBUTION: Mr. LETOMBE (**Company:** ENERSYS)

Number of pages: 38 with 4 annexes

Ed.	Date	Modified pages	Written by Name	Written by Visa	Technical Verification and Quality Approval Name	Technical Verification and Quality Approval Visa
1	13/06/16	1	F. ROHRI	FR	B. Pellerin	

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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 production of the item tested.

TEST CERTIFICATION FOR:	FCC Certification
***NAME OF THE EQUIPMENT UNDER TEST*:**	Industrial battery controller with connection Zigbee (2.4 GHz)
Serial number:	AA-1D03FC
Reference / model (P/N):	-
Software version:	Not communicated
Firmware version:	V5.1
NAME OF THE MANUFACTURER:	ENERSYS
ADDRESS OF THE APPLICANT:	
Company:	ENERSYS
Address:	Rue Alexander Fleming CS 40962 62033 ARRAS Cedex FRANCE
Person in charge:	Mr. LETOMBE
DATE OF TESTS:	04/02/2016
TESTS LOCATION:	EMITECH laboratory in Montigny Le Bretonneux (78) FRANCE
TESTS OPERATORS:	F. ROHRI / F. LHEUREUX

TABLE OF CONTENTS

1. INTRODUCTION

This document presents the results of Electromagnetic Compatibility tests performed on the equipment **«Industrial battery controller with connection ZIGBEE (2.4 GHz) »** according to reference documents listed below.

2. REFERENCE DOCUMENTS

FCC 47 CFR Part 15: 2015
Code of Federal Regulations
Title 47- Telecommunication
Chapter 1- Federal Communication Commission
Part 15- Radio frequency devices

ANSI C63.4: 2014
Methods of Measurement of Radio-Noise Emissions from Low Voltage Electrical and Electronics Equipment in the range of 9 kHz to 40 GHz.

KDB 558074 D01 DTS Meas Guidance V03r03
Guidance for performing compliance measurement on Digital Transmission Systems (DTS) operating under § 15.247

3. PRODUCT DESCRIPTION

Class:	A (industrial environment)
Utilization:	Equipment for vehicular
Antenna type and gain:	Integral antenna: Not communicated
Operating frequency range:	from 2405 MHz to 2480 MHz
Number of channels:	16
Channel spacing:	5 MHz
Modulation:	OQPSK
Power source:	15-120Vdc (32 Vdc for the tests)
Software power setting:	-

Modification of the equipment during the tests: No.

4. TESTS AND CONCLUSION

The following table summarizes test results of the EUT.

Subpart B of the standard FCC part 15 – Unintentional radiators

Test procedure	Designation of test	Test results				Comments
		Pass	Fail	N.A.	N.P.	
15.107	Measurement of conducted emission on AC mains ports			X		
15.109	Radiated emission limits	X				

Subpart C of the standard FCC part 15 – Intentional radiators

Test procedure	Designation of test	Test results				Comments
		Pass	Fail	N.A.	N.P.	
15.205	Restricted bands of operation	X				
15.207	Measurement of conducted emission on AC mains ports			X		
15.209	Radiated emission limits; general requirements	X				
15.215	Additional provisions to the general radiated emission limitations					
	(a) Alternative to general radiated emission limits	X				
	(b) Unwanted emissions outside of § 15.247 frequency bands	X				
	(c) 20 dB bandwidth and band-edge compliance	X				
15.247	Intentional radiated emissions					
	a) frequency hopping and digitally modulated					
	a) (1) hopping mode			X		
	a) (1) (i) frequency hopping in the band 902-928 MHz			X		
	a) (1) (ii) frequency hopping in the band 5725–5850 MHz			X		
	a) (1) (iii) frequency hopping in the band 2400–2483.5 MHz			X		
	a) (2) systems using digital modulation in the bands 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz (6 dB bandwith)	X				
	b) maximum peak conducted					
	b) (1) frequency hopping in the bands 2400–2483.5 MHz or 5725–5850 MHz			X		
	b) (2) frequency hopping in the band 902-928 MHz			X		
	b) (3) systems using digital modulation in the bands 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz	X				

Test procedure	Designation of test	Test results				Comments
		Pass	Fail	N.A.	N.P.	
	b) (4) maximum peak conducted > 6 dBi					
	b) (4) (i) frequency hopping in the band 2400–2483.5 MHz			X		
	b) (4) (ii) frequency hopping in the band 5725–5850 MHz			X		
	b) (4) (iii) fixed, point-to-point			X		
	c) directional antenna > 6 dBi					
	c) (1) fixed, point-to-point operation					
	c) (1) (i) in the band 2400–2483.5 MHz			X		
	c) (1) (ii) in the band 5725–5850 MHz			X		
	c) (1) (iii) fixed, point-to-point			X		
	c) (2) multiple directional beams in the band 2400–2483.5 MHz					
	c) (2) (i) information			X		
	c) (2) (ii) sum of the power supplied to all antennas			X		
	c) (2) (iii) one antenna for multiple directional beams			X		
	c) (2) (iv) single directional beam			X		
	d) intentional radiator	X				
	e) peak power spectral density	X				
	f) hybrid system			X		
	g) continuous data stream during the test					
	h) to avoid hopping on occupied channels					
	i) RF exposure compliance			X		P < 500 mW

N.A.: Not Applicable
N.P.: Not Performed

Conclusion:

The tested sample «**Industrial battery controller with connection ZIGBEE (2.4 GHz)** » submitted to the tests complies with the requirements of the standard:

- FCC 47 CFR PART 15 : 2015

According to the limits specified in this report.

5. DIGITAL MODULATION SYSTEMS

Standard: FCC 47 CFR PART 15 : 2015

Section: 15.247 a) (2)

Test configuration:

The system is tested in normalized test site.

The test unit is placed on a rotating table, 0.8 m from a ground plane. Zero degree azimuth corresponds to the front of the equipment under test.

The level was maximised in antenna height, azimuth and polarization. The maximum level measured on the spectrum analyser was recorded.

Distance of antenna: 3 meters

Instrumentation test list:

CATEGORY	BRAND	TYPE	Nr EMITECH
Antenna	Emco	3115	3374
Antenna mast	Maturo	MCU	8410
Antenna mast	Maturo	Maturo	8411
Cable	C&C	C&C	11136
Cable	C&C	C&C	11172
Cable	C&C	N-2m	11181
Cable	C&C	N-2m	11182
Shielded enclosure	SIDT	SIDT	0549
Spectrum analyzer	Rohde & Schwarz	FSP40 (V 4.00SP1-V3.0-10-2)	5175

Equipment under test operating condition:

E.U.T. is in continuous transmission mode.

Measure conditions:

Ambient temperature (°C): 20
Relative humidity (%): 50

Resolution bandwidth: 100 kHz

Results:

Power source: 15-120Vdc (32 Vdc for the tests)

Frequency	Mode	Results
2405 MHz	802.15.4	1.58 MHz
2440 MHz		1.59 MHz
2480 MHz		1.57 MHz

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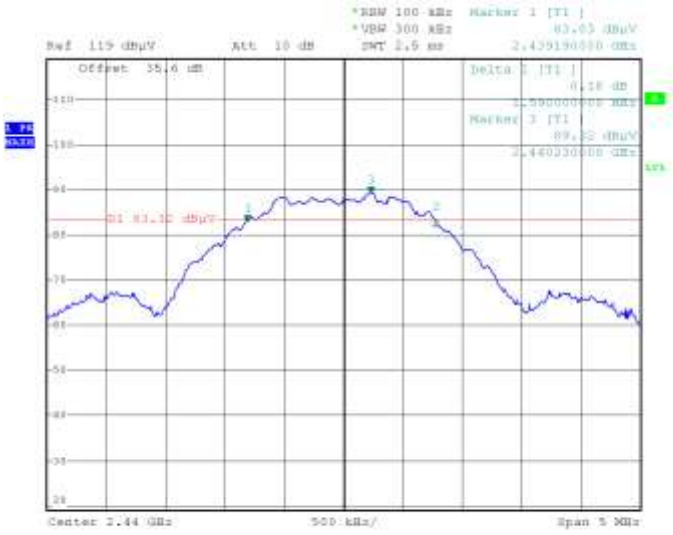

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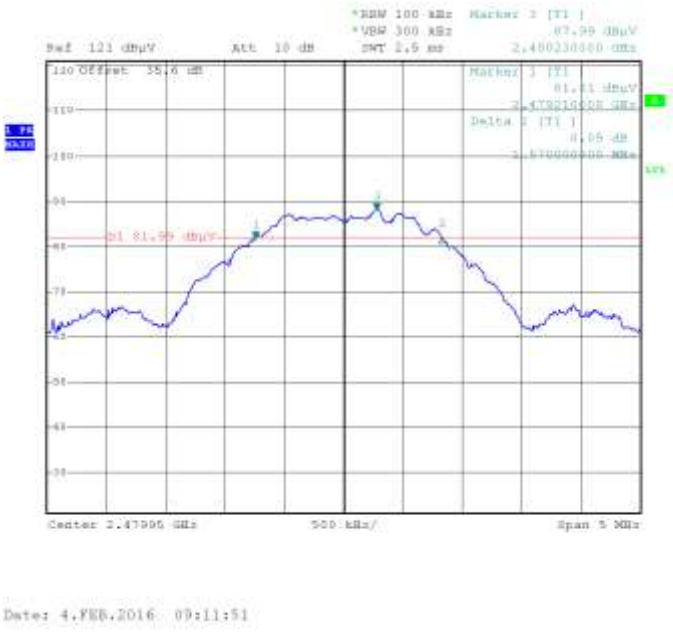

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Test conclusion: Complies with the requirements of the standard.

6. TRANSMITTER OUTPUT POWER

Standard: FCC 47 CFR PART 15 : 2015

Section: 15.247 b) (3)

Test configuration:

The system is tested in normalized test site.

The test unit is placed on a rotating table, 0.8 m from a ground plane. Zero degree azimuth corresponds to the front of the equipment under test.

The level was maximised in antenna height, azimuth and polarization. The maximum level measured on the spectrum analyser was recorded.

Distance of antenna: 3 meters

Instrumentation test list:

CATEGORY	BRAND	TYPE	Nr EMITECH
Antenna	Emco	3115	3374
Antenna mast	Maturo	MCU	8410
Antenna mast	Maturo	AM 4.0	8411
Cable	C&C	C&C	11136
Cable	C&C	C&C	11172
Cable	C&C	N-2m	11181
Cable	C&C	N-2m	11182
Shielded enclosure	SIDT	SIDT	0549
Spectrum analyzer	Rohde & Schwarz	FSP40 (V 4.00SP1-V3.0-10-2)	5175

Equipment under test operating condition:

E.U.T. is in continuous transmission mode.

Measure conditions:

Ambient temperature (°C): 20
Relative humidity (%): 50

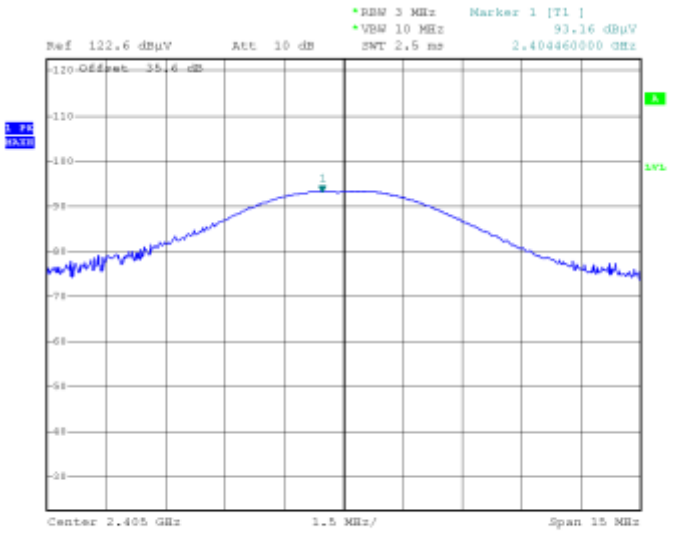
Resolution bandwidth: 3 MHz

Results:

Power source: 15-120Vdc (32 Vdc for the tests)

Frequency	Mode	Electro-magnetic field (dBµV/m)	TP* (dBm)	Limit (dBm)
2405 MHz	802.15.4	93.38	- 4.00	+ 30
2440 MHz		92.79	- 4.58	+ 30
2480 MHz		91.56	- 5.81	+ 30

* TP = $(E \times d)^2 / (30 \times 1.64)$ for d = 3 m



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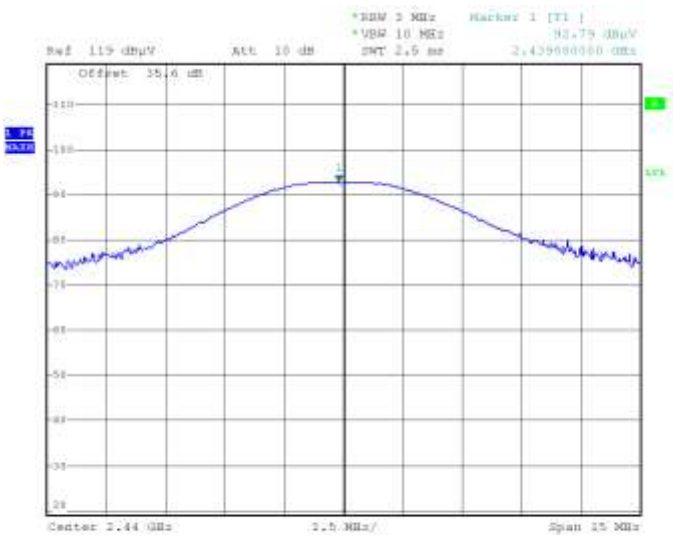

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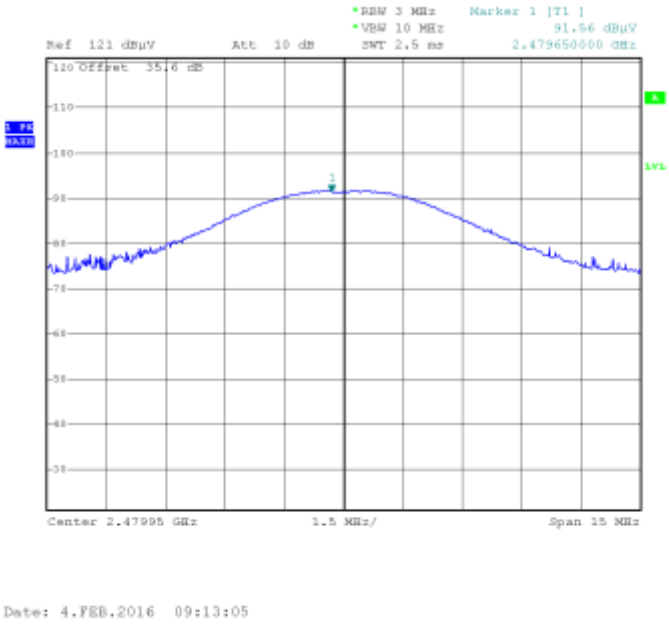


Test conclusion: Complies with the requirements of the standard.

7. PEAK POWER SPECTRAL DENSITY

Standard: FCC 47 CFR PART 15 : 2015

Section: 15.247 e)

Test configuration:

The system is tested in normalized test site.

The test unit is placed on a rotating table, 0.8 m from a ground plane. Zero degree azimuth corresponds to the front of the equipment under test.

The level was maximised in antenna height, azimuth and polarization. The maximum level measured on the spectrum analyser was recorded.

Distance of antenna: 3 meters

Instrumentation test list:

CATEGORY	BRAND	TYPE	Nr EMITECH
Antenna	Emco	3115	3374
Antenna mast	Maturo	MCU	8410
Antenna mast	Maturo	AM 4.0	8411
Cable	C&C	C&C	11136
Cable	C&C	C&C	11172
Cable	C&C	N-2m	11181
Cable	C&C	N-2m	11182
Shielded enclosure	SIDT	SIDT	0549
Spectrum analyzer	Rohde & Schwarz	FSP40 (V 4.00SP1-V3.0-10-2)	5175

Equipment under test operating condition:

E.U.T. is in continuous transmission mode.

Measure conditions:

Ambient temperature (°C): 20
Relative humidity (%): 50

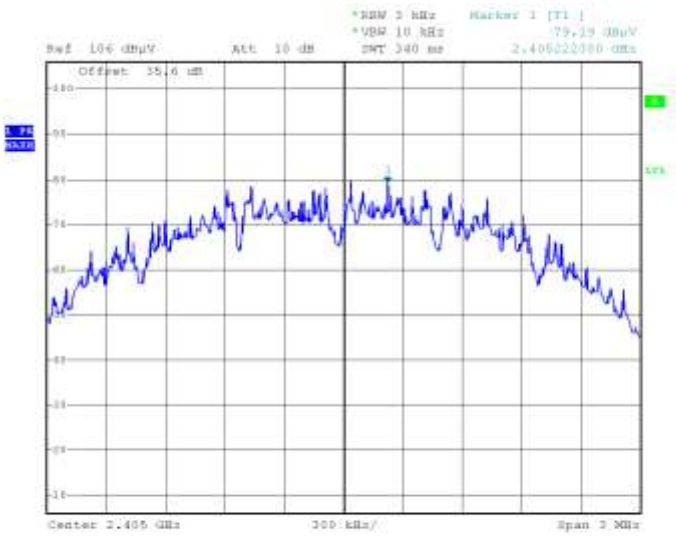
Resolution bandwidth: 3 kHz
Video bandwidth: 10 kHz

Results:

Power source: 15-120Vdc (32 Vdc for the tests)

Frequency	Mode	Electro-magnetic field (dBµV/m)	PPSD* (dBm)	Limit (dBm)
2405 MHz	802.15.4	79.19	- 18.90	+ 8.0
2440 MHz		78.61	- 18.76	
2480 MHz		76.71	- 20.66	

* PPSD = $(E \times d)^2 / (30 \times 1.64)$ for d = 3 m



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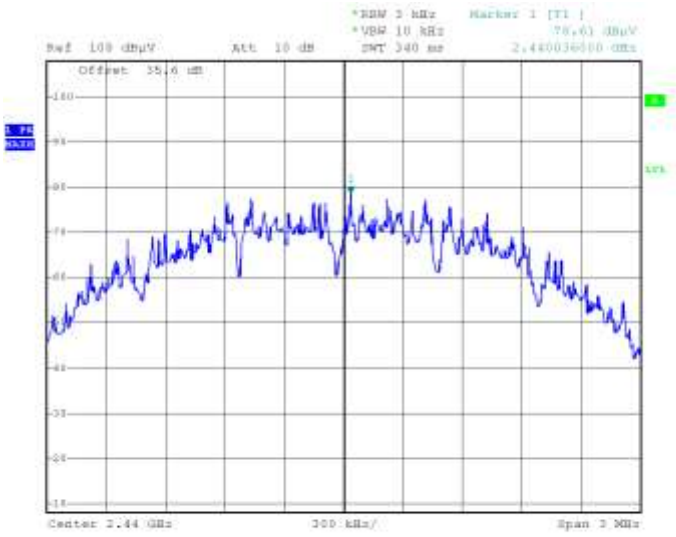

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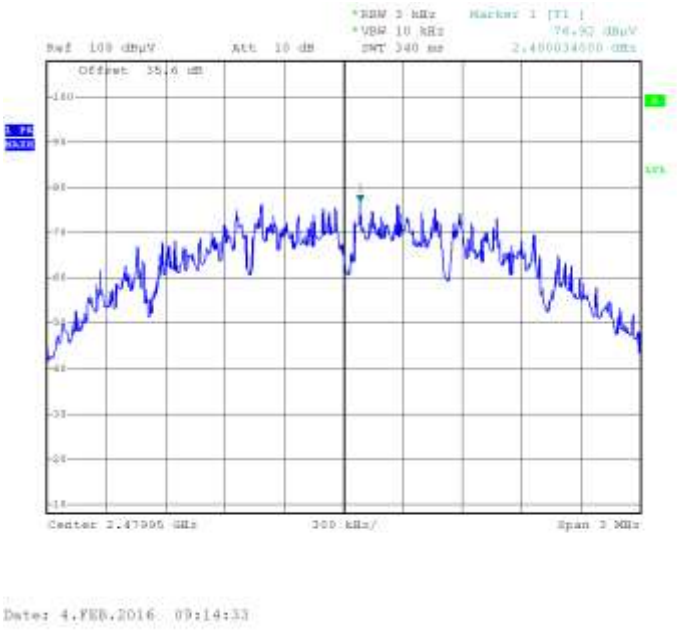


Test conclusion: Complies with the requirements of the standard.

8. ADDITIONAL PROVISIONS TO THE GENERAL RADIATED EMISSIONS LIMITATION

Standard: FCC 47 CFR PART 15 : 2015

Sections: 15.215 (b) and 15.247 (d)

Instrumentation test list:

CATEGORY	BRAND	TYPE	Nr EMITECH
Antenna	Emco	3115	3374
Antenna mast	Maturo	MCU	8410
Antenna mast	Maturo	AM 4.0	8411
Cable	C&C	C&C	11136
Cable	C&C	C&C	11172
Cable	C&C	N-2m	11181
Cable	C&C	N-2m	11182
Preamplifier	MITEQ	AFS42-00102650-42-10P-42	3229
Shielded enclosure	SIDT	SIDT	0549
Spectrum analyzer	Rohde & Schwarz	FSP40 (V 4.00SP1-V3.0-10-2)	5175

Equipment under test arrangement:

The system is tested in normalized test site.
The test unit is placed on a rotating table, 0.8 m from a ground plane. Zero degree azimuth corresponds to the front of the equipment under test.
The level was maximised in antenna height, azimuth and polarization. The maximum level measured on the spectrum analyser was recorded.

Results:

Ambient temperature (°C): 20
Relative humidity (%): 50

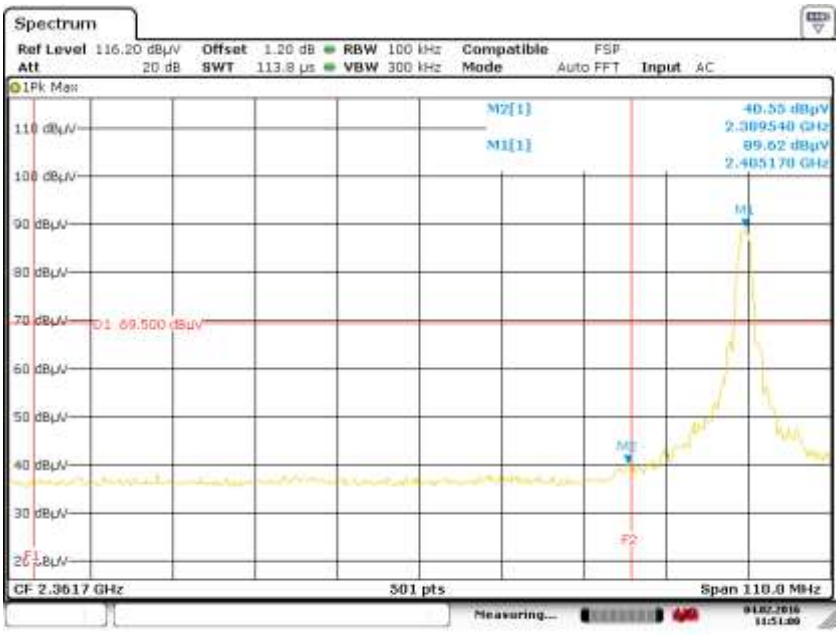
Lower Band Edge: from 2310 MHz to 2390 MHz
Upper Band Edge: from 2483.5 MHz to 2500 MHz

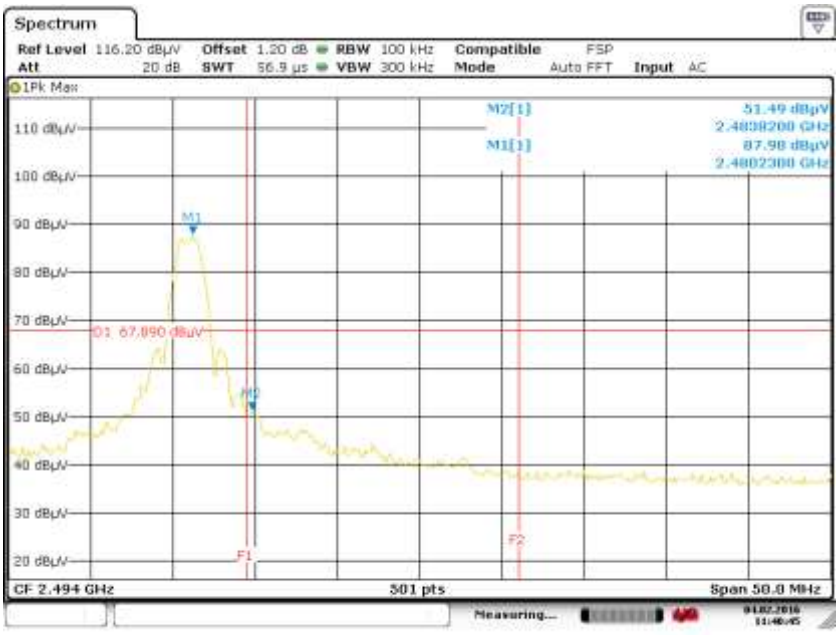
- Mode 802.15.4

Fundamental frequency (MHz)	Field Strength Level of fundamental (dBµV/m)	Detector (Peak or Average)	Frequency of maximum Band-edges Emission (MHz)	Delta Marker (dB) *	Calculated Max Out of Band Emission Level (dBµV/m)	Limits (dBµV/m)	Margin (dB)
2405.17	89.62	Peak	2389.40	- 49.07	40.55	54.0	13.45
2480.23	87.98	Peak	2483.82	- 36.49	51.49	54.0	2.51

The band edge readings were performed with a peak detector and with the E.U.T. set in a constant 100 % transmit state.

* According to step 2 of Marker-Delta Method DA 00-705.





9. UNINTENTIONAL RADIATED EMISSIONS AND TRANSMITTER UNWANTED EMISSION IN THE BAND 9 kHz – 25 GHz

Standard: FCC 47 CFR PART 15 : 2015

Sections: 15.205; 15.209 and 15.247

Equipment under test arrangement:

The equipment under test (EUT) is placed on a non-conductive test table at 0.8 m above the horizontal metal ground plane.

For maximum meter reading at each frequency, the antenna height is adjusted between 1 m and 4 m above the ground plane. A 360 degrees rotation of the EUT is performed in vertical and horizontal polarization. The frequency azimuth and antenna height are presented in the table on the next pages.

The E.U.T. is blocked in continuous transmission.

Frequencies range: 9 kHz – 30 MHz
30 MHz - 1 GHz
1 GHz – 25 GHz

Detection mode: Quasi-peak for 9 kHz – 30 MHz
Quasi-peak for 30 MHz - 1 GHz
Average for 1 GHz – 25 GHz

Resolution bandwidth: 200 Hz for 9 kHz – 150 kHz
9 kHz for 150 kHz – 30 MHz
120 kHz for 30 MHz - 1 GHz
1 MHz for 1 GHz – 25 GHz

Measurement distance: 3 meters from 9 kHz to 30 MHz
3 meters from 30 MHz to 25 GHz

- Limit for emission radiated outside the frequency band, except the harmonics, shall be attenuated by at least 20 dB below the level of fundamental or the general radiated emission limits.

From 9 kHz to 30 MHz

Frequencies range	Limit (µV/m)
9 – 490 kHz	2400/F (F in kHz) *
490 – 1705 kHz	24000/F (F in kHz) **
1.705 – 30 MHz	30 **

* Limits in µV/m can be extrapolated to 3 m using 40 dB / decade.
** Limits in µV/m can be extrapolated to 3 m using 20 dB / decade.

From 30 MHz to 25 GHz

Frequencies range (MHz)	Limit (dBµV/m)	(µV/m)
30 to 88	40.0	100
88 to 216	43.5	150
216 to 960	46.0	200
Above 960	54.0	500

Instrumentation test list:

CATEGORY	BRAND	TYPE	Nr EMITECH
Antenna	Emco	3115	3374
Antenna	Oritel	CM 42/25	1045
Antenna	Emco	6502	9579
Antenna	Schaffner	Bilog CBL6143A	5647
Antenna mast	Maturo	MCU	8410
Antenna mast	Maturo	AM 4.0	8411
Cable	C&C	C&C	11136
Cable	C&C	C&C	11172
Cable	C&C	N-2m	11181
Cable	C&C	N-2m	11182
Cable	C&C	K-2m	11133
Cable	C&C	K-2m	11132
Preamplifier	Miteq	AFS42-00102650-42-10P-42	3229
Shielded enclosure	SIDT	SIDT	0549
Spectrum analyzer	Rohde & Schwarz	FSP40 (V 4.00SP1-V3.0-10-2)	5175
Filter	Micro-tronics	Micro-tronics	4691
Preamplifier	Mini-Circuits	ZFL-1000LN	6367
Receiver	Rohde & Schwarz	ESRP7	10517

Results:

Ambient temperature (°C): 20
Relative humidity (%): 50
Power source: 15-120Vdc (32 Vdc for the tests)

Frequency 2405 MHz

FREQUENCY (MHz)	Detector	Antenna height (cm)	Azimuth (degree)	Resolution bandwidth	Polarization H: Horizontal V: Vertical	Field strength (dBµV/m)	Limits (dBµV/m)	Margin (dB)
4810	Average	150	0	1 MHz	V	34.76	54.0	19.24
4810	Average	100	350	1 MHz	H	37.54	54.0	16.46

Frequency 2440 MHz

FREQUENCY (MHz)	Detector	Antenna height (cm)	Azimuth (degree)	Resolution bandwidth	Polarization H: Horizontal V: Vertical	Field strength (dBµV/m)	Limits (dBµV/m)	Margin (dB)
4880	Average	100	10	1 MHz	V	34.59	54.0	19.41
4880	Average	100	0	1 MHz	H	35.33	54.0	18.67

Frequency 2480 MHz

FREQUENCY (MHz)	Detector	Antenna height (cm)	Azimuth (degree)	Resolution bandwidth	Polarization H: Horizontal V: Vertical	Field strength (dBµV/m)	Limits (dBµV/m)	Margin (dB)
4958.90	Average	100	350	1 MHz	V	30.53	54.0	23.47
4958.82	Average	100	0	1 MHz	H	30.57	54.0	23.43

No significant frequency has been found other than those given above between 9 kHz to 30 MHz and 8 GHz to 25 GHz.

Test conclusion:

The equipment complies with the requirements of the standard.

« □□□ End of report, 4 annexes to be forwarded □□□ »

ANNEX 1

ANTENNA FACTORS, INSERTION LOSSES AND AMPLIFIER VALUES

BILL OF MATERIAL

The test antenna used for the radiated emission between 9 kHz and 30 MHz is the active loop antenna n°9579. Antenna factors are given in table 1.

The test antenna used for the radiated emission between 30 MHz and 1 GHz is the bilog antenna n°5647. Antenna factors are given in table 2.

The measuring receiver n°10517 used in the frequency range 9 kHz and 30 MHz.

The measuring receiver n°10517 used in the frequency range 30 MHz to 1 GHz has an integrated preamplifier.

The spectrum analyzer n°5175 is used in the frequency range 1 GHz to 25 GHz.

The test cable used between 9 kHz and 30 MHz to connect the antennas to the receiver for measurements at a distance of 30 meters has losses given in table 3.

The test cables used between 30 MHz and 1 GHz to connect the antennas to the receiver for measurements at a distance of 3 meters has losses given in table 4.

The test antenna used for the radiated emission between 1 GHz and 18 GHz is the horn antenna n°3374. Factors are given in table 5.

The test antenna used for the radiated emission between 18 GHz and 25 GHz is the horn antenna n°1045. Factors are given in table 6.

The amplifier n°3229 used to connect the spectrum analyzer to the test cable has gain values given in the table 7.

The test cable used between 1 GHz and 8 GHz to connect the horn antenna to the amplifier for measurements at distance of 3 meters has losses given in table 8.

The test cables used between 8 GHz and 26 GHz to connect the horn antenna to the amplifier for measurements at distance of 3 meters has losses given in table 9.

Frequency (MHz)	Antenna factor (dB/m)	Frequency (MHz)	Antenna factor (dB/m)
0.009	- 11.800	0.8	- 11.200
0.01	- 11.800	1	- 11.200
0.015	- 11.800	1.5	- 11.100
0.02	- 11.800	2	- 11.000
0.03	- 11.800	3	- 10.900
0.05	- 11.700	5	- 10.700
0.08	- 11.700	8	- 10.300
0.1	- 11.600	10	- 10.000
0.15	- 11.600	15	- 9.300
0.2	- 11.500	20	- 8.400
0.3	- 11.500	25	- 6.300
0.5	- 11.400	30	- 5.700

TABLE 1 : ACTIVE LOOP ANTENNA

Frequency (MHz)	Antenna factor (dB/m)	Frequency (MHz)	Antenna factor (dB/m)
30	23.5	160	10.8
35	20.5	180	10.3
40	17.9	200	11.6
45	15.4	250	13.4
50	13.0	300	14.1
60	10.7	400	16.4
70	8.9	500	17.2
80	7.4	600	18.5
90	8.3	700	19.1
100	10.9	800	19.9
120	13.8	900	20.1
140	12.7	1000	20.6

TABLE 2 : BILOG ANTENNA

Frequency (MHz)	Loss (dB)	Frequency (MHz)	Loss (dB)
0.009	0.03	6.000	0.32
0.020	0.03	7.000	0.34
0.050	0.03	8.000	0.36
0.100	0.04	9.000	0.38
0.500	0.11	10.00	0.41
1.000	0.14	15.00	0.48
2.000	0.20	20.00	0.56
3.000	0.23	25.00	0.61
4.000	0.27	30.00	0.67
5.000	0.29	-	-

TABLE 3 : TEST CABLE FOR 3M MEASUREMENT INTO 9 kHz AND 30 MHz

Frequency (MHz)	Loss (dB)	Frequency (MHz)	Loss (dB)
30	0.77	250	2.19
40	0.90	300	2.42
50	0.99	400	2.83
60	1.08	500	3.12
70	1.17	600	3.43
80	1.25	700	3.75
90	1.32	800	4.00
100	1.41	900	4.22
150	1.70	1000	4.45
200	1.99	-	-

TABLE 4 : TEST CABLES FOR 3M MEASUREMENT INTO 30 MHz AND 1 GHz

Frequency (GHz)	Antenna factor (dB/m)	Frequency (GHz)	Antenna factor (dB/m)
1.0	23.7	10.0	37.6
1.5	25.0	10.5	37.8
2.0	27.5	11.0	38.1
2.5	28.8	11.5	38.3
3.0	29.8	12.0	38.8
3.5	31.2	12.5	38.8
4.0	32.5	13.0	39.4
4.5	32.5	13.5	40.0
5.0	33.5	14.0	40.1
5.5	34.1	14.5	40.6
6.0	34.1	15.0	40.6
6.5	34.4	15.5	39.7
7.0	35.4	16.0	39.3
7.5	36.6	16.5	39.9
8.0	36.6	17.0	41.4
8.5	37.0	17.5	45.1
9.0	37.1	18.0	46.3
9.5	37.2	-	-

TABLE 5 : HORN ANTENNA

Frequency (GHz)	Antenna factor (dB/m)	Frequency (GHz)	Antenna factor (dB/m)
18.0	30.7	22.5	30.9
18.5	30.7	23.0	31.2
19.0	30.5	23.5	31.1
19.5	30.7	24.0	31.3
20.0	30.7	24.5	31.5
20.5	30.8	25.0	31.0
21.0	30.9	25.5	31.0
21.5	30.5	26.0	31.4
22.0	30.6	-	-

TABLE 6 : HORN ANTENNA

Frequency (GHz)	Gain value (dB)	Frequency (GHz)	Gain value (dB)
1.0	33.4	12.0	32.4
1.5	33.7	13.0	32.5
2.0	33.9	14.0	31.6
2.5	34.0	15.0	33.0
3.0	33.9	16.0	33.5
4.0	34.3	17.0	33.9
5.0	35.2	18.0	34.3
6.0	34.7	19.0	34.4
7.0	34.0	20.0	32.9
8.0	33.7	21.0	33.2
9.0	31.8	22.0	34.3
9.5	31.1	23.0	34.6
10.0	30.5	24.0	34.4
10.5	30.7	25.0	34.5
11.0	31.1	26.0	32.5

TABLE 7 : AMPLIFIER GAIN VALUE

Frequency (GHz)	Gain value (dB)
1.0	6.900
1.5	8.462
2.0	9.722
2.5	11.073
3.0	9.410
4.0	10.846
5.0	12.359
6.0	13.978
7.0	15.357
8.0	16.022

TABLE 8 : TEST CABLE FOR 3M MEASUREMENT INTO 1 TO 8 GHz

Frequency (GHz)	Loss (dB)
9.0	5.33
9.5	5.41
10.0	5.60
10.5	0.19
11.0	5.90
12.0	6.11
13.0	6.41
14.0	6.60
15.0	6.88
16.0	7.17
17.0	7.51
18.0	7.59
19.0	7.65
20.0	7.87
21.0	8.13
22.0	8.31
23.0	8.47
24.0	8.65
25.0	8.85
26.0	9.06

TABLE 9: TEST CABLE FOR 3M MEASUREMENT INTO 8 TO 26 GHz

ANNEX 2

EXTERNAL PHOTOGRAPHS

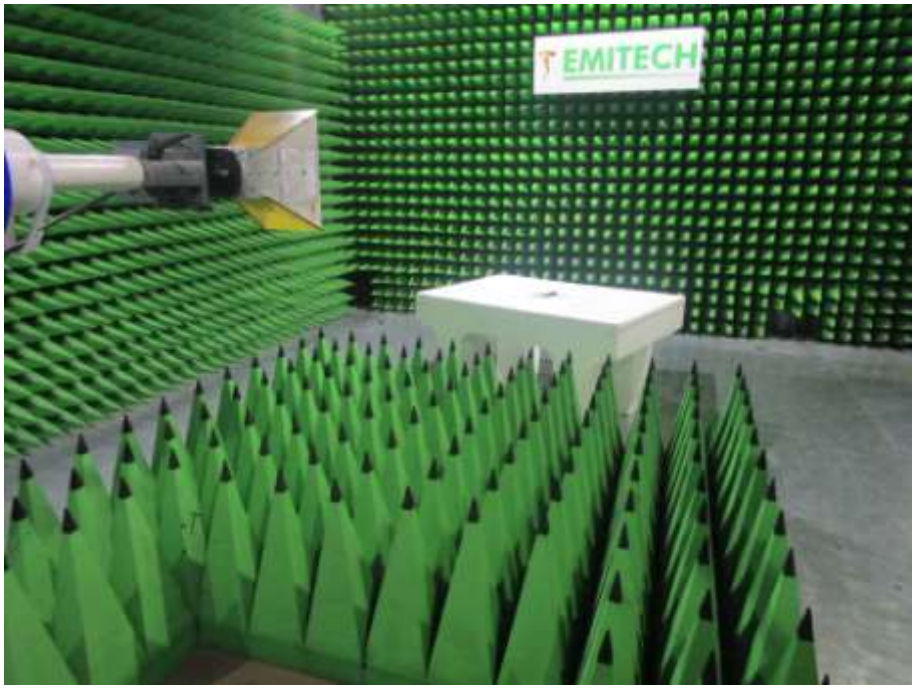

LEGACY
BOX

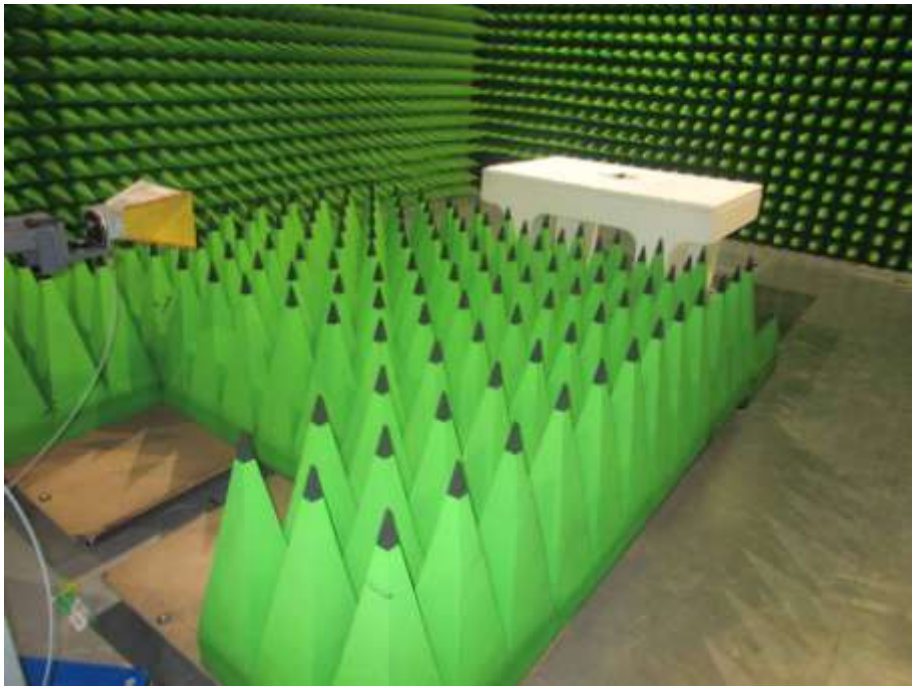

LEGACY
BOX
EUROCEM

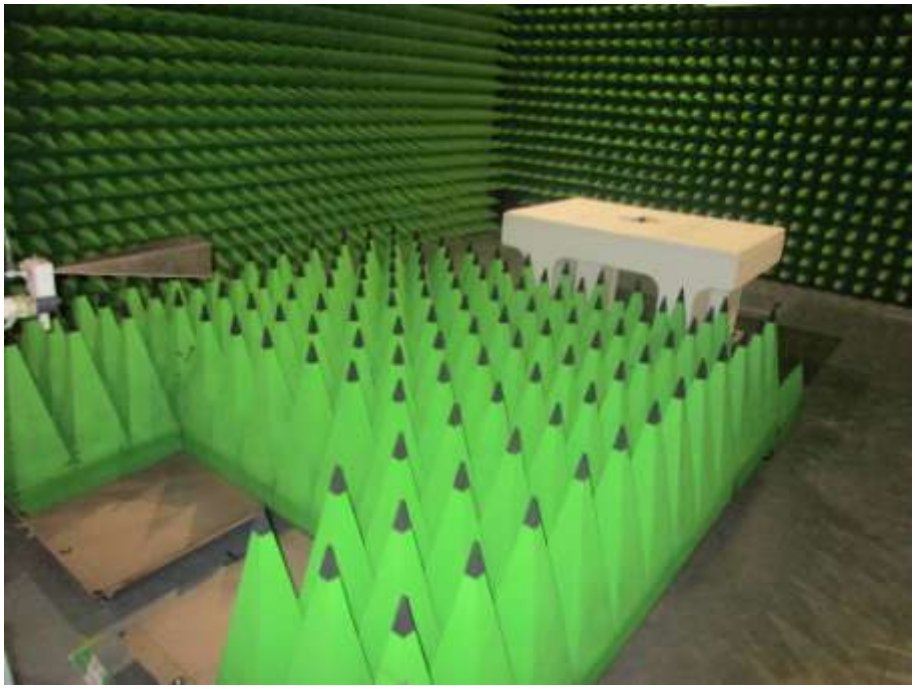

LEGACY
BOX
DOUGLAS BATTERY
AA-1D03FC

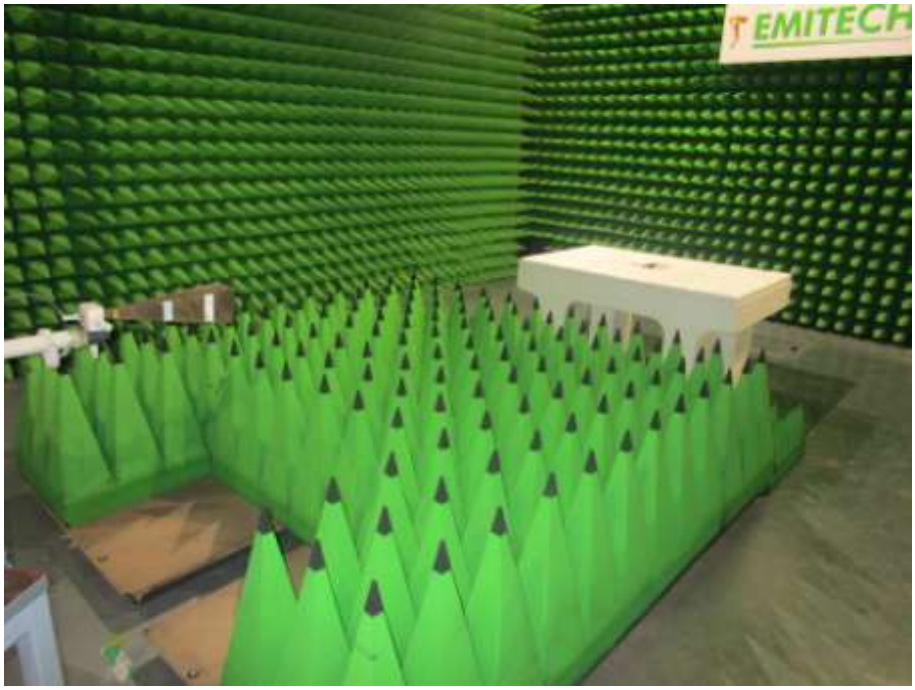
ANNEX 3

TEST SETUP PHOTOGRAPHS


EMITECH



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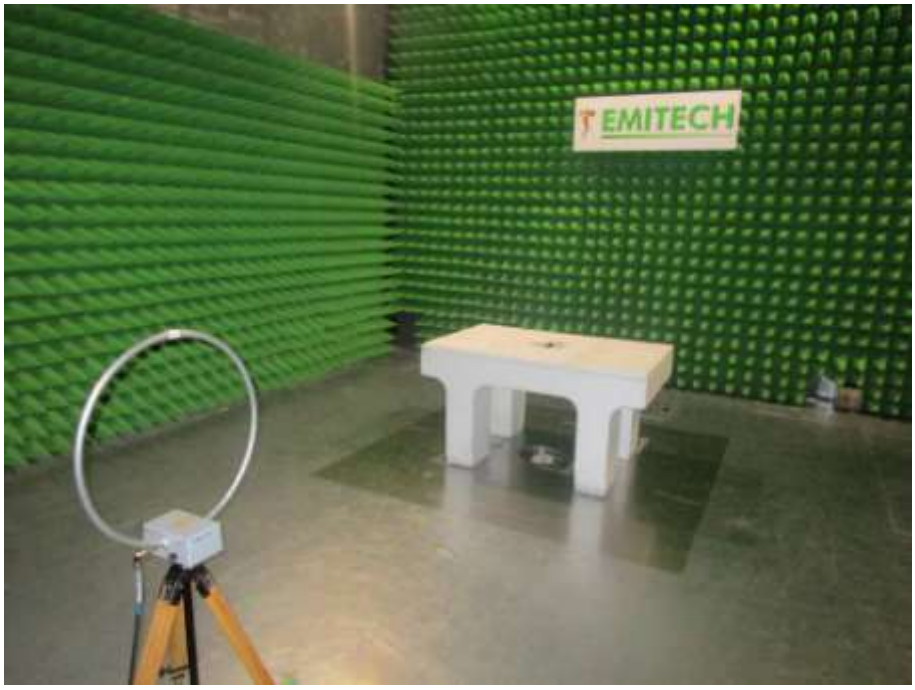
EMITECH


EMITECH


EMITECH

ANNEX 4

CALIBRATION DATES

N° EMITECH	LAST CALIBRATION	CALIBRATION DUE DATE
10517	18/09/2014	18/09/2016
0549	17/02/2015	17/02/2018
5647	25/02/2013	25/02/2017
11181	28/03/2014	28/03/2016
11136	10/03/2014	10/03/2016
11182	28/03/2014	28/03/2016
5175	23/06/2014	23/06/2016
3374	28/10/2015	28/10/2018
1045	21/03/2015	21/03/2019
11132	10/03/2014	10/03/2016
11133	10/03/2014	10/03/2016
11172	28/03/2014	28/03/2016
9579	22/08/2015	22/08/2017
3229	02/04/2015	02/04/2016
6367	16/07/2015	16/07/2016
4691	30/04/2015	30/04/2017