TEST REPORT

According to FCC, CFR 47 Part 15

UDRE radio remote control receiver

N°662102-CC-1-b

GYL technologies
Parc d'activités de Lanserre
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Summary

1 Reference and record of revisions of the test report:

Test report number :	**Revision :**	**Number of pages**	**Modification reasons :**
662102-CC-1-a	a	13	Creation, September 23, 2009
662102-CC-1-b	b	13	Modification of radiated emission
Redactor : Jean-Luc JAMET			**Date of writing** : October 26, 2009
Technical control: O. ROY 			**Quality Control: M. CABALLERO** 

2 Interpretation and remarks:

2.1 RESULTS:

This equipment complies with the rules of the FCC section 15.107, 15.109 class B and related sections.

3 GENERAL INFORMATION:

3.1 APPLICANT:

JAY ELECTRONIQUE
ZAC La Bâtie
35 Allée Champrond
38330 SAINT ISMIER Cedex
FRANCE

3.2 MANUFACTURER:

JAY ELECTRONIQUE
ZAC La Bâtie
35 Allée Champrond
38330 SAINT ISMIER Cedex

3.3 TEST DATE:

June 3 to 5, October 20 , 2009

3.4 TEST SITE:

GYL Technologies
Parc d'activités de Lanserre
49610 Juigné sur Loire – France
FCC registration Number: 90469

4 INTRODUCTION:

The following test report for the receiver part of a radio remote controls system is written in accordance with Part 15 of the Federal Communications Commissions. The Equipment under Test (EUT) was Industrial Enhanced-Safety Radio Controls named "UDRE radio remote control". The test results reported in this document relate only to the item that was tested.

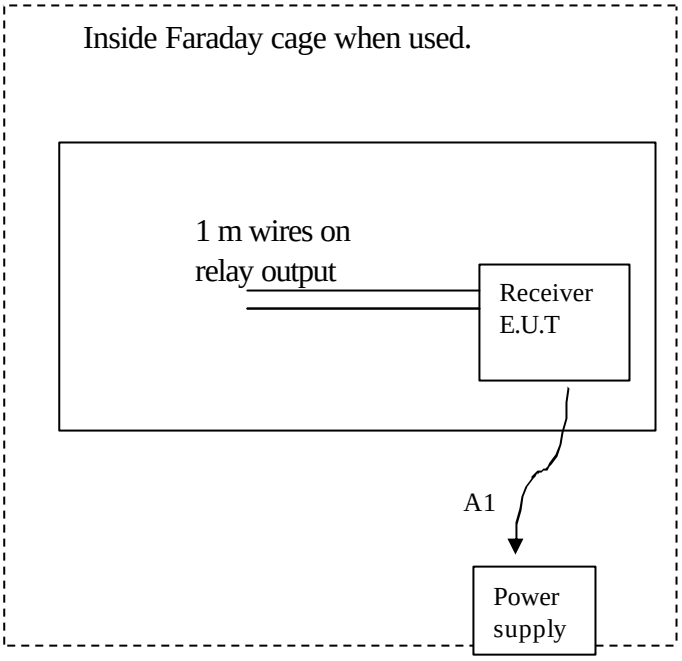
All measurements contained in this Application were conducted in accordance with ANSI C63.4 Methods of Measurement of Radio Noise Emissions of 2001. The instrumentation utilized for the measurements conforms to the ANSI C63.4 standard for EMI and Field Strength Instrumentation. Some accessories are used to increase sensitivity and prevent overloading of the measuring instrument. These are explained in this report. Calibration checks are performed regularly on the instruments, and all accessories including the high pass filter, preamplifier and cables.

All conducted and radiated emissions measurements were performed manually at GYL TECHNOLOGIES. The radiated emissions measurements required by the rules were performed on the three to ten meters, open field, test site maintained by GYL Technologies Parc d'activités de Lanserre, 49610 Juigné sur Loire , France. Complete description and site attenuation measurement data have been placed on file with the Federal Communications Commission.

5 MEASUREMENT EQUIPMENT LIST:

PART TYPE	MANUFACTURER	MODEL	GYL NUMBER	CALIBRATION DATE	CALIBRATION DUE DATE
RECEIVERS					
Receiver	Rohde & Schwarz	ESI 7	M02020	May 09	May 10
Spectrum analyzer	Rohde & Schwarz	FSEM 30	M02021	May 09	May 10
Filter 150 kHz	Rohde & Schwarz	EZ25	M02040	March 09	March 10
ARTIFICIAL MAINS NETWORKS					
LISN (50µH / 5/50Ω)	Rohde & Schwarz	ESH3-Z5	M02027	June-08	June-09
ANTENNAS					
Bilog (30-2000MHz)	CHASE	CBL-6112	M02031	June-08, June-09	June-10
Bilog (30-2000MHz)	CHASE	CBL-6112	M02032	June-08, June-09	June-10
Magnetic field antenna	R&S	HFH2-Z2	M01128	April 08	April 10
Horn antenna	EMCO	3115	M02045	Feb-09	Feb-10
Amplifier 0.5-18GHz	LUCIX Corporation	S005180L3201	M08007	April 09	April 10

6 CONFIGURATION OF TESTED SYSTEM:



E.U.T.: Equipment Under Test

7 EXERCISING TEST CONDITIONS:

The receiver is connected on the main supply; powered with 120V 60Hz.

8 CONFORMANCE STATEMENT:

8.1 STANDARDS REFERENCED FOR THIS REPORT:

PART 2: 2004	Frequency allocations and Radio Treaty Matters General Rules and Regulations
PART 15: 2006	Radio frequency devices
ANSI C63.4-2003	Standard format measurements/technical report personal computer and peripherals

8.2 JUSTIFICATION:

As mentioned in paragraph 5 of this report, the equipment is a radio remote control receiver. It can be installed in industry areas the following sub clause of the standard mentioned above are:

- Part 15.107 and 15.109 (subpart B) for respectively conducted and radiated emission for unintentional radiator (Class B)

TEST ACCORDING TO CFR 47 Part 15

Tests performed by Jean-Luc JAMET at GYL Technologies laboratories from 3 to 5 June, 2009.

8.3 REFERENCE DOCUMENTATION:

FCC part 15 (Sub part B) 15.107, 15.109 of 2008

8.4 POWER LINE CONDUCTED EMISSIONS MEASUREMENTS (15.107):

The power line conducted emission measurements were performed in a semi anechoic chamber. The EUT was assembled on a non conductive 80 centimeters high wooden table. Power was fed to the EUT through a 50 ohm / 50 micro-Henry Line Impedance Stabilization Network (EUT LISN). The EUT LISN was fed power through an A.C. filter box on the outside of the shielded enclosure. The filter box and EUT LISN housing are bonded to the ground plane of the shielded enclosure. The spectrum analyzer was connected to the A.C. line through an isolation transformer. The 50-ohm output of the EUT LISN was connected to the spectrum analyzer input through a Rohde and Schwartz 150 kHz high-pass filter. The filter is used to prevent overload of the spectrum analyzer from noise below 150 kHz. Conducted emission levels were measured on each current-carrying line with the receiver operating in the CISPR quasi-peak mode (or average mode if applicable

8.5 RESULTS:

The conducted emissions initial measurement consists of a prescan (tester in receiver mode), in order to determine the maximum quasi peak and average values.

- If the conducted emissions have limits showing a margin lower than 20dB, data collection measurement is performed on the six (6) highest frequencies to determine the compliance of the EUT.
- If the conducted emissions have limits showing a margin greater than 20dB, data collection measurement is not performed and the curves are given as evidence of compliance.

The following table lists worst-case conducted emission data. Specifically: emission frequency, measurement level (including cable loss and transducer factors) in quasi-peak and average mode and margin.

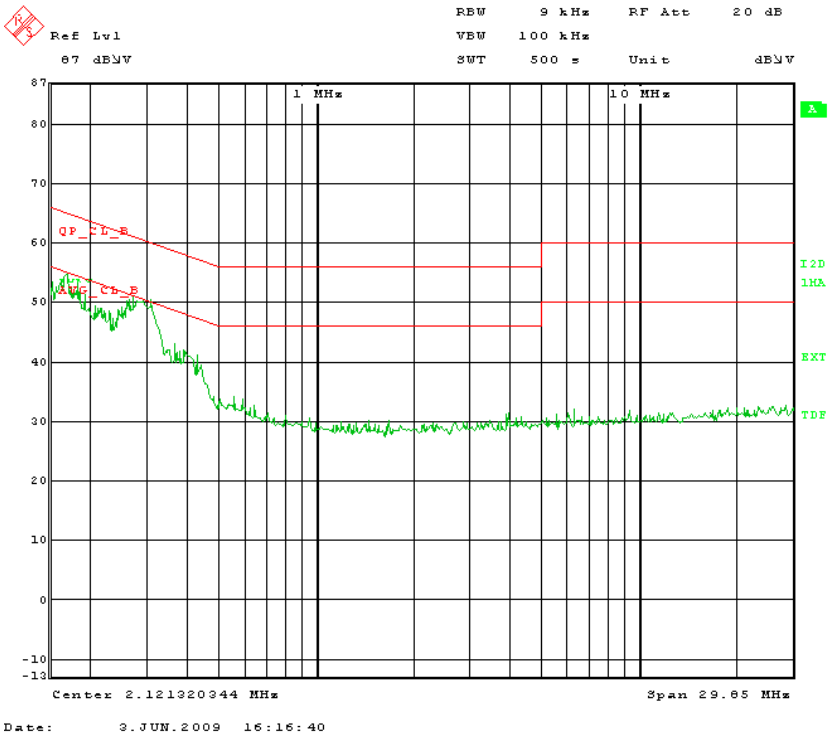
The conducted test was performed with the EUT exercise program loaded, and the emissions were scanned between 150 kHz to 30 MHz on the NEUTRAL SIDE and LIVE SIDE, herein referred to as Neutral, and Live respectively.

ESI 7 EMI TEST RECEIVER IN RECEIVER MODE	
Peak measurement time	5 ms
step size	4kHz
Preamplifier	OFF
Preselector	ON
Resolution, Band With	9 kHz
Final Quasi Peak measurement time	1 s minimum
Final average measurement time	1 sec minimum

8.5.1 Power supply

8.5.1.1 Neutral:

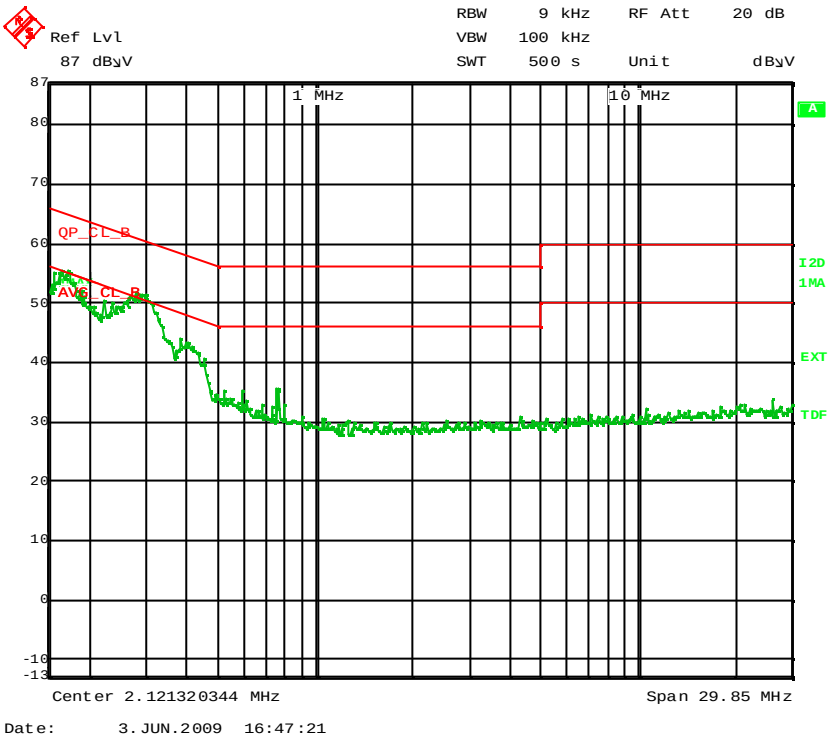
Legend: Green curve represents the peak values



Frequency (MHz)	Quasi-peak (dBµV)	QP Limit (dBµV)	QP margin (dB)
0,166	45,9	65,2	19,3
0,174	45,6	64,8	19,2
0,274	42,0	61,0	19,0
0,286	42,2	60,6	18,4
0,298	42,2	60,3	18,1
0,306	41,7	60,1	18,4

Frequency (MHz)	Average (dBµV)	Average Limit (dBµV)	Average margin (dB)
0,162	36,3	55,4	19,1
3,810	18,8	46,0	27,2
4,446	19,4	46,0	26,6
4,766	18,3	46,0	27,7
20,006	18,2	50,0	31,8

8.5.1.2 LIVE:



Frequency (MHz)	Quasi-peak (dBµV)	QP Limit (dBµV)	QP margin (dB)
0,170	46,4	65,0	18,6
0,266	42,5	61,2	18,8
0,278	42,9	60,9	17,9
0,290	43,4	60,5	17,2
0,302	43,0	60,2	17,2
0,314	41,9	59,9	18,0

Frequency (MHz)	Average (dBµV)	Average Limit (dBµV)	Average margin (dB)
0,158	39,1	55,6	16,5
12,066	20,6	50,0	29,4
14,766	19,2	50,0	30,8
15,086	18,0	50,0	32,0
15,718	20,3	50,0	29,7
16,990	19,3	50,0	30,7

8.6 INTERPRETATION AND REMARKS:

The equipment complies with the §15.107 requirements, Class B

8.7 RADIATED EMISSIONS MEASUREMENTS:

Emissions measurement results from 30MHz to 1GHz:

Before final measurements of radiated emissions were made on the open-field three/ten meter range; the EUT was pre-scanned in the semi anechoic at one meter distance. This was done in order to determine its emissions spectrum signature. The physical arrangement of the test system was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. This process was repeated during final radiated emissions measurements on the open-field range, at each frequency, in order to insure that maximum emission amplitudes were attained.

Final radiated emissions measurements were made on the three/ten-meter, open-field test site. The EUT was placed on a conductive turntable on isolated support, table, 0.8 meter above the ground plane. At each frequency, the EUT was rotated 360 degrees, and the antenna was raised and lowered from one to four meters in order to determine the maximum emission levels. Measurements were taken using both horizontal and vertical antenna polarizations. The spectrum analyzer's 6 dB bandwidth was set to 100kHz for peak measurement and 120 kHz for quasi-peak, and the analyzer was operated in the CISPR quasi-peak detection mode when needed. No video filter less than 10 times the resolution bandwidth was used. The range of the frequency spectrum to be investigated is specified in FCC Part 15. The highest emission amplitudes relative to the appropriate limit were measured and recorded in this report.

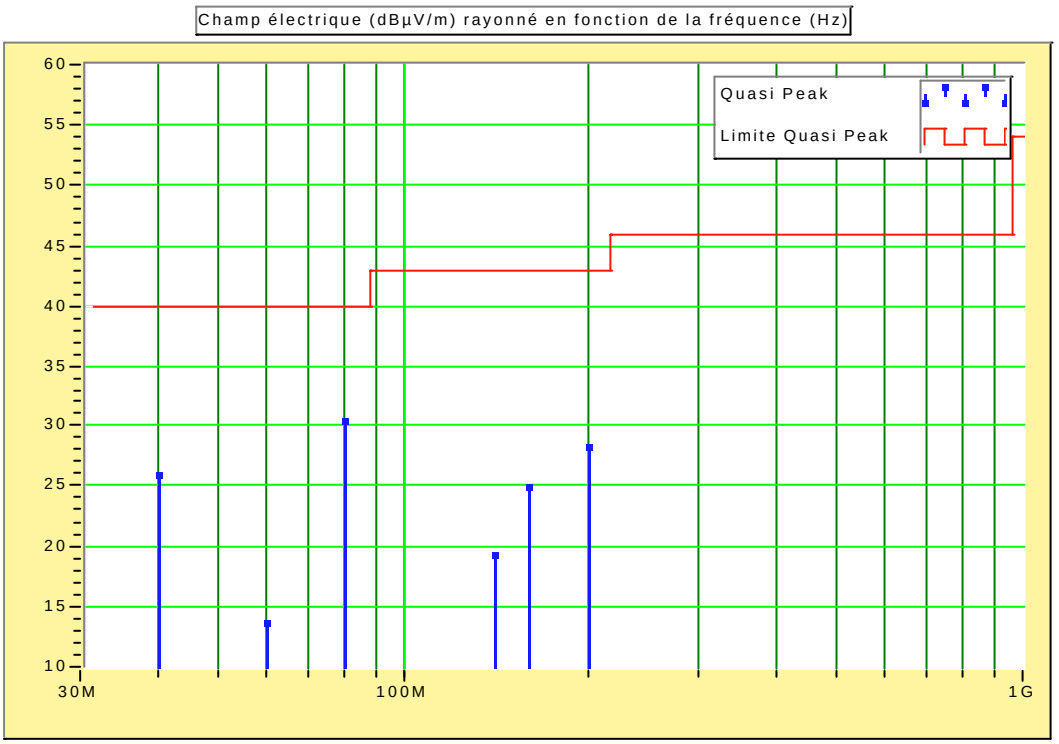
Summary of settings for measurements in restricted bands below 1GHz

ESI 7 EMI TEST RECEIVER IN RECEIVER MODE	
Peak measurement time	5 ms
step size	40 kHz
Preamplifier	ON
Preselector	ON
Resolution, Band Width	120 kHz
Final Quasi Peak measurement time	1 s minimum
Final average measurement time	1 s minimum

RESULTS (Class B):

The following data table lists the most significant emission frequencies, measured level, correction factor (includes cable and antenna corrections), corrected reading and the limit. The highest peaks are measured in quasi-peak detection mode at 3 meters distance.

Frequency (MHz)	Peak (dBµV/m)	Quasi peak (dBµV/m)	Limits	Margin (dB)	Polar.	Height (cm)	Angle (°)	Factor Corr. (dB)	Comment
39.997	32.2	25.9	40.0	14.1	V	114	360	14.6	ch64
59.996	18.2	13.7	40.0	26.3	V	108	360	6.4	ch01
79.993	31.6	30.4	40.0	9.6	V	106	360	9.4	ch01
140.045	23.7	19.3	43.0	23.7	H	125	360	12.2	ch32
159.993	26.9	24.9	43.0	18.1	H	107	360	13.1	ch32
200.015	29.9	28.2	43.0	14.8	H	167	360	11.7	ch32



Emissions measurement from 1GHz to 10GHz:

A pre-scan measurement is done very close to the product (less than 10cm) with 100 kHz RBW and a max peak detector. Then measurements are performed at 3 m with 1MHz RBW and VBW and a video averaging (10Hz) for average measurement.

A complete scan of particular frequencies is also performed on the antenna connector with 1MHz RBW with averaging (1kHz VBW) and without (1MHz VBW)

RESULTS:

Following LO leak on the lowest frequency, conducted measurement.

Freq. (MHz)	Peak level (dBm)	Peak Limit (dBm)	Peak margin (dB)	Avg (dBm)	Avg Limit (dBm)	Avg margin (dB)
911.49	NF			NF		
1822.98	-59.89	-31	28.89	-60.8	-51	9.8
2734.47	NF			NF		
3645.97	-72.10	-31	41.1	-73.8	-51	22.8
4557.46	NF			NF		
5468.95	NF			NF		
6380.45	-75	-31	44	-76.2	-51	25.2
7291.04	NF			NF		
8203.43	NF			NF		
9114.92	NF			NF		

Following LO leak on the highest frequency, conducted measurement.

Freq. (MHz)	Peak level (dBm)	Peak Limit (dBm)	Peak margin (dB)	Avg (dBm)	Avg Limit (dBm)	Avg margin (dB)
917.8928	NF			NF		
1835.80	-80	-31	49	-81.3	-51	30.3
2753.67	NF			NF		
3671.30	-83	-31	52	-84.1	-51	33.1
4590.00	NF			NF		
5507.8	NF			NF		
6425.4	NF			NF		
7343.10	-82.1	-31	51.1	-83.2	-51	32.2
8261.8	NF			NF		
9178.93	NF			NF		

The following data table lists the most significant emission frequencies, measured level, correction factor (includes cable and antenna corrections), corrected reading and the limit.

Freq. (MHz)	Peak (dBµV/m) At 3m	Peak Limit (dBµV/m)	Peak margin (dB)	Avg (dBµV/m) At 3m	Avg Limit (dBµV/m)	Avg margin (dB)
3645.3	48.1	74	25.9	40.96	54	13.04
3646.3	47.91	74	26.09	28.04	54	25.96
7291.6	50.26	74	23.74	36.85	54	17.15
7292.6	49.2	74	24.8	36.85	54	17.15

8.8 INTERPRETATION AND REMARKS:

The equipment complies with the §15.109 requirements, Class B