

TEST REPORT

1. Applicant

Name : Datalogic ADC s.r.l
Address : Via S. Vitalino, 13 - Calderara di Reno - 40012 (Bologna) - ITALY

2. Products

Name : Mobile Computer
Model : LYNX
Manufacturer : POINT MOBILE CO.,LTD

3. Test Standard : FCC CFR 47 Part 15B / ICES-003 Issue 4

4. Test Method : ANSI C63.4-2009

5. Test Results : Positive

6. Date of Application : June 29, 2012

7. Date of Issue : July 20, 2012

Tested by



Jong-gon Ban

Telecommunication Center
Senior Engineer

Approved by



Jeong-min Kim

Telecommunication Center
Manager

The test results contained apply only to the test sample(s) supplied by the applicant, and this test report shall not be reproduced in full or in part without approval of the KTL in advance.

Korea Testing Laboratory

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1. GENERAL INFORMATIONS

1.1 Applicant (Client)

Name	Datalogic ADC s.r.l.
Address	Via S. Vitalino, 13 – Calderara di Reno – 40012 (Bologna) - ITALY
Contact Person	Ruggero Cacioppo
Telephone No.	+39 051 314 73 93
E-mail address	Ruggero.cacioppo@datalogic.com
Manufacturer	POINT MOBILE CO.,LTD
Manufacturer Address	B-9F, Kabul great valley, 60-5, Gasan-dong, Geumcheon-gu, Seoul, Korea

1.2 Equipment (EUT)

FCC ID & Model Number	FCC ID : U4G0070, Model Name : LYNX	
IC Number & Model Number	IC Number :3862E-0070, Model Number : LYNX H2N0LD-1Q1-MEN0	
Series Model Description	LYNX H2N0LD-1N1-MEN0	Bluetooth, WiFi, Reader 1D, Numeric, Camera, GSM, UMTS, GPS
	LYNX H2N0WI-1N1-MEN0	Bluetooth, WiFi, Reader 2D, Numeric, Camera, GSM, UMTS, GPS
	LYNX H2N0LD-1Q1-MEN0	Bluetooth, WiFi, Reader 1D, QWERTY, Camera, GSM, UMTS, GPS
	LYNX H2N0WI-1Q1-MEN0	Bluetooth, WiFi, Reader 2D, QWERTY, Camera, GSM, UMTS, GPS
<u>Test Sample</u>	<u>Bluetooth, WiFi, Reader 1D, QWERTY, Camera, GSM, UMTS, GPS</u>	
RF Features	Bluetooth: BR(GFSK), EDR(π /4DQPSK, 8DPSK)	
	WLAN : 802.11b/b/n (BPSK/QPSK/CCK/16-QAM/64-QAM)	
	GSM: GSM/GPRS/EDGE850,1900	
	UMTS: WCDMA/HSPA850,1900	
Antenna Type	Internal Antenna	
Scan engine	1D laser	
Keypad and buttons	Qwerty (51 keys)	
AC/DC Adapter	Input : 100 -240 V 50/60 Hz 0.4 A, Output : DC 5.0 V, 1800 mA,	
Battery	Li-ion, 3.7 V, 1800 mAh (3600mAh optional)	
H/W & S/W version	H/W Ver. : 8 S/W Ver. : 50.00.53 B5	
<u>RF Module certificate</u> <u>802.11 b/g/n</u>	<u>FCC ID: TWG-SDCSSD40L, IC No. : 6616A-SDCSSD40L</u> <u>Name of Grantee: Summit Data Communications, Inc.</u>	
<u>RF Module certificate</u> <u>GSM/UMTS</u>	<u>FCC ID: QIPPH8-P, IC No. : 7830A-PH8P</u> <u>Name of Grantee: Cinterion Wireless Modules GmbH</u>	

1.3 Testing Laboratory

Testing Place	Korea Testing Labortory (KTL) 723, Haean-ro,Sangnok-gu, Ansan-si Gyunggi-Do , Korea
FCC registration number	408324
Industry Canada filing number	6298A
Test Engineer	Jong-gon Ban
Telephone number	+82 31 5000 133
Facsimile number	+82 31 5000 149
E-mail address	banjg@ktl.re.kr

2. SUMMARY OF TEST RESULTS

FCC Rules	IC Rules	Test Items	Result	Remarks
15.107(a)	ICES-003: 5.3	AC line Conducted Emission	Pass	-
15.109(a)	ICES-003: 5.5	Radiated Emission	Pass	-

Note 1 : Test results reported in this document relate only to the items tested

Note 2 : The required tests demonstrated compliance as per client declaration of test configuration, monitoring methodology and associated pass/fail criteria

Note 3 : Test results apply only to the item(s) tested

*** Modifications required for compliance**

No modifications were implemented by KTL.

All results in this report pertain to the un-modified sample provided to KTL.

3. TEST METHOLOGY

3.1 DECISION OF FINAL TEST MODE

1. The following test mode was scanned during the preliminary test:

Pre-Test Mode
Mode 1: Operating (EUT+Adapter+GSM/UMTS+BT+Reader 1D)

2. After the preliminary scan, the following test mode was found to produce the highest emission level.

Pre-Test Mode		
Emission	Conducted Emission	Mode 1
	Radiated Emission	Mode 1

Then, the above highest emission mode of the configuration of the EUT and cable was chosen for all final test items

3.2 Ancillary Equipment

The equipment under test has following AE.

- AC/DC Adaptor(with EuT) Model : KSAS0100500180D5
- Bluetooth Headset
- (Samsung and Plantronics) Model : MW600 and Voyager PRO HD
- Wireless LAN(ipTIME)
- -Adaptor(FAIRONE ELECRRONICS) Model : N704A
- PC(HP)
- -Adaptor(HP) Model : FSOD090800K
- - Model : dv6-2101AX
- - Model : PPP012D-S
- - Model : -
- - Model : -

4. TEST RESULTS

4.1 Conducted Emission

4.1.1 Test limit - FCC 15.107

(a) Except for Class A digital devices, for equipment that is designed to be conducted back onto the (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges.

Frequency (MHz)	Conducted Limits (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

4.1.2 Test Results Sample Calculation

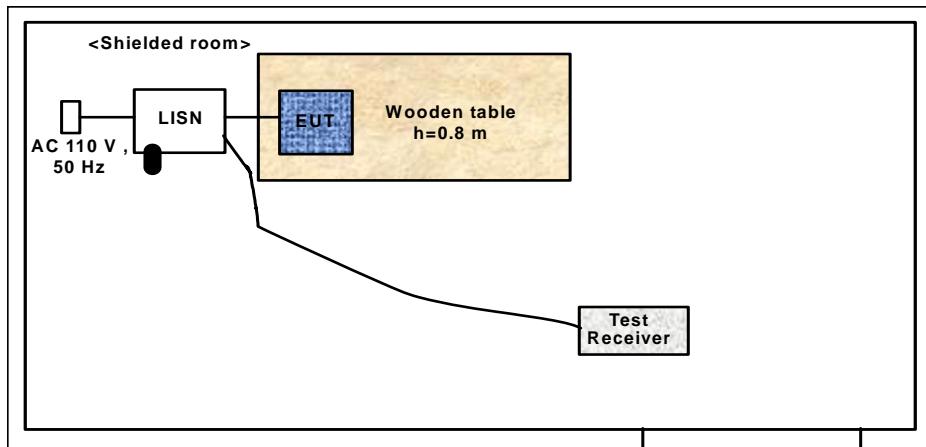
The emission level measured in decibels above one microvolt (dB μ V) was converted into microvolt (μ V) as shown in following sample calculation.

For example :

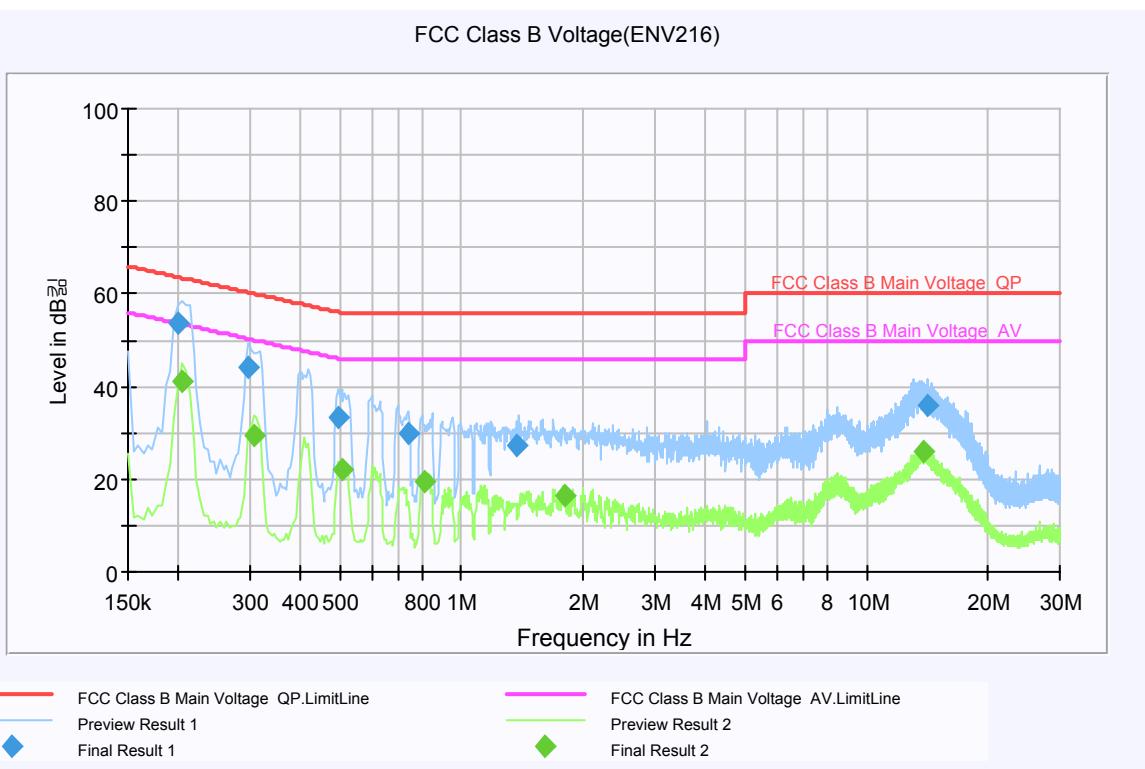
Measured Value at	0.1995 MHz	43.7 dB μ V @ Q-Peak mode
+ Correct factor *		9.8 dB
= Conducted Emission		53.5 dB μ V

* Correct factor is adding RF cable loss and Attenuation

4.1.3 Test Configuration



4.1.4 Test Results



Final Measurement - QuasiPeak

Frequency (MHz)	QuasiPeak (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.199500	53.5	N	9.8	10.1	63.6
0.298500	44.2	L1	9.7	16.1	60.3
0.496500	33.5	L1	9.7	22.6	56.1
0.739500	30.0	L1	9.7	26.0	56.0
1.369500	27.3	L1	9.7	28.7	56.0
14.113500	35.9	L1	10.0	24.1	60.0

Final Measurement - Average

Frequency (MHz)	Average (dB μ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.204000	41.2	L1	9.7	12.2	53.4
0.307500	29.5	N	9.8	20.5	50.0
0.505500	22.2	L1	9.7	23.8	46.0
0.811500	19.4	L1	9.7	26.6	46.0
1.792500	16.6	L1	9.7	29.4	46.0
13.852500	26.0	L1	10.0	24.0	50.0

Notes:

1. All Modes of operation were investigated and the worst-case emissions are reported.
2. Trace shown in plot are made using a peak detector.

4.2 Radiated Emissions

4.2.1 Test Procedure

4.2.1.1 Preliminary Testing for Reference

Preliminary testing was performed in a KTL absorber-lined room to determine the emission characteristics of the EUT. The EUT was placed on the wooden table which has dimensions of 0.8 meters in height, 1 meter in length and 1.5 meters in width. Receiving antenna (Biconi-Log antenna : 30 to 1000 MHz or Horn Antenna : 1 to 40 GHz) was placed at the distance of 3 meter from the EUT.

An attempt was made to maximize the emission level with the various configurations of the EUT. Emission levels from the EUT with various configurations were examined on a spectrum analyzer connected with a RF amplifier and graphed.

The emission was within the illumination area of the 3 dB beam width of the antenna so that the maximum emission from the EUT is measured.

4.2.1.2 Final Radiated Emission Test at an Absorber-Lined Room

The final measurement of radiated field strength was carried out in a KTL Absorber-Lined Room that was listed up at FCC according to the "Radiated Emissions Testing" procedure specified by ANSI C63.4.

Based on the test results in preliminary test, measurement was made in same test set up and configuration which produced maximum emission level. Receiving antenna was installed at 3-meter distance from the EUT, and was connected to an EMI receiver.

Turntable was rotated through 360 degrees and receiving antenna height was varied from 1 to 4 meters above the ground plane to read maximum emission level. Receiving antenna polarization was changed vertical and horizontal. The worst value was recorded.

If necessary, the radiated emission measurements could be performed at a closer distance than specified distance to ensure higher accuracy and their results were extrapolated to the specified distance using an inverse linear distance extrapolation factor (20 dB/decade) as per Section 15.31(f).

The maximum emission level from the EUT occurred in such configuration as shown in the following photograph.

Tested in EUT x, y, z axis and worst case results are reported

4.2.2 Limits

(a) Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency of Emission (MHz)	Field strength (Microvolts/meters)
30 – 88	100
88 – 216	150
216 – 960	200
Above 960	500

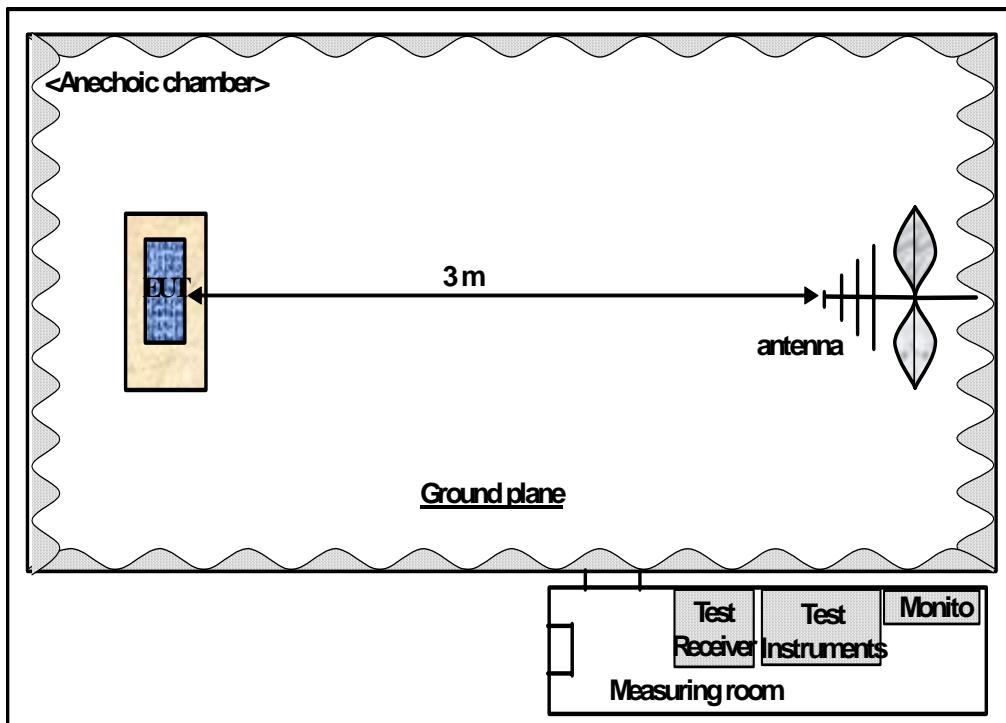
4.2.3 Sample Calculation

The emission level measured in decibels above one microvolt (dB μ V) was following sample calculation.

For example :

$$\begin{array}{ll}
 \text{Measured Value at } & 41.888 \text{ MHz} \quad 51.5 \text{ dB } \mu\text{V} \\
 \text{Antenna Factor & Cable loss - Preamplifier} & -17.3 \text{ dB} \\
 \hline
 = \text{ Radiated Emission} & 34.2 \text{ dB } \mu\text{V/m}
 \end{array}$$

4.2.4 Test Configuration



4.2.5 Test Results

4.2.5.1 Radiated Emission Results

Model Number : LYNX H2N0LD-1Q1-MEN0

Test distance : 3m

Date : July 11th, 2012

Frequency (MHz)	Antenna Pol. (H/V)	Bandwidth (kHz) Detector	Reading Level (dB μ V)	Correction Factor (dB)	Level Corrected (dB μ V/m)	Limit (dB μ V/m)	Margin (+/-)
41.888	V	120/Q-peak	51.5	-17.3	34.2	40.0	5.8
82.956	H	120/Q-peak	46.6	-21.3	25.3	40.0	14.7
89.088	H	120/Q-peak	51.8	-22.2	29.6	43.5	13.9
122.884	V	120/Q-peak	44.7	-18.6	26.1	43.5	17.4
152.156	H	120/Q-peak	42.5	-16.4	26.1	43.5	17.4
223.676	H	120/Q-peak	45.1	-18.5	26.6	46.0	19.4
229.856	H	120/Q-peak	46.5	-18.2	28.3	46.0	17.7
306.923	H	120/Q-peak	41.6	-15.2	26.4	46.0	19.6
318.735	H	120/Q-peak	41.0	-14.8	26.2	46.0	19.8
799.446	V	120/Q-peak	34.9	-4.4	30.5	46.0	15.5
831.093	H	120/Q-peak	35.7	-4.0	31.7	46.0	14.3

Level Corrected = Reading level + Correction factor (dB/m)

Correction factor = Antenna factor + Cable loss – Pre-amplifier (when using a pre-amplifier)

Note

1. Measurement was done over the frequency range from 30 MHz to 1 GHz. The EUT was rotated and the antenna was changed to a range of height of from 1 m to 4 m above the ground plane for maximum response.
2. Testing is include the rotation of the EUT through three orthogonal axes to determine the maximum emission.
3. Any emission values 20dB lower than the limit are not recorded.

Remark

1. Noise floor of 30 ~ 1000 MHz : <20 dB μ V at 3m distance
2. Noise floor of 1000 ~ 5000 MHz : <40 dB μ V at 3m distance
3. Noise floor of 5000 ~ 10000 MHz : <45 dB μ V at 3m distance

5. TEST EQUIPMENT

No.	Equipment	Manufacturer	Model	S/N
1	EMI Receiver (20 Hz ~ 26.5 GHz)	R&S	ESIB	100280
2	Spectrum Analyzer (100 Hz ~ 26.5 GHz)	Agilent	E4407B	US41443316
3	Spectrum Analyzer (3 Hz ~ 50 GHz)	Agilent	E4448A	MY43360322
4	Pre-Amplifier (100 kHz ~ 1 GHz)	SONOMA.	310N	186270
5	Pre-Amplifier (0.5 GHz ~ 26.5 GHz)	Agilent	83017A	MY39500982
6	LISN(50 Ω , 50 μH) (10 kHz ~ 100 MHz)	R&S	ESH3-Z5	826789009
7	Biconi-Log Ant. (30 MHz ~ 1000 MHz)	Schwarzbeck	VULB9168	9168-180
8	Horn Ant. (1 GHz ~ 18 GHz)	EMCO	3115	9012-3595
9	Horn Ant. (18 GHz ~ 40 GHz)	EMCO	3116	2664
10	Active Loop Ant. (9 kHz ~ 30 MHz)	EMCO	6502	2532
11	DC Power Supply	Agilent	E4356A	MY41000296