



# TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: Gryphon™ GM4100-BK-D910

To: FCC Part 15.249: 2008 Subpart C, RSS-210 Issue 7 June 2007  
& RSS-Gen Issue 2 June 2007

**Test Report Serial No:**  
RFI/RPT1/RP74494JD01A

<b>This Test Report Is Issued Under The Authority Of Brian Watson, Operations Director:</b>	pp 
<b>Checked By:</b>	Robert Graham
<b>Signature:</b>	
<b>Date of Issue:</b>	28 August 2009

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**1. Customer Information**






<b>Company Name:</b>	Datalogic Scanning Group S.r.l.
<b>Address:</b>	Via San Vitalino 13 Lippo Di Calderara Reno, 40012 Bologna Italy

## 2. Summary of Testing

### 2.1. General Information

<b>Specification Reference:</b>	47CFR15.249
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications) 2008: Part 15 Subpart C (Radio Frequency Devices) - Section 15.249
<b>Site Registration:</b>	FCC: 209735
<b>Specification Reference:</b>	RSS-210 Issue 7 June 2007
<b>Specification Title:</b>	Low-power Licence-exempt Radio communication Devices (All Frequency Bands): Category I Equipment.
<b>Specification Reference:</b>	RSS-GEN Issue 2 June 2007
<b>Specification Title:</b>	General Requirements and Information for the Certification of Radio communication Equipment
<b>Site Registration:</b>	Industry Canada: 3245B-2
<b>Location of Testing:</b>	RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH.
<b>Test Dates:</b>	24 August 2009 and 25 August 2009

### 2.2. Summary of Test Results

FCC Reference (47CFR)	IC Reference	Measurement	Port Type	Result
Part 15.109	RSS-Gen 4.10/6	Receiver/Idle Mode Radiated Spurious Emissions	Antenna	
Part 15.249(a)	RSS-Gen 4.8 RSS-210 A2.9	Transmitter Fundamental Field Strength	Antenna	
Part 2.1049	RSS-Gen 4.6.1	Transmitter 20 dB Bandwidth	Antenna	
Part 15.249(a)(d)(e) & 15.209	RSS-Gen 4.9 RSS-210 A2.9	Transmitter Radiated Spurious Emissions	Antenna	
Part 15.249(d) & 15.209	RSS-Gen 4.9 RSS-210 A2.9	Transmitter Band Edge Radiated Emissions	Antenna	

#### Key to Results

 = Complied     = Did not comply

### 2.3. Methods and Procedures

<b>Reference:</b>	ANSI C63.4 (2003)
<b>Title:</b>	American National Standard Methods of Measurement of Electromagnetic Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

### 2.4. Deviations from the Test Specification

For the measurements contained within this test report, there were no deviations from, additions to, or exclusions from the test specification identified above.

### **3. Equipment Under Test (EUT)**

#### **3.1. Identification of Equipment Under Test (EUT)**

<b>Description:</b>	Mobile Barcode Imager Gun
<b>Brand Name:</b>	Datalogic Scanning Inc.
<b>Model Name or Number:</b>	Gryphon™
<b>Type:</b>	GM4100-BK-D910
<b>Serial Number:</b>	E09P00001
<b>IMEI Number:</b>	Not applicable
<b>FCC ID Number:</b>	U4F0019
<b>IC ID Number:</b>	3862D-004

#### **3.2. Description of EUT**

The equipment under test was a mobile barcode imager, with a 910 MHz transceiver.

#### **3.3. Modifications Incorporated in the EUT**

No modifications were applied to the EUT during testing.

#### **3.4. Additional Information Related to Testing**

<b>Tested Technology:</b>	910 MHz transceiver	
<b>Channel Spacing:</b>	Single Channel	
<b>Transmit Frequency:</b>	910 MHz	
<b>Receive Frequency:</b>	910 MHz	
<b>Power Supply Requirement:</b>	Nominal	3.7 V

## **4. Operation and Monitoring of the EUT during Testing**

### **4.1. Operating Modes**

The EUT was tested in the following operating mode(s):

- Continuous transmit at maximum output power
- Receive Mode

### **4.2. Configuration and Peripherals**

The EUT was tested in the following configuration(s):

- For all tests the EUT was tested standalone. A test mode was enabled on the EUT to allow continuous transmissions or continuous receiving mode.

## **5. Measurements, Examinations and Derived Results**

### **5.1. General Comments**

Measurement uncertainties are evaluated in accordance with current best practice. Our reported expanded uncertainties are based on standard uncertainties, which are multiplied by an appropriate coverage factor to provide a statistical confidence level of approximately 95%. Please refer to *Section 6. Measurement Uncertainty* for details.



**5.2. Test Results**

**5.2.1. Receiver/Idle Radiated Spurious Emissions**

**Test Summary:**

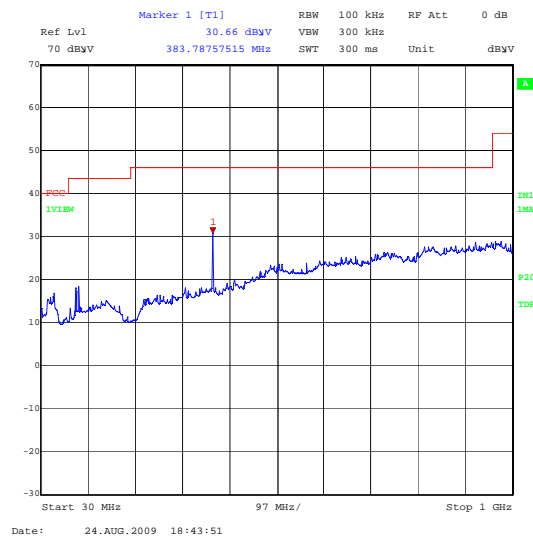
<b>FCC Part:</b>	Section 15.109
<b>Test Method Used:</b>	As detailed in ANSI C63.4 Section 8 and relevant annexes
<b>Frequency Range:</b>	30 MHz to 1000 MHz

**Environmental Conditions:**

<b>Temperature Range (°C):</b>	28
<b>Relative Humidity Range (%):</b>	35

**Results:**

Frequency (MHz)	Antenna Polarity	Q-P Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Result
383.992246	Vertical	30.9	46.0	15.1	Complied



*Note: This plot is a pre-scan and for indication purposes only. For final measurements, see accompanying tables.*

**Receiver/Idle Radiated Spurious Emissions (continued)****Test Summary:**

<b>FCC Part:</b>	Section 15.109
<b>Test Method Used:</b>	As detailed in ANSI C63.4 Section 8 and relevant annexes
<b>Frequency Range:</b>	1 GHz to 5 GHz

**Environmental Conditions:**

<b>Temperature Range (°C):</b>	28
<b>Relative Humidity Range (%):</b>	35

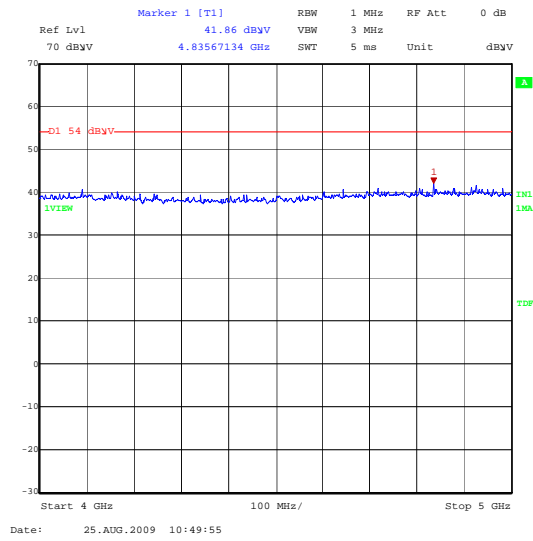
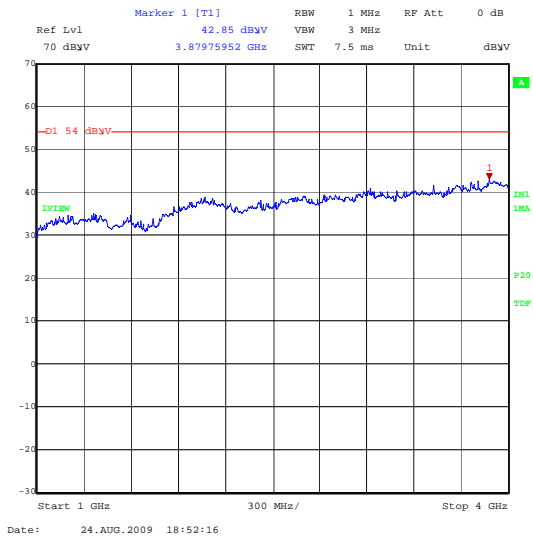
**Results: Highest Peak Level:**

<b>Frequency (MHz)</b>	<b>Antenna Polarity</b>	<b>Detector Level (dB<math>\mu</math>V)</b>	<b>Antenna Factor (dB)</b>	<b>Actual Level (dB<math>\mu</math>V/m)</b>	<b>Limit (dB<math>\mu</math>V/m)</b>	<b>Margin (dB)</b>	<b>Result</b>
3879.760	Vertical	37.6	5.3	42.9	54.0	11.1	Complied

**Note(s):**

1. No spurious emissions were detected above the noise floor of the measuring receiver; therefore, the highest peak noise floor reading of the measuring receiver was recorded as shown in the table above. The peak level was compared to the average limit as opposed to being compared to the peak limit because this is the more onerous limit.

### Receiver/Idle Radiated Spurious Emissions (continued)



Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

**5.2.2. Transmitter Fundamental Field Strength****Test Summary:**

<b>FCC Part:</b>	Section 15.249(a)
<b>Test Method Used:</b>	As detailed in ANSI C63.4 Section 8 and relevant annexes

**Environmental Conditions:**

<b>Temperature Range (°C):</b>	28
<b>Relative Humidity Range (%):</b>	38

**Results:**

<b>Frequency (MHz)</b>	<b>Antenna Polarity</b>	<b>Q-P Level (dB<math>\mu</math>V/m)</b>	<b>Limit (dB<math>\mu</math>V/m)</b>	<b>Margin (dB)</b>	<b>Result</b>
910	Horizontal	75.7	94.0	18.3	Complied

**5.2.3. Transmitter 20 dB Bandwidth**

**Test Summary:**

<b>FCC Part:</b>	2.1049
<b>Test Method Used:</b>	As detailed in ANSI C63.4 Section 13.1.7 and relevant annexes (see note below)

**Environmental Conditions:**

<b>Temperature (°C):</b>	28
<b>Relative Humidity (%):</b>	38

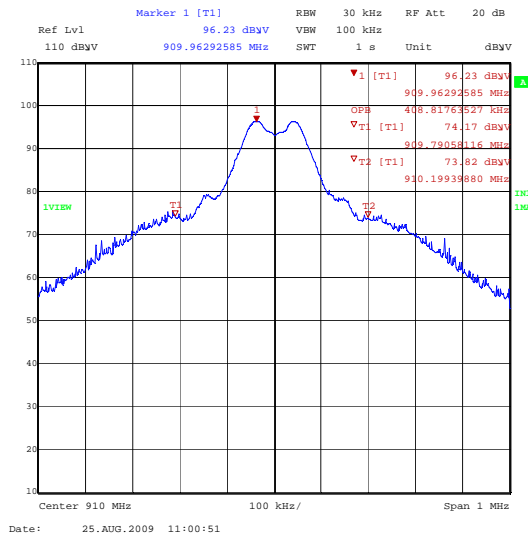
**Results:**

Transmitter 20 dB Bandwidth (MHz)	Limit (MHz)	Margin (MHz)	Result
0.409	26.0	25.591	Complied

Designated Frequency Band	
Band (MHz)	Bandwidth (MHz)
902-928	26.0

**Note(s):**

- In lieu of the test method detailed in ANSI C63.4 Section 13.1.7 the 99% occupied bandwidth was measured using the Occupied Bandwidth function of the spectrum analyser



**5.2.4. Transmitter Radiated Spurious Emissions**

**Test Summary:**

<b>FCC Part:</b>	15.249(a)(d)(e) & 15.209
<b>Test Method Used:</b>	As detailed in ANSI C63.4 Section 8 and relevant annexes
<b>Frequency Range:</b>	30 MHz to 1000 MHz

**Environmental Conditions:**

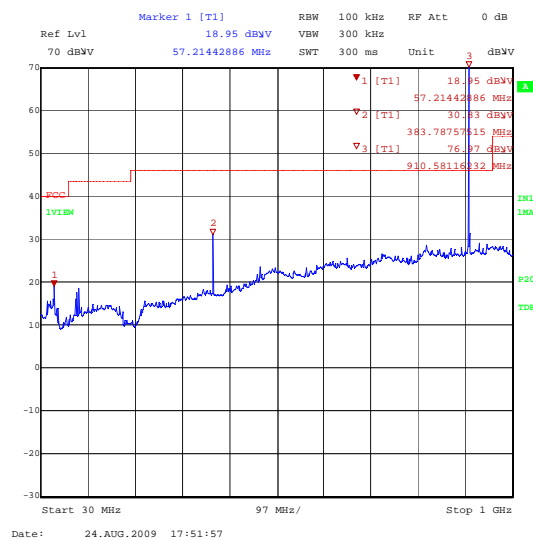
<b>Temperature (°C):</b>	28
<b>Relative Humidity (%):</b>	38

**Results:**

Frequency (MHz)	Antenna Polarity	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
56.596915	Vertical	23.8	40.0	17.0	Complied
383.987892	Vertical	34.9	46.0	11.1	Complied

**Note(s):**

- The emission shown at approximately 910 MHz on the 30 MHz to 1 GHz plot is the carrier.



*Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.*

**5.2.5. Transmitter Radiated Spurious Emissions****Test Summary:**

<b>FCC Part:</b>	15.249(a)(d)(e) & 15.209
<b>Test Method Used:</b>	As detailed in ANSI C63.4 Section 8 and relevant annexes
<b>Frequency Range:</b>	1 GHz to 10 GHz

**Environmental Conditions:**

<b>Temperature (°C):</b>	28
<b>Relative Humidity (%):</b>	38

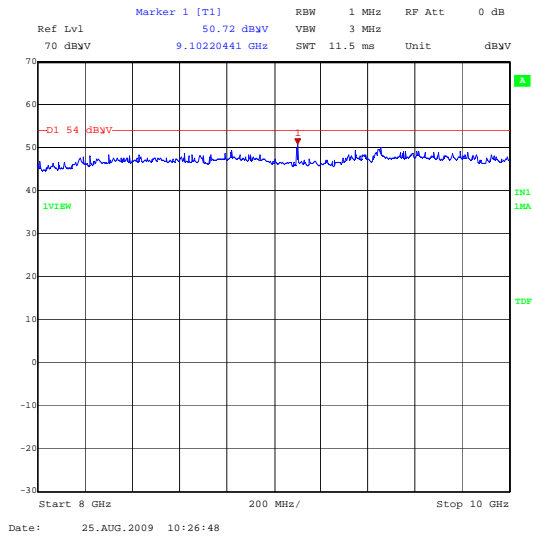
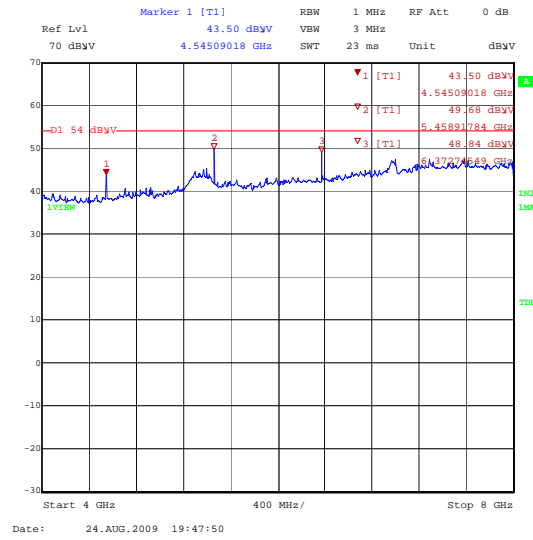
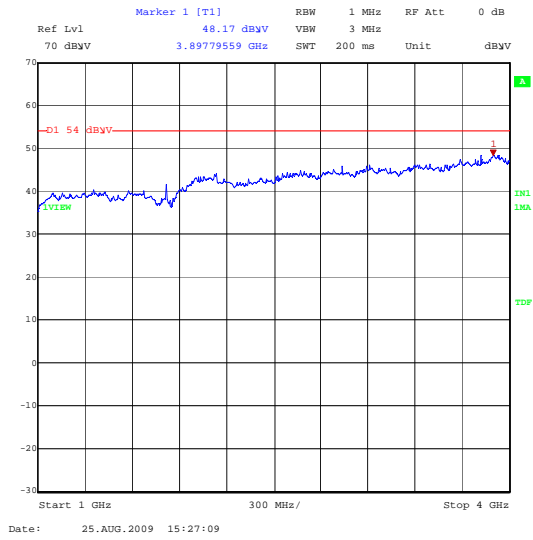
**Results: Highest Peak Level:**

Frequency (GHz)	Antenna Polarity	Detector Level (dB $\mu$ V)	Transducer Factor (dB)	Actual Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
4550.009790	Vertical	49.9	-3.0	46.9	74.0	27.1	Complied
5460.001810	Vertical	50.2	1.5	51.7	74.0	22.3	Complied
6369.987220	Vertical	48.8	1.8	50.6	74.0	23.4	Complied
9100.037970	Vertical	45.9	6.8	52.7	74.0	21.3	Complied

**Results: Highest Average Level:**

Frequency (GHz)	Antenna Polarity	Detector Level (dB $\mu$ V)	Transducer Factor (dB)	Actual Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
4550.009790	Vertical	44.7	-3.0	41.7	54.0	12.3	Complied
5460.001810	Vertical	47.3	1.5	48.8	54.0	5.2	Complied
6369.987220	Vertical	45.1	1.8	46.9	54.0	7.1	Complied
9100.037970	Vertical	40.1	6.8	46.9	54.0	7.1	Complied

**Transmitter Radiated Spurious Emissions (continued)**



*Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.*



**5.2.6. Transmitter Radiated Emissions at Band Edges**

**Test Summary:**

<b>FCC Part:</b>	15.249(d) & 15.209
<b>Test Method Used:</b>	As detailed in ANSI C63.4 Section 8 and relevant annexes

**Environmental Conditions:**

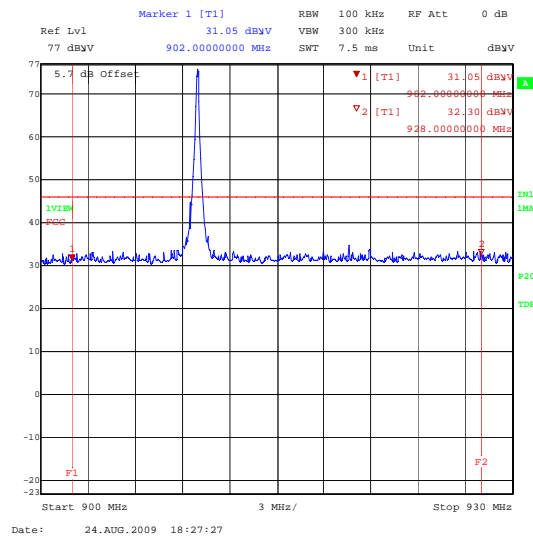
<b>Temperature (°C):</b>	28
<b>Relative Humidity (%):</b>	38

**Results: Bottom Band Edge**

Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
902	31.1	46.0	14.9	Complied

**Results: Top Band Edge**

Frequency (MHz)	Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Result
928	32.3	46.0	13.7	Complied



Note: These plots are pre-scans and for indication purposes only. For final measurements, see accompanying tables.

## **6. Measurement Uncertainty**

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor such that a confidence level of approximately 95% is maintained. For the purposes of this document “approximately” is interpreted as meaning “effectively” or “for most practical purposes”.

<b>Measurement Type</b>	<b>Range</b>	<b>Confidence Level (%)</b>	<b>Calculated Uncertainty</b>
20 dB Bandwidth	N/A	95%	±0.92 ppm
Radiated Spurious Emissions	9 kHz to 30 MHz	95%	±3.53 dB
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	±2.94 dB
Transmitter Fundamental Field Strength	30 MHz to 1000 MHz	95%	±4.64 dB

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty the published guidance of the appropriate accreditation body is followed.

**Appendix 1. Test Equipment Used**

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Last Calibrated	Cal. Interval (Months)
A1534	Pre Amplifier	Hewlett Packard	8449B OPT H02	3008A00405	Calibrated before use	-
A1818	Antenna	EMCO	3115	00075692	25 Oct 2008	12
A1975	High Pass Filter	AtlanTecRF	AFH-03000	090424010	Calibrated before use	-
A288	Antenna	Chase	CBL6111A	1589	13 Mar 2009	12
K0002	Site Reference 4421	Rainford EMC	N/A	N/A	26 Aug 2008	12
M1124	Spectrum Analyser	Rohde & Schwarz	ESIB26	100046K	09 Mar 2009	12

**NB** In accordance with UKAS requirements all the measurement equipment is on a calibration schedule.