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Report On

Limited FCC Testing of the
Crane Electronics Ltd RF-m
In accordance with FCC 47 CFR Part 15B

COMMERCIAL-IN-CONFIDENCE

FCC ID: TA6RFMT1

Document 75928950 Report 03 Issue 1

March 2015



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DATED

03 March 2015

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15B. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

T Guy

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SECTION 1

REPORT SUMMARY

Limited FCC Testing of the
Crane Electronics Ltd RF-m
In accordance with FCC 47 CFR Part 15B



1.1 INTRODUCTION

The information contained in this report is intended to show the verification of Limited FCC Testing of the Crane Electronics Ltd RF-m to the requirements of FCC 47 CFR Part 15B.

Objective	To perform Limited FCC Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Crane Electronics Ltd
Model Number(s)	RF-m
Serial Number(s)	95336
Number of Samples Tested	1
Test Specification/Issue/Date	FCC 47 CFR Part 15B (2014)
Incoming Release Date	Application Form 04 February 2015
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	046003 08 January 2015
Start of Test	19 February 2015
Finish of Test	19 February 2015
Name of Engineer(s)	T Guy
Related Document(s)	ANSI C63.4 (2009)



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1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15B is shown below.

Section	Spec Clause	Test Description	Result	Comments/Base Standard
Idle				
2.1	15.109	Radiated Emissions	Pass	ANSI C63.4



1.3 DECLARATION OF BUILD STATUS

MAIN EUT			
MANUFACTURING DESCRIPTION	RF Module		
MANUFACTURER	Crane Electronics Ltd.		
TYPE	RF-m		
PART NUMBER	CDWD1-0001-CRXXRX		
SERIAL NUMBER	Not supplied		
HARDWARE VERSION	101464 101465 iss.b		
SOFTWARE VERSION	Test version supplied		
TRANSMITTER OPERATING RANGE	2400 MHz – 2480 MHz		
RECEIVER OPERATING RANGE	2400 MHz – 2480 MHz		
COUNTRY OF ORIGIN	UK		
INTERMEDIATE FREQUENCIES	None		
EMISSION DESIGNATOR(S): (i.e. G1D, GXW)	1M00F1D		
MODULATION TYPES: (i.e. GMSK, QPSK)	GFSK		
HIGHEST INTERNALLY GENERATED FREQUENCY	16MHz		
OUTPUT POWER (W or dBm)	0dBm		
FCC ID	TA6RFMT1		
INDUSTRY CANADA ID	Not supplied		
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	The RF-m takes torque and angle signals from a transducer and transmits the reading to a datacollector.		
BATTERY/POWER SUPPLY			
MANUFACTURING DESCRIPTION	Li-Ion battery		
MANUFACTURER	INOV8		
TYPE	Li-Ion		
PART NUMBER	LI42B		
VOLTAGE	3.7V		
COUNTRY OF ORIGIN	CHINA		
MODULES (if applicable)			
MANUFACTURING DESCRIPTION			
MANUFACTURER			
TYPE			
POWER			
FCC ID			
COUNTRY OF ORIGIN			
INDUSTRY CANADA ID			
EMISSION DESIGNATOR			
DHSS/FHSS/COMBINED OR OTHER			
ANCILLARIES (if applicable)			
MANUFACTURING DESCRIPTION	Rotary transducer	Torque module	Laptop pc
MANUFACTURER	Crane Electronics Ltd.	Crane Electronics Ltd.	
TYPE	25Nm with angle	Torque Module	
PART NUMBER		IQVT1-0001-CRXXRX	
SERIAL NUMBER	94495	94509	
COUNTRY OF ORIGIN	UK	UK	

Signature

Date

4/2/15

Declaration of Build Status Serial Number



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1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Crane Electronics Ltd RF-m. A full technical description can be found in the manufacturer's documentation.

1.5 TEST CONDITIONS

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated in a shielded enclosure.

The EUT was powered from a 3.7 V battery.

FCC Measurement Facility Registration Number
90987 Octagon House, Fareham Test Laboratory

1.6 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standard were made during testing.

1.7 MODIFICATION RECORD

Modification 0 - No modifications were made to the test sample during testing.



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SECTION 2

TEST DETAILS

Limited FCC Testing of the
Crane Electronics Ltd RF-m
In accordance with FCC 47 CFR Part 15B



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2.1 RADIATED EMISSIONS**2.1.1 Specification Reference**

FCC 47 CFR Part 15B, Clause 15.109

2.1.2 Equipment Under Test and Modification State

RF-m S/N: 95336 - Modification State 0

2.1.3 Date of Test

19 February 2015

2.1.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.5 Test Procedure

The test was performed in accordance with ANSI C63.4, Clause 8.

Remarks

All final measurements were assessed against the Class B emission limits in FCC 47 CFR Part 15, Clause 15.109.

2.1.6 Environmental Conditions

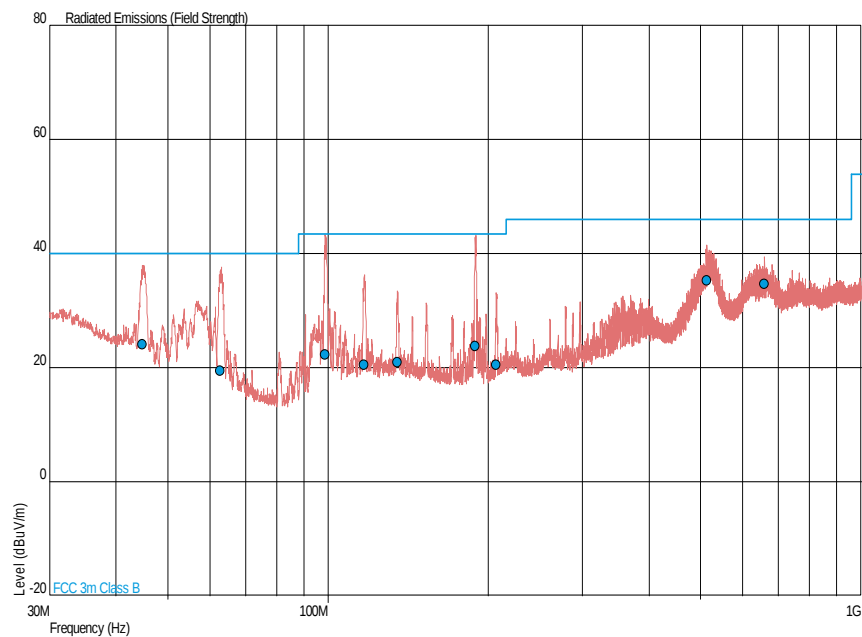
Ambient Temperature	20.3°C
Relative Humidity	33.0%



2.1.7 Test Results

Idle, 30 MHz to 1 GHz

Frequency (MHz)	QP Level (dB μ V/m)	QP Margin (dB μ V/m)	QP Level (μ V/m)	QP Margin (μ V/m)	Angle (Deg)	Height (m)	Polarity
44.890	24.0	-16.0	15.8	-84.2	129	1.00	Vertical
62.788	19.5	-20.5	9.4	-90.6	253	1.88	Vertical
98.722	22.3	-21.2	13.0	-137.0	69	2.24	Vertical
116.670	20.5	-23.0	10.6	-139.4	359	1.00	Vertical
135.060	21.0	-22.5	11.2	-138.8	299	1.00	Vertical
188.907	23.8	-19.7	15.5	-134.5	68	3.05	Vertical
206.886	20.5	-23.0	10.6	-139.4	301	1.00	Vertical
514.175	35.4	-10.6	58.9	-141.1	258	1.04	Horizontal
658.231	34.7	-11.3	54.3	-145.7	99	2.66	Horizontal





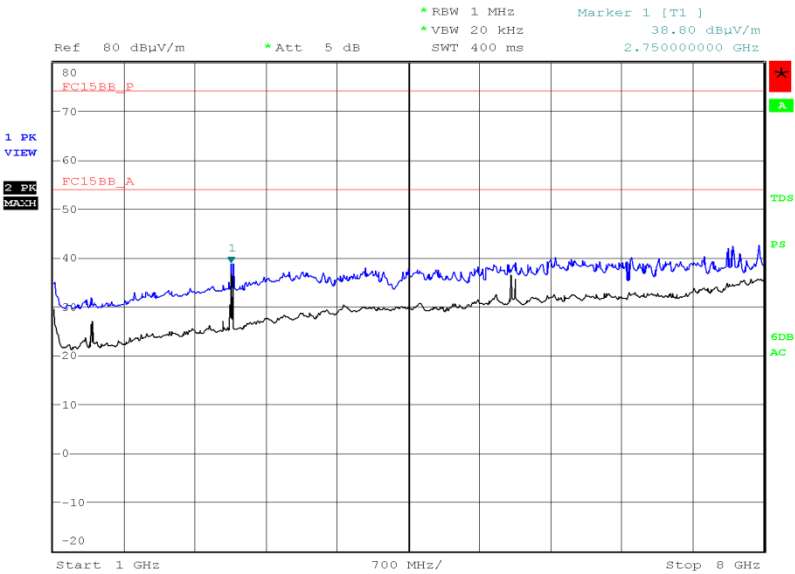
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Idle, 1 GHz to 13 GHz

Frequency (MHz)	Average Level (dBμV/m)	Peak Level (dBμV/m)	Average Level (μV/m)	Peak Level (μV/m)	Angle (deg)	Height (m)	Polarisation
*							

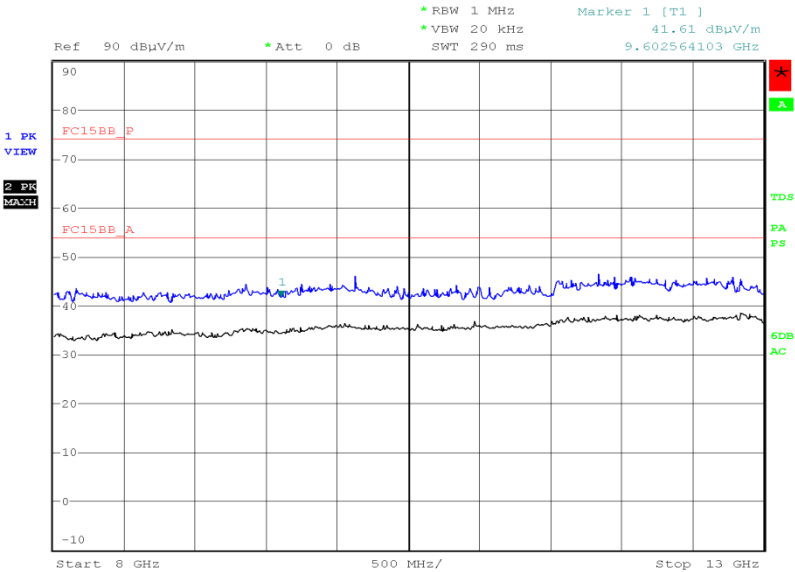
*No emissions were detected within 10 dB of the limit.

Idle, 1 GHz to 8 GHz



Date: 19.FEB.2015 23:38:59

Idle, 8 GHz to 13 GHz



Date: 19.FEB.2015 23:24:33



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FCC 47 CFR Part 15, Limit Clause 15.109Class B

Frequency of Emission (MHz)	Field Strength ($\mu\text{V/m}$)
30 to 88	100
88 to 216	150
216 to 960	200
Above 960	500



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SECTION 3

TEST EQUIPMENT USED



3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.1 - Radiated Emissions					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	2-May-2015
Dual Power Supply Unit	Thurlby	PL320	288	-	TU
Pre-Amplifier	Phase One	PS04-0086	1533	12	23-Dec-2015
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Antenna (Bilog)	Chase	CBL6143	2904	24	10-Jun-2015
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	27-Oct-2015
Tilt Antenna Mast	maturo GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	maturo GmbH	NCD	3917	-	TU
1GHz to 8GHz Low Noise Amplifier	Wright Technologies	APS04-0085	4365	12	1-Oct-2015

TU – Traceability Unscheduled



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3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	MU
Radiated Emissions	30 MHz to 1 GHz: ± 5.1 dB 1 GHz to 40 GHz: ± 6.3 dB



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SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA
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