9 February 2001

Ref: 10116.1

Attn: Mr Warrick Posel

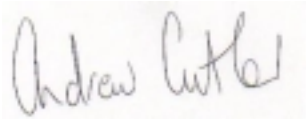
Gallagher Group Ltd
Private Bag 3026
Hamilton
New Zealand

Dear Warrick,

Attached are the results of measurements made upon the **ReaDX 20104KB Keypad Reader Transmitter** recently submitted to this Laboratory for testing.

The results show that this device **complies with 47 CFR Part 15 Subpart C**.

Yours faithfully,



Andrew Cutler
General Manager

EMC Technologies (NZ) Ltd

Test Report No **10116.1**
Report date: 9 February 2001

TEST REPORT

ReaDX 20104KB Keypad Reader Transmitter

tested to the Specification

47 Code of Federal Regulations

Part 15 - Radio Frequency Devices

Subpart C – Intentional Radiators

for

Gallagher Group Ltd

This Test Report is issued with the authority of:

Andrew Cutler - General Manager

Prepared By:

Karen Miller- Office Administrator

EMC Technologies (NZ) Ltd
STREET ADDRESS - 47 MacKelvie Street, Grey Lynn, Auckland, New Zealand
POSTAL ADDRESS - PO Box 68 307, Newton, Auckland, New Zealand
Telephone: +64 9 360 0862 Fax: +64 9 360 0861
E-mail: aucklab@ihug.co.nz
Web Site: www.emctech.com.au

Table of Contents

1. STATEMENT OF COMPLIANCE

The **ReaDX 20104KB Keypad Reader Transmitter** complies with 47 CFR Part 15 Subpart C when the methods described in ANSI C63.4 - 1992 are applied.

2. RESULTS SUMMARY

The results from testing are summarised in the following table:

Clause	Parameter	Result
15.205	Restricted bands of operation	Complies as the device operates on 125 kHz.
15.207	Conducted	Not applicable as the device is DC powered.
15.209	Radiated emissions - Fundamental	Complies with a 15.8 dB margin at 125 kHz.
15.209	Radiated emissions – Spurious Emissions	Complies with a 5.6 dB margin at 87.500 MHz.

3. CLIENT INFORMATION

Company Name	Gallagher Group Ltd
Address	Private Bag 3026
City	Hamilton
Country	New Zealand
Contact	Mr Warrick Posel

4. DESCRIPTION OF TEST SAMPLE

Brand Name	ReaDX
Model Number	20104KB
Product	Key Pad Reader Transmitter
Manufacturer	ReaDX Global Ltd
Country of Origin	New Zealand
Serial Number	0101230400002

5. MEASUREMENT STANDARD, METHODS AND PROCEDURES

Standard

The sample was tested in accordance with 47 CFR Part 15 Subpart C.

Methods and Procedures

The measurement methods and procedures as described in ANSI C63.4 - 1992 were used.

5.1 Description Of Radiated Emissions Test Method

Radiated emissions testing was carried out over the frequency range of 100 kHz to 1000 MHz.

As per section 15.33(a)(1) the transmitter at 125 kHz was tested up to the 10th harmonic. Measurements were made up to 1000 MHz in accordance with section 15.33(a)(4) as the transmitter is located with a keypad, which contains a digital device.

The keypad and transmitter were powered at 12 Vdc from 9 DC power supply.

Testing of the Device Under Test (DUT) for radiated emissions was carried out at the laboratory's open area test site - located at Dakota Lane, Ardmore Aerodrome, Auckland, New Zealand (Note: Site conforms to the requirements of CISPR 16, Part 1, Clause 16, and ANSI C63.4 - 1992.)

Before testing was carried out, a check of all-connecting cables and antennas is carried out.

The device was placed on the test tabletop, which is a total of 0.8 m above the test site ground plane.

Measurements were made with the antenna located 10m from the device below 30 MHz and at 3m above 30 MHz.

A Quasi-Peak detector was used between 30 and 1000 MHz.

An Average detector was used between 100 kHz and 30 MHz.

When an emission is located, it is positively identified and its maximum level is found by rotating the automated turntable, and by varying the antenna height with an automated antenna tower. The emission is measured in both vertical and horizontal antenna polarisations.

During the test, a number of ambient emissions were identified (list of which can be provided upon request).

The emission level was determined in field strength by taking the following into consideration:

Level (dBμV/m) = Receiver Reading (dBμV) + Antenna Factor (dB) + Coax Loss (dB)

Measurement uncertainty with a confidence interval of 95% is:

- Free radiation tests (100 kHz - 1000 MHz) ± 4.8 dB

6. TEST EQUIPMENT USED

Instrument	Manufacturer	Model	Serial No	Asset Ref
Aerial Controller	EMCO	1090	9112-1062	RFS 3710
Aerial Mast	EMCO	1070-1	9203-1661	RFS 3708
Biconical Antenna	Schwarzbeck	BBA 9106		RFS 3612
DC Power Supply	Harrison	626A		E1266
Log Periodic Antenna	Schwarzbeck	UHALP 9107		RFS 3702
Loop Antenna	Schwarzbeck	FMZ 1514		RFS 3602
Magnetic Loops	Schwarzbeck	0.15-30.0 MHz		RFS 3602
2m Tripple Loop Antenna	Rohde & Schwarz	HM020	843885/004	E1567
Spectrum Analyser	IFR	A-7750	-	-
Spectrum Analyser	Hewlett Packard	E7405A	US39150142	RFS 3776
Measurement Receiver	Rohde & Schwarz	ESVS 10	825475/017	RFS 3731
Turntable	EMCO	1080-1-2.1	9109-1578	RFS 3709
VHF Balun Antenna	Schwarzbeck	VHA 9103		RFS 3603

7. ACCREDITATIONS

Testing was carried out in accordance with EMC Technologies NZ Ltd registration with the Federal Communications Commission as a listed facility, Registration Number: 90838, which was updated on February 11th, 2000.

Testing was carried out in accordance with the terms of EMC Technologies (NZ) Ltd's International Accreditation New Zealand (TELARC) Accreditation to the New Zealand Code of Laboratory Management Practice incorporating ISO Guide 25: 1990 and ISO 9002: 1987.

All measurement equipment has been calibrated in accordance with the terms of the Ministry of Commerce, Laboratory Services' International Accreditation New Zealand (TELARC) Accreditation to the New Zealand Code of Laboratory Management Practice incorporating ISO Guide 25: 1990 and ISO 9002: 1994.

International Accreditation New Zealand has Mutual Recognition Arrangements for testing and calibration with 25 accreditation bodies in 21 economies. This includes NATA (Australia), UKAS (UK), SANAS (South Africa), NVLAP (USA), A2LA (USA), SWEDAC (Sweden). Further details can be supplied on request.

8. RESULTS

Section 15.205: Restricted bands of operation.

The device was observed operating on 125 kHz.

This frequency falls between the restricted bands of 90 – 110 kHz and 495 – 505 kHz.

Result: Complies.

Section 15.209: Radiated Emissions – Fundamental Emission

Frequency	Level	Antenna	Level	Limit	Margin	Result
kHz	dBuV	dB	dBuV/m	dBuV/m	dB	
125.0000	36.8	33.1	69.9	85.7	15.8	Pass

Magnetic loop measurements were made at a distance of 10 metres.

The 300 metre limit (2400 / F (kHz)) of 19.2 uV (25.7 dBuV/m) has been scaled by a factor of 40 dB per decade as per section 15.31 (f) (2).

Result: Complies.

Section 15.209: Radiated Emissions – Spurious Emissions

Transmitter Spurious Emissions

Frequency kHz	Level dBuV	Level dBuV/m	Limit dBuV/m	Margin dB	Result
250.000	Nil	-	79.6	-	Pass
375.000	Nil	-	76.1	-	Pass
500.000	Nil	-	53.6	-	Pass
625.000	Nil	-	51.7	-	Pass
750.000	Nil	-	50.1	-	Pass
875.000	Nil	-	48.8	-	Pass
1000.000	Nil	-	47.6	-	Pass
1125.000	Nil	-	46.6	-	Pass
1250.000	Nil	-	45.7	-	Pass

Magnetic loop measurements were made at a distance of 10 metres.

The 300 metre (2400 / F (kHz)) and 30 metre (24000 / F (kHz)) limits have been scaled by a factor of 40 dB per decade as per section 15.31 (f) (2).

Result: Complies.

Other emissions observed:

Frequency	Level		Recheck	Limit	Margin	Result	Worst Case
	Vertical	Horizontal					Antenna
MHz	dBµV/m	dBµV/m	dBµV/m	dBµV/m	dB		
43.313	21.6	21.9		40.0	18.1	Pass	Horizontal
47.065		19.8		40.0	20.2	Pass	Horizontal
49.311	29.1	22.9		40.0	10.9	Pass	Vertical
50.045		26.5		40.0	13.5	Pass	Horizontal
52.051	23.4	23.9		40.0	16.1	Pass	Horizontal
63.914		23.7		40.0	16.3	Pass	Horizontal
63.917	28.1	24.9		40.0	11.9	Pass	Vertical
71.905		17.3		40.0	22.7	Pass	Horizontal
75.893		21.4		40.0	18.6	Pass	Horizontal
79.895		33.6		40.0	6.4	Pass	Horizontal
83.511	24.3	25.9		40.0	14.1	Pass	Horizontal
83.877	23.5	29.5		40.0	10.5	Pass	Horizontal
83.885		31.6		40.0	8.4	Pass	Horizontal
85.510		31.5		40.0	8.5	Pass	Horizontal
87.500		34.4		40.0	5.6	Pass	Horizontal
88.253		33.2		43.5	10.3	Pass	Horizontal
89.002		30.5		43.5	13.0	Pass	Horizontal
90.498	22.1	29.1		43.5	14.4	Pass	Horizontal
92.242	25.7	25.4		43.5	17.8	Pass	Vertical
92.991	26.0	24.1		43.5	17.5	Pass	Vertical
93.749	28.9	24.9		43.5	14.6	Pass	Vertical
103.865		25.4		43.5	18.1	Pass	Horizontal
105.980		31.1		43.5	12.4	Pass	Horizontal
107.732		34.5		43.5	9.0	Pass	Horizontal
109.470	24.2	26.9		43.5	16.6	Pass	Horizontal
110.477		33.0		43.5	10.5	Pass	Horizontal
111.846		33.3		43.5	10.2	Pass	Horizontal
118.457		26.4		43.5	17.1	Pass	Horizontal
119.840		26.8		43.5	16.7	Pass	Horizontal
122.715	19.3	27.9		43.5	15.6	Pass	Horizontal

Frequency	Level Vertical	Horizontal	Recheck	Limit	Margin	Result	Worst Case Antenna
MHz	dBµV/m	dBµV/m	dBµV/m	dBµV/m	dB		
123.833		30.9		43.5	12.6	Pass	Horizontal
127.833		30.4		43.5	13.1	Pass	Horizontal
129.950		27.1		43.5	16.4	Pass	Horizontal
130.697	23.0	28.9		43.5	14.6	Pass	Horizontal
132.196		33.5		43.5	10.0	Pass	Horizontal
132.949	24.2	29.9		43.5	13.6	Pass	Horizontal
134.193		34.8		43.5	8.7	Pass	Horizontal
135.944		33.5		43.5	10.0	Pass	Horizontal
137.940		32.0		43.5	11.5	Pass	Horizontal
138.441	29.4	30.9		43.5	12.6	Pass	Horizontal
140.435	29.9	31.9		43.5	11.6	Pass	Horizontal
140.437		28.5		43.5	15.0	Pass	Horizontal
142.184		29.3		43.5	14.2	Pass	Horizontal
144.928		32.0		43.5	11.5	Pass	Horizontal
146.930		32.5		43.5	11.0	Pass	Horizontal
150.671		29.7		43.5	13.8	Pass	Horizontal
154.678	21.9	32.9		43.5	10.6	Pass	Horizontal
184.128		28.0		43.5	15.5	Pass	Horizontal
185.373	20.7	33.9		43.5	9.6	Pass	Horizontal
191.750		28.2		43.5	15.3	Pass	Horizontal
202.603		30.2		43.5	13.3	Pass	Horizontal
203.353	23.8	34.9		43.5	8.6	Pass	Horizontal
208.103	25.6	35.9		43.5	7.6	Pass	Horizontal
208.346		28.7		43.5	14.8	Pass	Horizontal
213.351	26.9	36.9		43.5	6.6	Pass	Horizontal
216.844		29.2		46.0	16.8	Pass	Horizontal
219.079		29.3		46.0	16.7	Pass	Horizontal
224.580		30.8		46.0	15.2	Pass	Horizontal
233.306		21.7		46.0	24.3	Pass	Horizontal
242.050		19.9		46.0	26.1	Pass	Horizontal
255.280	23.7	20.9		46.0	22.3	Pass	Vertical

Result: Complies.

9. PHOTOGRAPHS