EMC Technologies (NZ) Ltd

Test Report No **100514.2**
Report date: 10 June 2010

TEST REPORT

Kahne KW1 Wand Series RFID Trigger

tested to

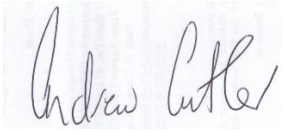
47 Code of Federal Regulations

Part 15 - Radio Frequency Devices

Subpart C – Intentional Radiators

for

Kahne Ltd



This Test Report is issued with the authority of:

Andrew Cutler - General Manager

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1. STATEMENT OF COMPLIANCE

The **Kahne KW1 Wand Series RFID Trigger** complies with FCC Part 15 Subpart C as an Intentional Radiator when the methods as described in ANSI C63.4 - 2003 are applied.

2. RESULTS SUMMARY

Clause	Parameter	Result
15.201	Equipment authorisation requirement	Certification required.
15.203	Antenna requirement	Complies. Antenna internal to the device.
15.204	External PA and antenna modifications	Not applicable. No external devices.
15.205	Restricted bands of operation	Complies. Device transmits on 134.300 kHz.
15.207	Conducted limits	Not applicable. Battery powered device that does not directly or indirectly connected to that AC mains supply.
15.209	Radiated emission limits - Fundamental	Complies with a 26.0 dB margin (peak).
15.209	Radiated emission limits - Spurious emissions <30 MHz	Complies. No spurious emissions detected below 30 MHz
15.209	Radiated emission limits – Spurious emissions >30 MHz	Complies with an 11.4 dB margin at 138.404 MHz (Horizontal).

3. INTRODUCTION

This report describes the tests and measurements performed for the purpose of determining compliance with the specification.

The client selected the test sample.

This report relates only to the sample tested.

This report contains no corrections or erasures.

Measurement uncertainties with statistical confidence intervals of 95% are shown below test results. Both Class A and Class B uncertainties have been accounted for, as well as influence uncertainties where appropriate.

4. CLIENT INFORMATION

Company Name	Kahne Ltd
Address	Floor 1, 64 Cook Street
City	Auckland, 1010
Country	New Zealand
Contact	Mr Michael Eivers

5. DESCRIPTION OF TEST SAMPLE

Brand Name	Kahne
Model Number	KW1 Wand Series
Product	Handheld RFID Trigger
Manufacturer	Kahne Ltd
Country of Origin	New Zealand
Serial Numbers	0410000120
FCC ID	WO7KW

Product Description

This device is a handheld wand device, operating in the 134.2 kHz band, that can trigger an In vitro bolus device to activate and download data stored to a waiting field receiver.

No data is transmitted or received by the KW1 Wand.

The signal that is produced is used to activate the bolus RFID device.

6. RESULTS

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 - 2003 were used.

Section 15.201: Equipment authorisation requirement

Certification as detailed in Subpart J of Part 2 is required for this device.

Section 15.203: Antenna requirement

This device has an internal antenna.

Result: Complies.

Section 15.204: External radio frequency power amplifiers and antenna modifications

It is not possible to attach an external power amplifier to this transmitter.

Result: Complies.

Section 15.205: Restricted bands of operation

The transmitter transmits on 134.300 kHz.

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

Result: Complies.

Section 15.209: Radiated emission limits, general requirements

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

Testing was carried out at the laboratory's open area test site - located at Driving Creek, Orere Point, Auckland, New Zealand.

This site conforms to the requirements of CISPR 16 and ANSI C63.4 - 2003.

Testing was carried out when the device was powered from internal batteries.

Device was tested transmitting continuously whilst the on/off button was held in place to initiate continuous transmission.

The device was placed in the centre of the test table when placed in the X, Y and Z planes (laying flat, face up and upright).

The worst case was found to be when the EUT was standing upright facing the antenna.

Below 30 MHz the centre of the loop antenna was placed 1 metre above the test site ground plane on a non conductive support.

Above 30 MHz the emission is measured in both vertical and horizontal antenna polarisations, where appropriate.

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, where appropriate, with an automated antenna tower.

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)

Fundamental emission:

Measurements were made using a magnetic loop antenna and a receiver with an average detector and a peak detector both using a 9 kHz bandwidth

Measurements were made at a distance of 10 metres with the limit being determined by using the extrapolation factor of 40 dB per decade limit, as detailed in section 15.31 f (2).

At 300 m the limit at 134.300 kHz is 17.8 uV/m or 25 dBuV/m (Average) and 45 dBuV/m (Peak).

An extrapolation factor of 40 dB/ per decade has been applied with limits of 85.0 dBuV/m (Average) and 105 dBuV/m (Peak) being applied.

Testing was carried out when the device was transmitting continuously.

Peak

Frequency (kHz)	Level (dBuV/m)	Distance (metres)	Limit (dBuV/m)	Margin (dB)
134.300	79.0	10.0	105.0	26.0

Average

Frequency (kHz)	Level (dBuV/m)	Distance (metres)	Limit (dBuV/m)	Margin (dB)
134.300	78.1	10.1	85.0	6.9

Result: Complies.

Measurement uncertainty with a confidence interval of 95% is:
- Free radiation tests (100 kHz – 30 MHz) ± 4.8 dB

Section 15.209: Spurious Emissions (below 30 MHz)

Frequency kHz	Level dBµV/m	Limit dBµV/m	Margin dB	Result	Detector	Antenna
268.600	-	99.0	-	Pass	Peak	Loop
268.600	-	79.0	-	Pass	Average	Loop
402.900	-	95.5	-	Pass	Peak	Loop
402.900	-	75.5	-	Pass	Average	Loop
537.200	-	53.0	-	Pass	Quasi Peak	Loop
671.500	-	51.1	-	Pass	Quasi Peak	Loop
805.800	-	49.5	-	Pass	Quasi Peak	Loop
940.100	-	48.1	-	Pass	Quasi Peak	Loop
1074.400	-	47.0	-	Pass	Quasi Peak	Loop
1208.700	-	46.0	-	Pass	Quasi Peak	Loop
1343.000	-	45.0	-	Pass	Quasi Peak	Loop
1477.300	-	44.2	-	Pass	Quasi Peak	Loop
1611.600	-	43.4	-	Pass	Quasi Peak	Loop
1745.900	-	49.5	-	Pass	Quasi Peak	Loop
1880.200	-	49.5	-	Pass	Quasi Peak	Loop

No further emissions detected when measurements were attempted between 2 – 30 MHz.

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

At each frequency the measurement antenna was further adjusted to give the highest field strength.

A receiver with an average detector and a peak detector using a 9 kHz bandwidth was used between 110 – 490 kHz and a quasi peak detector with a 9 kHz bandwidth was used between 490 kHz – 30.0 MHz.

The 300 metre limit between 125 – 490 kHz has been scaled by a factor of 40 dB per decade, as per section 15.31 (f) (2). The 30 metre limit between 490 – 1705 kHz has been scaled by a factor of 40 dB per decade, as per section 15.31 (f) (2).

The limit between 110 – 490 kHz was increased by 20 dB when the peak detector was used.

The spurious emissions observed do not exceed the level of the fundament emission.

Result: Complies.
Measurement uncertainty with a confidence interval of 95% is:
- Free radiation tests (100 kHz – 30 MHz) ± 4.8 dB

Section 15.209: Spurious Emissions (above 30 MHz)

Measurements between 30 –1000 MHz have been made at a distance of 3 metres as the device appears to contain a digital device.

A receiver with a quasi peak detector with a 120 kHz bandwidth was used between 30 – 1000 MHz.

The device was tested transmitting continuously on 134.2 kHz.

The limits as described in Section 15.209 have been applied as follows:

30.0 – 88.0 MHz	100 uV/m	40 dBuV/m
88.0 – 216.0 MHz	150 uV/m	43.5 dBuV/m
216.9 – 960.0 MHz	200 uV/m	46.0 dBuV/m
Above 960 MHz	500 uV/m	54.0 dBuV

Frequency MHz	Vertical dBµV/m	Horizontal dBµV/m	Limit dBµV/m	Margin dB	Result	Antenna
48.170	20.3		40.0	19.7	Pass	Vertical
76.995		24.8	40.0	15.2	Pass	Horizontal
78.070		25.5	40.0	14.5	Pass	Horizontal
80.353		25.1	40.0	14.9	Pass	Horizontal
85.188	22.0	28.7	40.0	11.3	Pass	Horizontal
87.073		24.6	40.0	15.4	Pass	Horizontal
93.120		29.6	43.5	13.9	Pass	Horizontal
109.245		19.8	43.5	23.7	Pass	Horizontal
109.378		18.0	43.5	25.5	Pass	Horizontal
138.404	18.9	32.1	43.5	11.4	Pass	Horizontal
140.015		31.1	43.5	12.4	Pass	Horizontal
144.715		31.3	43.5	12.2	Pass	Horizontal
168.098		25.8	43.5	17.7	Pass	Horizontal

Result: Complies
Measurement uncertainty with a confidence interval of 95% is:
- Free radiation tests (30 – 1000 MHz) ± 4.1 dB

7. TEST EQUIPMENT USED

Instrument	Manufacturer	Model	Serial No	Asset Ref	Cal Due
Aerial Controller	EMCO	1090	9112-1062	RFS 3710	Not applicable
Aerial Mast	EMCO	1070-1	9203-1661	RFS 3708	Not applicable
Biconical Antenna	Schwarzbeck	BBA 9106	-	RFS 3613	31/01/2011
Receiver	R & S	ESCS 30	847124/020	E1595	30/01/2011
Receiver	R & S	ESHS 10	828404/005	RFS 3728	10/07/2010
Log Periodic	Schwarzbeck	VUSLP 9111	9111-228	3785	31/01/2011
Loop Antenna	EMCO	6502	9003-2485	3798	12/06/2011
Mains Network	R & S	ESH2-Z5	881362/034	3628	22/07/2010
Variac	General Radio	1592	-	RFS 3690	Not applicable
Turntable	EMCO	1080-1-2.1	9109-1578	RFS 3709	Not applicable
VHF Balun	Schwarzbeck	VHA 9103	-	RFS 3613	31/01/2011

8. ACCREDITATIONS

Testing was carried out in accordance with EMC Technologies Ltd registration with the Federal Communications Commission as a listed facility, registration number: 90838, which was updated in January, 2010.

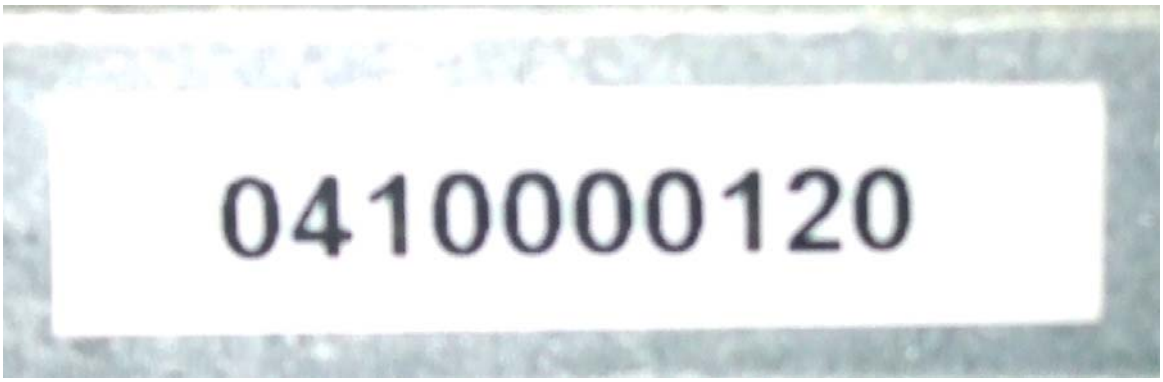
All testing was carried out in accordance with the terms of EMC Technologies (NZ) Ltd International Accreditation New Zealand (IANZ) Accreditation to NZS/ISO/IEC 17025, 2005.

All measurement equipment has been calibrated in accordance with the terms of the EMC Technologies (NZ) Ltd International Accreditation New Zealand (IANZ) Accreditation to NZS/ISO/IEC 17025, 2005.

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

9. PHOTOTGRAPHS

External photos



Test site setup