

# Global EMC Inc. Labs EMC & RF Test Report

As per

**RSS 210 Issue 8**

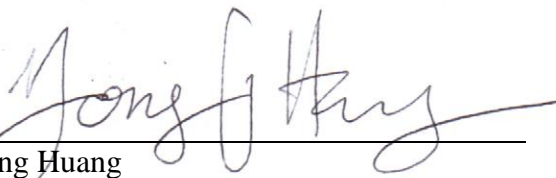
**&**

**FCC Part 15 Subpart C**

**Unlicensed Intentional Radiators**

on the

**RFID wall mounted reader**



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Testing produced for



See Appendix A for full customer & EUT details.




Industry  
Canada  
REGISTRATION #6844B-1



REG#382292




ACCREDITED  
Testing Laboratory  
Certificate  
#2555.01

Client	Kaba Ilco Inc.	
Product	RFID wall mounted reader	
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	

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Client	Kaba Ilco Inc.	
Product	RFID wall mounted reader	
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	

## Report Scope

This report addresses the EMC verification testing and test results of the RFID wall mounted reader, herein referred to as EUT (Equipment Under Test) performed at Global EMC Labs.

The EUT was tested for compliance against the following standards:


RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013

Test procedures, results, justifications, and engineering considerations, if any, follow later in this report.

The results contained in this report relate only to the item(s) tested.

This report does not imply product endorsement by A2LA or any other accreditation agency, any government, or Global EMC Inc.


Opinions/interpretations expressed in this report, if any, are outside the scope of Global EMC Inc accreditation. Any opinions expressed do not necessarily reflect the opinions of Global EMC Inc, unless otherwise stated.

Client	Kaba Ilco Inc.	
Product	RFID wall mounted reader	
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	

## Summary

The results contained in this report relate only to the item(s) tested.


EUT FCC Certification #, FCC ID:	<b>Q8SR79KSR</b>
EUT Industry Canada Certification #, IC:	4652A- R79KSR
EUT Passed all tests performed.	Yes (see test results summary)
Tests conducted by	Yong Huang

Client	Kaba Ilco Inc.	
Product	RFID wall mounted reader	
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	

### **Test Results Summary**

Standard/Method	Description	Class/Limit	Result
FCC 15.203	Antenna Requirement	Unique	Pass See Justification
FCC 15.205 RSS 210 (Table 1)	Restricted Bands for intentional operation	QuasiPeak Average	Pass
FCC 15.207	Power line conducted emissions	QuasiPeak Average	Pass See Justification
FCC 15.209 RSS-210 (Table 2)	Intentional / Spurious Radiated emissions	QuasiPeak Average	Pass
<b>Overall Result</b>			<b>PASS</b>

If the product as tested or otherwise complies with the specification, the EUT is deemed to comply with the requirement and is deemed a 'PASS' grade. If not 'FAIL' grade will be issued. Note that 'PASS' / 'FAIL' grade is independent of any measurement uncertainties. A 'PASS' / 'FAIL' grade within measurement uncertainty is marked with a '\*'.

Client	Kaba Ilco Inc.	
Product	RFID wall mounted reader	
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	

### ***Justifications, Descriptions, or Deviations***

The following justifications for tests not performed or deviations from the above listed specifications apply:

For the Antenna requirement specified in FCC 15.203 (RSS 210 section 5.5), this device is designed with an integral antenna or proprietary antenna connector which meets the requirements of FCC 15.203.

For the Restricted Bands of operation as specified in FCC 15.205, the EUT is designed to only operate at 13.56 MHz

For the scope of this test report, radiated testing of the EUT was pre-scanned in three orthogonal axis to maximize emissions. Maximum emissions were found in the vertical EUT polarization. This setup was used for all testing in this report.


For the power line conducted emissions requirements, the EUT is DC powered, and this test is performed with a power supply provided by customer.

As per customer's instruction, the EUT has two possible mutually exclusive DC inputs, accounting for 4 of those ports. Configurations with both DC voltage inputs were pre-scanned individually, and no difference in emissions was observed. The other four communication ports were fully cabled during the test program.

Peripherals were as supplied and designated by the client.


A later revision of the standard may have been substituted in place of the previous dated referenced revision. The year of the specification used are listed under applicable standards. Using the later revision accomplishes the goal of ensuring compliance to the intent of the previous specification, while allowing the laboratory to incorporate the extensions and clarifications made available by a later revision.

No deviations are recorded.

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### ***Applicable Standards, Specifications and Methods***

- ANSI C63.4:2009 - Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
- CFR 47 FCC 15:2013 - Code of Federal Regulations – Radio Frequency Devices
- CISPR 22:2008 - Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement
- ICES-003:2012 - Digital Apparatus - Spectrum Management and Telecommunications Policy Interference-Causing Equipment Standard
- ISO 17025:2005 - General Requirements for the competence of testing and calibration laboratories
- RSS 210:2010 - Issue 8: Spectrum Management and Telecommunications Policy. Radio Standards Specification Low Power Licence-Exempt Radio communication Devices

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Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	

### ***Sample calculation(s)***

Margin = limit – (received signal + antenna factor + cable loss – pre-amp gain)

Margin = 50.5dBuV/m – (50dBuV + 10dB + 2.5dB – 20dB)


Margin = 8.5 dB

### ***Document Revision Status***

Revision 1 - First released on the 30<sup>th</sup>, Oct. 2014

Revision 2 - Revised as per TCB requirement, Justification section and Radiated Emission section, on the 12<sup>th</sup>, Nov.2014



Client	Kaba Ilco Inc.	
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Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	

## Definitions and Acronyms

The following definitions and acronyms are applicable in this report.  
See also ANSI C63.14.

**AE** – Auxillary Equipment.

**BW** – Bandwidth. Unless otherwise stated, this refers to the 6 dB bandwidth.

**EMC** – Electro-Magnetic Compatibility

**EMI** – Electro-Magnetic Immunity


**EUT** – Equipment Under Test

**ITE** – Information Technology Equipment with a primary function(s) of entry, storage, display, retrieval, transmission, processing, switching, or control, of data.

**LISN** – Line impedance stabilization network

**NCR** – No Calibration Required

**RF** – Radio Frequency


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Product	RFID wall mounted reader	
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	

## Testing Facility

Testing for EMC on the EUT was carried out at Global EMC labs in Montréal, Québec, Canada. The testing lab consists of a 3m semi-anechoic chamber calibrated to be able to allow measurements on an EUT with a maximum width or length of up to 2m and height up to 3m. The chamber is equipped with a turn table that is capable of testing devices up to 3300lb in weight. This facility is capable of testing products that are rated for 120 Vac and 240Vac single phase, or 208 Vac 3 phase input. DC capability is also available. The chamber is equipped with an antenna mast that controls polarization and height from the control room adjoining the shielded chamber. Radiated emissions measurements are performed using a Bilog, and Horn antenna where applicable. Conducted emissions, unless otherwise stated, are performed using a LISN.

### **Calibrations and Accreditations**


The measurement site used is registered with Federal Communications Commission (FCC, 382292) and Industry Canada (IC, 6844B-1). This site is calibrated for Normalized Site Attenuation (NSA) using test procedures outlined in ANSI C63.4 “Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz”. The semi-anechoic chamber is lined with ferrite tiles and absorption cones to minimize any undesired reflections. All measuring equipment is calibrated on an annual or bi-annual basis as listed for each respective test.

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### ***Testing Environmental Conditions and Dates***

Following were the environmental conditions in the facility during time of testing –

<b>Date</b>	<b>Test</b>	<b>Init.</b>	<b>Temperature (°C)</b>	<b>Humidity (%)</b>	<b>Pressure (kPa)</b>
Sep. 18 – 19, 2014	All	YH	20-25°C	30-45%	100 -103kPa

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## Detailed Test Results Section

Client	Kaba Ilco Inc.	
Product	RFID wall mounted reader	
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	

*Power Line Conducted Emissions*

**Purpose**

The purpose of this test is to ensure that the RF energy unintentionally emitted from the EUT’s power line does not exceed the limits listed below as defined in the applicable test standard, as measured from a LISN. This helps protect lower frequency radio services such as AM radio, shortwave radio, amateur radio operators, maritime radio, CB radio, and so on, from unwanted interference.

**Limits & Method**

The limits are as defined in 47 CFR FCC Part 15 Section 15.207

Method is as defined in ANSI C64:2003


Average Limits		QuasiPeak Limits	
150 kHz – 500 kHz	56 to 46 dBuV	150 kHz – 500 kHz	66 to 56 dBuV
500 kHz – 5 MHz	46 dBuV	500 kHz – 5 MHz	56 dBuV
5 MHz – 30 MHz	50 dBuV	500 kHz – 30 MHz	60 dBuV

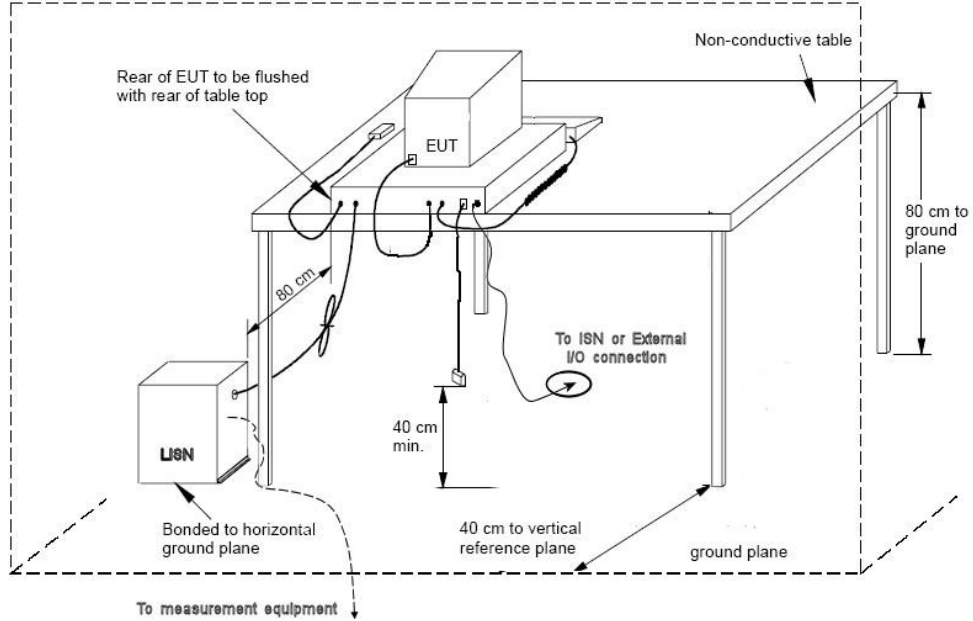
The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.

Note: If the Peak or Quasi Peak detector measurements do not exceed the Average limits, then the EUT is deemed to have passed the requirements.


Both limits are applicable, and each is specified as being measured with a 9 kHz measurement bandwidth .

**Typical Setup Diagram**

Client	Kaba Ilco Inc.	
Product	RFID wall mounted reader	
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	



Note: The vertical reference plane is optional as per ANSI C63.4 section 5.2.2


Client	Kaba Ilco Inc.	
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Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	

### Measurement Uncertainty

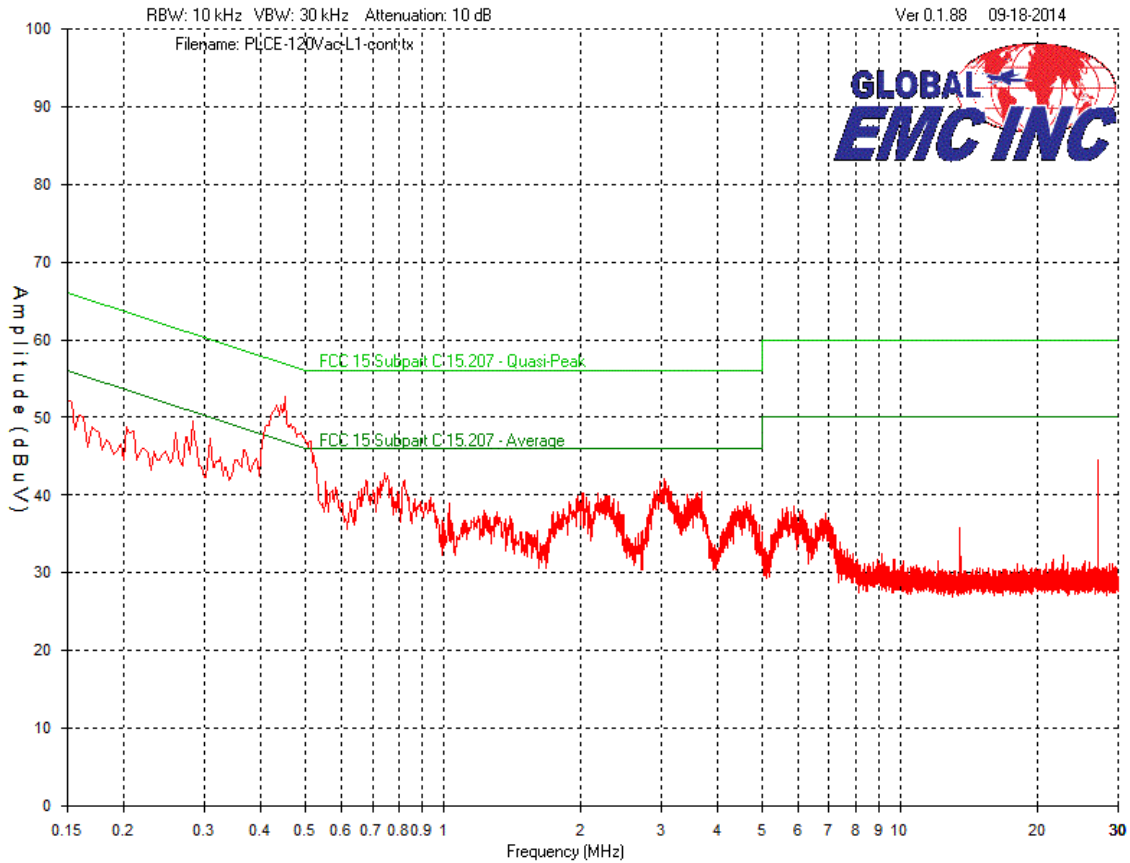
The expanded measurement uncertainty is calculated in accordance with CISPR 16-4-2 and is +/-3.6 dB with a 'k=2' coverage factor and a 95% confidence level.

### Preliminary Graphs


Note the graphs shown below are for graphical illustration only. For final measurements with the appropriate detector where applicable, please refer to the table. The graph shown below is a peak measurement graph, measured with a resolution bandwidth greater then or equal to the final required detector. These graphs are performed as a worst case measurement to enable the detection of frequencies of concern and for considerable time savings.

Client	Kaba Ilco Inc.	
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Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	

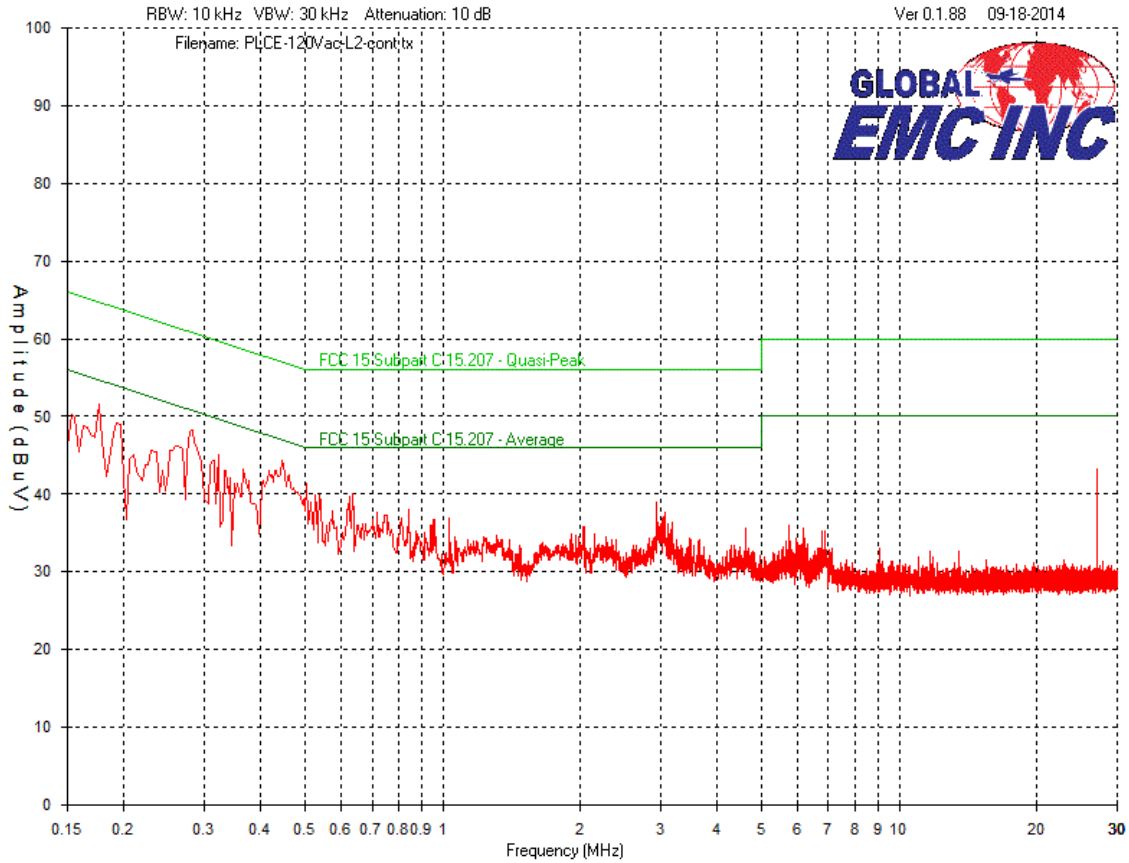
Phase (Black/Brown)






Client	Kaba Ilco Inc.	
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Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	

Neutral (White/Blue)



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## Final Measurements


Peak Emissions vs. Average Limit Table - Line 1 – 120Vac/60Hz

Test Frequency (MHz)	Det. mode	Received signal (dBµV)	Attenuator (dB)	Cable loss (dB)	LISN factor (dB)	Emission Level (dBµV)	Emission limit (dBµV)	Margin (dB)	Result
0.4518	AVG	25.7	10	0	0.2	35.9	46.8	10.9	PASS
0.2827	PEAK	38.9	10	0	0.6	49.5	50.7	1.2	PASS
0.747	PEAK	32.6	10	0	0.2	42.8	46	3.2	PASS
3.0587	PEAK	31.9	10	0.1	0.2	42.2	46	3.8	PASS
0.1533	PEAK	40.5	10	0	1.5	52	55.8	3.8	PASS
27.1079	PEAK	33.9	10	0.2	0.5	44.6	50	5.4	PASS

Peak Emissions vs. Average Limit Table - Line 2 – 120Vac/60Hz

Test Frequency (MHz)	Det. mode	Received signal (dBµV)	Attenuator (dB)	Cable loss (dB)	LISN factor (dB)	Emission Level (dBµV)	Emission limit (dBµV)	Margin (dB)	Result
0.2827	PEAK	37.7	10	0	0.6	48.3	50.7	2.4	PASS
0.4452	PEAK	34.1	10	0	0.2	44.3	47	2.7	PASS
0.1765	PEAK	40.4	10	0	1.2	51.6	54.6	3.0	PASS
0.3225	PEAK	34.6	10	0	0.4	45	49.6	4.6	PASS
0.1931	PEAK	38.0	10	0	1.1	49.1	53.9	4.8	PASS
0.2595	PEAK	35.5	10	0	0.7	46.2	51.4	5.2	PASS


Note: See ‘Appendix B – EUT & Test Setup Photographs’ for photos showing the test set-up for the highest line conducted emission

Client	Kaba Ilco Inc.	
Product	RFID wall mounted reader	
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	

## Test Equipment List

Equipment	Model No.	Manufacturer	Last calibration date	Next calibration due date	Asset#
HP Spectrum Analyzer	8566B	HP	2013-01-22	2015-01-22	4169
Spectrum Analyzer Display	8566B	HP	1-22-13	1-22-15	4168
Quasi Peak Adapter	85650A	HP	2013-01-23	2015-01-23	4170
LISN	FCC-LISN-50/250-16-2-01	FCC	2013-05-06	2015-05-06	4005
RF Cable 7m	LMR-400-7M-50OHM-MN-MN	LexTec	N/A	N/A	4025
RF Cable 1m	LMR-400-1M-50OHM-MN-MN	LexTec	N/A	N/A	4026
Attenuator 10 dB	FP-50-10	Trilithic	N/A	N/A	4027

This report module is based on GEMC template "FCC – Power Line Conducted Emissions Class A\_Rev1"

Client	Kaba Ilco Inc.	
Product	RFID wall mounted reader	
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	

## *Radiated Emissions*

### **Purpose**

The purpose of this test is to ensure that the RF energy unintentionally emitted from the EUT does not exceed the limits listed below as defined in the applicable test standard, as measured from a receiving antenna. This helps protect broadcast radio services such as television, FM radio, pagers, cellular telephones, emergency services, and so on, from unwanted interference.

### **Limit(s) and Method**

The method is as defined in ANSI C63.4

The limits are as defined in FCC Part 15, Section 15.209:

0.009 MHz – 0.490 MHz, 2400/F(kHz) uV/m at 300 m<sup>4</sup>

0.490 MHz – 1.705 MHz, 24000/F(kHz) uV/m at 30 m<sup>4</sup>

1.705 MHz – 30 MHz, 30 uV/m at 30 m<sup>4</sup>

30 MHz – 88 MHz, 100 uV/m (40.0 dBuV/m<sup>1</sup>) at 3 m

88 MHz – 216 MHz, 150 uV/m (43.5 dBuV/m<sup>1</sup>) at 3 m

216 MHz – 960 MHz, 200 uV/m (46.0 dBuV/m<sup>1</sup>) at 3 m

Above 960 MHz, 500 uV/m (54.0 dBuV/m<sup>1</sup>) at 3 m

Above 1000 MHz, 500 uV/m (54 dBuV/m<sup>2</sup>) at 3m


Above 1000 MHz, 5000 uV/m (74 dBuV/m<sup>3</sup>) at 3m

<sup>1</sup>Limit is with 120 kHz measurement bandwidth and a using a Quasi Peak detector.

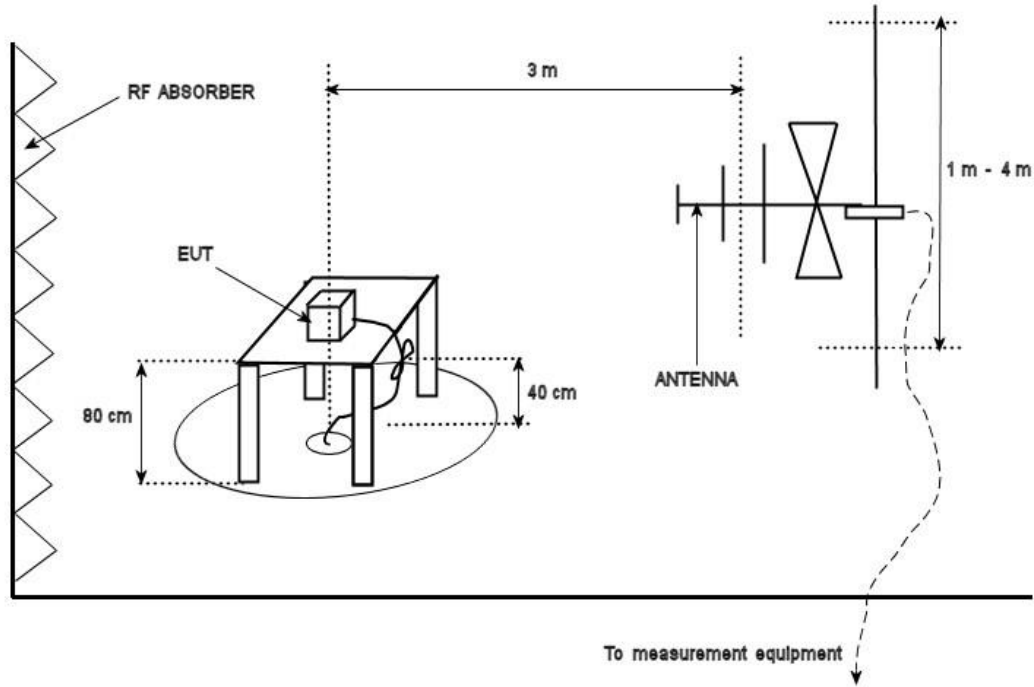
<sup>2</sup>Limit is with 1 MHz measurement bandwidth and using an Average detector


<sup>3</sup>Limit is with 1 MHz measurement bandwidth and using an Peak detector

<sup>4</sup>Limit is with using a Quasi-peak detector with a bandwidth as defined in CISPR 16-1-1

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**Typical Radiated Emissions Setup**



Client	Kaba Ilco Inc.	
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Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	

## Measurement Uncertainty


The expanded measurement uncertainty is calculated in accordance with CISPR 16-4-2 and is +/-4.4 dB with a 'k=2' coverage factor and a 95% confidence level.

## Preliminary Graphs

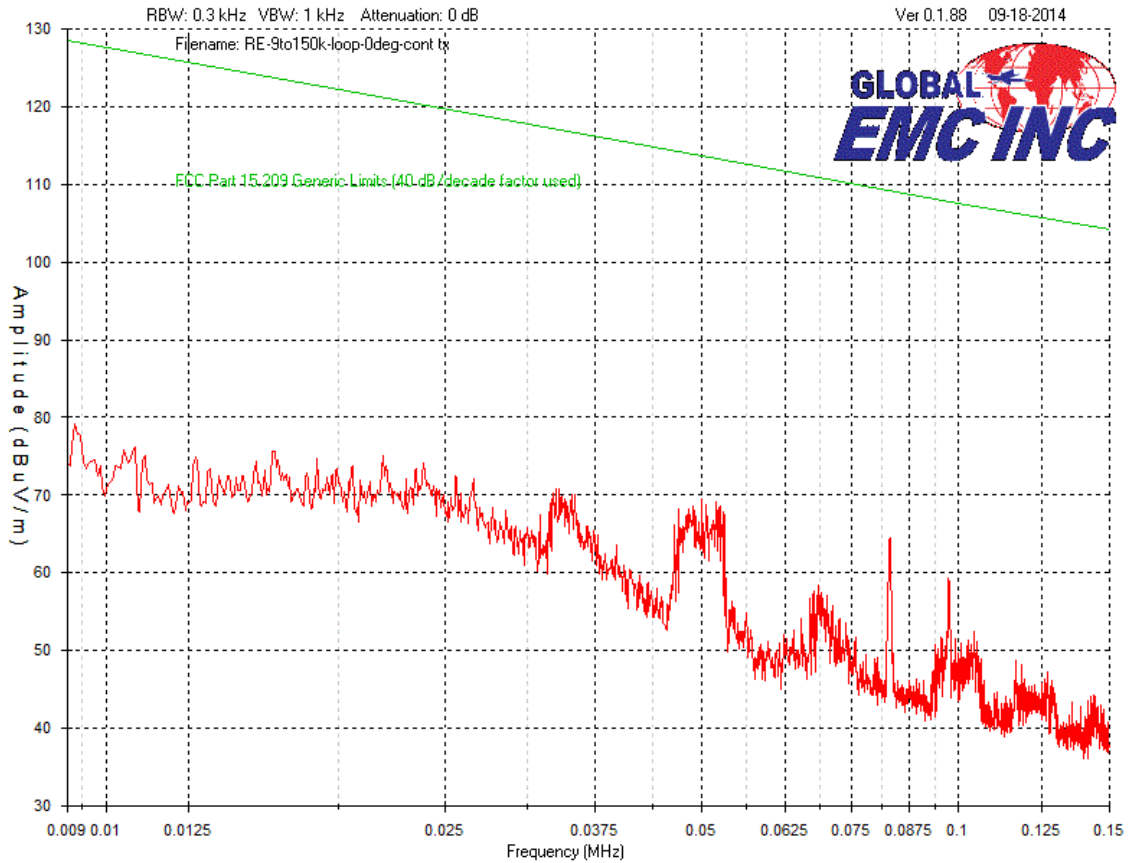
Note the graphs shown below are for graphical illustration only. For final measurements with the appropriate detector, please refer to the final measurement table where applicable. The graph shown below is a maximized peak measurement graph, measured with a resolution bandwidth greater than the final required detector and over a full 0-360 rotation. This peaking process is done as a worst case measurement. This process enables the detection of frequencies of concern for final measurement, and provides considerable time savings. Final measurements are performed over a full 0-360 degrees rotation and 1 – 4 meter height of measurement antenna.


In accordance with FCC Part 15, Subpart A, Section 15.33, the device was scanned to the 10<sup>th</sup> harmonic ( a minimum of a 1 GHz).

Devices scanned above 1GHz may be scanned at a closer test distance, and in accordance with FCC Part 15, Subpart A, Section 15.31, an extrapolation factor of 20 dB/decade was used above 30 MHz, and 40 dB/decade below 30 MHz.

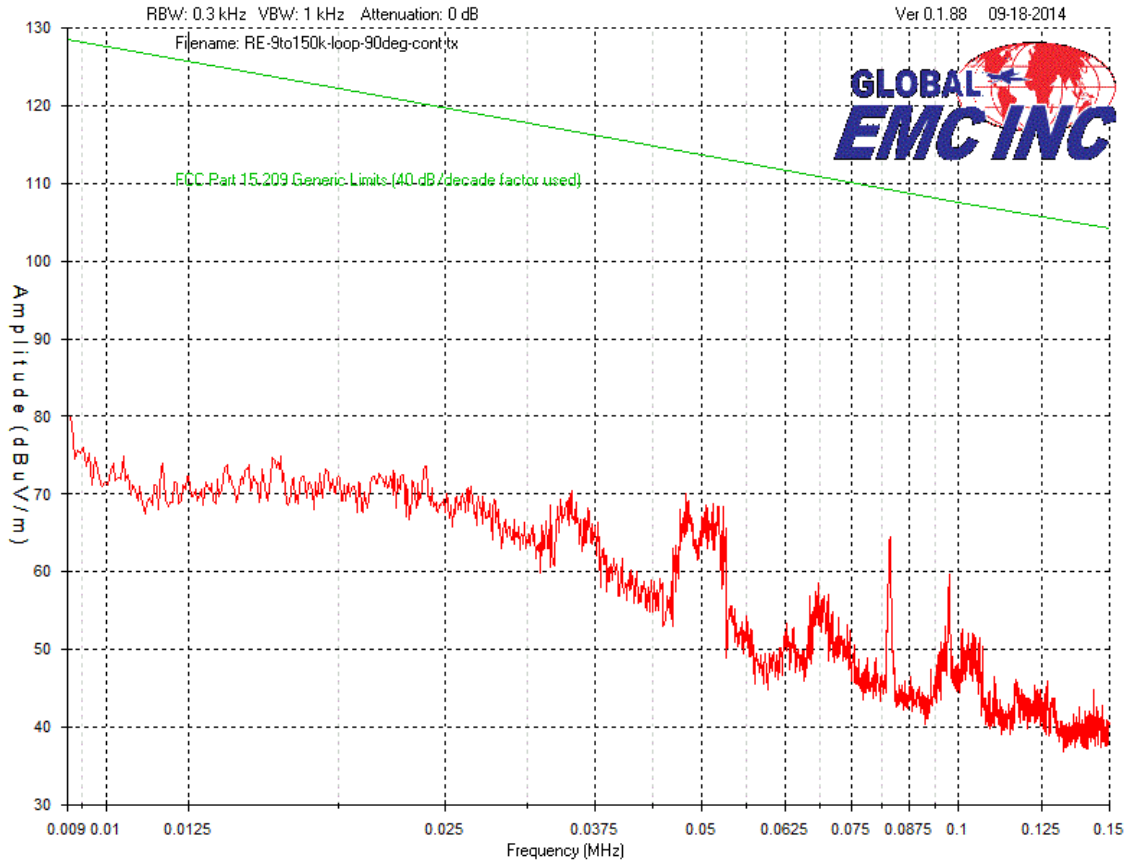
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9 kHz to 150 kHz – Loop @ 0 degree




Client	Kaba Ilco Inc.	
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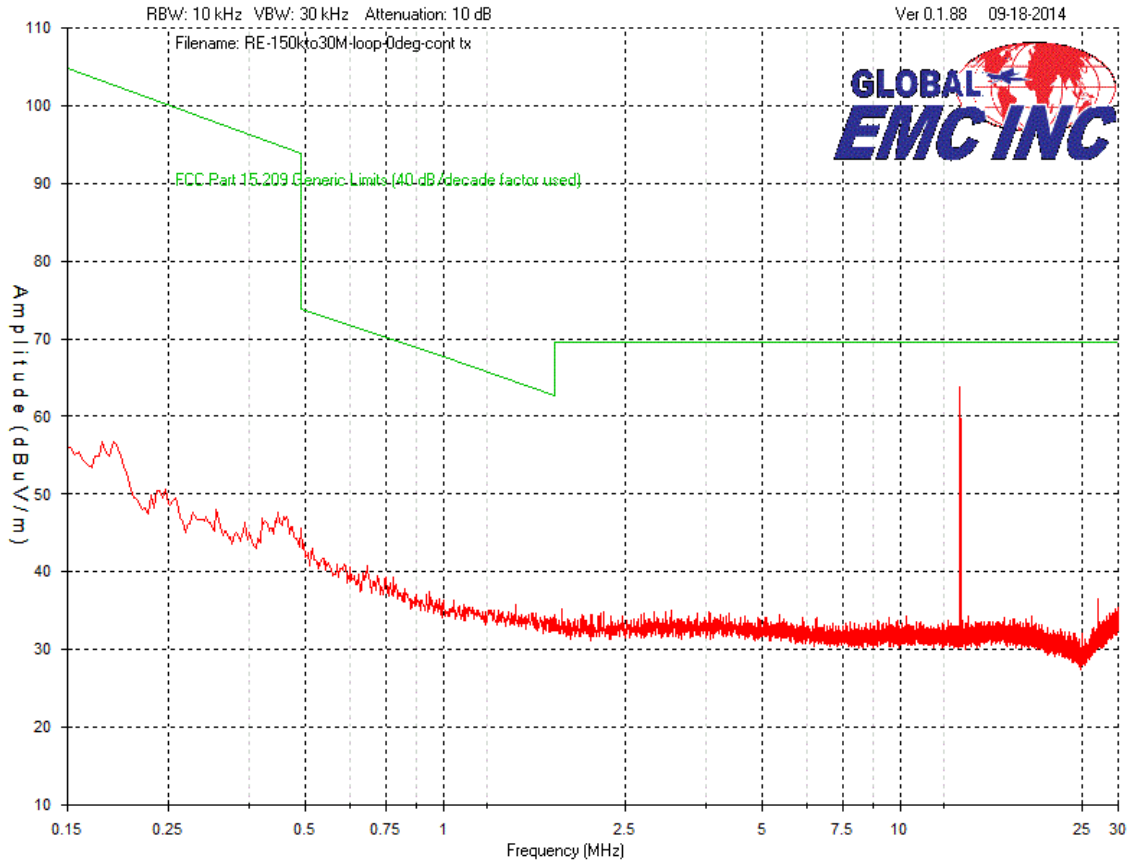
9 kHz to 150 kHz – Loop @ 90 degree






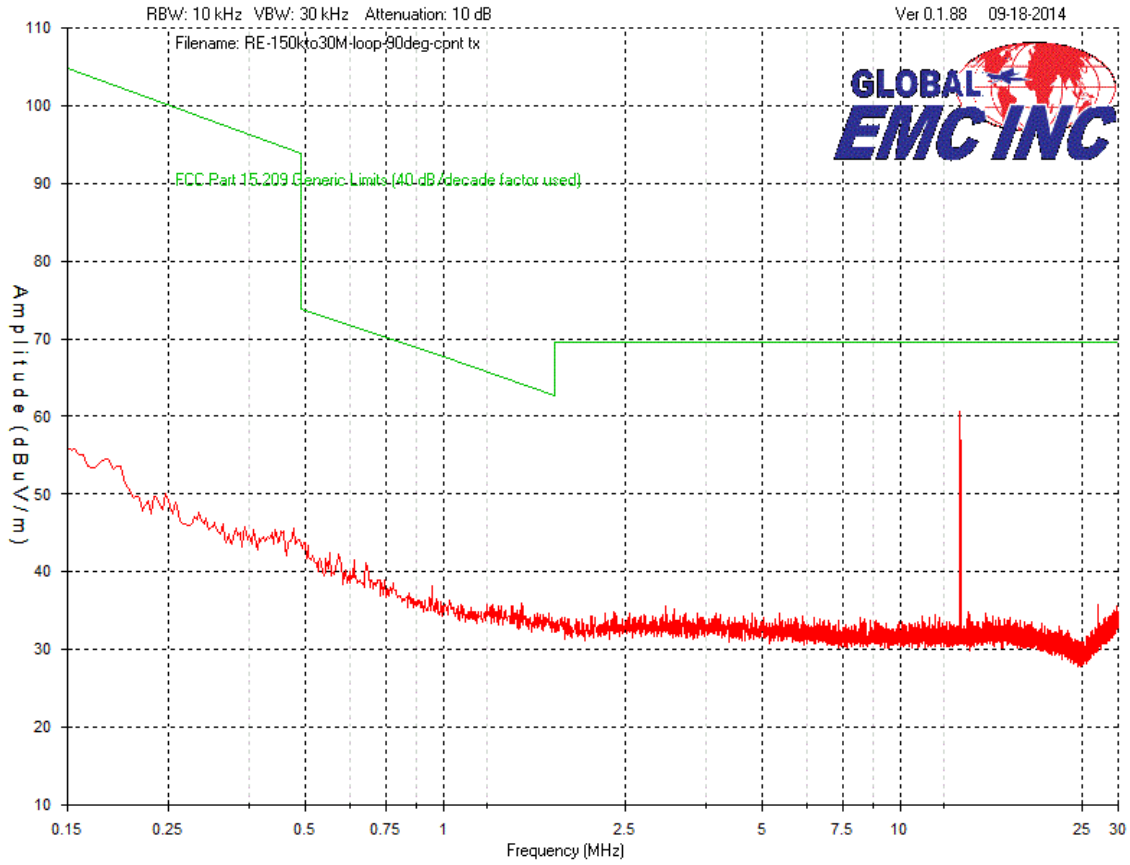
Client	Kaba Ilco Inc.	
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150 kHz to 30 MHz-Loop @ 0 degree



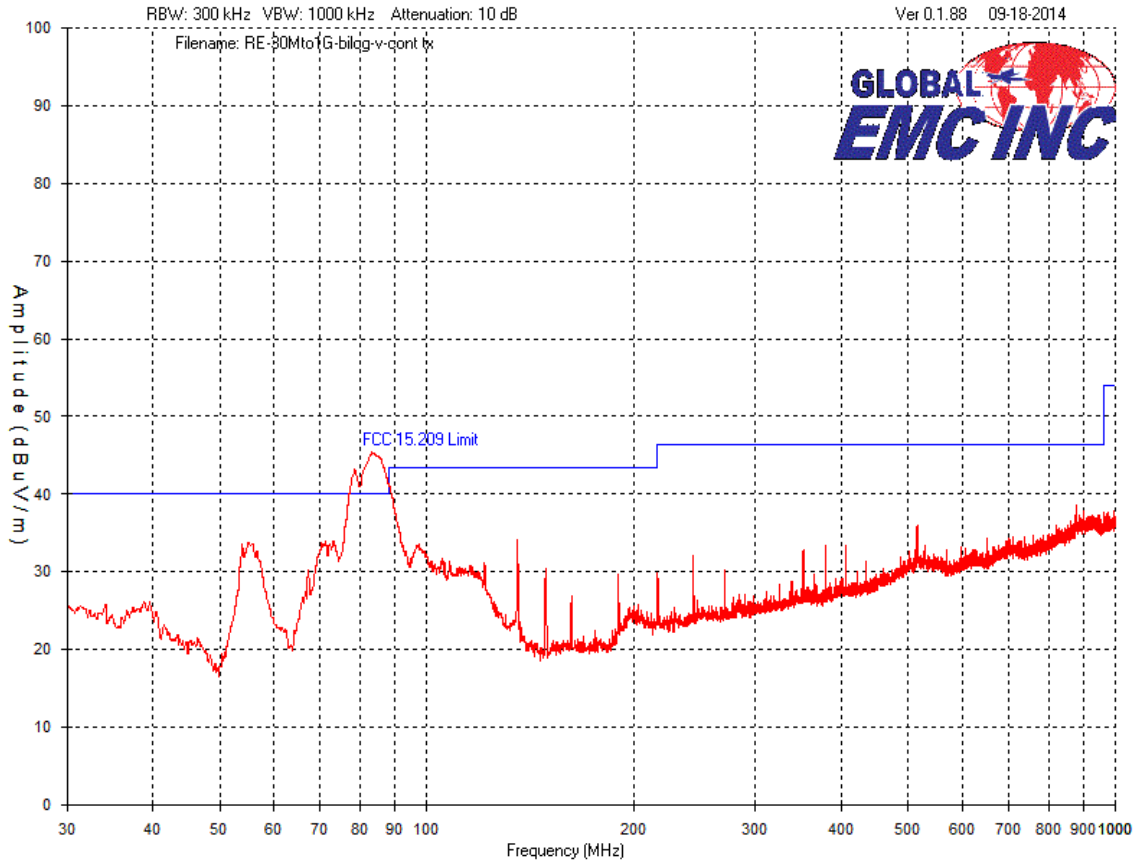
Client	Kaba Ilco Inc.	
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Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	


150 kHz to 30 MHz-Loop @ 90 degree



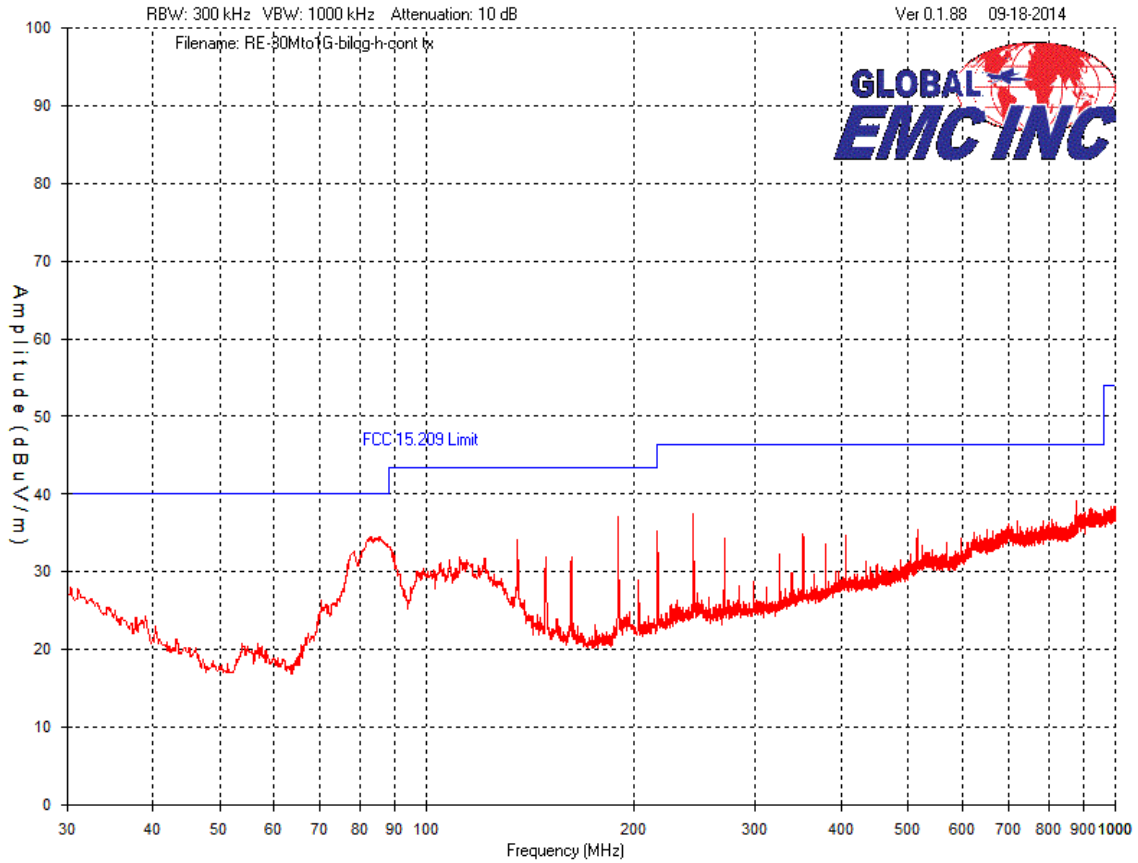
Client	Kaba Ilco Inc.	
Product	RFID wall mounted reader	
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	


### 30MHz to 1GHz – Vertical – Peak Emissions Graph



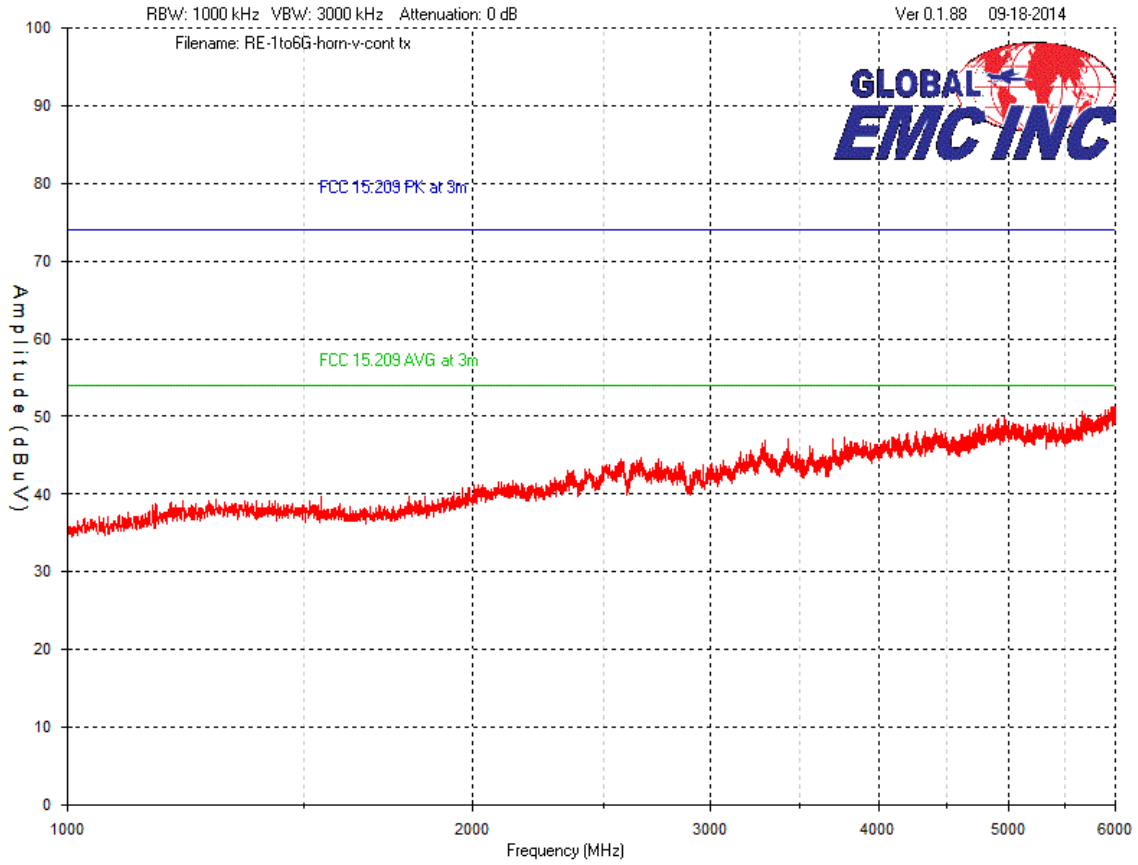
Client	Kaba Ilco Inc.	
Product	RFID wall mounted reader	
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	


### 30MHz to 1GHz – Horizontal – Peak Emissions Graph



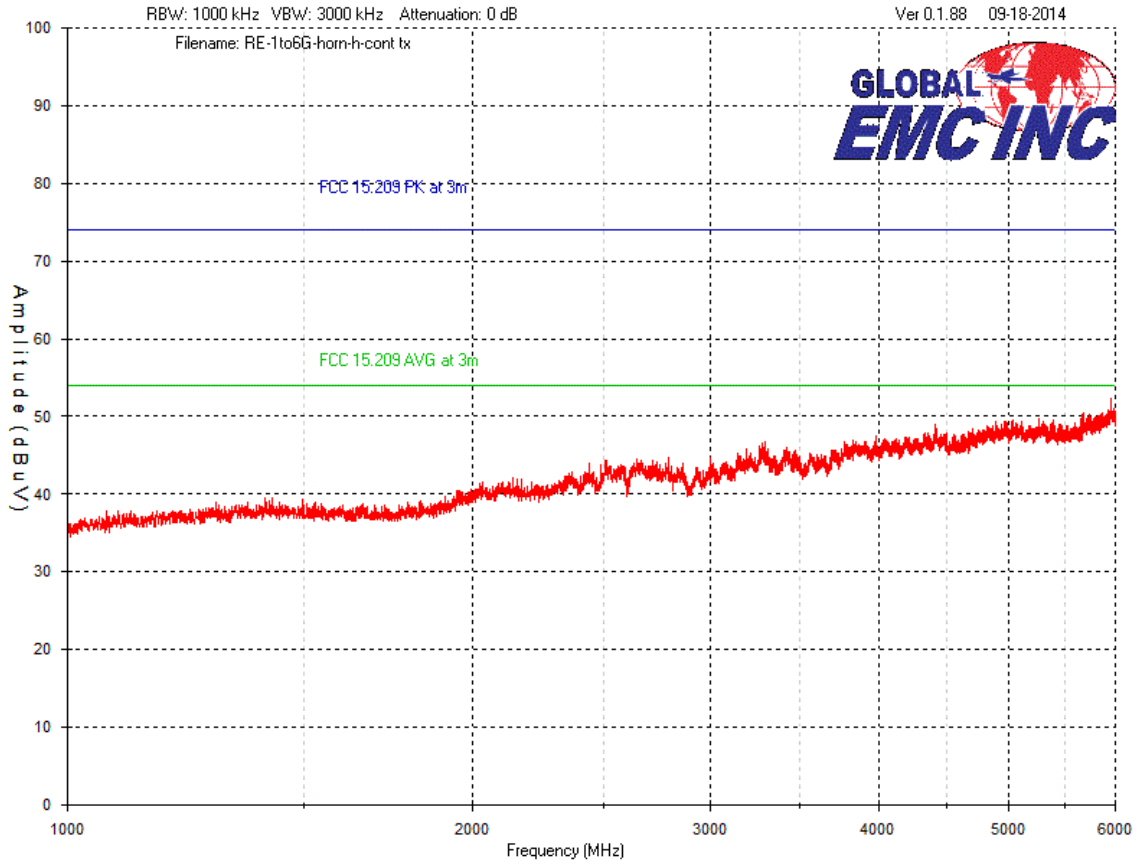
Client	Kaba Ilco Inc.	
Product	RFID wall mounted reader	
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	


### 1GHz to 6GHz– Vertical – Peak Emissions Graph



Client	Kaba Ilco Inc.	
Product	RFID wall mounted reader	
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	

### 1GHz to 6GHz– Horizontal – Peak Emissions Graph



Client	Kaba Ilco Inc.	
Product	RFID wall mounted reader	
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	


## Final Measurements

### Peak Emissions vs. Quasi Peak Limit Table – Loop@0 degree@3m distance

Frequency (MHz)	Raw (dBuV)	Att. (dB)	Cable (dB)	Cur. Factor	Ant. (dB/m)	Amp (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pass/Fail
13.556	51.2	3	0.4	51.5	-13.9	-28.5	63.7	69.5	5.8	Pass
27.1112	24.8	3	0.5	51.5	-14.8	-28.5	36.5	69.5	33.0	Pass
19.4265	22.1	3	0.4	51.5	-14.2	-28.5	34.3	69.5	35.2	Pass
14.1397	21.7	3	0.4	51.5	-13.8	-28.5	34.3	69.5	35.2	Pass
10.2957	22.1	3	0.4	51.5	-14.3	-28.5	34.2	69.5	35.3	Pass
25.1477	22.2	3	0.5	51.5	-16.6	-28.5	32.1	69.5	37.4	Pass

### Peak Emissions vs. Quasi Peak Limit Table – Loop@90 degree@3m distance

Frequency (MHz)	Raw (dBuV)	Att. (dB)	Cable (dB)	Cur. Factor	Ant. (dB/m)	Amp (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pass/Fail
13.556	48.2	3	0.4	51.5	-13.9	-28.5	60.7	69.5	8.8	Pass
27.1145	24.1	3	0.5	51.5	-14.8	-28.5	35.8	69.5	33.7	Pass
14.0833	22.4	3	0.4	51.5	-13.8	-28.5	35	69.5	34.5	Pass
15.4531	22.1	3	0.4	51.5	-13.8	-28.5	34.7	69.5	34.8	Pass
10.0668	18.7	3	0.4	51.5	-14.3	-28.5	30.8	69.5	38.7	Pass
0.1566	24.3	3	0	51.5	5.8	-28.8	55.8	104.4	48.6	Pass

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#### Emission Reading Table – Vertical


Frequency (MHz)	Det. mode	Raw (dBuV)	Ant. (dB/m)	Att. (dB)	Cab. (dB)	Amp (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pass/Fail
83.059*	Q.P	46.7	7.7	3	0.9	-28.5	29.8	40	10.2	Pass
55.317	PEAK	51.4	7.2	3	0.8	-28.5	33.9	40	6.1	Pass
135.342	PEAK	51.0	7.5	3	1.1	-28.5	34.1	43.5	9.4	Pass
515.97	PEAK	40.2	19.6	3	2.1	-28.8	36.1	46.4	10.3	Pass
379.491	PEAK	41.7	15.5	3	1.8	-28.6	33.4	46.4	13.0	Pass
406.069	PEAK	40.9	16.3	3	1.9	-28.7	33.4	46.4	13.0	Pass

#### Emission Reading Table – Horizontal

Frequency (MHz)	Det. mode	Raw (dBuV)	Ant. (dB/m)	Att. (dB)	Cab. (dB)	Amp (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pass/Fail
83.059*	PEAK	51.1	8.1	3	0.9	-28.5	34.6	40	5.4	Pass
189.468	PEAK	51.3	9.9	3	1.3	-28.5	37.0	43.5	6.5	Pass
243.594	PEAK	49.2	12.2	3	1.6	-28.6	37.4	46.4	9.0	Pass
135.342	PEAK	49.9	8.7	3	1.1	-28.5	34.2	43.5	9.3	Pass
216.143	PEAK	48.3	11	3	1.5	-28.6	35.2	46.4	11.2	Pass
351.943	PEAK	43.2	15.6	3	1.8	-28.6	35.0	46.4	11.4	Pass

Note (\*): The frequency range of 72 MHz to 90 MHz was investigated to be a single broadband emission and this was found to be the maximum value over this frequency range.




Client	Kaba Ilco Inc.	
Product	RFID wall mounted reader	
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	

## Test Equipment List

Equipment	Model No.	Manufacturer	Last calibration date	Next calibration due date	Asset #
Spectrum Analyzer	8566B	HP	1/22/13	1/22/15	4169
Quasi Peak Adapter	85650A	HP	1/23/13	1/23/15	4170
Loop Antenna	EM 6879	Electro-Metrics	10-11-13	10-11-15	4040
BiLog Antenna	3142-C	ETS	4/25/13	4/25/15	4002
Attenuator 3 dB	FP-50-3	Trilithic	N/A	N/A	4028
9kHz-1GHz, 28dB preamp	LNA 6901	Teseq	8-6-13	8-6-15	4036
Horn Antenna	ATH1G18G	AR	4/3/13	4/3/15	4003
1GHz-26.5GHz preamp	HP 8449B	HP	4/25/13	4/25/15	4006
RF Cable 7m	LMR-400-7M-50OHM-MN-MN	LexTec	NCR	NCR	4026
RF Cable 1M	LMR-400-1M-50OHM-MN-MN	LexTec	N/A	N/A	4039
RF Cable 10m	LMR-400-10M-50OHM-MN-MN	LexTec	NCR	NCR	4025

This report module is based on GEMC template "FCC - 15.209 - Radiated Emissions\_Rev5.doc"

Client	Kaba Ilco Inc.	
Product	RFID wall mounted reader	
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	

## ***20dB Bandwidth***

### **Purpose**


The purpose of this test is to measure the bandwidth of EUT. This also helps prevent corruption of data by ensuring adequate data separation to distinguish the reception of the intended information.

### **Limits**

The Limit is as specified in FCC Part 15 and RSS 210.

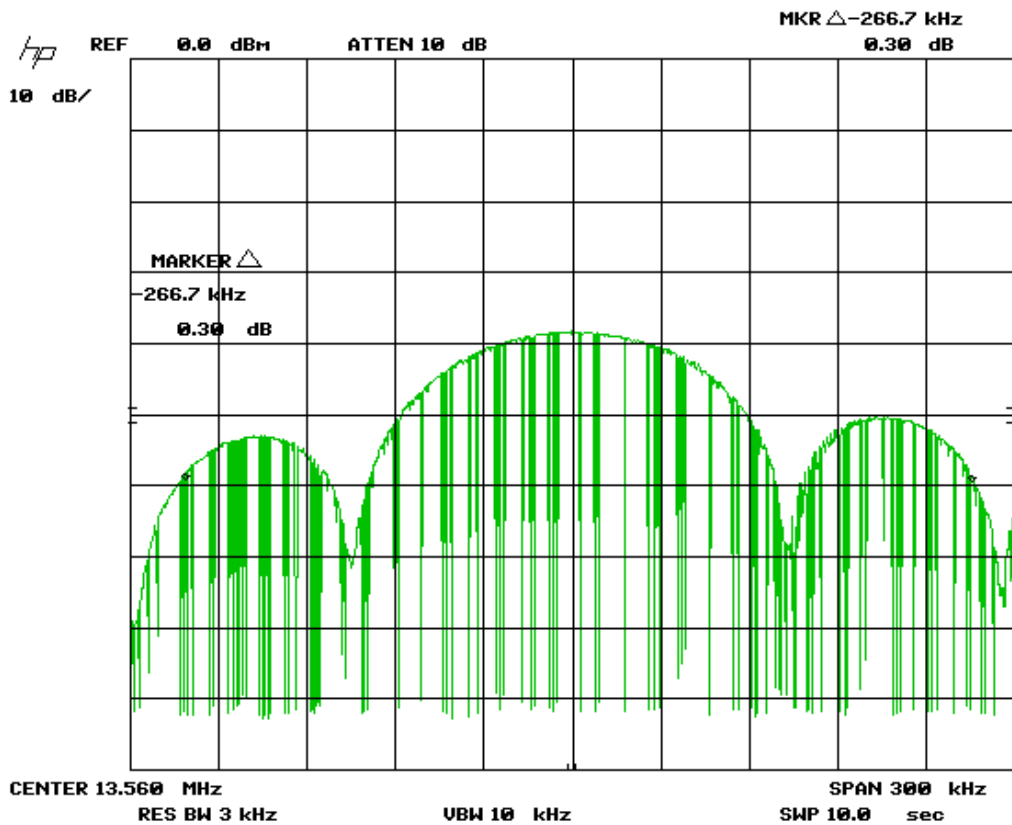
### **Results**

The EUT passed. The 20 dB BW measured was 266.7 kHz


Client	Kaba Ilco Inc.	
Product	RFID wall mounted reader	
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	

### Graph(s)

The graphs shown below shows the channel spacing during the operation of the device. This is measured by a max hold on the spectrum analyzer and the highest resolution bandwidth that is sufficiently low to exhibit the 20 dB bandwidth of a channel during operation of the EUT. This measurement is a peak measurement. Max hold is performed for a duration of not less than 1 minute.




Note: See 'Appendix B – EUT & Test Setup Photographs' for photos showing the test set-up.

Client	Kaba Ilco Inc.	
Product	RFID wall mounted reader	
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	

## Test Equipment List


Equipment	Model No.	Manufacturer	Last calibration date	Next calibration due date	Asset #
Spectrum Analyzer	8566B	HP	1/22/13	1/22/15	4169
Quasi Peak Adapter	85650A	HP	1/23/13	1/23/15	4170
Loop Antenna	EM 6879	Electro-Metrics	10-11-13	10-11-15	4040
BiLog Antenna	3142-C	ETS	4/25/13	4/25/15	4002
Attenuator 3 dB	FP-50-3	Trilithic	N/A	N/A	4028
9kHz-1GHz, 28dB preamp	LNA 6901	Teseq	8-6-13	8-6-15	4036
Horn Antenna	ATH1G18G	AR	4/3/13	4/3/15	4003
1GHz-26.5GHz preamp	HP 8449B	HP	4/25/13	4/25/15	4006
RF Cable 7m	LMR-400-7M-50OHM-MN-MN	LexTec	NCR	NCR	4026
RF Cable 1M	LMR-400-1M-50OHM-MN-MN	LexTec	N/A	N/A	4039
RF Cable 10m	LMR-400-10M-50OHM-MN-MN	LexTec	NCR	NCR	4025

This report module is based on GEMC template "FCC - 15.209 - Radiated Emissions\_Rev5.doc"

Client	Kaba Ilco Inc.	
Product	RFID wall mounted reader	
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	

## Appendix A – EUT Summary


For further details for filing purposes, refer to filing package.

Client	Kaba Ilco Inc.	
Product	RFID wall mounted reader	
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	

## General EUT Description

Client Details	
Organization / Address	Kaba Ilco Inc. 7301 Decarie Blvd. Montreal Qc H4P 2G7
Contact	Michael Mosca
Phone	514-735-5410
Email	michael.mosca@kaba.com
EUT (Equipment Under Test) Details	
EUT Name (for report title)	RFID wall mounted reader
EUT Model / SN (if known)	R79K and SR
EUT revision	SR
EUT is powered using	DC
Input voltage range(s) (V)	6-24 Volts
Frequency range(s) (Hz)	13.56 MHz
Transmits RF energy? (describe)	Yes
Basic EUT functionality description	RFID reader for access control
Step by step instructions for setup and operation	Wire power and signal wires to a controller board
I/O cable description Specify length and type	500 feet shielded
Available connectors on EUT	4
Dimensions of product	L 70mm W 45mm D 25mm
Method of monitoring EUT and description of failure for immunity.	Counter that verifies locking mechanism

Note the EUT is considered to have been received the date of the commencement of the first test, unless otherwise stated. For a close-up picture of the EUT, see ‘Appendix B – EUT & Test Setup Photographs’.

Client	Kaba Ilco Inc.	
Product	RFID wall mounted reader	
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	

## EUT Functional Description

RFID reader for access control.

## EUT Configuration

The EUT was configured in the following way during the tests:

- Wire power and signal wires to a controller board.
- Cables and earthing were connected as per manufacturer's specification.
- The EUT was powered on and transmitting continuously during all tests.

## Operational Setup

These devices are required to be attached to the EUT for its normal operation.

(Ex Monitor to track progress)

None.


## Test Signals Required For Test

The following patterns or signals were generated during test by the peripherals as described above to exercise the EUT during testing.

None.

## Modifications Required for Compliance


None.

Client	Kaba Ilco Inc.	
Product	RFID wall mounted reader	
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	

## Appendix B – EUT and Test Setup Photographs


Note: These photos are for information purposes only. Also refer to PDF files that are separate from this test report.



Client	Kaba Ilco Inc.	
Product	RFID wall mounted reader	
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	


**EUT's Photo:**



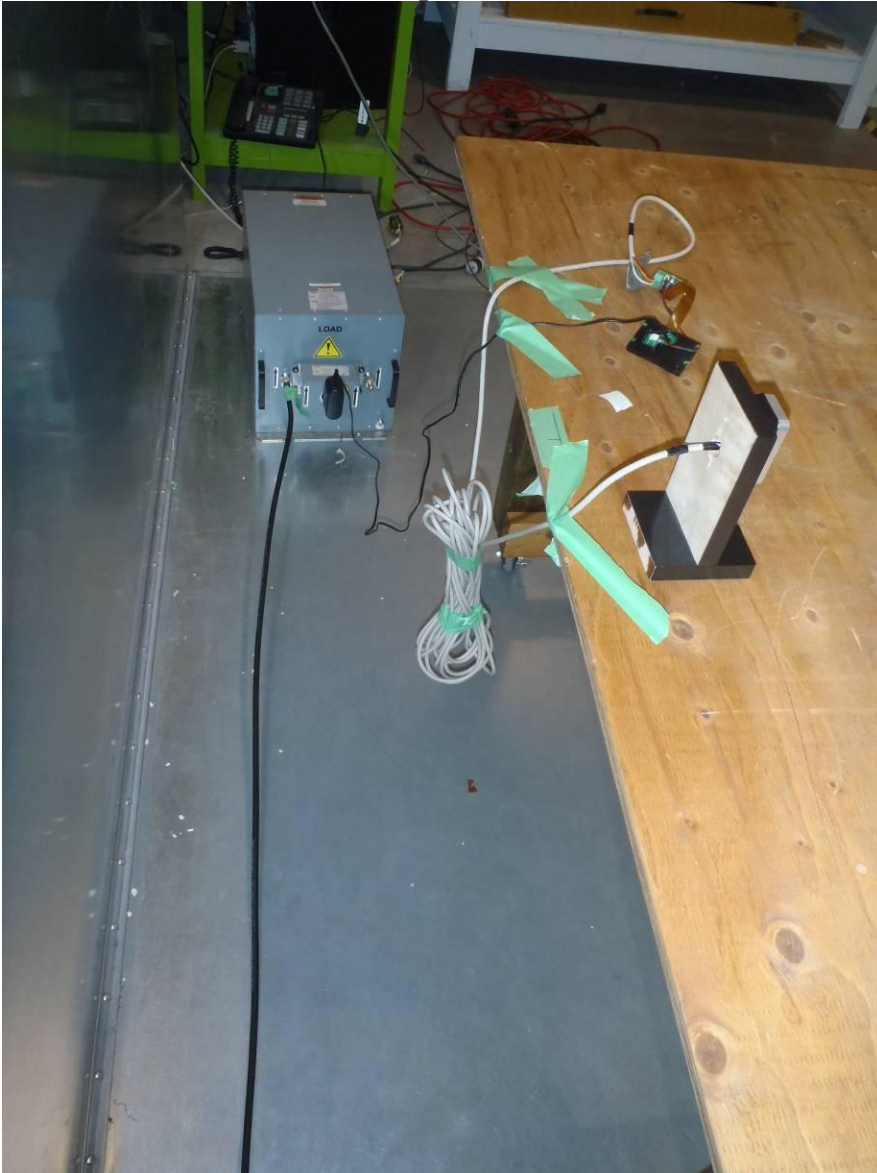
Client	Kaba Ilco Inc.	
Product	RFID wall mounted reader	
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	


**Conducted Emission Test Setup Photo#1:**



Client	Kaba Ilco Inc.	
Product	RFID wall mounted reader	
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	


**Conducted Emission Test Setup Photo#2:**



Client	Kaba Ilco Inc.	
Product	RFID wall mounted reader	
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	


**Radiated Emission Test Setup Photo#1:**



Client	Kaba Ilco Inc.	
Product	RFID wall mounted reader	
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	

**Radiated Emission Test Setup Photo#2:**



Client	Kaba Ilco Inc.	
Product	RFID wall mounted reader	
Standard(s)	RSS 210 Issue 8:2010 / FCC Part 15 Subpart C 15:2013	

**Radiated Emission Test Setup Photo#3:**

