EMC TEST REPORT

Report Number: 100360832ATL-001d
Project Number: G100360832

Report Issue Date: May 8, 2014

Product Designation: G90

Standards: CFR47 FCC Part 15 Subpart C:2014 Section 15.225, CFR47 FCC Subpart B:2014 Section 15.209
Industry Canada RSS-210 Issue 8 December 2010, Annex 2 Section A2.6
Industry Canada RSS-GEN Issue 3 December 2010

Tested by:
Intertek Testing Services NA, Inc.
1950 Evergreen Blvd, Suite 100
Duluth, GA 30096 USA

Client:
Salto Systems S.L.
Pol. Lanbarren, C/ Arkotz 9
20180-OIARTZUN Gipuzkoa
Spain

Report prepared by Mary Sampson

Mary Sampson/Senior Project Engineer

Report reviewed by

Vathana Van/Senior Project Engineer

1 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 4.0. The remaining test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product tested **complies** with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested.

2 Test Summary

Section	Test full name	Result
3	Client Information	
4	Description of Equipment Under Test	
5	System Setup and Method	
6	Fundamental Frequency Radiated Emissions FCC Part 15 Subpart C: 2014 15.225(a), (b), (c), (d) IC RSS-210 Issue 8 December 2010 Annex A2.6 (a), (b), (c), (d)	Pass
7	Transmitter Spurious Emissions Below 30 MHz FCC Part 15 Subpart C: 2014 15.209, 15.225(d) IC RSS-210 Issue 8 December 2010 A2.6(d)	Pass
8	Transmitter Spurious Emission Above 30MHz FCC Part 15 Subpart C: 2014 15.209, 15.225(d) IC RSS-210 Issue 8 December 2010 A2.6(d)	Pass
9	Receiver Spurious Emissions Above 30MHz FCC Part 15 Subpart B: 2014 15.109 IC RSS-Gen Issue 3 December 2010: Section 6.0	Pass
10	20dB and Occupied Bandwidth FCC Part 15 Subpart C:2014 15.225 IC RSS-Gen Issue 3 December 2010 Section 4.6	Pass
11	Frequency Stability FCC Part 15 Subpart C:2014 15.225(e) IC RSS-Gen Issue 3 December 2010 Section 4.7 IC RSS-210 December 2010 Annex A2.6	Pass
12	Revision History	

Section	Test full name	Result

3 Client Information

This EUT was tested at the request of:

Client: Salto Systems S.L.
Pol. Lanbarren, C/ Arkotz 9
20180-OIARTZUN Gipuzkoa
Spain

Contact: Julen Gutierrez
Telephone: +34 943 344 550
Fax: +34 943 341 621
Email: j.gutierrez@saltosystems.com

4 Description of Equipment Under Test

Manufacturer: Salto Systems S.L.
Pol. Lanbarren, C/ Arkotz 9
20180-OIARTZUN Gipuzkoa
Spain

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
SALTO GEO Cylinder	Salto Systems S.L.	G90	908082

Receive Date:	11/25/2013
Received Condition:	Good
Type:	Production

Description of Equipment Under Test (provided by client)

The SALTO G90 GEO cylinder is specially designed to fit most doors that are equipped with a surface mounted lock case, panic bar, top guards that needs a RIM cylinder.

Equipment Under Test Power Configuration			
Rated Voltage	Rated Current	Rated Frequency	Number of Phases
3.0 Vdc	Standby 19uA Opening 180mA	DC	DC

Operating modes of the EUT:

No.	Descriptions of EUT Exercising
1	The EUT was powered with 3.45 to 2.55 Vdc using a power supply during frequency stability testing and 3.0 V battery for remaining test cases and placed in a continuous transmit state with normal modulation for testing and standby mode.
2	

Software used by the EUT:

No.	Descriptions of EUT Exercising
1	None

5 System Setup and Method

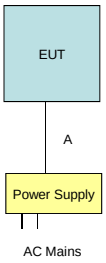
Cables					
ID	Description	Length (m)	Shielding	Ferrites	Termination
A	DC Input	2.0	None	None	Power Supply

Support Equipment			
Description	Manufacturer	Model Number	Serial Number
Power Supply	Tektronix	PS2510G	TW50295

5.1 Method:

Configuration as required by ANSI C63.4-2003.

5.2 EUT Block Diagram:



General notes: For Frequency Stability, a power supply was used to power device. All other test cases, battery powered.

6 Fundamental Frequency Radiated Emissions

6.1 Method

Tests are performed in accordance with FCC Part 15 Subpart C:2014 15.225(a)(b)(c)(d), IC RSS-210 Issue 8 December 2010 A2.6(a)(b)(c)(d), ANSI C63.4-2003.

TEST SITE: 10m Semi-Anechoic Chamber

10 Meter Semi-Anechoic Chamber The test site for radiated emissions is located at 1950 Evergreen Blvd, Suite 100, Duluth, Georgia 30096. It is a 10 meter semi-anechoic chamber manufactured by Panashield. Embedded in the floor is a 3 meter diameter turntable.

Measurement Uncertainty

For radiated emissions, U_{lab} (3.9 dB at 3m and 3.6 dB at 10m below 1 GHz, and 4.2 dB at 3m above 1 GHz) < U_{CISPR} (5.2 dB), which is the reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

Sample Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG
Where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 52.0 dBμV
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
FS = 32 dBμV/m

To convert from dBμV to μV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in μV
NF = Net Reading in dBμV

Example:

FS = RA + AF + CF – AG = 52.0 + 7.4 + 1.6 – 29.0 = 32.0
$UF = 10^{(32\ dB\mu V / 20)}$ = 39.8 μV/m

6.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
213108;	EMI Receiver, Preselector section	Hewlett Packard	85460A	3348A00203	01/03/2013	01/03/2014
213109;	EMI Receiver	Hewlett Packard	8546A	3410A00173	01/03/2013	01/03/2014
213071;	Antenna, Active Loop (1kHz to 30 MHz)	EMCO	6507	9204-1283	04/04/2013	04/04/2014
211897;	Digital Pocket Thermometer and Hydrometer	Mannix	SAM700BAR	none	12/18/2012	12/18/2013
ST-4;	7m Cable, 0.01-18GHz	Storm Products Co.	A81-0303-275.6	12-07-001	08/21/2013	08/21/2014
MP3;	Cable MP3, 18 GHz, N, 10m	Megaphase	G919-NKNK-394	MP3	05/13/2013	05/13/2014
E205;	Cable, N-N, 3 meters, 18GHz	Megaphase	TM18-NKNK-118	9053201 003	05/08/2013	05/08/2014

Software Utilized:

Name	Manufacturer	Version
Tile	Quantum Change	3.4.K.22

6.3 Results:

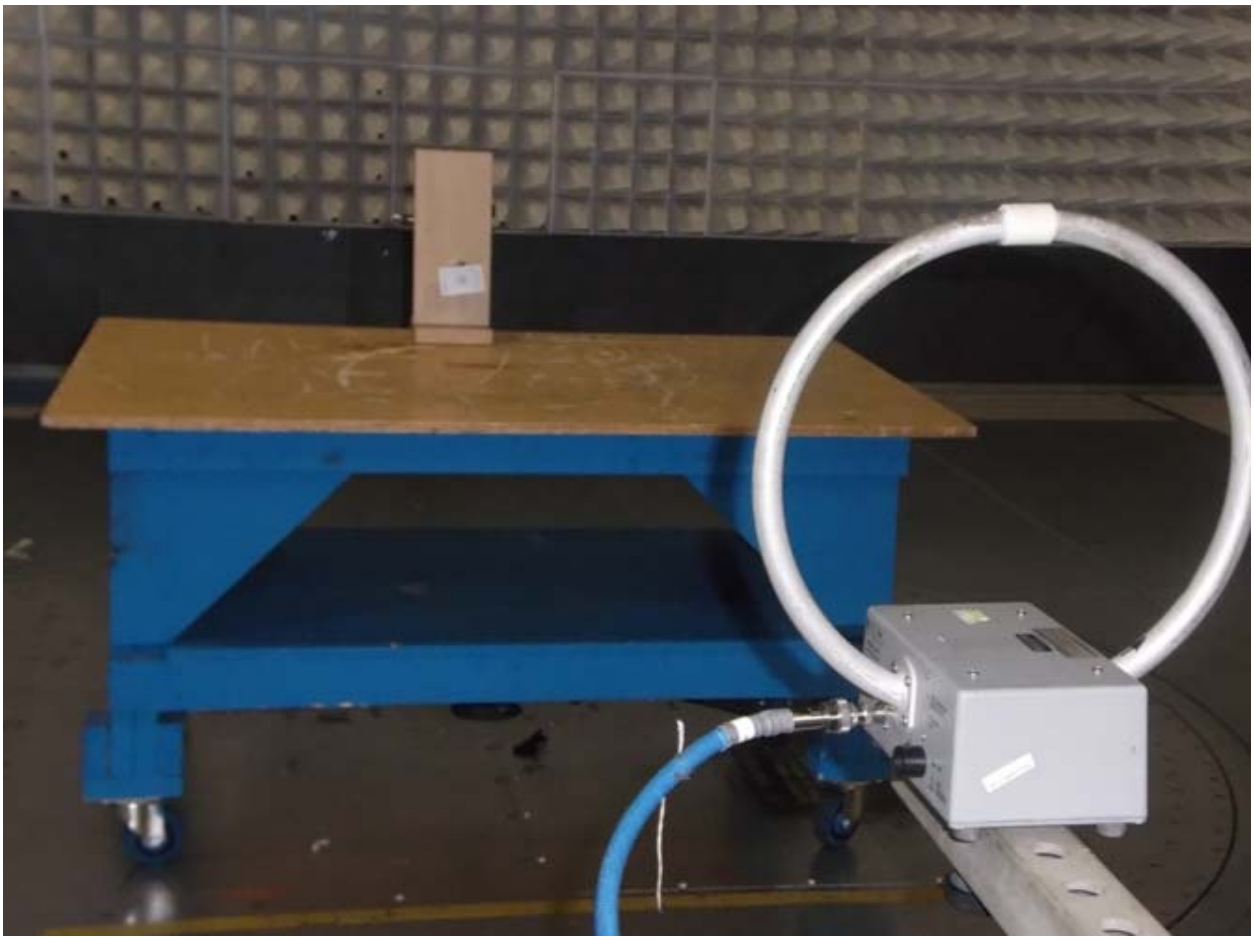
The sample tested was found to Comply.

The Field Strength of any emissions shall not exceed the limits as follows:

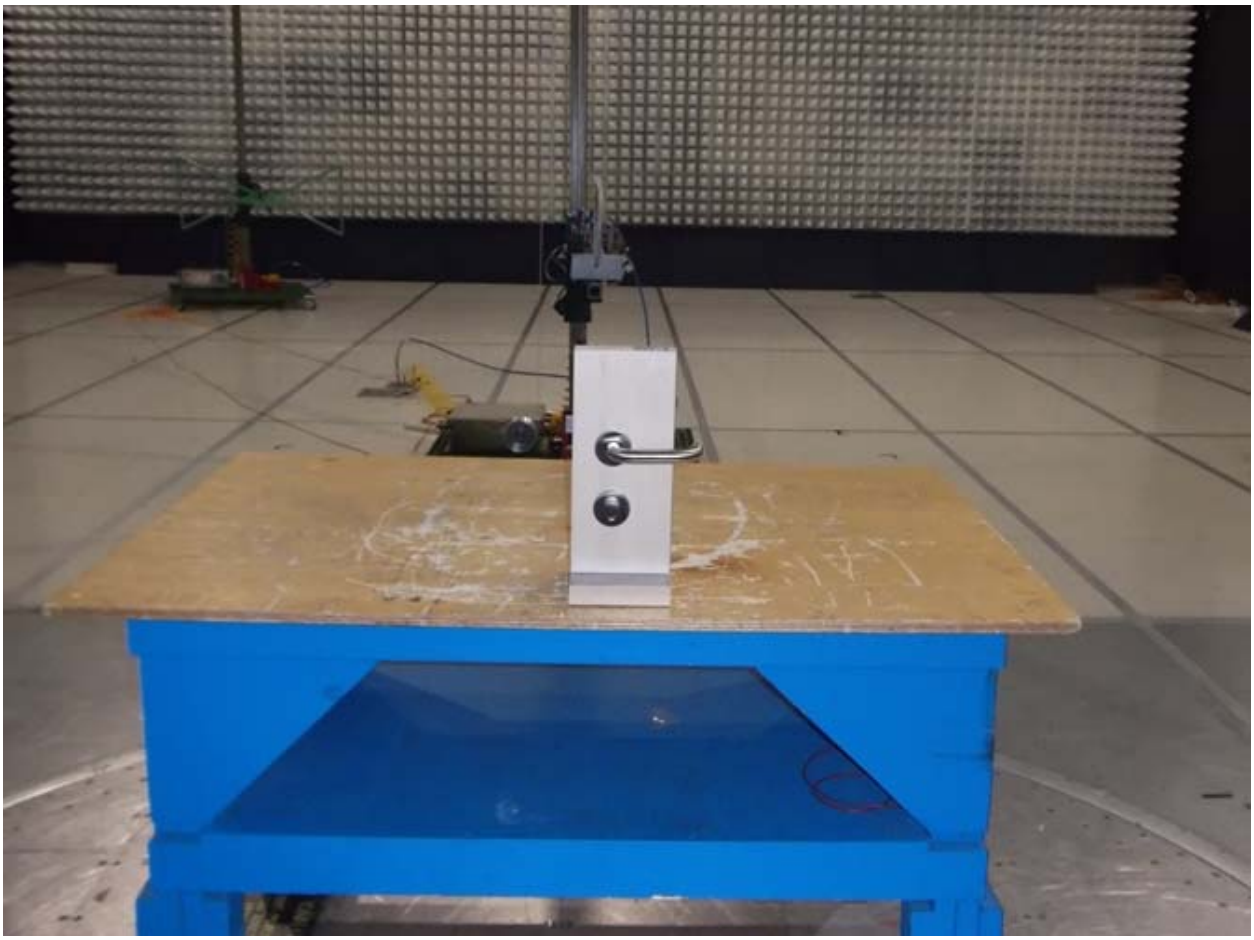
Frequency Bands	Field Strength Limits		Test Distance
(MHz)	µV/m	dBµV/m	(meters)
13.553-13.567	15,848	84.0	30
13.410-13.553	334	50.5	30
13.567-13.710	334	50.5	30
13.110-13.410	106	40.51	30
13.710-14.010	106	40.51	30
Outside of 13.110-14.010	§15.209		

6.4 Setup Photographs:

Front



Rear



6.5 Plots/Data:

Client: Salto Systems
Model Number: G90
Project Number: G100360832
Tested By: MS
Date: 12/9/13
Frequency Range (MHz): Fundamental
Input power: Battery, 3V

Receiver: HP 8546A
Antenna: EMCO 6507 h
Cables: ST-4+MP3+E-205
Preamp:
Test Distance (m): 3
Limit: FCC 15
Modifications for compliance (y/n): N

A	B	C	D	E	F	G	H	I	J
Ant. Pol. (V/H)	**Frequency MHz**	**Reading dB(uV)**	**Antenna Factor dB(1/m)**	**Cable Loss dB**	**Pre-amp Factor dB**	**Net dB(uV/m)**	**Limit dB(uV/m)**	**Margin dB**	**Detectors / Bandwidths Det/RBW/VBW**
Co=Axial									
V	13.560	33.9	34.4	0.6	0.0	68.9	124.0	-55.1	QP/9k/30k
V	13.553	22.1	34.4	0.5	0.0	57.1	90.5	-33.4	QP/9k/30k
V	13.567	22.4	34.4	0.6	0.0	57.3	90.5	-33.2	QP/9k/30k
V	13.410	8.0	34.4	0.5	0.0	42.9	80.5	-37.6	QP/9k/30k
V	13.710	8.1	34.4	0.6	0.0	43.0	80.5	-37.5	QP/9k/30k
V	13.110	7.9	34.4	0.5	0.0	42.8	69.5	-26.7	QP/9k/30k
V	14.010	7.5	34.4	0.6	0.0	42.5	69.5	-27.0	QP/9k/30k
Co-Planar									
V	13.560	39.4	34.4	0.6	0.0	74.3	124.0	-49.7	QP/9k/30k
V	13.553	26.8	34.4	0.5	0.0	61.7	90.5	-28.7	QP/9k/30k
V	13.567	27.1	34.4	0.6	0.0	62.0	90.5	-28.5	QP/9k/30k
V	13.410	9.2	34.4	0.5	0.0	44.1	80.5	-36.4	QP/9k/30k
V	13.710	10.3	34.4	0.6	0.0	45.2	80.5	-35.3	QP/9k/30k
V	13.110	8.0	34.4	0.5	0.0	42.8	69.5	-26.7	QP/9k/30k
V	14.010	7.7	34.4	0.6	0.0	42.6	69.5	-26.9	QP/9k/30k
Calculations		G=C+D+E-F		I=G-H					

Test Personnel: Mary Sampson
Test Date: 12/9/13
Supervising/Reviewing Engineer: (Where Applicable)
Product Standard: FCC 15.225, IC RSS-210
Limit Applied: Per Section 6.3
Input Voltage: Battery, 3 AAA
Pretest Verification w/ Ambient Signals or BB Source: **BB Source**
Ambient Temperature: 21.7 ºC
Relative Humidity: 44.4 %
Atmospheric Pressure: 986.9 mbars

Deviations, Additions, or Exclusions: None

7 Transmitter Spurious Emissions Below 30MHz

7.1 Method

Tests are performed in accordance with FCC Part 15 Subpart C: 2014 15.209, 15.225(d), IC RSS-210 Issue 8 December 2010 A2.6(d), ANSI C63.4-2003.

TEST SITE: 10m Semi-Anechoic Chamber

The EMC Lab has one Semi-anechoic Chamber and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

10 Meter Semi-Anechoic Chamber The test site for radiated emissions is located at 1950 Evergreen Blvd, Suite 100, Duluth, Georgia 30096. It is a 10 meter semi-anechoic chamber manufactured by Panashield. Embedded in the floor is a 3 meter diameter turntable.

Measurement Uncertainty

For conducted emissions, U_{lab} (2.8 dB in worst case) < U_{CISPR} (3.6 dB), which is the reference value in CISPR 16-4-2 Table 1, hence the compliance of the product is only based on the measured value, and no measurement uncertainty correction is required, based on CISPR 22 and CISPR 11 (for 2006 and later revisions) Clause 11.

Sample Calculations

The following is how net line-conducted readings were determined:

NF = RF + LF + CF + AF
Where NF = Net Reading in dBμV
RF = Reading from receiver in dBμV
LF = LISN or ISN Correction Factor in dB
CF = Cable Correction Factor in dB
AF = Attenuator Loss Factor in dB

To convert from dBμV to μV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in μV
NF = Net Reading in dBμV

Example:

NF = RF + LF + CF + AF = 28.5 + 0.2 + 0.4 + 20.0 = 49.1 dBμV
$UF = 10^{(49.1\ dB\mu V / 20)}$ = 285.1 μV/m

7.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
200162;	EMI Receiver (20Hz-40GHz)	Rohde & Schwarz	ESU 40	100314	02/15/2013	02/15/2014
213071;	Antenna, Active Loop (1kHz to 30 MHz)	EMCO	6507	9204-1283	04/04/2013	04/04/2014
ST-4;	7m Cable, 0.01-18GHz	Storm Products Co.	A81-0303-275.6	12-07-001	08/21/2013	08/21/2014
MP3;	Cable MP3, 18 GHz, N, 10m	Megaphase	G919-NKNK-394	MP3	05/13/2013	05/13/2014
E205;	Cable, N-N, 3 meters, 18GHz	Megaphase	TM18-NKNK-118	9053201 003	05/08/2013	05/08/2014
211897;	Digital Pocket Thermometer and Hydrometer	Mannix	SAM700BAR	none	12/18/2012	12/18/2013

Software Utilized:

Name	Manufacturer	Version
Tile	Quantum Change	3.4.K.22

7.3 Results:

The sample tested was found to Comply.

The Field Strength of any emissions shall not exceed the limits as follows:

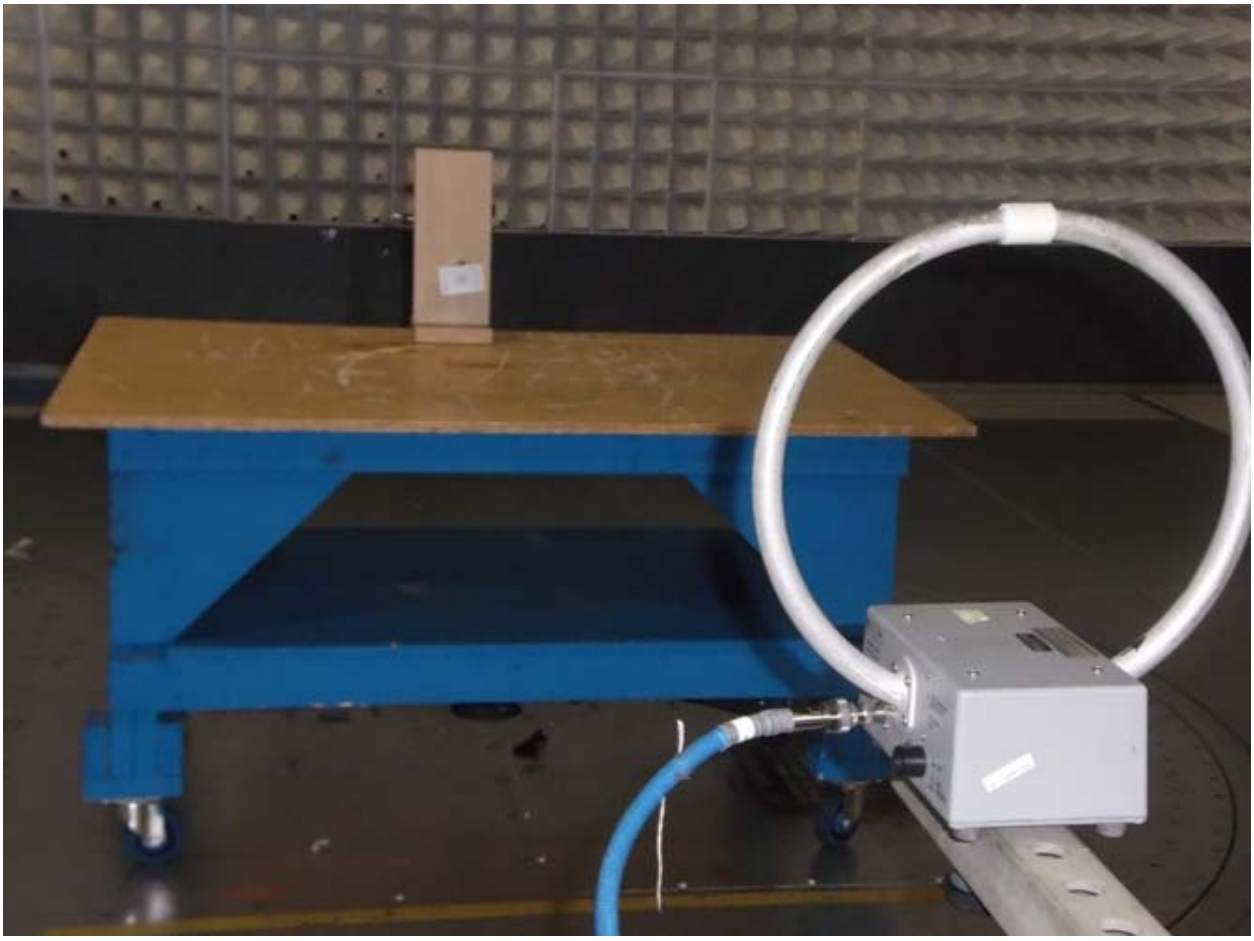
FCC Part 15.209

Frequency	Field Strength		Test Distance
(MHz)	µV/m	dBµV/m	(meters)
0.009-0.490	2400/F(kHz)	20*Log(2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	20*Log(24000/F(kHz)	30
1.705-30.0	30.00	29.54	30

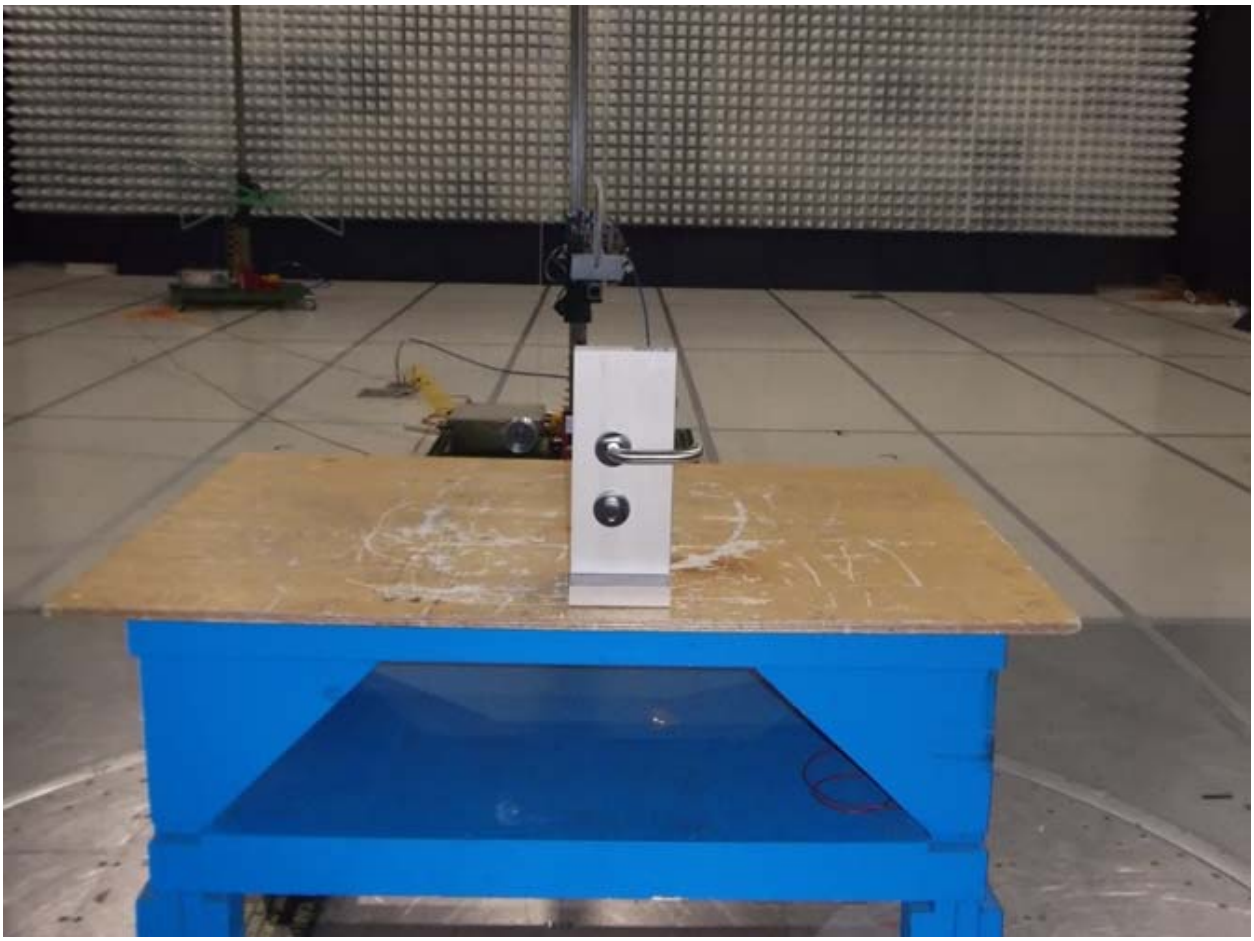
IC RSS-210 Annex A2.6(d): Emissions outside the band 13.110-14.010 must not exceed 30 microvolts/m (29.5 dBµV/m) at 30 m (69.5 dBµV/m) at 3 m.

7.4 Setup Photographs:

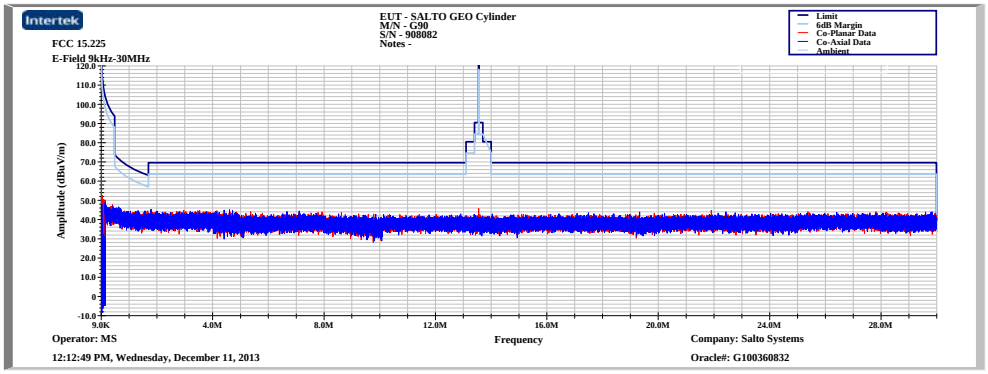
Front



Rear



7.5 Plots/Data:



Test Personnel:	Mary Sampson	Test Date:	12/11/13
Supervising/Reviewing Engineer: (Where Applicable)			
Product Standard:	FCC 15.225, IC RSS-210	Limit Applied:	Per Section 7.3
Input Voltage:	Battery, 3 V		
Pretest Verification w/ Ambient Signals or BB Source:	**BB Source**	Ambient Temperature:	21.7 ºC
		Relative Humidity:	35.1 %
		Atmospheric Pressure:	996.2 mbars

Deviations, Additions, or Exclusions: None

8 Transmitter Spurious Above 30MHz

8.1 Method

Tests are performed in accordance with FCC Part Subpart C: 2014 15.209, 15.225(d), IC RSS-210 Issue 8 December 2010 A2.6(d), ANSI C63.4-2003.

TEST SITE: 10m Semi-Anechoic Chamber

The EMC Lab has one Semi-anechoic Chamber and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

8.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
211518;	Antenna, BiLog, 20-2000MHz	Chase	CBL6112A	2228	03/04/2013	03/04/2014
213108;	EMI Receiver, Preselector section	Hewlett Packard	85460A	3348A00203	01/03/2013	01/03/2014
213109;	EMI Receiver	Hewlett Packard	8546A	3410A00173	01/03/2013	01/03/2014
TW2 211411;	Cable TW2	Andrews	Cable TW2	TW2	05/08/2013	05/08/2014
ST-5;	7m Cable, 0.01-18GHz	Storm Products Co.	A81-0303-275.6	121-07-002	08/05/2013	08/05/2014
E205;	Cable, N-N, 3 meters, 18GHz	Megaphase	TM18-NKNK-118	9053201 003	05/08/2013	05/08/2014
E206;	Cable, N-N, 3 meters, 18GHz	Megaphase	TM18-NKNK-118	9053201 004	05/13/2013	05/13/2014
200074;	Preamplifier, 10 MHz to 2000 MHz, 27 dB gain	Mini-Circuits	ZKL-2	D052005	10/22/2013	10/22/2014
211897;	Digital Pocket Thermometer and Hydrometer	Mannix	SAM700BAR	none	12/18/2012	12/18/2013

Software Utilized:

Name	Manufacturer	Version
Tile	Quantum Change	3.4.K.22

8.3 Results:

The sample tested was found to Comply.

FCC Part 15.209

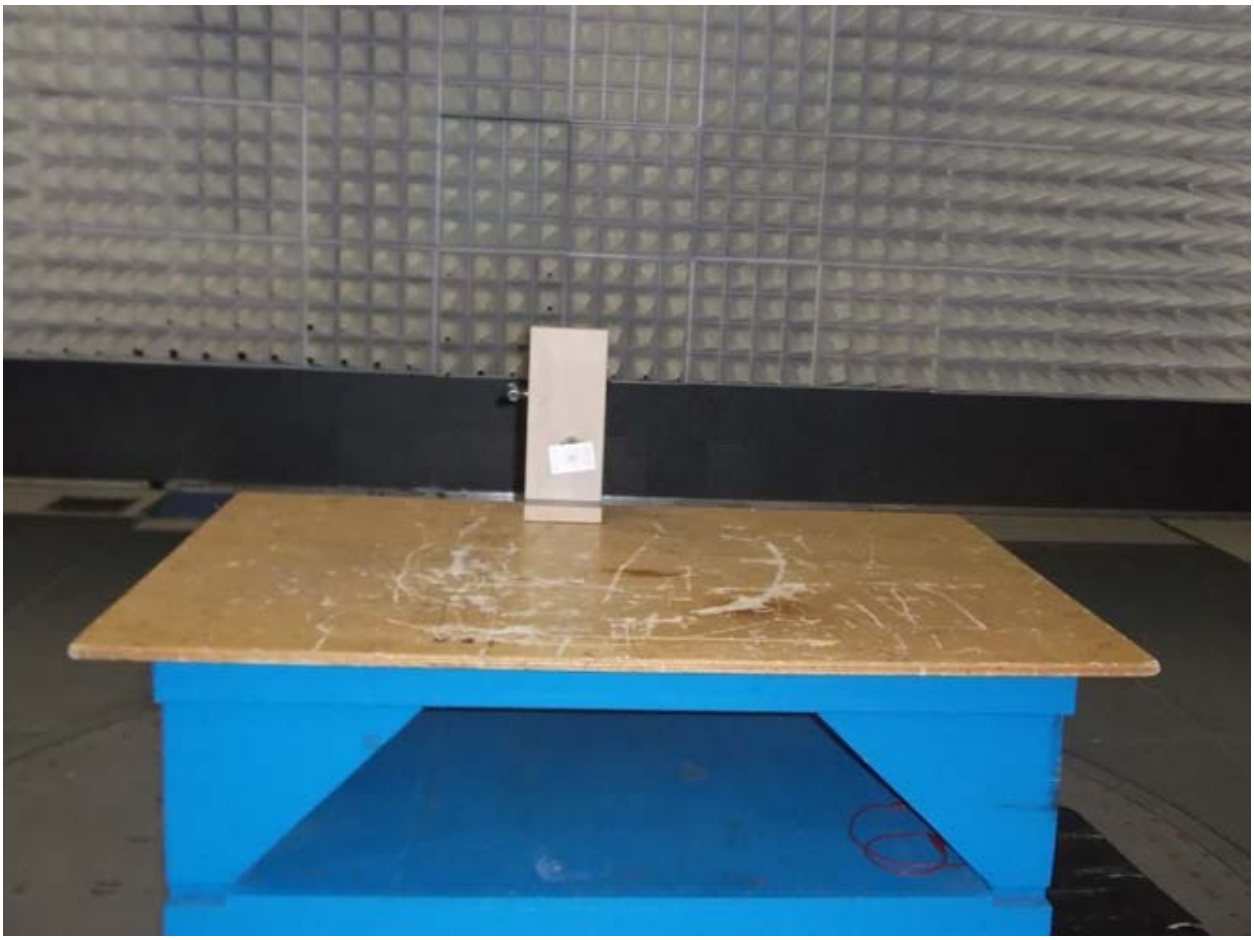
Frequency	Field Strength		Test Distance
(MHz)	µV/m	dBµV/m	(meters)
30-88	100	40.0	3
88-216	150	43.52	3
216-960	200	46.02	3
Above 960	500	53.98	3

IC RSS-210 A2.6(d): emissions outside the band 13.110-14.010 MHz must not exceed 30 microvolts/m (29.5 dBµV/m) at 30 m (49.5 dBµV/m) at 3 m.

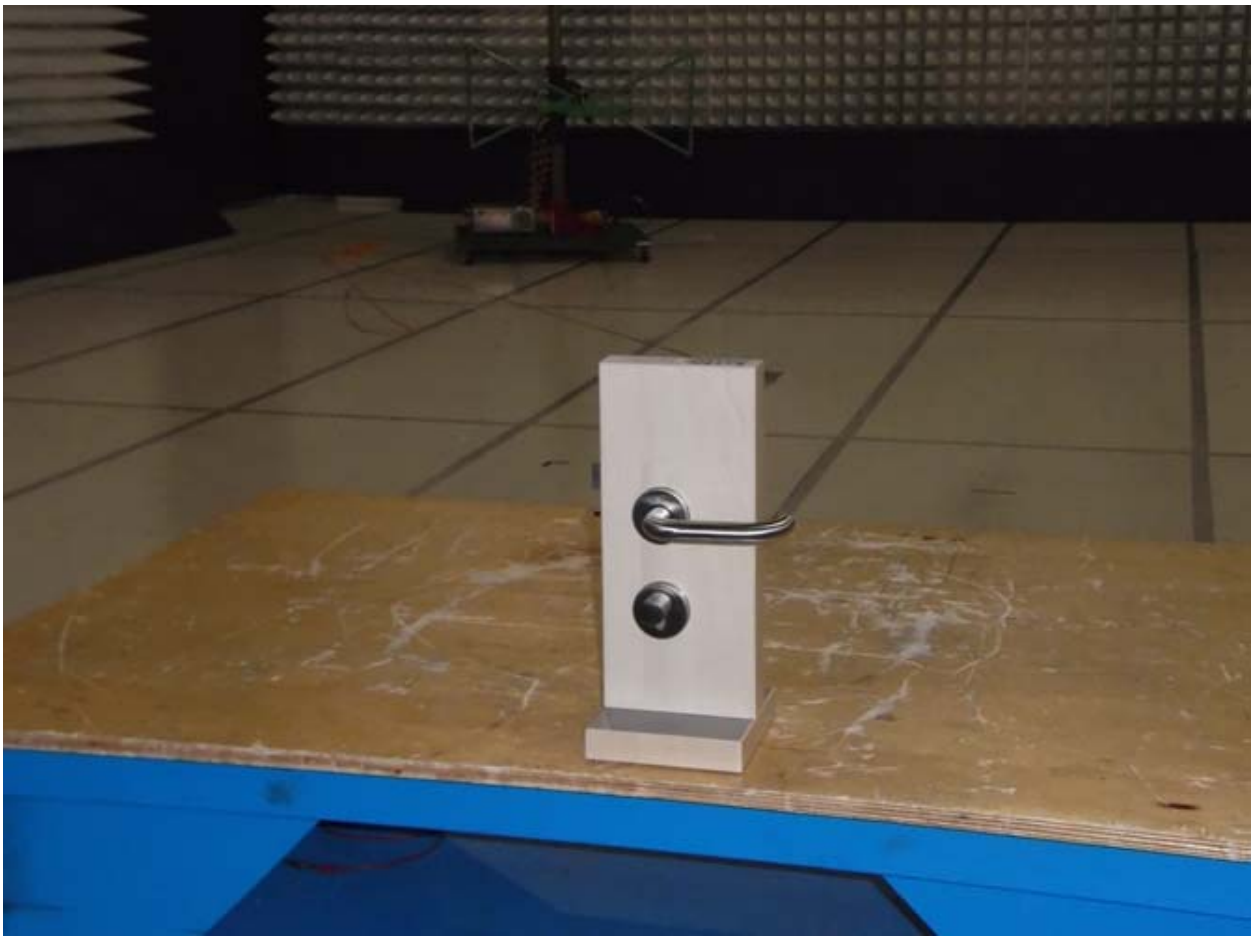
Since the IC RSS-210 limits are less stringent than the FCC 15.209 limits under 960 MHz, the FCC limits were used.

8.4 Setup Photographs:

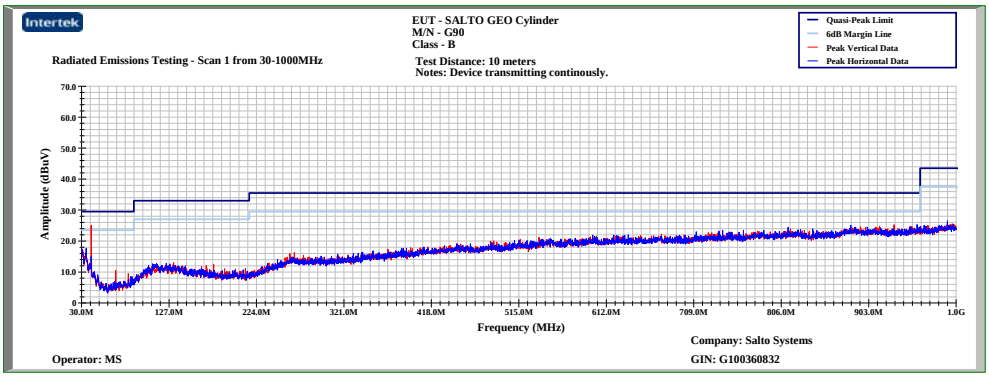
Front



Rear



8.5 Plots/Data:



Client: Salto Systems
Model Number: G90
Project Number: G100360832
Tested By: MS
Date: 12/13/13
Frequency Range (MHz): 30-1000
Input power: Battery, 3V

Receiver: HP 8546A
Antenna: Chase 2228
Cables: ST-5+TW2+E-205+E-206
Preamp: ZKL-2 200074
Test Distance (m): 10
Limit: FCC15 Class B-10m

Modifications for compliance (y/n): n

A	B	C	D	E	F	G	H	I	J
Ant. Pol. (V/H)	**Frequency MHz**	**Reading dB(uV)**	**Antenna Factor dB(1/m)**	**Cable Loss dB**	**Pre-amp Factor dB**	**Net dB(uV/m)**	**10m Limit dB(uV/m)**	**Margin dB**	**Detectors / Bandwidths Det/RBW/VBW**
V	40.683	44.3	12.5	1.0	31.5	26.2	29.5	-3.3	QP/120k/300k
H	813.518	23.0	20.5	4.9	30.8	17.6	35.5	-17.9	QP/120k/300k
H	883.115	22.3	21.0	5.1	30.8	17.6	35.5	-17.9	QP/120k/300k
V	931.130	22.1	20.3	5.4	30.7	17.1	35.5	-18.4	QP/120k/300k
H	956.593	22.1	21.6	5.6	30.7	18.6	35.5	-16.9	QP/120k/300k
H	990.300	22.0	21.6	5.9	30.6	18.9	43.5	-24.6	QP/120k/300k
Calculations		G=C+D+E-F		I=G-H					

Test Personnel: Mary Sampson
Supervising/Reviewing Engineer: (Where Applicable)
Product Standard: FCC 15.225
Input Voltage: Battery, 3V
Pretest Verification w/ BB Source: **Yes**

Test Date: 12/13/13
Limit Applied: Per Section 8.3
Ambient Temperature: 21.1 ºC
Relative Humidity: 29.3 %
Atmospheric Pressure: 993.4 mbars

Deviations, Additions, or Exclusions: None

9 Receiver Spurious Emissions Above 30 MHz

9.1 Method

Tests are performed in accordance with FCC Subpart B: 2014 15.109, IC RSS-Gen Issue 3 December 2010, Section 6.0, ANSI C63.4-2003.

TEST SITE: 10m Semi-Anechoic Chamber

The EMC Lab has two Semi-anechoic Chambers and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

9.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
211518;	Antenna, BiLog, 20-2000MHz	Chase	CBL6112A	2228	03/04/2013	03/04/2014
213108;	EMI Receiver, Preselector section	Hewlett Packard	85460A	3348A00203	01/03/2013	01/03/2014
213109;	EMI Receiver	Hewlett Packard	8546A	3410A00173	01/03/2013	01/03/2014
211897;	Digital Pocket Thermometer and Hydrometer	Mannix	SAM700BAR	none	12/18/2012	12/18/2013
200074;	Preamplifier, 10 MHz to 2000 MHz, 27 dB gain	Mini-Circuits	ZKL-2	D052005	10/22/2013	10/22/2014
ST-5;	7m Cable, 0.01-18GHz	Storm Products Co.	A81-0303-275.6	121-07-002	08/05/2013	08/05/2014
E205;	Cable, N-N, 3 meters, 18GHz	Megaphase	TM18-NKNK-118	9053201 003	05/08/2013	05/08/2014
E206;	Cable, N-N, 3 meters, 18GHz	Megaphase	TM18-NKNK-118	9053201 004	05/13/2013	05/13/2014
TW2 211411;	Cable TW2	Andrews	Cable TW2	TW2	05/08/2013	05/08/2014

Software Utilized:

Name	Manufacturer	Version
Tile	Quantum Change	3.4.K.22

9.3 Results:

The sample tested was found to Comply.

FCC Part 15.109

Frequency	Field Strength		Test Distance
(MHz)	µV/m	dBµV/m	(meters)
30-88	100	40.0	3
88-216	150	43.52	3
216-960	200	46.02	3
Above 960	500	53.98	3

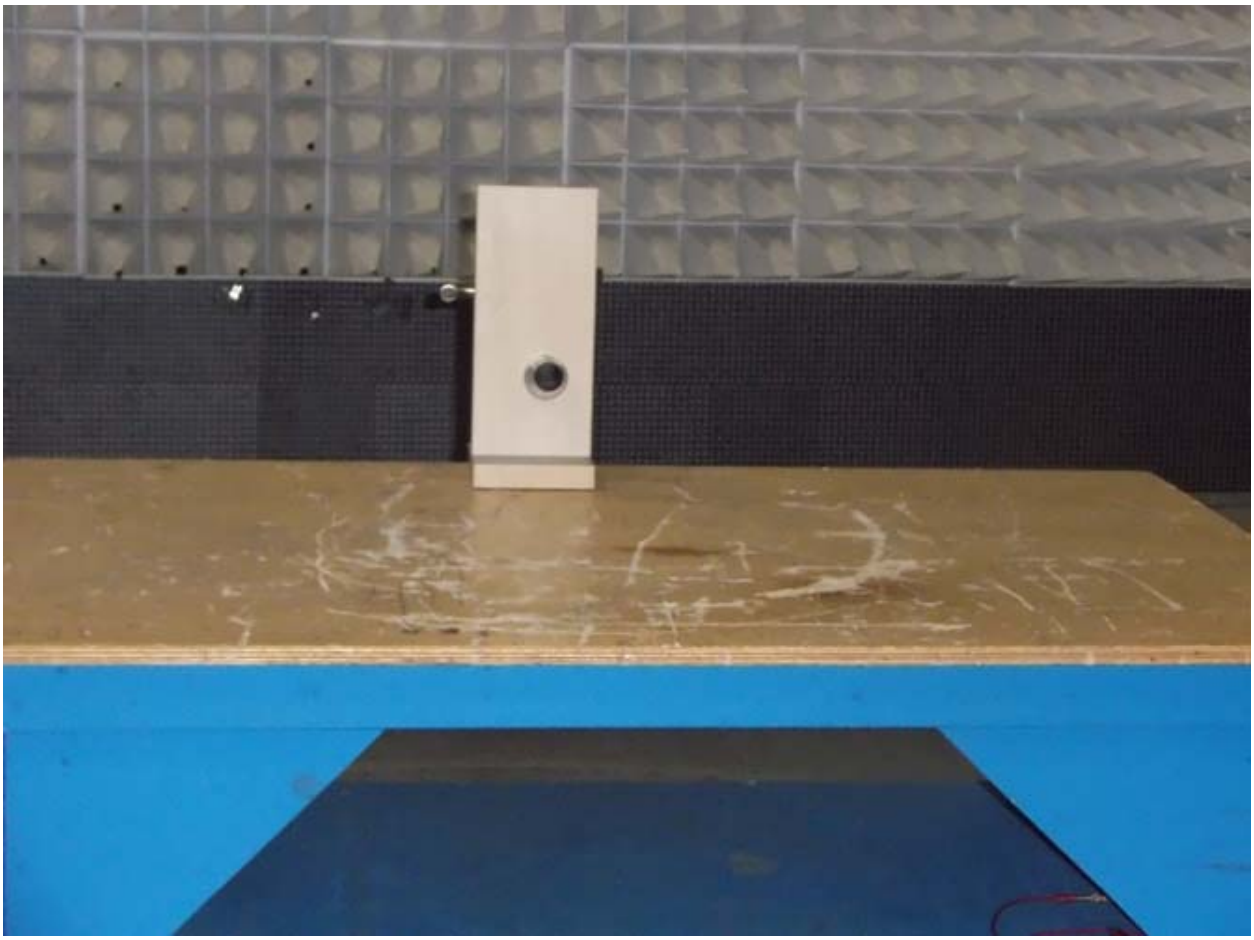
IC RSS-Gen Table 2:

Frequency (MHz)	Field Strength (microvolts/m at 3 metres)*
30-88	100
88-216	150
216-960	200
Above 960	500

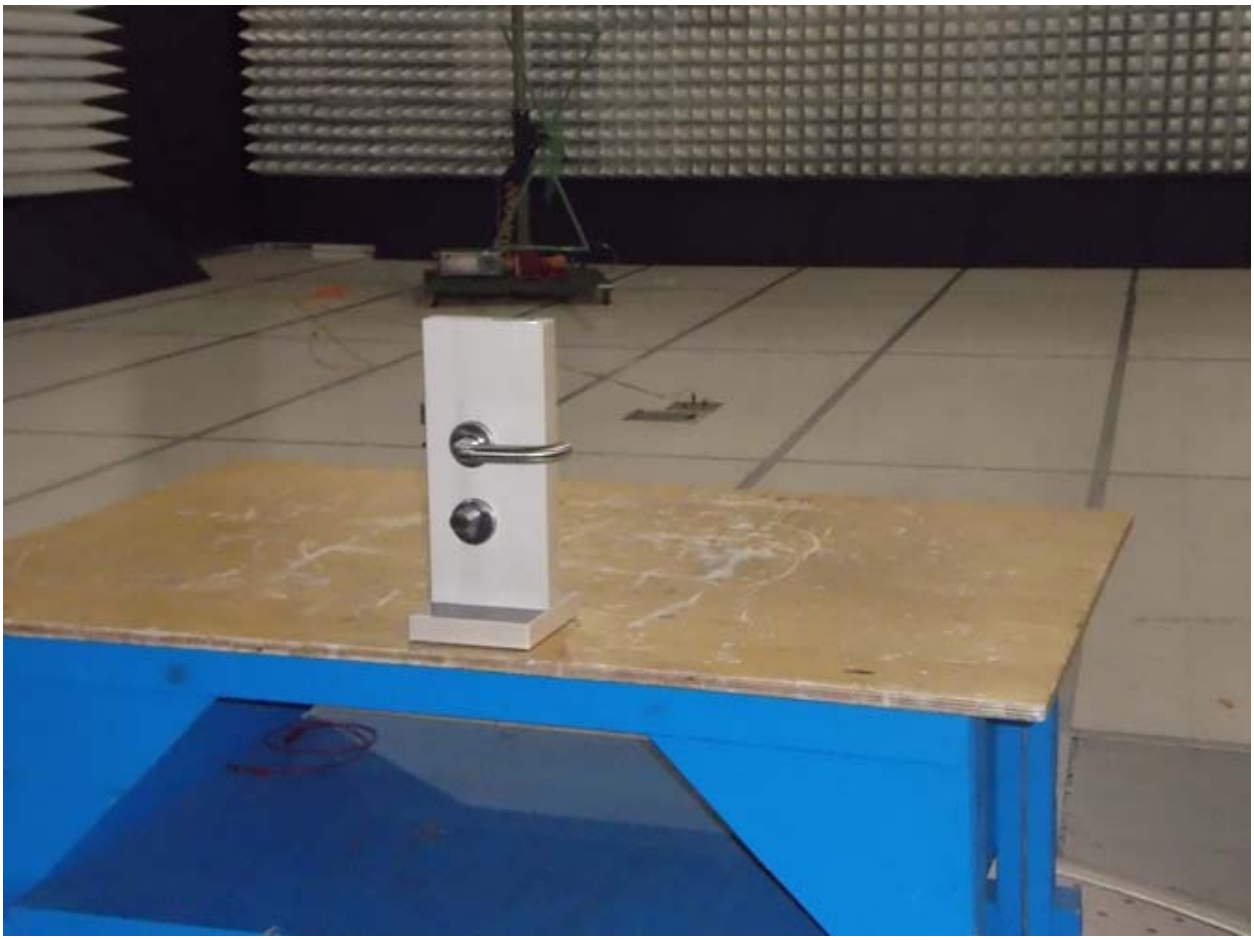
*Measurements for compliance with limits in the above table may be performed at distances other than 3 metres, in accordance with Section 7.2.7.

9.4 Setup Photographs:

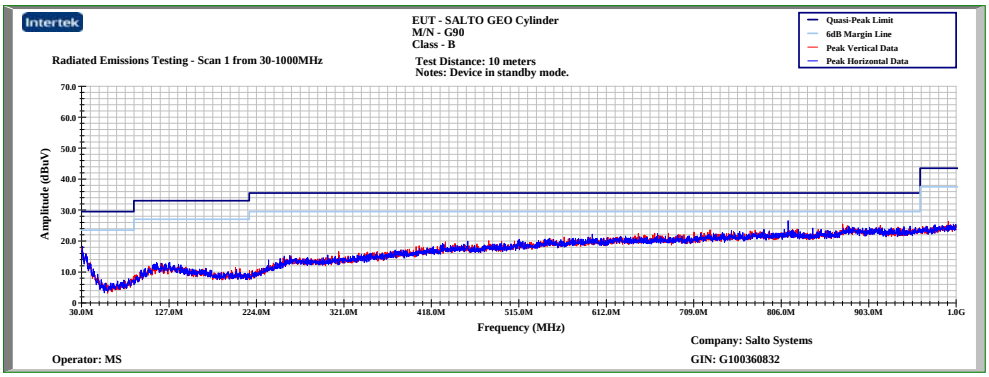
Front



Rear



9.5 Plots/Data:



Client: Salto Systems
Model Number: G90
Project Number: G100360832
Tested By: MS
Date: 12/13/13
Frequency Range (MHz): 30-1000
Input power: Battery, 3V

Receiver: HP 8546A
Antenna: Chase 2228
Cables: ST-5+TW2+E-205+E-206
Preamp: ZKL-2 200074
Test Distance (m): 10
Limit: FCC15 Class B-10m

Modifications for compliance (y/n): n

A	B	C	D	E	F	G	H	I	J
Ant. Pol. (V/H)	**Frequency MHz**	**Reading dB(uV)**	**Antenna Factor dB(1/m)**	**Cable Loss dB**	**Pre-amp Factor dB**	**Net dB(uV/m)**	**10m Limit dB(uV/m)**	**Margin dB**	**Detectors / Bandwidths Det/RBW/VBW**
V	30.000	24.0	18.6	0.8	31.6	11.9	29.5	-17.6	QP/120k/300k
H	30.970	24.3	16.8	0.9	31.6	10.3	29.5	-19.2	QP/120k/300k
V	726.945	22.4	19.5	4.6	30.9	15.6	35.5	-19.9	QP/120k/300k
H	813.518	22.4	20.5	4.9	30.8	17.0	35.5	-18.5	QP/120k/300k
V	874.143	22.1	20.7	5.1	30.8	17.2	35.5	-18.3	QP/120k/300k
V	991.270	21.9	21.4	5.9	30.6	18.6	43.5	-24.9	QP/120k/300k
Calculations		G=C+D+E-F		I=G-H					

Test Personnel: Mary Sampson
Test Date: 12/13/13
Supervising/Reviewing Engineer: (Where Applicable)
Product Standard: FCC 15.109 IC RSS-Gen
Limit Applied: Per section 9.3
Input Voltage: Battery, 3V
Pretest Verification w/ BB Source: **Yes**
Ambient Temperature: 21.1 ºC
Relative Humidity: 29.3 %
Atmospheric Pressure: 993.4 mbars

Deviations, Additions, or Exclusions: None

10 20dB Bandwidth and Occupied Bandwidth

10.1 Method

Tests are performed in accordance with FCC Part 15 Subpart C:2014, IC RSS-Gen Issue 3 December 2010 Section 4.6, ANSI C63.4-2003.

TEST SITE: 10m Semi-Anechoic Chamber

The EMC Lab has one Semi-anechoic Chamber and one Shielded Chamber. AC Mains Power is available at 120, 230, and 277 Single Phase; 208, 400, and 480 3-Phase. Large reference ground-planes are installed in the general lab area to facilitate EMC work not requiring a shielded environment.

10.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
NYM EMC36						
200162						
T006217						

Software Utilized:

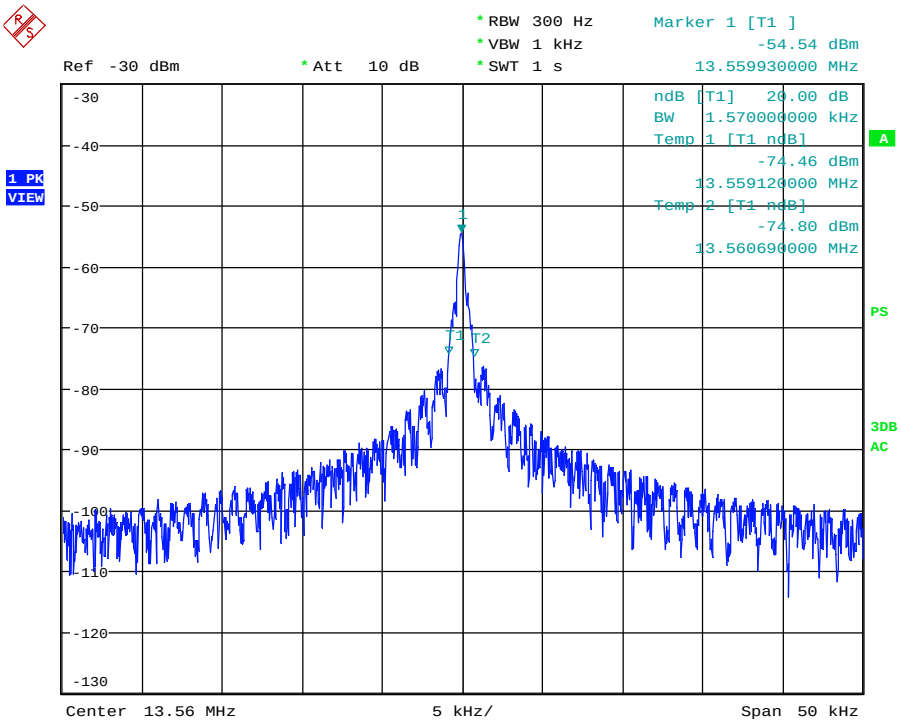
Name	Manufacturer	Version
None (Spectrum Analyzer Firmware)		

10.3 Results:

The sample tested was found to Comply.

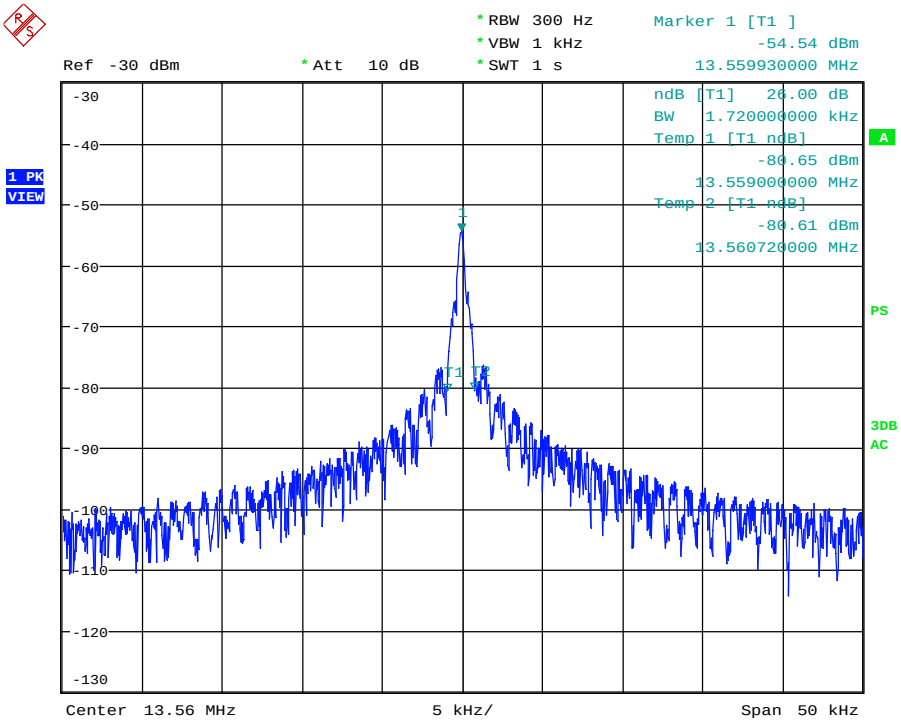
10.4 Data:

20 dB Bandwidth



Date: 8.MAY.2014 17:14:02

Occupied Bandwidth



Date: 8.MAY.2014 17:14:36

Test Personnel:	Mary Sampson	Test Date:	05/08/14
Supervising/Reviewing Engineer: (Where Applicable)			
Product Standard:	FCC 15.225, IC RSS-210		
Input Voltage:	Battery, 3V		
		Ambient Temperature:	23 ºC
Pretest Verification w/ BB Source	**BB Source**	Relative Humidity:	39 %
		Atmospheric Pressure:	988 mbars

Notes:

(1) The EUT met the requirements without any degradation of performance.

Deviations, Additions, or Exclusions: None

11 Frequency Stability

11.1 Method

Tests are performed in accordance with FCC Part 15 Subpart C: 2014 15.225, IC RSS-GEN Issue 3 December 2010 Section 4.7, IC RSS-210 December 2010 A2.6, ANSI C63.4-2003.

TEST SITE: Temperature/humidity chamber in the Safety Lab

11.2 Test Equipment Used:

Asset	Description	Manufacturer	Model	Serial	Cal Date	Cal Due
T006217;	THDX	Oregon Scientific	BA888	NSN	12/11/2013	12/11/2014
211678;	Power Supply	Tektronix	PS2510G	TW50295	VBU	VBU
Rental;	EMC Analyzer	Agilent	7405A	MY42000128	8/23/13	8/23/14
211540;	Walk-In Enviromental Chamber	Thermotron	WP-867-THCM1-5-5AC	32891	04/10/2013	04/10/2014
213047;	Multimeter	Fluke	87	65290209	01/09/2013	01/09/2014

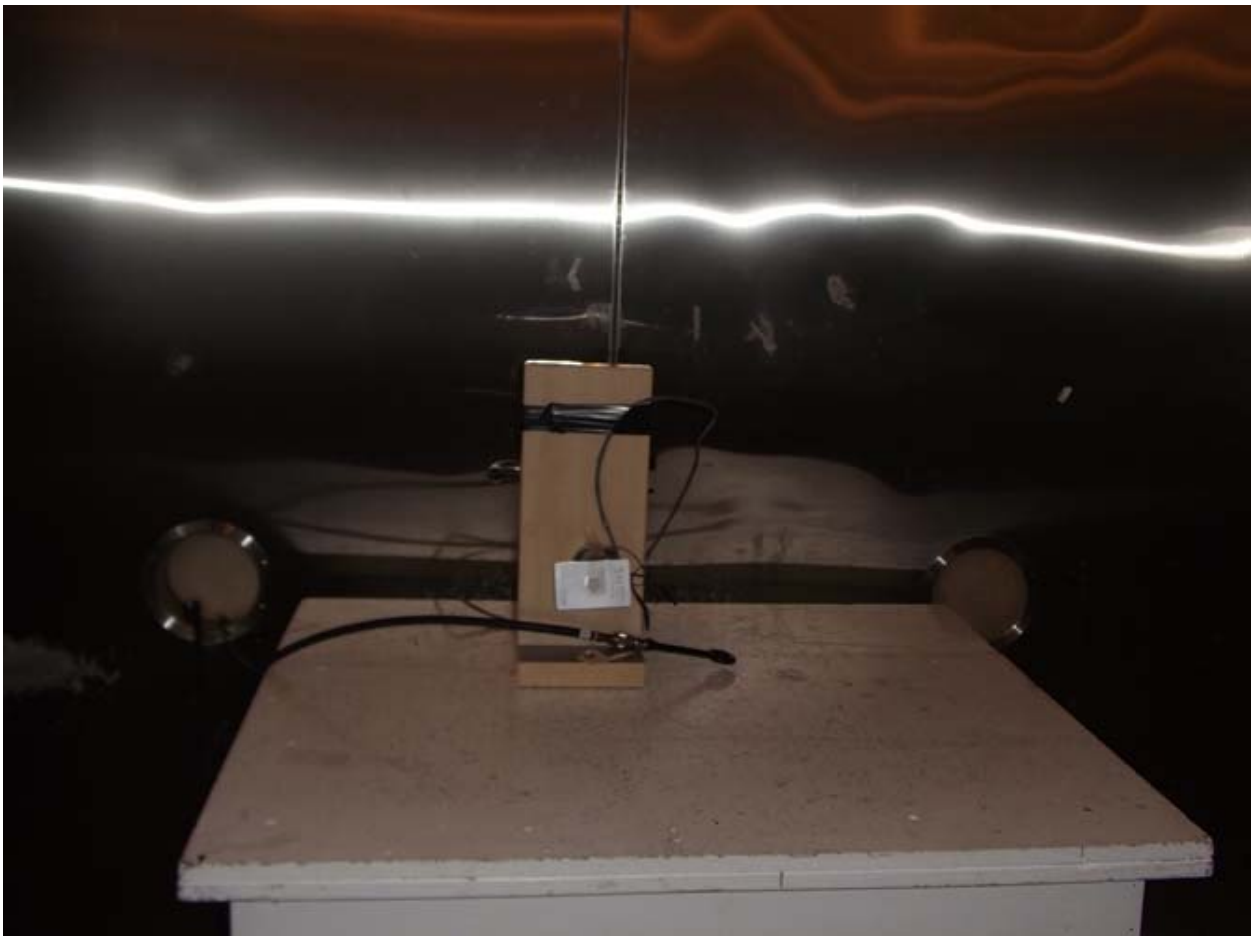
Software Utilized:

Name	Manufacturer	Version
None (Spectrum Analyzer Firmware)		

11.3 Results:

The sample tested was found to Comply.

11.4 Setup Photographs:



11.5 Data:

Intertek

Frequency Stability

Company:	Salto Systems S.L.						Test Equipment Used:				
Model #:	G90										
Serial #:	908082										
Engineer(s):	Mary Sampson				Location:	Safety					
Project #:	G100360832		Date(s):	12/18/13							
Standard:	FCC Part 15.225, IC RSS-Gen, IC RSS-210										
		Limit:	100	PPM							
		Nominal f:	13.56	MHz			Voltage:	3	Vdc		

%	Voltage Volts	Frequency MHz	Deviation kHz	Limit kHz
-15%	2.55	13.561000	0.5	1.36
-10%	2.7	13.560500	0	1.36
-5%	2.85	13.560000	-0.5	1.36
+0%	3	13.560500	0	1.36
+5%	3.15	13.560500	0	1.36
+10%	3.3	13.561000	0.5	1.36
+15%	3.45	13.560500	0	1.36

Temp Celsius	Frequency MHz	Deviation kHz	Limit kHz
-30	13.561000	0.5	1.36
-20	13.560500	0	1.36
-10	13.560500	0	1.36
0	13.560500	0	1.36
10	13.560500	0	1.36
20	13.560500	0	1.36
30	13.560500	0	1.36
40	13.561000	0.5	1.36
50	13.560000	-0.5	1.36

Test Personnel:	Mary Sampson	Test Date:	12/18/13
Supervising/Reviewing Engineer: (Where Applicable)			
Product Standard:	FCC 15.225, IC RSS-210	Test Levels:	Per Section 11.3
Input Voltage:	2.55 to 3.45 Vdc		
Pretest Verification w/Ambient Signals or BB Source:	**Ambient Signals**	Ambient Temperature:	21.5 ºC
		Relative Humidity:	26 %
		Atmospheric Pressure:	990 mbars

Notes:

(1) The EUT met the requirements without any degradation of performance.

Deviations, Additions, or Exclusions: None

12 Revision History

Revision Level	Date	Report Number	Prepared By	Reviewed By	Notes
0	01/24/2014	100360832ATL-001	MS MTS	VV VJV	Original Issue
1	05/08/2014	100360832ATL-001	MS MTS	VV VJV	Updated with comments from TCB Reviewer.