

Ingersoll Rand

TEST REPORT FOR

Physical Access Control Reader, XF2100 Rev. C & XF2110 Rev. C

Tested To The Following Standards:

**FCC Part 15 Subpart C Sections 15.207, 15.225
And
RSS-210 Issue 7**

Report No.: 91096-12

Date of issue: November 16, 2010



**TESTING
CERT #803.01, 803.02,
803.05, 803.06**

This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of EMC testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

Ingersoll Rand
500 Golden Ridge Road., Bldg. 1
Golden, CO 80401

REPRESENTATIVE: Chao Lor
Customer Reference Number: 306477

DATE OF EQUIPMENT RECEIPT:**DATE(S) OF TESTING:****REPORT PREPARED BY:**

Joyce Walker
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 91096

October 5, 2010

October 5 - 11, 2010

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the sample equipment tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.

A handwritten signature in black ink that reads "Steve Behm".

Steve Behm
Director of Quality Assurance & Engineering Services
CKC Laboratories, Inc.

Test Facility Information



Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S):
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Site Registration & Accreditation Information

Location	CB #	JAPAN	CANADA	FCC
Mariposa A	US0103	R-563, C-578, T-1492 & G-87	3082A-2	90477

SUMMARY OF RESULTS

Standard / Specification: FCC Part 15 Subpart C & RSS-210 Issue 7

Description	Test Procedure/Method	Results
Conducted Emissions	FCC Part 15 Subpart C Section 15.207 / ANSI C63.4 (2003)	Pass
Carrier	FCC Part 15 Subpart C Section 15.209 / ANSI C63.4 (2003)	Pass
Occupied Band Width	FCC Part 15 Subpart C Section 15.209 / ANSI C63.4 (2003) and RSS-210 Issue 7	Pass
Carrier	FCC Part 15 Subpart C Section 15.225 / ANSI C63.4 (2003)	Pass
Occupied Band Width	FCC Part 15 Subpart C Section 15.225 / ANSI C63.4 (2003) and RSS-210 Issue 7	Pass
Frequency Stability	FCC Part 15 Subpart C Section 15.225 / ANSI C63.4 (2003)	Pass
Spurious Emissions	FCC Part 15 Subpart C Section 15.209 / ANSI C63.4 (2003)	Pass

Conditions During Testing

This list is a summary of the conditions noted for or modifications made to the equipment during testing.

Summary of Conditions
None

EQUIPMENT UNDER TEST (EUT)

The following models have been tested by CKC Laboratories: **XF2100C & XF2110C**

The manufacturer states that the following model name revision to the EUTs do not effect them electrically and they remain identical to the ones which were tested, or any differences between them do not affect their EMC characteristics, and therefore meets the level of testing equivalent to the tested models:

XF2100 Rev. C & XF2110 Rev. C

EQUIPMENT UNDER TEST

Physical Access Control Reader

Manuf: Ingersoll Rand
Model: XF2100 Rev. C
Serial: 0100

Physical Access Control Reader

Manuf: Ingersoll Rand
Model: XF2110 Rev. C
Serial: 0100

Physical Access Control Reader*

Manuf: Ingersoll Rand
Model: XF1100 Rev. C
Serial: 0100

*Model XF1100 Rev. C was tested together with the EUTs (XF2110 Rev. C and XF2100 Rev. C) during radiated emissions.

PERIPHERAL DEVICES

The EUT was tested with the following peripheral device(s):

DC Power Supply

Manuf: Topward Electric Instruments
Model: TPS 4000
Serial: 918520

15.207 AC Conducted Emissions

Test Data Sheets

Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338 • (209) 966-5240

Customer: **Ingersoll Rand (XceedID)**
 Specification: **15.207 AC Mains - Average**
 Work Order #: **91096**
 Test Type: **Conducted Emissions**
 Equipment: **Physical Access Control Reader**
 Manufacturer: Ingersoll Rand
 Model: XF2100C
 S/N: 0100

Date: 11/11/2010
 Time: 16:25:55
 Sequence#: 16
 Tested By: Chuck Kendall
 120V 60Hz

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00374	50uH LISN-BLACK LEAD	8028-TS-50-BNC	4/22/2009	4/22/2011
T2	AN01183	Spectrum Analyzer Display	85662A	3/10/2009	3/10/2011
T3	AN01184	Spectrum Analyzer	8568B	3/10/2009	3/10/2011
T4	AN00069	Quasi Peak Adapter	85650A	3/10/2009	3/10/2011
T5	AN02608	High Pass Filter	HE9615-150K- 50-720B	2/11/2010	2/11/2012
T6	ANP02229	Attenuator	PE7010-10	5/20/2009	5/20/2011
T7	ANMACOND	Cable		5/10/2009	5/10/2011

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Physical Access Control Reader*	Ingersoll Rand	XF2100C	0100

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments	TPS 4000	918520

Test Conditions / Notes:

FCC 15.207
 Tag reader is setting upright (vertical) to the surface of the wooden support table 80cm atop a plastic cart. It is displaying a red light until the tag activates it.
 Transmitters are on.
 Actual integral antenna is connected.
 Emissions measurements at fundamental frequency taken with integral antenna for reference and taken with dummy load attached for final results.
 From 150 kHz to 30 MHz - RBW=9kHz, VBW=30kHz
 Temp = 65°F
 Relative Humidity = 50 %
 Press = 97.2 mb

Ext Attn: 0 dB

Measurement Data:

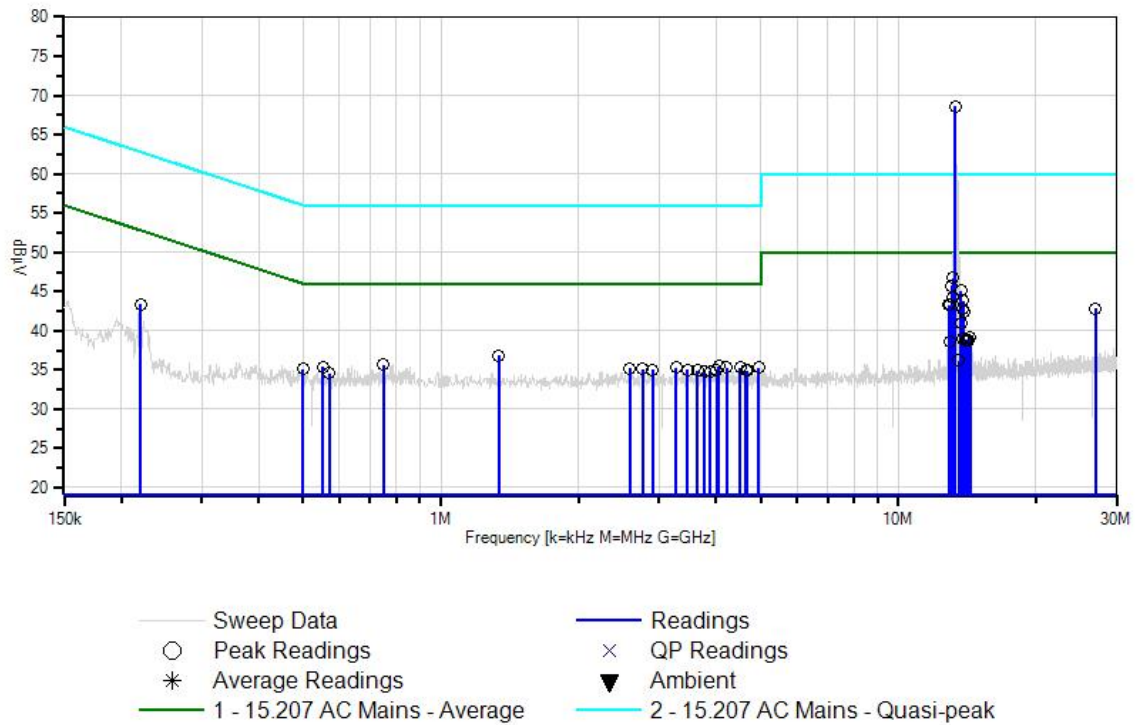
Reading listed by margin.

Test Lead: Black

#	Freq MHz	Rdng dB μ V	T1 T5 dB	T2 T6 dB	T3 T7 dB	T4 dB	Dist Table	Corr dB μ V	Spec dB μ V	Margin dB	Polar Ant
1	13.337M	56.9	+0.6 +0.1	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	68.6	50.0 Fundamental with integral antenna	+18.6	Black
2	13.175M	35.0	+0.6 +0.1	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	46.7	50.0	-3.3	Black
3	13.094M	34.0	+0.6 +0.1	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	45.7	50.0	-4.3	Black
4	13.716M	33.3	+0.6 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	45.1	50.0	-4.9	Black
5	13.130M	32.6	+0.6 +0.1	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	44.3	50.0	-5.7	Black
6	13.833M	32.0	+0.6 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	43.8	50.0	-6.2	Black
7	12.878M	31.7	+0.5 +0.1	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	43.3	50.0	-6.7	Black
8	13.004M	31.6	+0.6 +0.1	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	43.3	50.0	-6.7	Black
9	27.026M	30.2	+1.2 +0.1	+0.0 +9.9	+0.0 +1.4	+0.0	+0.0	42.8	50.0	-7.2	Black
10	13.797M	30.9	+0.6 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	42.7	50.0	-7.3	Black
11	13.914M	30.6	+0.6 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	42.4	50.0	-7.6	Black
12	13.752M	29.1	+0.6 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	40.9	50.0	-9.1	Black
13	1.341M	26.4	+0.0 +0.1	+0.0 +9.9	+0.0 +0.4	+0.0	+0.0	36.8	46.0	-9.2	Black
14	220.538k	33.3	+0.1 +0.2	+0.0 +9.7	+0.0 +0.1	+0.0	+0.0	43.4	52.8	-9.4	Black
15	747.758k	25.3	+0.0 +0.2	+0.0 +9.9	+0.0 +0.3	+0.0	+0.0	35.7	46.0	-10.3	Black
16	4.045M	24.7	+0.2 +0.1	+0.0 +9.9	+0.0 +0.6	+0.0	+0.0	35.5	46.0	-10.5	Black
17	551.414k	25.3	+0.0 +0.1	+0.0 +9.8	+0.0 +0.2	+0.0	+0.0	35.4	46.0	-10.6	Black
18	4.211M	24.5	+0.2 +0.1	+0.0 +9.9	+0.0 +0.6	+0.0	+0.0	35.3	46.0	-10.7	Black
19	4.509M	24.6	+0.1 +0.1	+0.0 +9.9	+0.0 +0.6	+0.0	+0.0	35.3	46.0	-10.7	Black
20	4.947M	24.6	+0.1 +0.1	+0.0 +9.9	+0.0 +0.6	+0.0	+0.0	35.3	46.0	-10.7	Black
21	3.271M	24.7	+0.1 +0.1	+0.0 +9.9	+0.0 +0.5	+0.0	+0.0	35.3	46.0	-10.7	Black
22	2.591M	24.6	+0.1 +0.1	+0.0 +9.9	+0.0 +0.5	+0.0	+0.0	35.2	46.0	-10.8	Black

23	499.056k	24.9	+0.1 +0.1	+0.0 +9.8	+0.0 +0.2	+0.0	+0.0	35.1	46.0	-10.9	Black
24	2.761M	24.5	+0.1 +0.1	+0.0 +9.9	+0.0 +0.5	+0.0	+0.0	35.1	46.0	-10.9	Black
25	14.337M	27.3	+0.6 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	39.1	50.0	-10.9	Black
26	2.906M	24.4	+0.1 +0.1	+0.0 +9.9	+0.0 +0.5	+0.0	+0.0	35.0	46.0	-11.0	Black
27	3.459M	24.4	+0.1 +0.1	+0.0 +9.9	+0.0 +0.5	+0.0	+0.0	35.0	46.0	-11.0	Black
28	13.869M	27.2	+0.6 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	39.0	50.0	-11.0	Black
29	4.011M	24.1	+0.2 +0.1	+0.0 +9.9	+0.0 +0.6	+0.0	+0.0	34.9	46.0	-11.1	Black
30	3.641M	24.2	+0.2 +0.1	+0.0 +9.9	+0.0 +0.5	+0.0	+0.0	34.9	46.0	-11.1	Black
31	4.679M	24.2	+0.1 +0.1	+0.0 +9.9	+0.0 +0.6	+0.0	+0.0	34.9	46.0	-11.1	Black
32	4.645M	24.2	+0.1 +0.1	+0.0 +9.9	+0.0 +0.6	+0.0	+0.0	34.9	46.0	-11.1	Black
33	3.769M	24.1	+0.2 +0.1	+0.0 +9.9	+0.0 +0.5	+0.0	+0.0	34.8	46.0	-11.2	Black
34	3.875M	24.0	+0.2 +0.1	+0.0 +9.9	+0.0 +0.6	+0.0	+0.0	34.8	46.0	-11.2	Black
35	14.040M	27.0	+0.6 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	38.8	50.0	-11.2	Black
36	14.121M	26.9	+0.6 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	38.7	50.0	-11.3	Black
37	14.247M	26.9	+0.6 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	38.7	50.0	-11.3	Black
38	571.049k	24.5	+0.0 +0.1	+0.0 +9.8	+0.0 +0.2	+0.0	+0.0	34.6	46.0	-11.4	Black
39	12.959M	27.0	+0.5 +0.1	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	38.6	50.0	-11.4	Black
40	13.560M	24.4	+0.6 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	36.2	50.0 Fundamental with dummy load at antenna port	-13.8	Black

CKC Laboratories, Inc. Date: 11/11/2010 Time: 16:25:55 Ingersoll Rand (XceedID) WO#: 91096
15.207 AC Mains - Average Test Lead: Black 120V 60Hz Sequence#: 16 Ext ATTN: 0 dB



Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338 • (209) 966-5240

Customer: **Ingersoll Rand (XceedID)**
 Specification: **15.207 AC Mains - Average**
 Work Order #: **91096**
 Test Type: **Conducted Emissions**
 Equipment: **Physical Access Control Reader**
 Manufacturer: Ingersoll Rand
 Model: XF2100C
 S/N: 0100

Date: 10/7/2010
 Time: 16:15:38
 Sequence#: 15
 Tested By: Chuck Kendall
 120V 60Hz

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00374	50uH LISN-WHITE LEAD	8028-TS-50-BNC	4/22/2009	4/22/2011
T2	AN01183	Spectrum Analyzer Display	85662A	3/10/2009	3/10/2011
T3	AN01184	Spectrum Analyzer	8568B	3/10/2009	3/10/2011
T4	AN00069	Quasi Peak Adapter	85650A	3/10/2009	3/10/2011
T5	AN02608	High Pass Filter	HE9615-150K-50-720B	2/11/2010	2/11/2012
T6	ANP02229	Attenuator	PE7010-10	5/20/2009	5/20/2011
T7	ANMACOND	Cable		5/10/2009	5/10/2011

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Physical Access Control Reader*	Ingersoll Rand	XF2100C	0100

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments	TPS 4000	918520

Test Conditions / Notes:

FCC 15.207
 Tag reader is setting upright (vertical) to the surface of the wooden support table 80cm atop a plastic cart. It is displaying a red light until the tag activates it.
 Transmitters are on.
 Actual integral antenna is connected.
 Emissions measurements at fundamental frequency taken with integral antenna for reference and taken with dummy load attached for final results.
 From 150 kHz to 30 MHz - RBW=9kHz, VBW=30kHz
 Temp = 65°F
 Relative Humidity = 50 %
 Press = 97.2 mb

Ext Attn: 0 dB

Measurement Data:

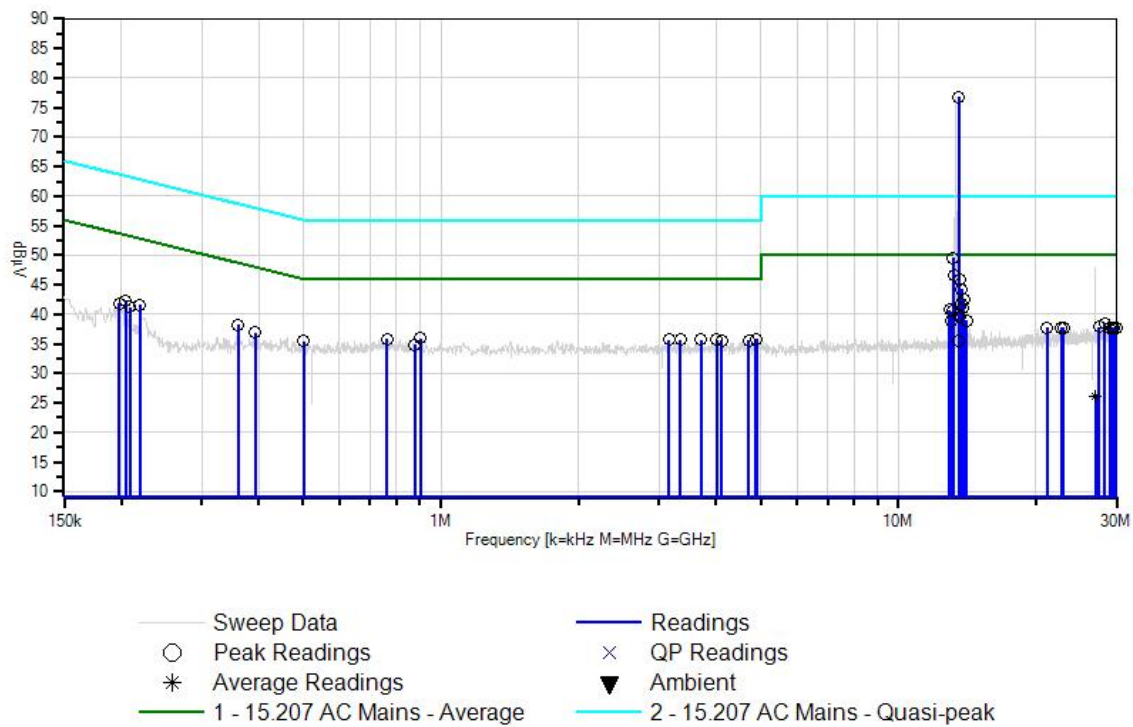
Reading listed by margin.

Test Lead: White

#	Freq MHz	Rdng dB μ V	T1 T5 dB	T2 T6 dB	T3 T7 dB	T4 dB	Dist Table	Corr dB μ V	Spec dB μ V	Margin dB	Polar Ant
1	13.560M	64.6	+1.0 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	76.8	50.0 Fundamental with integral antenna	+26.8	White
2	13.157M	37.4	+1.0 +0.1	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	49.5	50.0	-0.5	White
3	13.202M	34.5	+1.0 +0.1	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	46.6	50.0	-3.4	White
4	13.616M	33.7	+1.0 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	45.9	50.0	-4.1	White
5	13.770M	32.0	+1.0 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	44.2	50.0	-5.8	White
6	13.896M	30.2	+1.0 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	42.4	50.0	-7.6	White
7	13.707M	29.7	+1.0 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	41.9	50.0	-8.1	White
8	13.860M	28.9	+1.0 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	41.1	50.0	-8.9	White
9	12.950M	28.7	+1.0 +0.1	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	40.8	50.0	-9.2	White
10	13.121M	28.4	+1.0 +0.1	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	40.5	50.0	-9.5	White
11	902.518k	25.1	+0.5 +0.1	+0.0 +9.9	+0.0 +0.3	+0.0	+0.0	35.9	46.0	-10.1	White
12	761.575k	24.8	+0.6 +0.2	+0.0 +9.9	+0.0 +0.3	+0.0	+0.0	35.8	46.0	-10.2	White
13	4.905M	24.5	+0.7 +0.1	+0.0 +9.9	+0.0 +0.6	+0.0	+0.0	35.8	46.0	-10.2	White
14	3.339M	24.6	+0.6 +0.1	+0.0 +9.9	+0.0 +0.5	+0.0	+0.0	35.7	46.0	-10.3	White
15	3.148M	24.6	+0.6 +0.1	+0.0 +9.9	+0.0 +0.5	+0.0	+0.0	35.7	46.0	-10.3	White
16	3.709M	24.6	+0.6 +0.1	+0.0 +9.9	+0.0 +0.5	+0.0	+0.0	35.7	46.0	-10.3	White
17	4.875M	24.4	+0.7 +0.1	+0.0 +9.9	+0.0 +0.6	+0.0	+0.0	35.7	46.0	-10.3	White
18	4.011M	24.5	+0.6 +0.1	+0.0 +9.9	+0.0 +0.6	+0.0	+0.0	35.7	46.0	-10.3	White
19	4.109M	24.4	+0.6 +0.1	+0.0 +9.9	+0.0 +0.6	+0.0	+0.0	35.6	46.0	-10.4	White
20	4.717M	24.3	+0.7 +0.1	+0.0 +9.9	+0.0 +0.6	+0.0	+0.0	35.6	46.0	-10.4	White
21	13.653M	27.3	+1.0 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	39.5	50.0	-10.5	White
22	360.161k	27.7	+0.4 +0.1	+0.0 +9.8	+0.0 +0.2	+0.0	+0.0	38.2	48.7	-10.5	White

23	500.510k	24.9	+0.5 +0.1	+0.0 +9.8	+0.0 +0.2	+0.0	+0.0	35.5	46.0	-10.5	White
24	13.085M	26.9	+1.0 +0.1	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	39.0	50.0	-11.0	White
25	204.540k	31.9	+0.4 +0.2	+0.0 +9.7	+0.0 +0.1	+0.0	+0.0	42.3	53.4	-11.1	White
26	392.158k	26.3	+0.4 +0.2	+0.0 +9.8	+0.0 +0.2	+0.0	+0.0	36.9	48.0	-11.1	White
27	14.112M	26.7	+1.0 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	38.9	50.0	-11.1	White
28	219.811k	31.2	+0.4 +0.2	+0.0 +9.7	+0.0 +0.1	+0.0	+0.0	41.6	52.8	-11.2	White
29	877.000k	24.0	+0.5 +0.1	+0.0 +9.9	+0.0 +0.3	+0.0	+0.0	34.8	46.0	-11.2	White
30	28.280M	24.9	+2.0 +0.2	+0.0 +9.9	+0.0 +1.5	+0.0	+0.0	38.5	50.0	-11.5	White
31	197.995k	31.5	+0.4 +0.2	+0.0 +9.7	+0.0 +0.1	+0.0	+0.0	41.9	53.7	-11.8	White
32	208.903k	30.8	+0.4 +0.2	+0.0 +9.7	+0.0 +0.1	+0.0	+0.0	41.2	53.2	-12.0	White
33	27.437M	24.5	+1.9 +0.1	+0.0 +9.9	+0.0 +1.5	+0.0	+0.0	37.9	50.0	-12.1	White
34	22.689M	24.8	+1.5 +0.2	+0.0 +9.9	+0.0 +1.4	+0.0	+0.0	37.8	50.0	-12.2	White
35	28.979M	24.2	+2.0 +0.2	+0.0 +9.9	+0.0 +1.5	+0.0	+0.0	37.8	50.0	-12.2	White
36	29.431M	24.1	+2.1 +0.2	+0.0 +9.9	+0.0 +1.5	+0.0	+0.0	37.8	50.0	-12.2	White
37	21.166M	24.9	+1.4 +0.2	+0.0 +9.9	+0.0 +1.3	+0.0	+0.0	37.7	50.0	-12.3	White
38	22.977M	24.6	+1.6 +0.2	+0.0 +9.9	+0.0 +1.4	+0.0	+0.0	37.7	50.0	-12.3	White
39	29.514M	23.8	+2.1 +0.3	+0.0 +9.9	+0.0 +1.5	+0.0	+0.0	37.6	50.0	-12.4	White
40	29.664M	23.8	+2.1 +0.3	+0.0 +9.9	+0.0 +1.5	+0.0	+0.0	37.6	50.0	-12.4	White
41	29.897M	23.8	+2.1 +0.3	+0.0 +9.9	+0.0 +1.5	+0.0	+0.0	37.6	50.0	-12.4	White
42	13.560M	23.3	+1.0 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	35.5	50.0 Fundamental with dummy load at antenna port	-14.5	White
43	27.017M	12.8	+1.9 +0.1	+0.0 +9.9	+0.0 +1.4	+0.0	+0.0	26.1	50.0	-23.9	White
^	27.026M	34.6	+1.9 +0.1	+0.0 +9.9	+0.0 +1.4	+0.0	+0.0	47.9	50.0	-2.1	White

CKC Laboratories, Inc. Date: 10/7/2010 Time: 16:15:38 Ingersoll Rand (XceedID) WO#: 91096
15.207 AC Mains - Average Test Lead: White 120V 60Hz Sequence#: 15 Ext ATTN: 0 dB



Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338 • (209) 966-5240

Customer: **Ingersoll Rand (XceedID)**
 Specification: **15.207 AC Mains - Average**
 Work Order #: **91096**
 Test Type: **Conducted Emissions**
 Equipment: **Physical Access Control Reader**
 Manufacturer: Ingersoll Rand
 Model: XF2110C
 S/N: 0100

Date: 10/7/2010
 Time: 3:38:59 PM
 Sequence#: 13
 Tested By: Chuck Kendall
 120V 60Hz

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00374	50uH LISN-BLACK LEAD	8028-TS-50-BNC	4/22/2009	4/22/2011
T2	AN01183	Spectrum Analyzer Display	85662A	3/10/2009	3/10/2011
T3	AN01184	Spectrum Analyzer	8568B	3/10/2009	3/10/2011
T4	AN00069	Quasi Peak Adapter	85650A	3/10/2009	3/10/2011
T5	AN02608	High Pass Filter	HE9615-150K-50-720B	2/11/2010	2/11/2012
T6	ANP02229	Attenuator	PE7010-10	5/20/2009	5/20/2011
T7	ANMACOND	Cable		5/10/2009	5/10/2011

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Physical Access Control Reader*	Ingersoll Rand	XF2110C	0100

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments	TPS 4000	918520

Test Conditions / Notes:

FCC 15.207
 Tag reader is setting upright (vertical) to the surface of the wooden support table 80cm atop a plastic cart. It is displaying a red light until the tag activates it.
 Transmitters are on.
 Actual integral antenna is connected.
 Emissions measurements at fundamental frequency taken with integral antenna for reference and taken with dummy load attached for final results.
 From 150 kHz to 30 MHz - RBW=9kHz, VBW=30kHz
 Temp = 65°F
 Relative Humidity = 50 %
 Press = 97.2 mb

Ext Attn: 0 dB

Measurement Data:

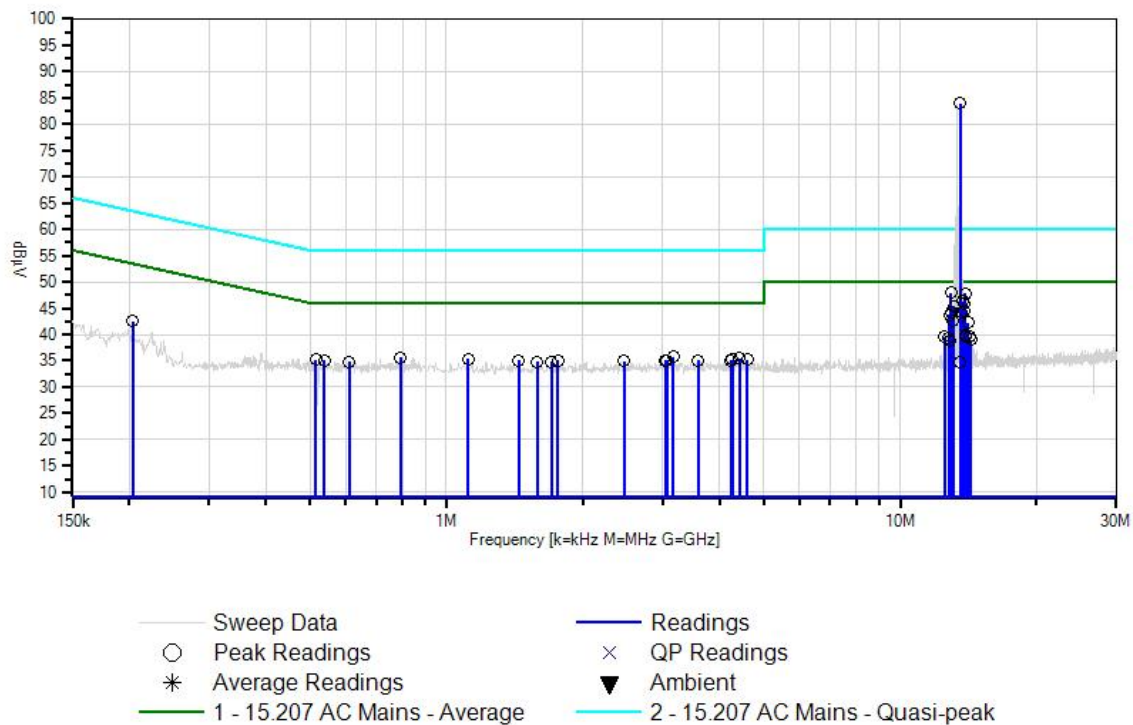
Reading listed by margin.

Test Lead: Black

#	Freq MHz	Rdng dB μ V	T1 T5 dB	T2 T6 dB	T3 T7 dB	T4 dB	Dist Table	Corr dB μ V	Spec dB μ V	Margin dB	Polar Ant
1	13.560M	72.2	+0.6 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	84.0	50.0	+34.0	Black
Fundamental with integral antenna											
2	12.941M	36.3	+0.5 +0.1	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	47.9	50.0	-2.1	Black
3	13.896M	36.0	+0.6 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	47.8	50.0	-2.2	Black
4	13.698M	34.5	+0.6 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	46.3	50.0	-3.7	Black
5	13.860M	34.1	+0.6 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	45.9	50.0	-4.1	Black
6	13.121M	33.7	+0.6 +0.1	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	45.4	50.0	-4.6	Black
7	13.824M	32.7	+0.6 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	44.5	50.0	-5.5	Black
8	12.995M	32.4	+0.6 +0.1	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	44.1	50.0	-5.9	Black
9	13.653M	32.3	+0.6 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	44.1	50.0	-5.9	Black
10	12.860M	32.1	+0.5 +0.1	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	43.7	50.0	-6.3	Black
11	13.076M	30.9	+0.6 +0.1	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	42.6	50.0	-7.4	Black
12	14.103M	30.4	+0.6 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	42.2	50.0	-7.8	Black
13	13.977M	28.2	+0.6 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	40.0	50.0	-10.0	Black
14	3.161M	25.2	+0.1 +0.1	+0.0 +9.9	+0.0 +0.5	+0.0	+0.0	35.8	46.0	-10.2	Black
15	13.950M	27.9	+0.6 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	39.7	50.0	-10.3	Black
16	793.572k	25.2	+0.1 +0.1	+0.0 +9.9	+0.0 +0.3	+0.0	+0.0	35.6	46.0	-10.4	Black
17	12.526M	28.0	+0.5 +0.1	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	39.6	50.0	-10.4	Black
18	4.428M	24.7	+0.2 +0.1	+0.0 +9.9	+0.0 +0.6	+0.0	+0.0	35.5	46.0	-10.5	Black
19	14.247M	27.7	+0.6 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	39.5	50.0	-10.5	Black
20	1.115M	25.0	+0.0 +0.1	+0.0 +9.9	+0.0 +0.3	+0.0	+0.0	35.3	46.0	-10.7	Black
21	4.275M	24.4	+0.2 +0.1	+0.0 +9.9	+0.0 +0.6	+0.0	+0.0	35.2	46.0	-10.8	Black
22	515.054k	25.0	+0.1 +0.1	+0.0 +9.8	+0.0 +0.2	+0.0	+0.0	35.2	46.0	-10.8	Black

23	12.815M	27.6	+0.5 +0.1	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	39.2	50.0	-10.8	Black
24	4.603M	24.5	+0.1 +0.1	+0.0 +9.9	+0.0 +0.6	+0.0	+0.0	35.2	46.0	-10.8	Black
25	1.762M	24.7	+0.1 +0.0	+0.0 +9.9	+0.0 +0.4	+0.0	+0.0	35.1	46.0	-10.9	Black
26	539.052k	24.9	+0.1 +0.1	+0.0 +9.8	+0.0 +0.2	+0.0	+0.0	35.1	46.0	-10.9	Black
27	3.586M	24.4	+0.2 +0.1	+0.0 +9.9	+0.0 +0.5	+0.0	+0.0	35.1	46.0	-10.9	Black
28	3.063M	24.5	+0.1 +0.1	+0.0 +9.9	+0.0 +0.5	+0.0	+0.0	35.1	46.0	-10.9	Black
29	1.443M	24.6	+0.1 +0.0	+0.0 +9.9	+0.0 +0.4	+0.0	+0.0	35.0	46.0	-11.0	Black
30	203.813k	32.4	+0.1 +0.2	+0.0 +9.7	+0.0 +0.1	+0.0	+0.0	42.5	53.5	-11.0	Black
31	3.038M	24.4	+0.1 +0.1	+0.0 +9.9	+0.0 +0.5	+0.0	+0.0	35.0	46.0	-11.0	Black
32	14.319M	27.2	+0.6 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	39.0	50.0	-11.0	Black
33	4.245M	24.2	+0.2 +0.1	+0.0 +9.9	+0.0 +0.6	+0.0	+0.0	35.0	46.0	-11.0	Black
34	2.463M	24.3	+0.1 +0.1	+0.0 +9.9	+0.0 +0.5	+0.0	+0.0	34.9	46.0	-11.1	Black
35	12.905M	27.3	+0.5 +0.1	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	38.9	50.0	-11.1	Black
36	610.318k	24.6	+0.0 +0.2	+0.0 +9.8	+0.0 +0.2	+0.0	+0.0	34.8	46.0	-11.2	Black
37	1.587M	24.4	+0.1 +0.0	+0.0 +9.9	+0.0 +0.4	+0.0	+0.0	34.8	46.0	-11.2	Black
38	1.702M	24.4	+0.1 +0.0	+0.0 +9.9	+0.0 +0.4	+0.0	+0.0	34.8	46.0	-11.2	Black
39	13.560M	23.0	+0.6 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	34.8	50.0 Fundamental with dummy load at antenna port	-15.2	Black

CKC Laboratories, Inc. Date: 10/7/2010 Time: 3:38:59 PM Ingersoll Rand (XceedID) WO#: 91096
15.207 AC Mains - Average Test Lead: Black 120V 60Hz Sequence#: 13 Ext ATTN: 0 dB



Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338 • (209) 966-5240

Customer: **Ingersoll Rand (XceedID)**
 Specification: **15.207 AC Mains - Average**
 Work Order #: **91096**
 Test Type: **Conducted Emissions**
 Equipment: **Physical Access Control Reader**
 Manufacturer: Ingersoll Rand
 Model: XF2110C
 S/N: 0100

Date: 10/7/2010
 Time: 15:50:30
 Sequence#: 14
 Tested By: Chuck Kendall
 120V 60Hz

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00374	50uH LISN-WHITE LEAD	8028-TS-50-BNC	4/22/2009	4/22/2011
T2	AN01183	Spectrum Analyzer Display	85662A	3/10/2009	3/10/2011
T3	AN01184	Spectrum Analyzer	8568B	3/10/2009	3/10/2011
T4	AN00069	Quasi Peak Adapter	85650A	3/10/2009	3/10/2011
T5	AN02608	High Pass Filter	HE9615-150K-50-720B	2/11/2010	2/11/2012
T6	ANP02229	Attenuator	PE7010-10	5/20/2009	5/20/2011
T7	ANMACOND	Cable		5/10/2009	5/10/2011

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Physical Access Control Reader*	Ingersoll Rand	XF2110C	0100

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments	TPS 4000	918520

Test Conditions / Notes:

FCC 15.207
 Tag reader is setting upright (vertical) to the surface of the wooden support table 80cm atop a plastic cart. It is displaying a red light until the tag activates it.
 Transmitters are on.
 Actual integral antenna is connected.
 Emissions measurements at fundamental frequency taken with integral antenna for reference and taken with dummy load attached for final results.
 From 150 kHz to 30 MHz - RBW=9kHz, VBW=30kHz
 Temp = 65°F
 Relative Humidity = 50 %
 Press = 97.2 mb

Ext Attn: 0 dB

Measurement Data:

Reading listed by margin.

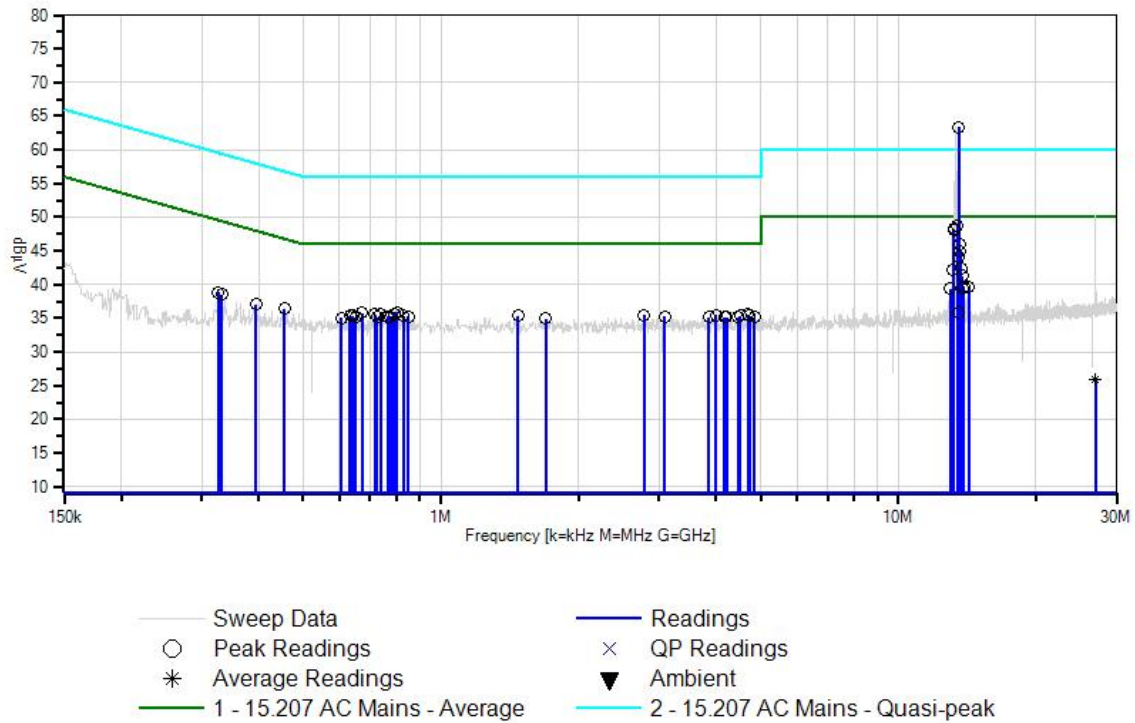
Test Lead: White

#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBμV	T5	T6	T7						
			dB	dB	dB	dB	Table	dBμV	dBμV	dB	Ant
1	13.560M	51.2	+1.0	+0.0	+0.0	+0.0	+0.0	63.4	50.0	+13.4	White
			+0.2	+9.9	+1.1				Fundamental with integral antenna		

2	13.454M	36.6	+1.0 +0.1	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	48.7	50.0	-1.3	White
3	13.211M	36.1	+1.0 +0.1	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	48.2	50.0	-1.8	White
4	13.247M	35.9	+1.0 +0.1	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	48.0	50.0	-2.0	White
5	13.589M	33.7	+1.0 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	45.9	50.0	-4.1	White
6	13.634M	32.8	+1.0 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	45.0	50.0	-5.0	White
7	13.535M	31.9	+1.0 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	44.1	50.0	-5.9	White
8	13.716M	30.2	+1.0 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	42.4	50.0	-7.6	White
9	13.175M	30.1	+1.0 +0.1	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	42.2	50.0	-7.8	White
10	13.797M	29.1	+1.0 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	41.3	50.0	-8.7	White
11	801.571k	25.0	+0.6 +0.1	+0.0 +9.9	+0.0 +0.3	+0.0	+0.0	35.9	46.0	-10.1	White
12	672.857k	25.2	+0.5 +0.1	+0.0 +9.8	+0.0 +0.2	+0.0	+0.0	35.8	46.0	-10.2	White
13	789.936k	24.8	+0.6 +0.1	+0.0 +9.9	+0.0 +0.3	+0.0	+0.0	35.7	46.0	-10.3	White
14	13.905M	27.5	+1.0 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	39.7	50.0	-10.3	White
15	717.216k	24.7	+0.5 +0.2	+0.0 +9.9	+0.0 +0.3	+0.0	+0.0	35.6	46.0	-10.4	White
16	454.697k	25.7	+0.5 +0.2	+0.0 +9.8	+0.0 +0.2	+0.0	+0.0	36.4	46.8	-10.4	White
17	738.305k	24.7	+0.5 +0.2	+0.0 +9.9	+0.0 +0.3	+0.0	+0.0	35.6	46.0	-10.4	White
18	14.238M	27.3	+1.1 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	39.6	50.0	-10.4	White
19	4.700M	24.3	+0.7 +0.1	+0.0 +9.9	+0.0 +0.6	+0.0	+0.0	35.6	46.0	-10.4	White
20	2.782M	24.4	+0.6 +0.1	+0.0 +9.9	+0.0 +0.5	+0.0	+0.0	35.5	46.0	-10.5	White
21	3.994M	24.3	+0.6 +0.1	+0.0 +9.9	+0.0 +0.6	+0.0	+0.0	35.5	46.0	-10.5	White
22	13.833M	27.3	+1.0 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	39.5	50.0	-10.5	White
23	13.013M	27.3	+1.0 +0.1	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	39.4	50.0	-10.6	White
24	829.205k	24.5	+0.6 +0.1	+0.0 +9.9	+0.0 +0.3	+0.0	+0.0	35.4	46.0	-10.6	White
25	641.587k	24.8	+0.5 +0.1	+0.0 +9.8	+0.0 +0.2	+0.0	+0.0	35.4	46.0	-10.6	White
26	632.134k	24.8	+0.5 +0.1	+0.0 +9.8	+0.0 +0.2	+0.0	+0.0	35.4	46.0	-10.6	White
27	4.726M	24.1	+0.7 +0.1	+0.0 +9.9	+0.0 +0.6	+0.0	+0.0	35.4	46.0	-10.6	White

28	4.518M	24.1	+0.7 +0.1	+0.0 +9.9	+0.0 +0.6	+0.0	+0.0	35.4	46.0	-10.6	White
29	1.477M	24.5	+0.6 +0.0	+0.0 +9.9	+0.0 +0.4	+0.0	+0.0	35.4	46.0	-10.6	White
30	776.119k	24.4	+0.6 +0.1	+0.0 +9.9	+0.0 +0.3	+0.0	+0.0	35.3	46.0	-10.7	White
31	765.211k	24.4	+0.6 +0.1	+0.0 +9.9	+0.0 +0.3	+0.0	+0.0	35.3	46.0	-10.7	White
32	3.084M	24.2	+0.6 +0.1	+0.0 +9.9	+0.0 +0.5	+0.0	+0.0	35.3	46.0	-10.7	White
33	849.566k	24.5	+0.5 +0.1	+0.0 +9.9	+0.0 +0.3	+0.0	+0.0	35.3	46.0	-10.7	White
34	325.982k	28.3	+0.4 +0.1	+0.0 +9.8	+0.0 +0.2	+0.0	+0.0	38.8	49.6	-10.8	White
35	725.215k	24.3	+0.5 +0.2	+0.0 +9.9	+0.0 +0.3	+0.0	+0.0	35.2	46.0	-10.8	White
36	4.169M	24.0	+0.6 +0.1	+0.0 +9.9	+0.0 +0.6	+0.0	+0.0	35.2	46.0	-10.8	White
37	650.314k	24.5	+0.5 +0.1	+0.0 +9.8	+0.0 +0.2	+0.0	+0.0	35.1	46.0	-10.9	White
38	394.339k	26.5	+0.4 +0.2	+0.0 +9.8	+0.0 +0.2	+0.0	+0.0	37.1	48.0	-10.9	White
39	331.800k	28.0	+0.4 +0.1	+0.0 +9.8	+0.0 +0.2	+0.0	+0.0	38.5	49.4	-10.9	White
40	3.854M	23.9	+0.6 +0.1	+0.0 +9.9	+0.0 +0.6	+0.0	+0.0	35.1	46.0	-10.9	White
41	4.854M	23.8	+0.7 +0.1	+0.0 +9.9	+0.0 +0.6	+0.0	+0.0	35.1	46.0	-10.9	White
42	4.467M	23.9	+0.6 +0.1	+0.0 +9.9	+0.0 +0.6	+0.0	+0.0	35.1	46.0	-10.9	White
43	4.220M	23.9	+0.6 +0.1	+0.0 +9.9	+0.0 +0.6	+0.0	+0.0	35.1	46.0	-10.9	White
44	606.682k	24.3	+0.5 +0.2	+0.0 +9.8	+0.0 +0.2	+0.0	+0.0	35.0	46.0	-11.0	White
45	1.694M	24.0	+0.6 +0.0	+0.0 +9.9	+0.0 +0.4	+0.0	+0.0	34.9	46.0	-11.1	White
46	13.560M	23.7	+1.0 +0.2	+0.0 +9.9	+0.0 +1.1	+0.0	+0.0	35.9	50.0 Fundamental with dummy load at antenna port	-14.1	White
47	27.026M Ave	12.7	+1.9 +0.1	+0.0 +9.9	+0.0 +1.4	+0.0	+0.0	26.0	50.0	-24.0	White
^	27.026M	37.0	+1.9 +0.1	+0.0 +9.9	+0.0 +1.4	+0.0	+0.0	50.3	50.0	+0.3	White

CKC Laboratories, Inc. Date: 10/7/2010 Time: 15:50:30 Ingersoll Rand (XceedID) WO#: 91096
15.207 AC Mains - Average Test Lead: White 120V 60Hz Sequence#: 14 Ext ATTN: 0 dB



Test Setup Photos



XF2100C



XF2100C



XF2110C



XF2110C

15.209 Carrier

Test Data Sheets

Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338 • (209) 966-5240

Customer: **Ingersoll Rand (XceedID)**

Specification: **15.209 Radiated Emissions**

Work Order #: **91096**

Date: 10/6/2010

Test Type: **Maximized Emissions**

Time: 13:53:25

Equipment: **Physical Access Control Reader**

Sequence#: 6

Manufacturer: Ingersoll Rand

Tested By: Chuck Kendall

Model: XF2100C/XF2110C

S/N: 0100/0100

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN01992	Biconilog Antenna	CBL6111C	10/9/2009	10/9/2011
	AN00062	Preamplifier	8447D	6/23/2010	6/23/2012
T1	AN02660	Spectrum Analyzer	E4446A	6/30/2010	6/30/2012
	ANP05904	Cable	32022-2-29094K-144TC	6/9/2009	6/9/2011
	ANP01403	Cable	58758-23	6/10/2009	6/10/2011
T2	AN00226	Loop Antenna	6502	4/10/2009	4/10/2011
T3	ANMA10M	Cable		5/10/2009	5/10/2011

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Physical Access Control Reader	Ingersoll Rand	XF2110C	0100
Physical Access Control Reader	Ingersoll Rand	XF2100C	0100

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments	TPS 4000	918520

Test Conditions / Notes:

Tag reader is setting upright (vertical) to the surface of the wooden support table 80cm atop a 40' diameter flush-mounted turntable. It is displaying a red light until the tag activates it.

Range of frequencies: 125 kHz

From 9 kHz to 150 kHz -RBW=200Hz, VBW=1kHz

No detectable change in field strength amplitude on voltage variations in accordance with 15.31(e).

Temp = 60°F

RH = 50 %

Press = 97.2 mb

All antennas are less than 0.05m²

XF2100C ant dims are 3.94" x 5.24" or .1001 m x .1331 m or 0.0133233 m²

XF2110C ant dims are 3.94" x 5.24" or .1001 m x .1331 m or 0.0133233 m²

Ext Attn: 0 dB

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	T3 dB		Dist Table	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar Ant
1	124.870k	89.8	+0.0	+9.7	+0.0		-80.0	19.5	25.7 XF2100C fundamental	-6.2	Vert
2	124.810k	88.0	+0.0	+9.7	+0.0		-80.0	17.7	25.7 XF2100C fundamental	-8.0	Vert
3	124.960k	87.9	+0.0	+9.7	+0.0		-80.0	17.6	25.7 XF2110C fundamental	-8.1	Vert
4	124.935k	79.9	+0.0	+9.7	+0.0		-80.0	9.6	25.7 XF2110C fundamental	-16.1	Horiz

Test Setup Photos



Low Frequency - Horizontal



Low Frequency - Vertical

15.209 / RSS-210 Occupied Band Width

Engineer Name: Chuck Kendall

Test Equipment					
Asset/Serial #	Description	Model	Manufacturer	Cal Date	Cal Due
AN02660	Spectrum Analyzer	E4446A	Agilent	6/30/2010	6/30/2012
AN00226	Loop Antenna	6502	EMCO	4/10/2009	4/10/2011
ANMA10M	Cable			5/10/2009	5/10/2011

Test Conditions

Tag reader is setting upright (vertical) to the surface of the wooden support table 80cm atop a 40' diameter flush-mounted turntable. It is displaying a red light until the tag activates it.

Range of frequencies: 125 kHz

From 9 kHz to 150 kHz -RBW=200Hz, VBW=1kHz

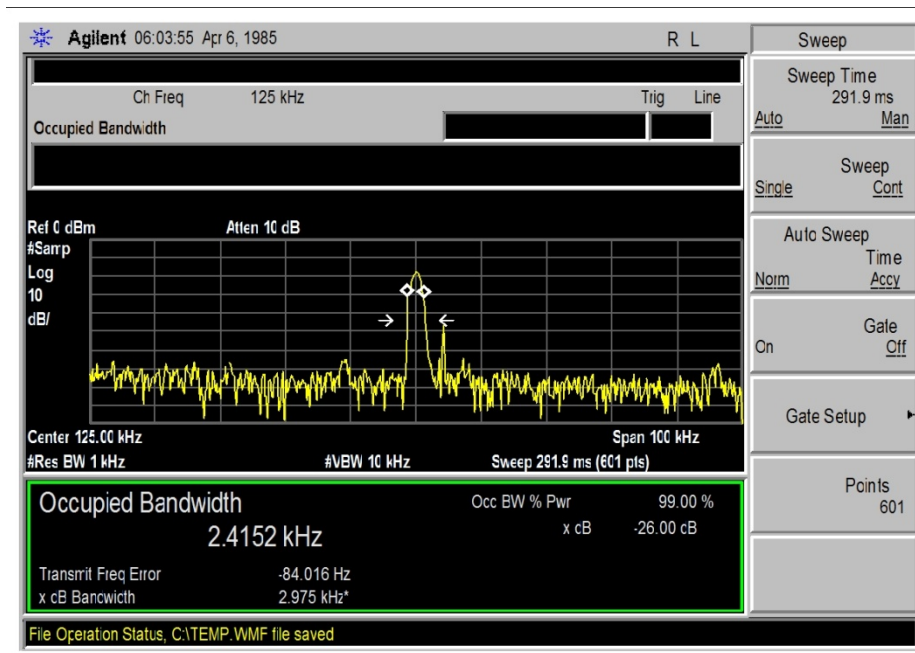
Temp = 60°F

Relative Humidity = 50 %

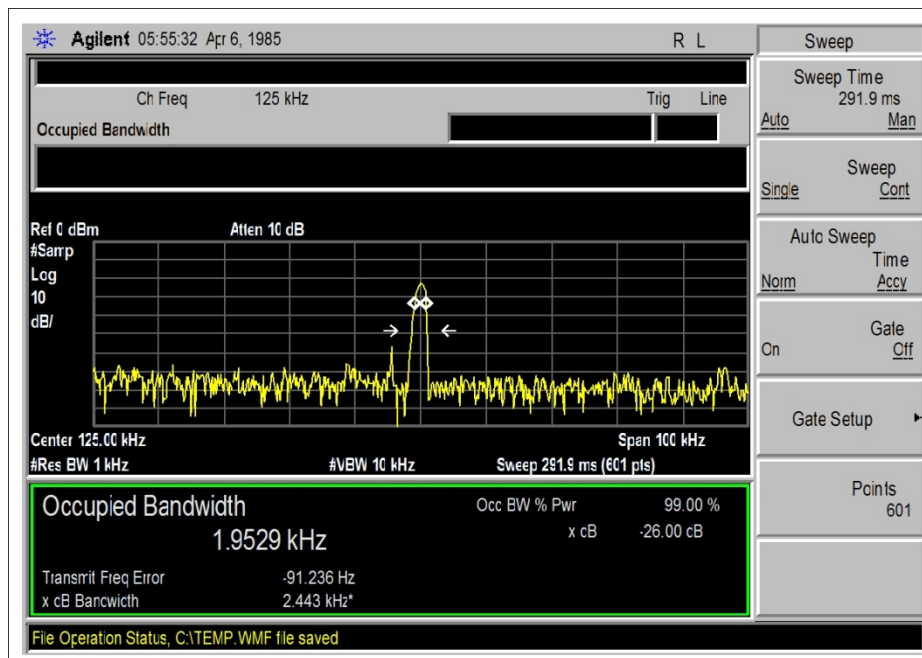
Press = 97.2 mb

Model	Occupied Bandwidth (kHz)
XF2100C	2.415
XF2110C	1.953

Test Plots



XF2100C



XF2110C

Test Setup Photos



Low Frequency - Horizontal



Low Frequency - Vertical

15.225 Carrier

Test Data Sheets

Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338 • (209) 966-5240

Customer: **Ingersoll Rand (XceedID)**
 Specification: **15.225 Carrier and Spurious Emissions (13.110-14.010 MHz Transmitter)**
 Work Order #: **91096** Date: 10/6/2010
 Test Type: **Maximized Emissions** Time: 13:53:25
 Equipment: **Physical Access Control Reader** Sequence#: 5
 Manufacturer: Ingersoll Rand Tested By: Chuck Kendall
 Model: XF2100C/XF2110C
 S/N: 0100/0100

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN01992	Biconilog Antenna	CBL6111C	10/9/2009	10/9/2011
	AN00062	Preamp	8447D	6/23/2010	6/23/2012
T1	AN02660	Spectrum Analyzer	E4446A	6/30/2010	6/30/2012
	ANP05904	Cable	32022-2-29094K-144TC	6/9/2009	6/9/2011
	ANP01403	Cable	58758-23	6/10/2009	6/10/2011
T2	AN00226	Loop Antenna	6502	4/10/2009	4/10/2011
T3	ANMA10M	Cable		5/10/2009	5/10/2011

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Physical Access Control Reader	Ingersoll Rand	XF2110C	0100
Physical Access Control Reader	Ingersoll Rand	XF2100C	0100

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments	TPS 4000	918520

Test Conditions / Notes:

Tag reader is setting upright (vertical) to the surface of the wooden support table 80cm atop a 40' diameter flush-mounted turntable. It is displaying a red light until the tag activates it.
 Range of frequencies: 13.56 MHz
 From 150 kHz to 30 MHz - RBW=9kHz, VBW=30kHz

 Temp = 60°F
 Relative Humidity = 50 %
 Press = 97.2 mb
 All antennas are less than 0.05m²
 XF2100C ant dims are 3.94" x 5.24" or .1001 m x .1331 m or 0.0133233 m²
 XF2110C ant dims are 3.94" x 5.24" or .1001 m x .1331 m or 0.0133233 m²

Ext Attn: 0 dB

Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	T3 dB		Dist Table	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar Ant
1	13.562M	77.1	+0.0	+10.2	+0.8		-40.0	48.1	84.0 XF2100C fundamental	-35.9	Vert
2	13.562M	75.4	+0.0	+10.2	+0.8		-40.0	46.4	84.0 XF2110C fundamental	-37.6	Vert
3	13.562M	70.2	+0.0	+10.2	+0.8		-40.0	41.2	84.0 XF2110C fundamental	-42.8	Horiz
4	13.561M	70.1	+0.0	+10.2	+0.8		-40.0	41.1	84.0 XF2100C fundamental	-42.9	Horiz

Test Setup Photos



Low Frequency - Horizontal



Low Frequency - Vertical

15.225 / RSS-210 Occupied Band Width

Engineer Name: Chuck Kendall

Test Equipment					
Asset/Serial #	Description	Model	Manufacturer	Cal Date	Cal Due
AN02660	Spectrum Analyzer	E4446A	Agilent	6/30/2010	6/30/2012
AN00226	Loop Antenna	6502	EMCO	4/10/2009	4/10/2011
ANMA10M	Cable			5/10/2009	5/10/2011

Test Conditions

Tag reader is setting upright (vertical) to the surface of the wooden support table 80cm atop a 40' diameter flush-mounted turntable. It is displaying a red light until the tag activates it.

Range of frequencies: 13.56 MHz

From 150 kHz to 30 MHz - RBW=9kHz, VBW=30kHz

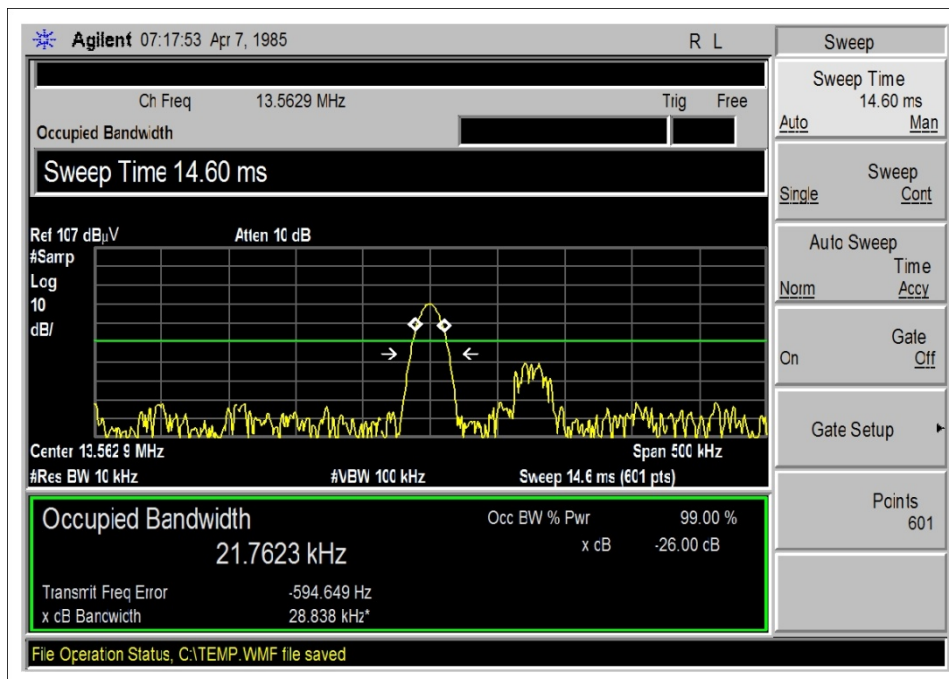
Temp = 60°F

Relative Humidity = 50 %

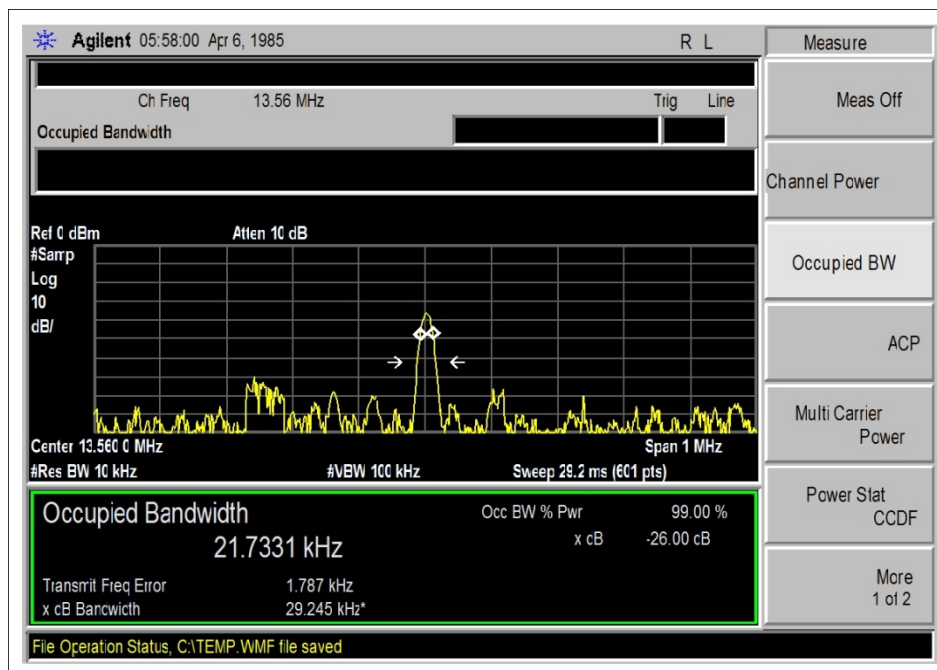
Press = 97.2 mb

Model	99% Bandwidth (kHz)	26dB Bandwidth (kHz)
XF2100C	21.762	28.838
XF2110C	21.733	29.245

Test Plots



XF2100C



XF2110C

Test Setup Photos



Low Frequency - Horizontal



Low Frequency - Vertical

15.225 Frequency Stability

Engineer Name: Chuck Kendall

Test Equipment					
Asset/Serial #	Description	Model	Manufacturer	Cal Date	Cal Due
AN02660	Spectrum Analyzer	E4446A	Agilent	6/30/2010	6/30/2012
AN00226	Loop Antenna	6502	EMCO	4/10/2009	4/10/2011
ANMA10M	Cable			5/10/2009	5/10/2011
AN01879	Temperature Chamber	S-1.2 Min.	Thermotron	12/16/2008	12/16/2010
AN02242	Thermometer	HH-26K	Omega	10/20/2009	10/20/2011

Test Conditions

Ambient conditions: Tag reader is setting upright (vertical) to the surface of the wooden support table 80cm atop a 40' diameter flush-mounted turntable. It is displaying a red light until the tag activates it. For temperature testing, the equipment is placed inside a temperature chamber.

Range of frequencies: 13.56 MHz

Temp = 60°F

Relative Humidity = 50 %

Press = 97.2 mb

All antennas are less than 0.05m²

XF2100C ant dims are 3.94" x 5.24" or .1001 m x .1331 m or 0.0133233 m²

XF2110C ant dims are 3.94" x 5.24" or .1001 m x .1331 m or 0.0133233 m²

Test Data

Frequency Stability

Customer:
WO#:
Date:
Test Engineer:
Test Specification

Ingersoll Rand
91096
8-Oct-10
Chuck Kendall
FCC 15.225

Device Model #:
Operating Voltage:
Frequency Limit:

XF2100C
12
0.01

VDC/VAC
PPM/%

Temperature Variations

Channel Frequency:		Channel 1 (MHz)	Dev. (MHz)
		13.5621	
Temp (C)	Voltage		
-20	12	13.56187	0.00023
-10	12	13.56213	0.00003
0	12	13.56217	0.00007
10	12	13.56217	0.00007
20	12	13.56213	0.00003
30	12	13.5621	0.00000
40	12	13.56203	0.00007
50	12	13.562	0.00010

Voltage Variations ($\pm 15\%$)

20	10.2	13.56213	0.00003
20	12	13.56213	0.00003
20	13.8	13.56213	0.00003

Max Deviation (MHz)	0.00023
Max Deviation (%)	0.00170
	PASS

Frequency Stability

Customer: Ingersoll Rand
WO#: 91096
Date: 8-Oct-10
Test Engineer: Chuck Kendall
Test Specification: FCC 15.225

Device Model #: XF2110C
Operating Voltage: 12 VDC/VAC
Frequency Limit: 0.01 PPM/%

Temperature Variations

			Channel 1 (MHz)	Dev. (MHz)
Channel Frequency:			13.561797	
Temp (C)	Voltage			
-20	12		13.56187	0.00007
-10	12		13.56187	0.00007
0	12		13.56187	0.00007
10	12		13.56187	0.00007
20	12		13.56180	0.00000
30	12		13.56183	0.00003
40	12		13.5618	0.00000
50	12		13.56177	0.00003

Voltage Variations ($\pm 15\%$)

20	10.2	13.56180	0.00000
20	12	13.56180	0.00000
20	13.8	13.56180	0.00000

Max Deviation (MHz)	0.00135
Max Deviation (%)	0.00054
	PASS

Test Setup Photos



15.209 Spurious Emissions

Test Data

Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338 • (209) 966-5240

Customer: **Ingersoll Rand (XceedID)**

Specification: **15.209 Radiated Emissions**

Work Order #: **91096**

Date: 10/5/2010

Test Type: **Maximized Emissions**

Time: 11:51:18

Equipment: **Physical Access Control Reader**

Sequence#: 3

Manufacturer: Ingersoll Rand

Tested By: Chuck Kendall

Model: XF2100C/XF2110C/XF1100C

S/N: 0100/0100/0100

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN01992	Biconilog Antenna	CBL6111C	10/9/2009	10/9/2011
	AN00062	Preamp	8447D	6/23/2010	6/23/2012
	AN02660	Spectrum Analyzer	E4446A	6/30/2010	6/30/2012
	ANP05904	Cable	32022-2-29094K-144TC	6/9/2009	6/9/2011
	ANP01403	Cable	58758-23	6/10/2009	6/10/2011
T1	AN00226	Loop Antenna	6502	4/10/2009	4/10/2011
T2	ANMA10M	Cable		5/10/2009	5/10/2011

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Physical Access Control Reader	Ingersoll Rand	XF2110C	0100
Physical Access Control Reader	Ingersoll Rand	XF2100C	0100
Physical Access Control Reader	Ingersoll Rand	XF1100C	0100

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments	TPS 4000	918520

Test Conditions / Notes:

Tag reader is setting upright (vertical) to the surface of the wooden support table 80cm atop a 40' diameter flush-mounted turntable. It is displaying a red light until the tag activates it.

Range of frequencies: 0.009 MHz to 30 MHz

Range of frequencies: 0.009 MHz to 30 MHz

From 9 kHz to 150 kHz -RBW=200Hz, VBW=1kHz

From 150 kHz to 30 MHz - RBW=9kHz, VBW=30kHz

Temp = 60°F

Relative Humidity = 50 %

Press = 97.2 mb

Note: An extra model, XF1100C, was tested at the same time but does not pertain to this report.

Ext Attn: 0 dB

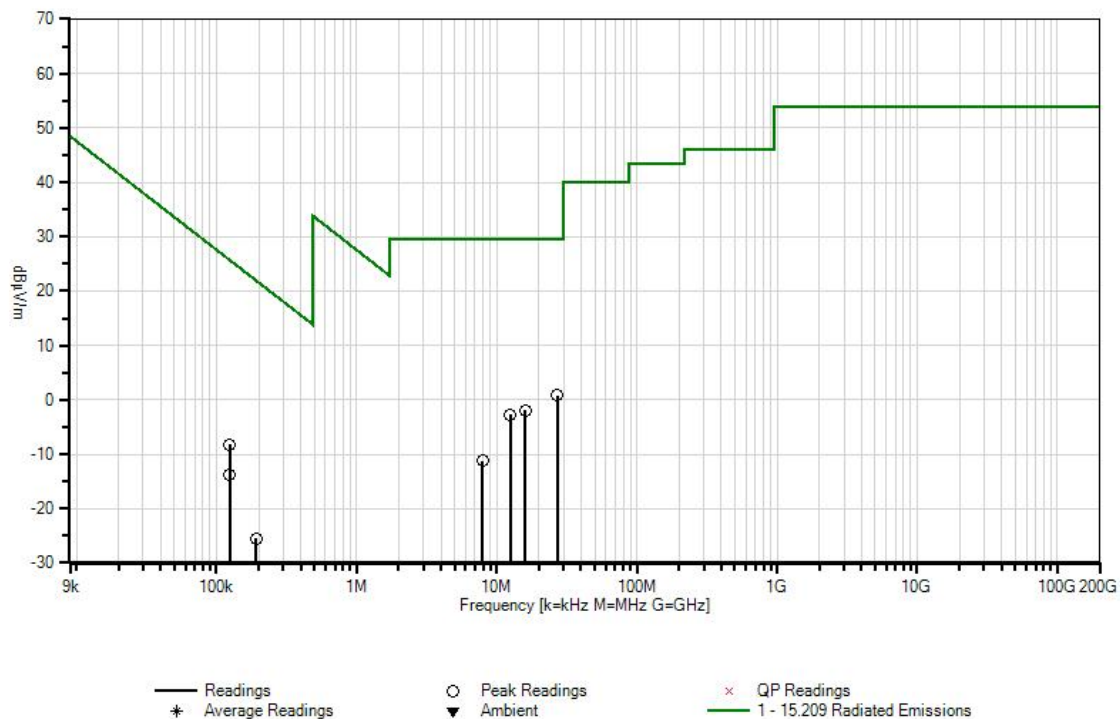
Measurement Data:

Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB			Dist Table	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar Ant
1	27.146M	33.5	+6.2	+1.2			-40.0	0.9	29.5	-28.6	Vert
2	15.984M	26.8	+10.3	+0.9			-40.0	-2.0	29.5	-31.5	Vert
3	12.517M	26.6	+9.9	+0.8			-40.0	-2.7	29.5	-32.2	Vert
4	124.392k	62.0	+9.7	+0.0			-80.0	-8.3	25.7	-34.0	Vert
5	124.916k	56.5	+9.7	+0.0			-80.0	-13.8	25.7	-39.5	Vert
6	7.942M	18.9	+9.3	+0.6			-40.0	-11.2	29.5	-40.7	Vert
7	192.830k	44.7	+9.8	+0.0			-80.0	-25.5	21.9	-47.4	Vert

CKC Laboratories, Inc. Date: 10/5/2010 Time: 11:51:18 Ingersoll Rand (XceedID) WO#: 91096
15.209 Radiated Emissions Test Distance: 3 Meters Sequence#: 3 Ext ATTN: 0 dB



Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Drive • Mariposa, CA 95338 • (209) 966-5240

Customer: **Ingersoll Rand (XceedID)**
 Specification: **15.209 Radiated Emissions**
 Work Order #: **91096** Date: 10/5/2010
 Test Type: **Maximized Emissions** Time: 10:33:03
 Equipment: **Physical Access Control Reader** Sequence#: 1
 Manufacturer: Ingersoll Rand Tested By: Chuck Kendall
 Model: XF2100C/XF2110C
 S/N: 0100/0100

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN01992	Biconilog Antenna	CBL6111C	10/9/2009	10/9/2011
T2	AN00062	Preamp	8447D	6/23/2010	6/23/2012
	AN02660	Spectrum Analyzer	E4446A	6/30/2010	6/30/2012
T3	ANP05904	Cable	32022-2-29094K-144TC	6/9/2009	6/9/2011
T4	ANP01403	Cable	58758-23	6/10/2009	6/10/2011

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Physical Access Control Reader	Ingersoll Rand	XF2110C	0100
Physical Access Control Reader	Ingersoll Rand	XF2100C	0100

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments	TPS 4000	918520

Test Conditions / Notes:

Tag reader is setting upright (vertical) to the surface of the wooden support table 80cm atop a 40' diameter flush-mounted turntable. It is displaying a red light until the tag activates it.
 Range of frequencies: 30 MHz to 1000 MHz
 Temp = 60°F
 Relative Humidity = 50 %
 Press = 97.2 mb

Ext Attn: 0 dB

Measurement Data:

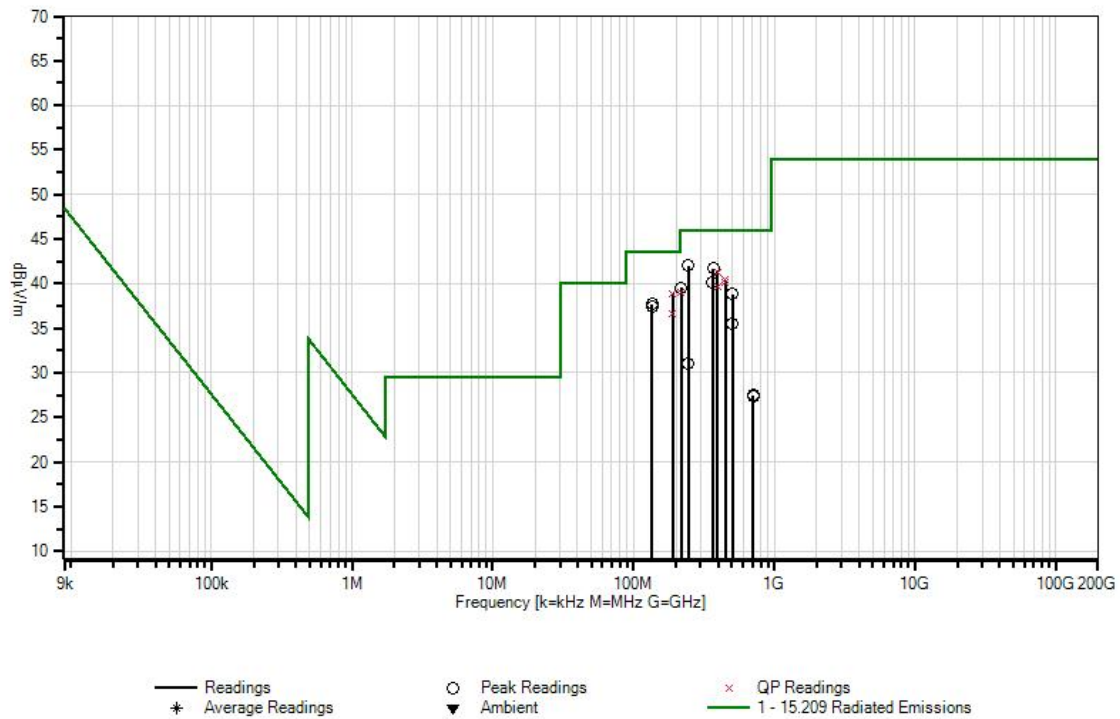
Reading listed by margin.

Test Distance: 3 Meters

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar Ant
1	244.102M	58.3	+12.2	-30.0	+0.8	+0.7	+0.0	42.0	46.0	-4.0	Horiz
2	366.165M	54.1	+15.8	-30.1	+1.0	+0.9	+0.0	41.7	46.0	-4.3	Vert
3	189.870M	58.7	+9.1	-30.2	+0.7	+0.6	+0.0	38.9	43.5	-4.6	Horiz
QP	^ 189.864M	59.9	+9.1	-30.2	+0.7	+0.6	+0.0	40.1	43.5	-3.4	Horiz
5	393.298M	53.1	+16.5	-30.3	+1.0	+0.9	+0.0	41.2	46.0	-4.8	Vert
QP											

^	393.298M	54.1	+16.5	-30.3	+1.0	+0.9	+0.0	42.2	46.0	-3.8	Vert
7	447.547M	51.4	+17.5	-30.5	+1.0	+1.0	+0.0	40.4	46.0	-5.6	Horiz
	QP										
^	447.544M	52.5	+17.5	-30.5	+1.0	+1.0	+0.0	41.5	46.0	-4.5	Horiz
9	135.635M	55.4	+11.8	-30.6	+0.6	+0.5	+0.0	37.7	43.5	-5.8	Vert
10	447.541M	51.2	+17.5	-30.5	+1.0	+1.0	+0.0	40.2	46.0	-5.8	Vert
	QP										
^	447.548M	53.6	+17.5	-30.5	+1.0	+1.0	+0.0	42.6	46.0	-3.4	Vert
12	366.161M	52.5	+15.8	-30.1	+1.0	+0.9	+0.0	40.1	46.0	-5.9	Horiz
13	135.630M	55.2	+11.8	-30.6	+0.6	+0.5	+0.0	37.5	43.5	-6.0	Horiz
14	393.289M	51.6	+16.5	-30.3	+1.0	+0.9	+0.0	39.7	46.0	-6.3	Horiz
	QP										
^	393.293M	53.7	+16.5	-30.3	+1.0	+0.9	+0.0	41.8	46.0	-4.2	Horiz
16	216.990M	57.9	+10.4	-30.1	+0.7	+0.6	+0.0	39.5	46.0	-6.5	Vert
17	189.873M	56.5	+9.1	-30.2	+0.7	+0.6	+0.0	36.7	43.5	-6.8	Vert
	QP										
^	189.870M	57.7	+9.1	-30.2	+0.7	+0.6	+0.0	37.9	43.5	-5.6	Vert
19	216.985M	57.4	+10.4	-30.1	+0.7	+0.6	+0.0	39.0	46.0	-7.0	Horiz
	QP										
^	216.983M	59.9	+10.4	-30.1	+0.7	+0.6	+0.0	41.5	46.0	-4.5	Horiz
21	501.778M	49.0	+18.3	-30.5	+1.0	+1.0	+0.0	38.8	46.0	-7.2	Vert
22	501.795M	45.7	+18.3	-30.5	+1.0	+1.0	+0.0	35.5	46.0	-10.5	Horiz
23	244.110M	47.3	+12.2	-30.0	+0.8	+0.7	+0.0	31.0	46.0	-15.0	Vert
24	705.207M	34.2	+21.3	-30.5	+1.2	+1.3	+0.0	27.5	46.0	-18.5	Vert
25	705.204M	34.1	+21.3	-30.5	+1.2	+1.3	+0.0	27.4	46.0	-18.6	Horiz

CKC Laboratories, Inc. Date: 10/5/2010 Time: 10:33:03 Ingersoll Rand (XceedID) WO#: 91096
 15.209 Radiated Emissions Test Distance: 3 Meters Sequence#: 1 Ext ATTN: 0 dB



Test Setup Photos



Low Frequency - Horizontal



Low Frequency - Vertical



High Frequency

SUPPLEMENTAL INFORMATION

Measurement Uncertainty

Uncertainty Value	Parameter
4.73 dB	Radiated Emissions
3.34 dB	Mains Conducted Emissions
3.30 dB	Disturbance Power

The reported measurement uncertainties are calculated based on the worst case of all laboratory environments from CKC Laboratories, Inc. test sites. Only those parameters which require estimation of measurement uncertainty are reported. The reported worst case measurement uncertainty is less than the maximum values derived in CISPR 16-4-2. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k=2$. Compliance is deemed to occur provided measurements are below the specified limits.

Emissions Test Details

TESTING PARAMETERS

The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. Cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the setup photographs. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables.

The emissions data was taken with a spectrum analyzer or receiver. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the table below. The corrected data was then compared to the applicable emission limits. Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in $\text{dB}\mu\text{V}/\text{m}$, the spectrum analyzer reading in $\text{dB}\mu\text{V}$ was corrected by using the following formula. This reading was then compared to the applicable specification limit.

SAMPLE CALCULATIONS		
	Meter reading	(dB μ V)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dB μ V/m)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed were used to collect the emissions data. A spectrum analyzer or receiver was used for all measurements. The following table shows the measuring equipment bandwidth settings that were used in designated frequency bands. For testing emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used.

MEASURING EQUIPMENT BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	>1 GHz	1 MHz

SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the emissions tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "Peak" mode. Whenever a "Quasi-Peak" or "Average" reading is listed as one of the highest readings, this is indicated as a "QP" or an "Ave" on the appropriate rows of the data sheets. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the spectrum analyzer/receiver readings recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature of the measuring device called "peak hold," the measuring device had the ability to measure transients or low duty cycle transient emission peak levels. In this mode the measuring device made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

When the true peak values exceeded or were within 2 dB of the specification limit, quasi-peak measurements were taken using the quasi-peak detector.

Average

For certain frequencies, average measurements may be made using the spectrum analyzer/receiver. To make these measurements, the test engineer reduces the video bandwidth on the measuring device until the modulation of the signal is filtered out. At this point the measuring device is set into the linear mode and the scan time is reduced.