

Ingersoll Rand

TEST REPORT FOR

Physical Access Control Reader, XF1100 Rev. C

Tested To The Following Standards:

FCC Part 15 Subpart B Sections 15.107 and 15.109

Report No.: 91097-16

Date of issue: November 9, 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: 306478

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

Dianne Dudley
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 91096

October 5, 2010

October 5-7, 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, reading "Steve Behm", is positioned above a horizontal line.

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

SUMMARY OF RESULTS

Standard / Specification: FCC Part 15 Subpart B

Description	Test Procedure/Method	Results
Conducted Emissions	FCC Part 15 Subpart B Section 15.107 Class B / ANSI C63.4 (2003)	Pass
Radiated Emissions	FCC Part 15 Subpart B Section 15.109 Class B / 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 model has been tested by CKC Laboratories: **XF1100C**

The manufacturer states that the following model name revision to the EUT does not effect it electrically and remains identical to the one which was tested, or any differences between them do not affect its EMC characteristics, and therefore meets the level of testing equivalent to the tested model: **XF1100 Rev. C**

EQUIPMENT UNDER TEST

Physical Access Control Reader

Manuf: Ingersoll Rand
Model: XF1100 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: XF2100 Rev. C
Serial: 0100

*Models XF2110 Rev. C and XF2100 Rev. C were tested together with the EUT (XF1100 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

FCC PART 15 SUBPART B

This report contains EMC emissions test results under United States Federal Communications Commission (FCC) 47 CFR 15B requirements for Unlicensed Radio Frequency Devices, Subpart B - Unintentional Radiators.

15.107 AC Conducted Emissions

Test Notes: Conducted Disturbances at Mains Terminals, LISN method.

Test Procedure: ANSI C63.4

Test Data Sheets

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

Customer: **Ingersoll Rand (XceedID)**
 Specification: **15.107 AC Mains Class B - Average**
 Work Order #: **91096**
 Test Type: **Conducted Emissions**
 Equipment: **Physical Access Control Reader**
 Manufacturer: Ingersoll Rand
 Model: XF1100C
 S/N: 0100

Date: 10/7/2010
 Time: 5:01:57 PM
 Sequence#: 17
 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
	AN01183	Spectrum Analyzer Display	85662A	3/10/2009	3/10/2011
	AN01184	Spectrum Analyzer	8568B	3/10/2009	3/10/2011
	AN00069	Quasi Peak Adapter	85650A	3/10/2009	3/10/2011
T2	AN02608	High Pass Filter	HE9615-150K-50-720B	2/11/2010	2/11/2012
T3	ANP02229	Attenuator	PE7010-10	5/20/2009	5/20/2011
T4	ANMACOND	Cable		5/10/2009	5/10/2011

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
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:

15.107 AC Mains Class B - Average 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. Range of frequencies: 0.150 MHz to 30 MHz Transmitter is transmitting continuously. Dummy load is installed in place of the integral antenna. RBW=9kHz, VBW=30kHz Temp = 65°F RH = 50 % Press = 97.2 mb
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Ext Attn: 0 dB

Measurement Data:

Reading listed by margin.

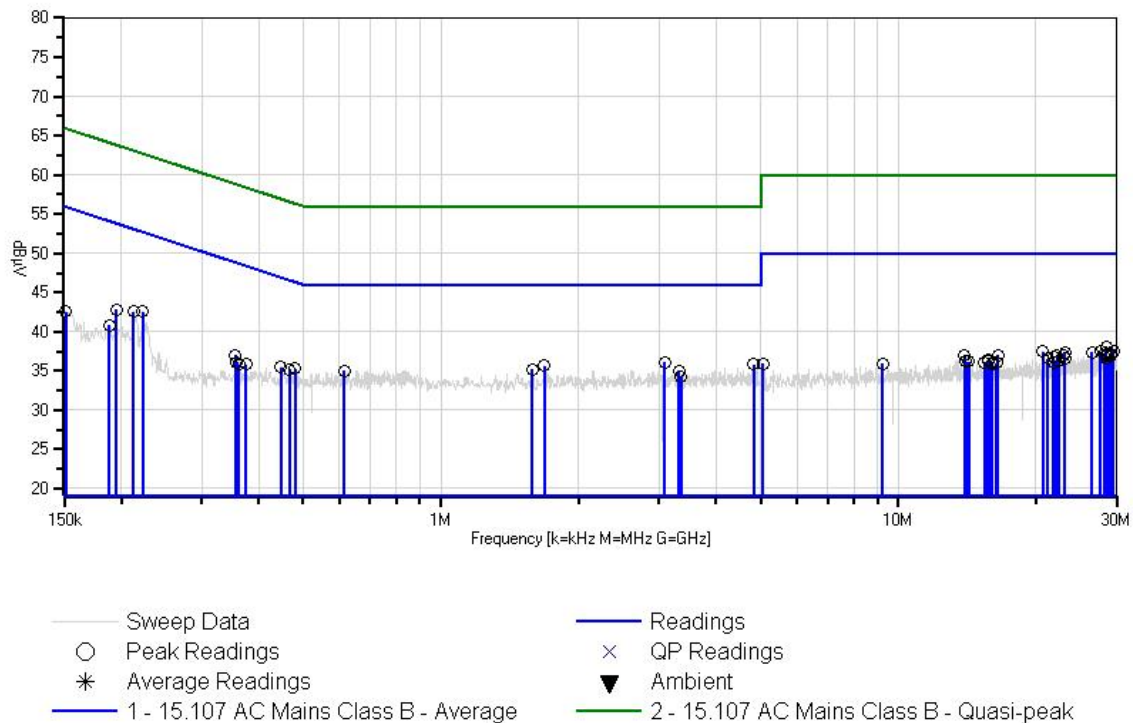
Test Lead: Black

#	Freq MHz	Rdng dBμV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBμV	Spec dBμV	Margin dB	Polar Ant
1	3.089M	25.5	+0.1	+0.1	+9.9	+0.5	+0.0	36.1	46.0	-9.9	Black
2	222.720k	32.5	+0.1	+0.2	+9.7	+0.1	+0.0	42.6	52.7	-10.1	Black
3	4.828M	25.1	+0.1	+0.1	+9.9	+0.6	+0.0	35.8	46.0	-10.2	Black
4	1.681M	25.3	+0.1	+0.0	+9.9	+0.4	+0.0	35.7	46.0	-10.3	Black
5	212.539k	32.5	+0.1	+0.2	+9.7	+0.1	+0.0	42.6	53.1	-10.5	Black
6	1.583M	24.8	+0.1	+0.0	+9.9	+0.4	+0.0	35.2	46.0	-10.8	Black
7	480.149k	25.0	+0.1	+0.2	+9.8	+0.2	+0.0	35.3	46.3	-11.0	Black
8	195.086k	32.7	+0.1	+0.2	+9.7	+0.1	+0.0	42.8	53.8	-11.0	Black
9	3.314M	24.4	+0.1	+0.1	+9.9	+0.5	+0.0	35.0	46.0	-11.0	Black
10	613.954k	24.9	+0.0	+0.1	+9.8	+0.2	+0.0	35.0	46.0	-11.0	Black
11	446.698k	25.2	+0.1	+0.2	+9.8	+0.2	+0.0	35.5	46.9	-11.4	Black
12	467.059k	24.9	+0.1	+0.2	+9.8	+0.2	+0.0	35.2	46.6	-11.4	Black
13	3.348M	23.7	+0.1	+0.1	+9.9	+0.5	+0.0	34.3	46.0	-11.7	Black
14	355.070k	26.8	+0.1	+0.1	+9.8	+0.2	+0.0	37.0	48.8	-11.8	Black
15	28.431M	25.1	+1.3	+0.2	+9.9	+1.5	+0.0	38.0	50.0	-12.0	Black
16	29.568M	24.5	+1.4	+0.3	+9.9	+1.5	+0.0	37.6	50.0	-12.4	Black

17	20.707M	25.2	+0.9	+0.2	+9.9	+1.3	+0.0	37.5	50.0	-12.5	Black
18	27.663M	24.6	+1.3	+0.2	+9.9	+1.5	+0.0	37.5	50.0	-12.5	Black
19	374.705k	25.6	+0.1	+0.1	+9.8	+0.2	+0.0	35.8	48.4	-12.6	Black
20	23.169M	24.9	+1.0	+0.2	+9.9	+1.4	+0.0	37.4	50.0	-12.6	Black
21	26.499M	24.8	+1.2	+0.1	+9.9	+1.4	+0.0	37.4	50.0	-12.6	Black
22	357.979k	25.9	+0.1	+0.1	+9.8	+0.2	+0.0	36.1	48.8	-12.7	Black
23	28.260M	24.4	+1.3	+0.2	+9.9	+1.5	+0.0	37.3	50.0	-12.7	Black
24	28.493M	24.2	+1.3	+0.2	+9.9	+1.5	+0.0	37.1	50.0	-12.9	Black
25	29.191M	24.1	+1.4	+0.2	+9.9	+1.5	+0.0	37.1	50.0	-12.9	Black
26	361.615k	25.6	+0.1	+0.1	+9.8	+0.2	+0.0	35.8	48.7	-12.9	Black
27	13.977M	25.2	+0.6	+0.2	+9.9	+1.1	+0.0	37.0	50.0	-13.0	Black
28	16.544M	25.0	+0.7	+0.2	+9.9	+1.2	+0.0	37.0	50.0	-13.0	Black
29	23.013M	24.5	+1.0	+0.2	+9.9	+1.4	+0.0	37.0	50.0	-13.0	Black
30	22.265M	24.4	+1.0	+0.2	+9.9	+1.4	+0.0	36.9	50.0	-13.1	Black
31	28.588M	24.0	+1.3	+0.2	+9.9	+1.5	+0.0	36.9	50.0	-13.1	Black
32	29.075M	23.9	+1.4	+0.2	+9.9	+1.5	+0.0	36.9	50.0	-13.1	Black
33	21.806M	24.5	+0.9	+0.2	+9.9	+1.3	+0.0	36.8	50.0	-13.2	Black
34	151.454k	29.9	+0.1	+2.8	+9.7	+0.1	+0.0	42.6	55.9	-13.3	Black
35	188.542k	30.6	+0.1	+0.3	+9.7	+0.1	+0.0	40.8	54.1	-13.3	Black
36	28.527M	23.8	+1.3	+0.2	+9.9	+1.5	+0.0	36.7	50.0	-13.3	Black
37	21.265M	24.3	+0.9	+0.2	+9.9	+1.3	+0.0	36.6	50.0	-13.4	Black
38	23.139M	24.1	+1.0	+0.2	+9.9	+1.4	+0.0	36.6	50.0	-13.4	Black
39	15.680M	24.4	+0.7	+0.2	+9.9	+1.2	+0.0	36.4	50.0	-13.6	Black
40	15.752M	24.3	+0.7	+0.2	+9.9	+1.2	+0.0	36.3	50.0	-13.7	Black
41	14.076M	24.4	+0.6	+0.2	+9.9	+1.1	+0.0	36.2	50.0	-13.8	Black
42	14.247M	24.4	+0.6	+0.2	+9.9	+1.1	+0.0	36.2	50.0	-13.8	Black

43	22.400M	23.7	+1.0	+0.2	+9.9	+1.4	+0.0	36.2	50.0	-13.8	Black
44	15.427M	24.2	+0.7	+0.1	+9.9	+1.2	+0.0	36.1	50.0	-13.9	Black
45	16.076M	24.1	+0.7	+0.2	+9.9	+1.2	+0.0	36.1	50.0	-13.9	Black
46	16.382M	24.0	+0.7	+0.2	+9.9	+1.2	+0.0	36.0	50.0	-14.0	Black
47	21.941M	23.7	+0.9	+0.2	+9.9	+1.3	+0.0	36.0	50.0	-14.0	Black
48	5.053M	25.2	+0.1	+0.1	+9.9	+0.6	+0.0	35.9	50.0	-14.1	Black
49	9.229M	24.7	+0.3	+0.1	+9.9	+0.9	+0.0	35.9	50.0	-14.1	Black
50	16.049M	23.9	+0.7	+0.2	+9.9	+1.2	+0.0	35.9	50.0	-14.1	Black

CKC Laboratories, Inc. Date: 10/7/2010 Time: 5:01:57 PM Ingersoll Rand (XceedID) WO#: 91096
15.107 AC Mains Class B - Average Test Lead: Black 120V 60Hz Sequence#: 17 Ext ATTN: 0 dB



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

Customer: **Ingersoll Rand (XceedID)**
 Specification: **15.107 AC Mains Class B - Average**
 Work Order #: **91096**
 Test Type: **Conducted Emissions**
 Equipment: **Physical Access Control Reader**
 Manufacturer: **Ingersoll Rand**
 Model: **XF1100C**
 S/N: **0100**

Date: 10/7/2010
 Time: 5:07:05 PM
 Sequence#: 18
 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
	AN01183	Spectrum Analyzer Display	85662A	3/10/2009	3/10/2011
	AN01184	Spectrum Analyzer	8568B	3/10/2009	3/10/2011
	AN00069	Quasi Peak Adapter	85650A	3/10/2009	3/10/2011
T2	AN02608	High Pass Filter	HE9615-150K-50-720B	2/11/2010	2/11/2012
T3	ANP02229	Attenuator	PE7010-10	5/20/2009	5/20/2011
T4	ANMACOND	Cable		5/10/2009	5/10/2011

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
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:

15.107 AC Mains Class B - Average
 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.
 Range of frequencies: 0.150 MHz to 30 MHz
 Transmitter is transmitting continuously.
 Dummy load is installed in place of the integral antenna.
 RBW=9kHz, VBW=30kHz
 Temp = 65°F
 RH = 50 %
 Press = 97.2 mb

Ext Attn: 0 dB

Measurement Data:

Reading listed by margin.

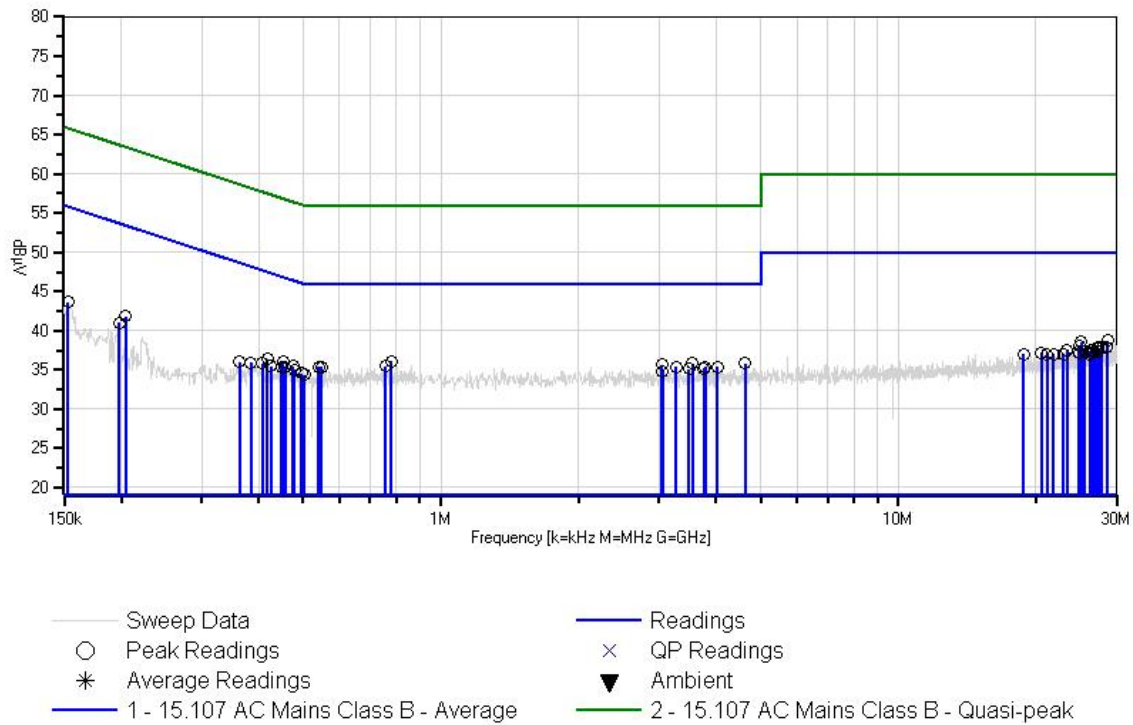
Test Lead: White

#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB μ V	Spec dB μ V	Margin dB	Polar Ant
1	779.028k	25.2	+0.6	+0.1	+9.9	+0.3	+0.0	36.1	46.0	-9.9	White
2	3.548M	24.7	+0.6	+0.1	+9.9	+0.5	+0.0	35.8	46.0	-10.2	White

3	4.628M	24.5	+0.7	+0.1	+9.9	+0.6	+0.0	35.8	46.0	-10.2	White
4	3.046M	24.6	+0.6	+0.1	+9.9	+0.5	+0.0	35.7	46.0	-10.3	White
5	757.939k	24.5	+0.6	+0.2	+9.9	+0.3	+0.0	35.5	46.0	-10.5	White
6	548.506k	24.8	+0.5	+0.1	+9.8	+0.2	+0.0	35.4	46.0	-10.6	White
7	540.506k	24.8	+0.5	+0.1	+9.8	+0.2	+0.0	35.4	46.0	-10.6	White
8	3.263M	24.3	+0.6	+0.1	+9.9	+0.5	+0.0	35.4	46.0	-10.6	White
9	4.024M	24.2	+0.6	+0.1	+9.9	+0.6	+0.0	35.4	46.0	-10.6	White
10	3.782M	24.3	+0.6	+0.1	+9.9	+0.5	+0.0	35.4	46.0	-10.6	White
11	451.061k	25.4	+0.5	+0.2	+9.8	+0.2	+0.0	36.1	46.9	-10.8	White
12	3.756M	24.1	+0.6	+0.1	+9.9	+0.5	+0.0	35.2	46.0	-10.8	White
13	474.331k	24.8	+0.5	+0.2	+9.8	+0.2	+0.0	35.5	46.4	-10.9	White
14	3.488M	24.0	+0.6	+0.1	+9.9	+0.5	+0.0	35.1	46.0	-10.9	White
15	417.610k	25.8	+0.4	+0.2	+9.8	+0.2	+0.0	36.4	47.5	-11.1	White
16	3.055M	23.7	+0.6	+0.1	+9.9	+0.5	+0.0	34.8	46.0	-11.2	White
17	456.878k	24.7	+0.5	+0.2	+9.8	+0.2	+0.0	35.4	46.7	-11.3	White
18	28.671M	25.1	+2.0	+0.2	+9.9	+1.5	+0.0	38.7	50.0	-11.3	White
19	478.694k	24.3	+0.5	+0.2	+9.8	+0.2	+0.0	35.0	46.4	-11.4	White
20	25.121M	25.4	+1.7	+0.2	+9.9	+1.4	+0.0	38.6	50.0	-11.4	White
21	448.879k	24.7	+0.5	+0.2	+9.8	+0.2	+0.0	35.4	46.9	-11.5	White
22	495.420k	24.0	+0.5	+0.1	+9.8	+0.2	+0.0	34.6	46.1	-11.5	White
23	204.540k	31.4	+0.4	+0.2	+9.7	+0.1	+0.0	41.8	53.4	-11.6	White
24	502.692k	23.8	+0.5	+0.1	+9.8	+0.2	+0.0	34.4	46.0	-11.6	White
25	425.609k	24.9	+0.4	+0.2	+9.8	+0.2	+0.0	35.5	47.3	-11.8	White
26	406.702k	25.2	+0.4	+0.2	+9.8	+0.2	+0.0	35.8	47.7	-11.9	White
27	24.868M	24.9	+1.7	+0.2	+9.9	+1.4	+0.0	38.1	50.0	-11.9	White
28	27.848M	24.3	+2.0	+0.2	+9.9	+1.5	+0.0	37.9	50.0	-12.1	White

29	28.602M	24.3	+2.0	+0.2	+9.9	+1.5	+0.0	37.9	50.0	-12.1	White
30	152.909k	30.7	+0.4	+2.7	+9.7	+0.1	+0.0	43.6	55.8	-12.2	White
31	27.389M	24.4	+1.9	+0.1	+9.9	+1.5	+0.0	37.8	50.0	-12.2	White
32	384.886k	25.4	+0.4	+0.1	+9.8	+0.2	+0.0	35.9	48.2	-12.3	White
33	27.348M	24.3	+1.9	+0.1	+9.9	+1.5	+0.0	37.7	50.0	-12.3	White
34	23.422M	24.4	+1.6	+0.2	+9.9	+1.4	+0.0	37.5	50.0	-12.5	White
35	26.348M	24.2	+1.8	+0.2	+9.9	+1.4	+0.0	37.5	50.0	-12.5	White
36	26.601M	24.2	+1.9	+0.1	+9.9	+1.4	+0.0	37.5	50.0	-12.5	White
37	24.792M	24.2	+1.7	+0.2	+9.9	+1.4	+0.0	37.4	50.0	-12.6	White
38	25.539M	24.1	+1.8	+0.2	+9.9	+1.4	+0.0	37.4	50.0	-12.6	White
39	362.342k	25.5	+0.4	+0.1	+9.8	+0.2	+0.0	36.0	48.7	-12.7	White
40	197.995k	30.6	+0.4	+0.2	+9.7	+0.1	+0.0	41.0	53.7	-12.7	White
41	27.239M	23.9	+1.9	+0.1	+9.9	+1.5	+0.0	37.3	50.0	-12.7	White
42	26.786M	24.0	+1.9	+0.1	+9.9	+1.4	+0.0	37.3	50.0	-12.7	White
43	20.580M	24.4	+1.4	+0.2	+9.9	+1.3	+0.0	37.2	50.0	-12.8	White
44	24.936M	24.0	+1.7	+0.2	+9.9	+1.4	+0.0	37.2	50.0	-12.8	White
45	26.423M	23.9	+1.8	+0.2	+9.9	+1.4	+0.0	37.2	50.0	-12.8	White
46	21.184M	24.2	+1.4	+0.2	+9.9	+1.3	+0.0	37.0	50.0	-13.0	White
47	18.815M	24.3	+1.3	+0.2	+9.9	+1.3	+0.0	37.0	50.0	-13.0	White
48	21.824M	24.1	+1.5	+0.2	+9.9	+1.3	+0.0	37.0	50.0	-13.0	White
49	26.238M	23.7	+1.8	+0.2	+9.9	+1.4	+0.0	37.0	50.0	-13.0	White
50	22.959M	23.9	+1.6	+0.2	+9.9	+1.4	+0.0	37.0	50.0	-13.0	White

CKC Laboratories, Inc. Date: 10/7/2010 Time: 5:07:05 PM Ingersoll Rand (XceedID) WO#: 91096
15.107 AC Mains Class B - Average Test Lead: White 120V 60Hz Sequence#: 18 Ext ATTN: 0 dB



Test Setup Photos



XF1100C



XF1100C

15.109 Radiated Emissions

Test Notes: Radiated disturbances emanating from enclosure.

Test Procedure: ANSI C63.4

Test Data Sheets

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

Customer: **Ingersoll Rand (XceedID)**
 Specification: **15.109 Radiated Emissions Class B**
 Work Order #: **91096**
 Test Type: **Maximized Emissions**
 Equipment: **Physical Access Control Reader**
 Manufacturer: Ingersoll Rand
 Model: XF1100C/2100C/2110C
 S/N: 0100/0100/0100

Date: 10/5/2010
 Time: 10:33:03
 Sequence#: 1
 Tested By: Chuck Kendall

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
Physical Access Control Reader	Ingersoll Rand	XF1100C	0100

Support Devices:

Function	Manufacturer	Model #	S/N
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Test Conditions / Notes:

15.109 Radiated Emissions Class B
 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
 RBW = 120 kHz, VBW = 300 kHz
 All three EUTs were operating : XF1000C, XF2100C, & XF2110C
 Temp = 60°F
 RH = 50 %
 Press = 97.2 mb
 Note: Extra models, XF2110C & , XF2100C were tested at the same time but do not pertain to this report.

Ext Attn: 0 dB

Measurement Data:

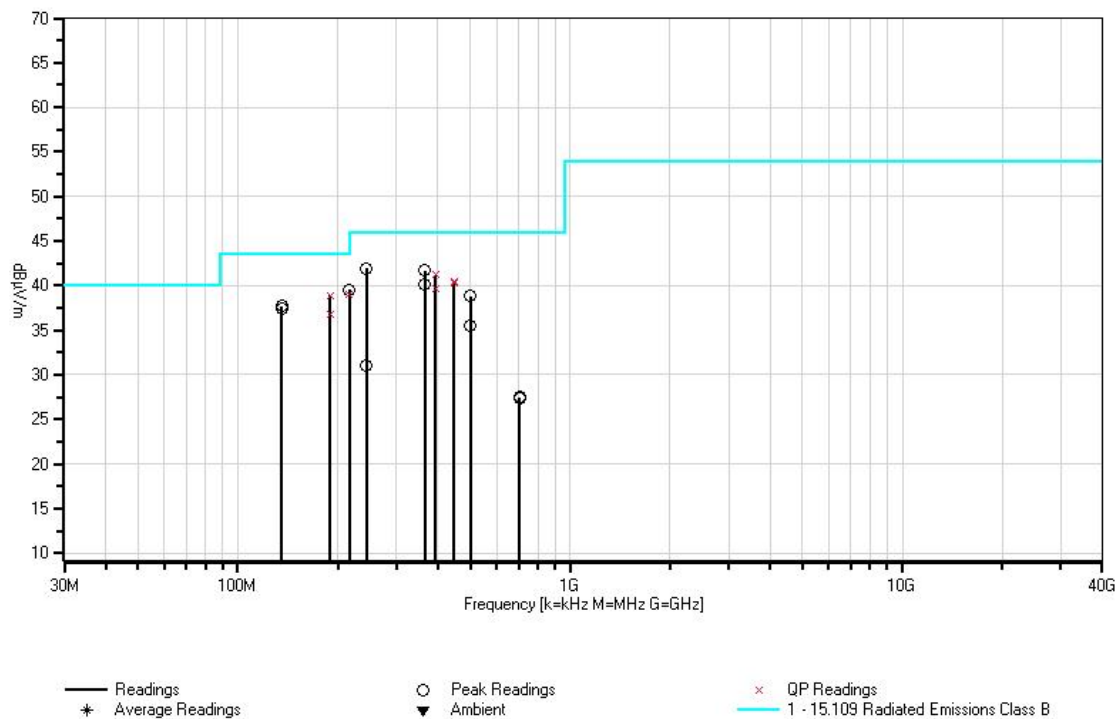
Reading listed by margin.

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 QP	58.7	+9.1	-30.2	+0.7	+0.6	+0.0	38.9	43.5	-4.6	Horiz
^	189.864M	59.9	+9.1	-30.2	+0.7	+0.6	+0.0	40.1	43.5	-3.4	Horiz
5	393.298M QP	53.1	+16.5	-30.3	+1.0	+0.9	+0.0	41.2	46.0	-4.8	Vert
^	393.298M	54.1	+16.5	-30.3	+1.0	+0.9	+0.0	42.2	46.0	-3.8	Vert
7	447.547M QP	51.4	+17.5	-30.5	+1.0	+1.0	+0.0	40.4	46.0	-5.6	Horiz
^	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 QP	51.2	+17.5	-30.5	+1.0	+1.0	+0.0	40.2	46.0	-5.8	Vert
^	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 QP	51.6	+16.5	-30.3	+1.0	+0.9	+0.0	39.7	46.0	-6.3	Horiz
^	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 QP	56.5	+9.1	-30.2	+0.7	+0.6	+0.0	36.7	43.5	-6.8	Vert
^	189.870M	57.7	+9.1	-30.2	+0.7	+0.6	+0.0	37.9	43.5	-5.6	Vert
19	216.985M QP	57.4	+10.4	-30.1	+0.7	+0.6	+0.0	39.0	46.0	-7.0	Horiz
^	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
15.109 Radiated Emissions Class B Test Distance: 3 Meters Sequence#: 1 Ext ATTN: 0 dB



Test Setup Photos



LOW FREQUENCY HORIZONTAL

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 dB μ V/m, the spectrum analyzer reading in dB μ 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.