Ingersoll Rand

ADDENDUM TEST REPORT TO 92315-10

Prox Reader, PR10

Tested To The Following Standards:

FCC Part 15 Subpart C Sections 15.207, 15.209
and
RSS 210 Issue 8

Report No.: 92315-10A

Date of issue: June 6, 2012

ACCREDITED
Testing Certificates:
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.

Testing the Future
CKC LABORATORIES, INC.

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ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

Ingersoll Rand
500 Golden Ridge Rd.
Bldg. 1, Suite 160
Golden, CO 80401

Representative: Bryan Hoff
Customer Reference Number: 4011258

REPORT PREPARED BY:

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

Project Number: 92315

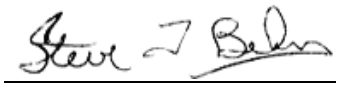
DATE OF EQUIPMENT RECEIPT: March 12, 2012
DATE(S) OF TESTING: March 12 - April 3, 2012

Revision History

Original: Testing of the Prox Reader, PR10 to FCC Part 15 Subpart C Sections 15.207, 15.209 and RSS 210 Issue 8.
Addendum A: Removed an incorrect reference to clock frequencies and changed the transmit frequency from 13.56MHz to 125kHz in all test condition references. Added a reference statement regarding 15.31(e) on the carrier data sheet.

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.



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 #	Taiwan	Canada	FCC	Japan
Mariposa A	US0103	SL2-IN-E-1147R	3082A-2	90477	R-563 C-578 T-1492 G-87

SUMMARY OF RESULTS

Standard / Specification: FCC Part 15 Subpart C Sections 15.207, 15.209 and RSS 210 Issue 8

Description	Test Procedure/Method	Results
Conducted Emissions	FCC Part 15 Subpart C Section 15.207 / ANSI C63.4 (2003)	Pass
Carrier Radiated Emissions	FCC Part 15 Subpart C Section 15.209/ ANSI C63.4 (2003)	Pass
Spurious Radiated Emissions	FCC Part 15 Subpart C Section 15.209/ ANSI C63.4 (2003)	Pass
99% Bandwidth	RSS 210 Issue 8	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)

EQUIPMENT UNDER TEST

Prox Reader
Manuf: Ingersoll Rand
Model: PR10
Serial: E0001

PERIPHERAL DEVICES

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

Dual Tracking DC Power Supply
Manuf: Topwards Electronic instruments CO. LTD.
Model: 4303
Serial: 918520

FCC PART 15 SUBPART C

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

15.207 AC Conducted Emissions

Test Data Sheets

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 425-402-1717

Customer: **Ingersoll Rand**
Specification: **15.207 AC Mains - Average**
Work Order #: **92315** Date: 3/15/2012
Test Type: **Conducted Emissions** Time: 2:07:12 PM
Equipment: **Prox Reader** Sequence#: 3
Manufacturer: Ingersoll Rand Tested By: Michael Rauch Jr.
Model: PR10 120V 60Hz
S/N: E0001

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN01184	Spectrum Analyzer	8568B	5/4/2011	5/4/2013
	AN01183	Spectrum Analyzer Display	85662A	5/4/2011	5/4/2013
T1	ANP00082	Attenuator	PE7002-10	6/7/2011	6/7/2013
T2	ANMACOND	Cable		5/10/2011	5/10/2013
T3	AN02609	High Pass Filter	HE9615-150K-50-720B	3/15/2012	3/15/2014
T4	AN00374	50uH LISN-Black Lead Amplitude (dB)	8028-TS-50-BNC	10/31/2011	10/31/2013
	AN00374	50uH LISN-White Lead Amplitude (dB)	8028-TS-50-BNC	10/31/2011	10/31/2013

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Prox Reader*	Ingersoll Rand	PR10	E0001

Support Devices:

Function	Manufacturer	Model #	S/N
Dual Tracking DC Power Supply	Topwards Electronic instruments CO. LTD.	4303	918520

Test Conditions / Notes:

EUT set up a wooden table in the center of flush mounted turntable.
EUT support equipment is located on top of the turntable.
Frequencies investigated: 150k to 30MHz
TX Freq: 125kHz
RBW used in accordance with CISPR 16, VBW is greater than RBW
Temperature = 16°C
Relative Humidity = 51%
Pressure = 97.7 kPa

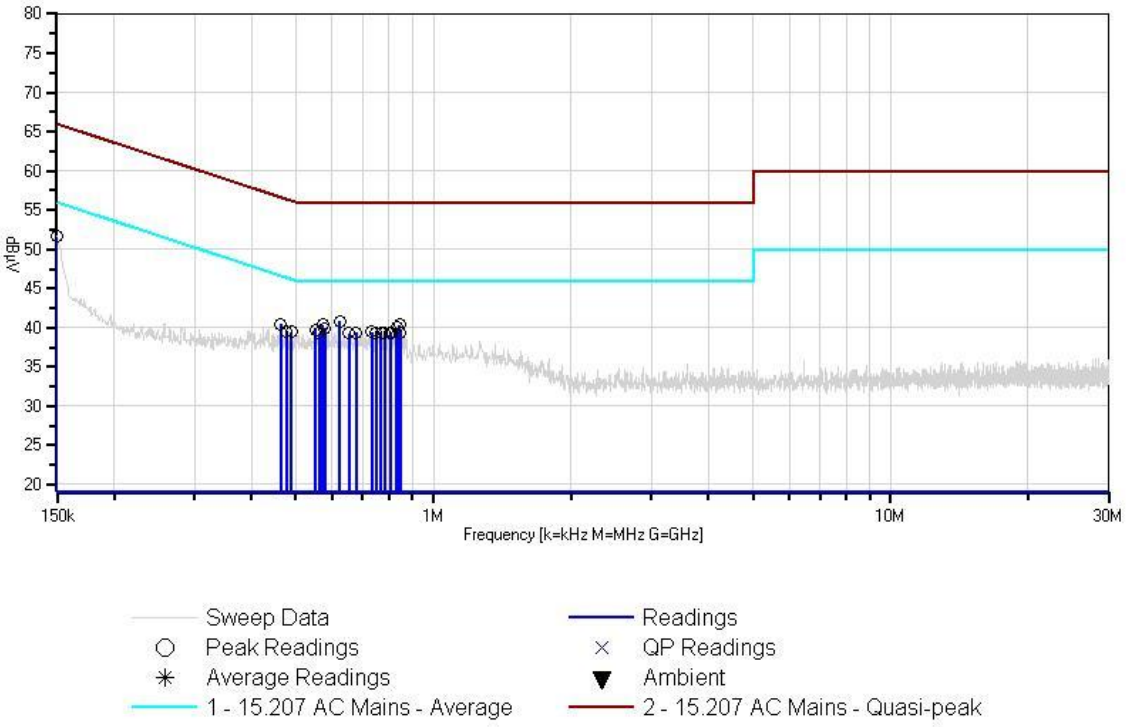
Ext Attn: 0 dB

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	150.000k	29.2	+10.0	+0.1	+7.4	+4.9	+0.0	51.6	56.0	-4.4	Black
2	624.134k	26.1	+10.0	+0.2	+0.3	+4.2	+0.0	40.8	46.0	-5.2	Black
3	571.776k	25.7	+10.0	+0.2	+0.2	+4.3	+0.0	40.4	46.0	-5.6	Black
4	841.567k	25.8	+10.0	+0.3	+0.2	+4.1	+0.0	40.4	46.0	-5.6	Black
5	830.659k	25.4	+10.0	+0.3	+0.2	+4.1	+0.0	40.0	46.0	-6.0	Black
6	462.696k	25.7	+10.0	+0.2	+0.2	+4.4	+0.0	40.5	46.6	-6.1	Black
7	577.594k	25.2	+10.0	+0.2	+0.2	+4.3	+0.0	39.9	46.0	-6.1	Black
8	551.414k	25.0	+10.0	+0.2	+0.2	+4.3	+0.0	39.7	46.0	-6.3	Black
9	733.214k	24.8	+10.0	+0.3	+0.2	+4.2	+0.0	39.5	46.0	-6.5	Black
10	845.203k	24.8	+10.0	+0.3	+0.2	+4.1	+0.0	39.4	46.0	-6.6	Black
11	677.947k	24.8	+10.0	+0.2	+0.2	+4.2	+0.0	39.4	46.0	-6.6	Black
12	768.120k	24.8	+10.0	+0.3	+0.2	+4.1	+0.0	39.4	46.0	-6.6	Black
13	804.480k	24.8	+10.0	+0.3	+0.2	+4.1	+0.0	39.4	46.0	-6.6	Black
14	782.664k	24.7	+10.0	+0.3	+0.2	+4.1	+0.0	39.3	46.0	-6.7	Black
15	807.389k	24.7	+10.0	+0.3	+0.2	+4.1	+0.0	39.3	46.0	-6.7	Black
16	561.595k	24.6	+10.0	+0.2	+0.2	+4.3	+0.0	39.3	46.0	-6.7	Black
17	488.875k	24.8	+10.0	+0.2	+0.2	+4.3	+0.0	39.5	46.2	-6.7	Black

18	748.486k	24.6	+10.0	+0.3	+0.2	+4.2	+0.0	39.3	46.0	-6.7	Black
19	653.222k	24.6	+10.0	+0.2	+0.3	+4.2	+0.0	39.3	46.0	-6.7	Black
20	475.786k	24.8	+10.0	+0.2	+0.2	+4.4	+0.0	39.6	46.4	-6.8	Black

CKC Laboratories, Inc. Date: 3/15/2012 Time: 2:07:12 PM Ingersoll Rand WO#: 92315
15.207 AC Mains - Average Test Lead: Black Black Sequence#: 3 Ext ATTN: 0 dB



Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 425-402-1717

Customer: **Ingersoll Rand**
Specification: **15.207 AC Mains - Average**
Work Order #: **92315** Date: 3/15/2012
Test Type: **Conducted Emissions** Time: 2:02:34 PM
Equipment: **Prox Reader** Sequence#: 2
Manufacturer: Ingersoll Rand Tested By: Michael Rauch Jr.
Model: PR10 120V 60Hz
S/N: E0001

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN01184	Spectrum Analyzer	8568B	5/4/2011	5/4/2013
	AN01183	Spectrum Analyzer Display	85662A	5/4/2011	5/4/2013
T1	ANP00082	Attenuator	PE7002-10	6/7/2011	6/7/2013
T2	ANMACOND	Cable		5/10/2011	5/10/2013
	AN00374	50uH LISN-Black Lead Amplitude (dB)	8028-TS-50-BNC	10/31/2011	10/31/2013
T3	AN00374	50uH LISN-White Lead Amplitude (dB)	8028-TS-50-BNC	10/31/2011	10/31/2013
T4	AN02609	High Pass Filter	HE9615-150K-50-720B	3/15/2012	3/15/2014

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Prox Reader*	Ingersoll Rand	PR10	E0001

Support Devices:

Function	Manufacturer	Model #	S/N
Dual Tracking DC Power Supply	Topwards Electronic instruments CO. LTD.	4303	918520

Test Conditions / Notes:

EUT set up a wooden table in the center of flush mounted turntable.
EUT support equipment is located on top of the turntable.
Frequencies investigated: 150k to 30MHz
TX Freq: 125kHz
RBW used in accordance with CISPR 16, VBW is greater than RBW
Temperature = 16°C
Relative Humidity = 51%
Pressure = 97.7 kPa

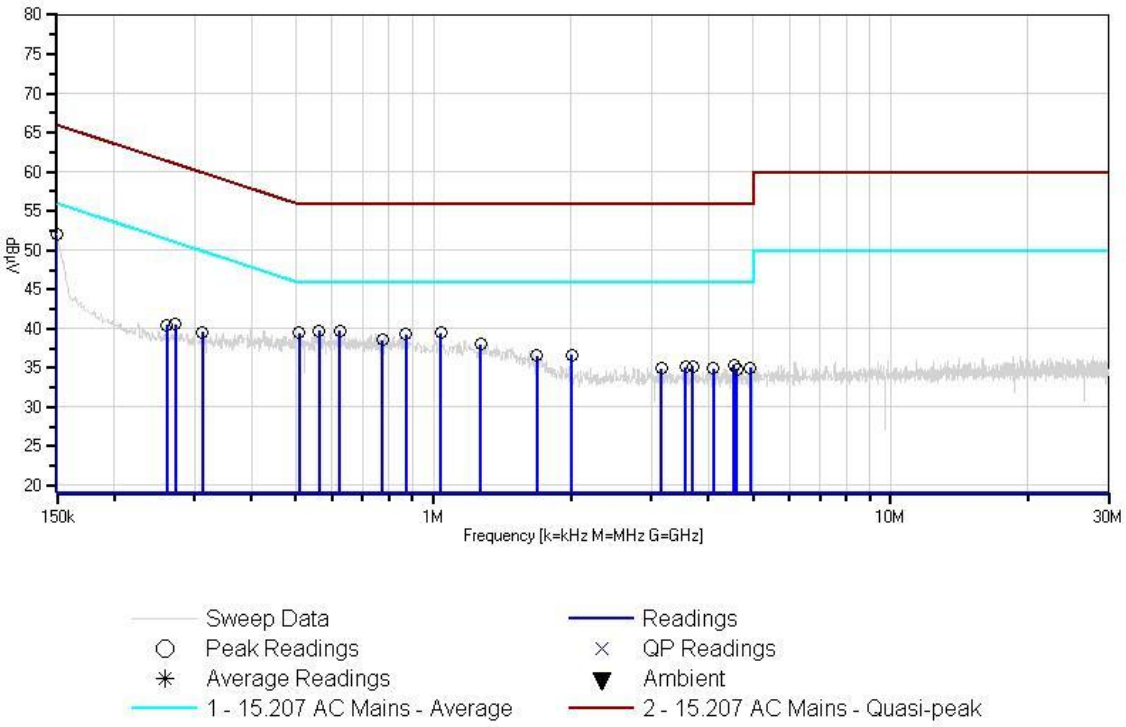
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Lead: White

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	150.000k	29.7	+10.0	+0.1	+4.8	+7.4	+0.0	52.0	56.0	-4.0	White
2	563.050k	25.0	+10.0	+0.2	+4.3	+0.2	+0.0	39.7	46.0	-6.3	White
3	624.134k	24.9	+10.0	+0.2	+4.3	+0.3	+0.0	39.7	46.0	-6.3	White

4	508.510k	24.8	+10.0	+0.2	+4.3	+0.2	+0.0	39.5	46.0	-6.5	White
5	1.039M	24.9	+10.0	+0.3	+4.1	+0.2	+0.0	39.5	46.0	-6.5	White
6	869.201k	24.7	+10.0	+0.3	+4.1	+0.2	+0.0	39.3	46.0	-6.7	White
7	772.483k	23.9	+10.0	+0.3	+4.2	+0.2	+0.0	38.6	46.0	-7.4	White
8	1.268M	23.7	+10.0	+0.3	+3.8	+0.2	+0.0	38.0	46.0	-8.0	White
9	2.008M	26.0	+10.0	+0.4	+0.1	+0.2	+0.0	36.7	46.0	-9.3	White
10	1.685M	24.1	+10.0	+0.4	+1.9	+0.2	+0.0	36.6	46.0	-9.4	White
11	312.166k	24.8	+10.0	+0.2	+4.5	+0.1	+0.0	39.6	49.9	-10.3	White
12	272.170k	25.6	+10.0	+0.2	+4.6	+0.2	+0.0	40.6	51.1	-10.5	White
13	4.543M	24.6	+10.0	+0.6	+0.1	+0.1	+0.0	35.4	46.0	-10.6	White
14	3.692M	24.5	+10.0	+0.5	+0.1	+0.1	+0.0	35.2	46.0	-10.8	White
15	260.534k	25.5	+10.0	+0.2	+4.6	+0.2	+0.0	40.5	51.4	-10.9	White
16	3.565M	24.4	+10.0	+0.5	+0.1	+0.1	+0.0	35.1	46.0	-10.9	White
17	4.943M	24.2	+10.0	+0.6	+0.1	+0.1	+0.0	35.0	46.0	-11.0	White
18	3.157M	24.2	+10.0	+0.5	+0.1	+0.1	+0.0	34.9	46.0	-11.1	White
19	4.097M	24.1	+10.0	+0.6	+0.1	+0.1	+0.0	34.9	46.0	-11.1	White
20	4.603M	24.0	+10.0	+0.6	+0.1	+0.1	+0.0	34.8	46.0	-11.2	White

CKC Laboratories, Inc. Date: 3/15/2012 Time: 2:02:34 PM Ingersoll Rand WO#: 92315
15.207 AC Mains - Average Test Lead: White White Sequence#: 2 Ext ATTN: 0 dB



Test Setup Photos

15.209 Carrier and Spurious Radiated Emissions

Carrier Radiated Emissions

Test Data

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

Customer: **Ingersoll Rand**
Specification: **15.209 Radiated Emissions**
Work Order #: **92315** Date: 3/19/2012
Test Type: **Maximized Emissions** Time: 15:11:48
Equipment: **Prox Reader** Sequence#: 1
Manufacturer: Ingersoll Rand Tested By: Michael Rauch Jr.
Model: PR10
S/N: E0001

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN01184	Spectrum Analyzer	8568B	5/4/2011	5/4/2013
	AN01183	Spectrum Analyzer Display	85662A	5/4/2011	5/4/2013
T1	AN00226	Loop Antenna	6502	7/8/2011	7/8/2013
T2	ANP01017	Cable		3/16/2012	3/16/2014

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Prox Reader*	Ingersoll Rand	PR10	E0001

Support Devices:

Function	Manufacturer	Model #	S/N
Dual Tracking DC Power Supply	Topwards Electronic instruments CO. LTD.	4303	918520

Test Conditions / Notes:

EUT set up a wooden table in the center of flush mounted turntable.
EUT support equipment is located on top of the turntable.
Frequencies investigated: 9k to 30MHz
TX Freq: 125kHz
RBW used in accordance with CISPR 16, VBW is greater than RBW

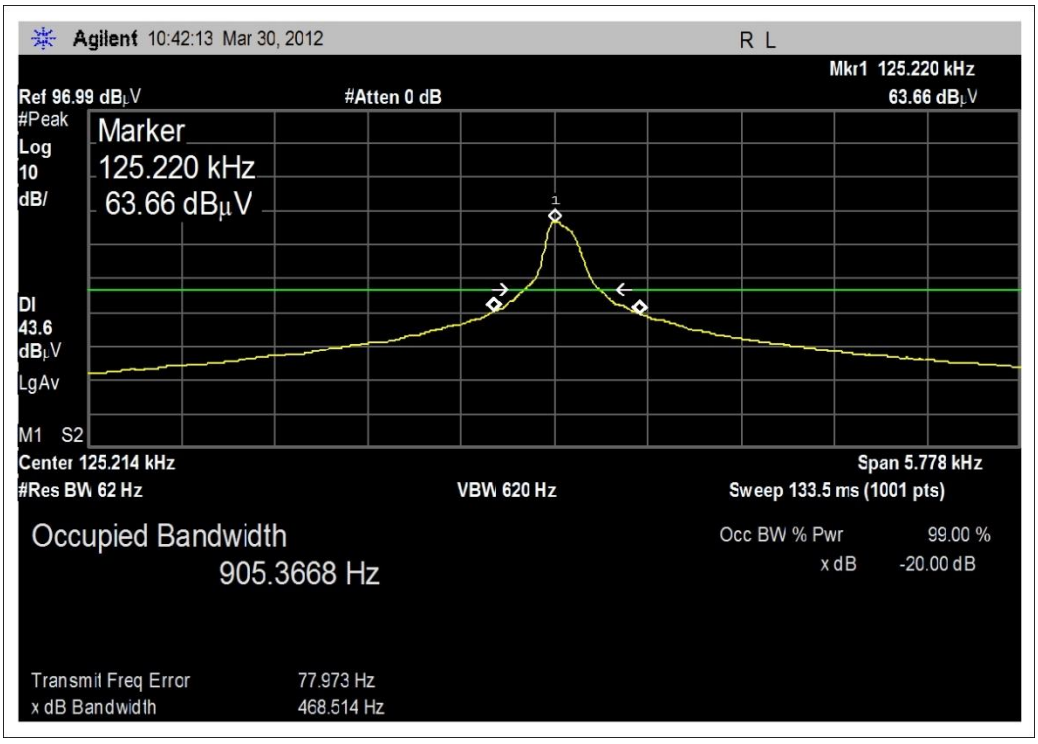
15.31(e)
Voltage variations preformed in accordance with 15.31(e) no changes were observed to transmitter output.

Temperature = 16°C
Relative Humidity = 51%
Pressure = 97.7 kPa

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 10 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	125.260k	42.2	+9.7	-0.1			-59.1	-7.3	25.6	-32.9	Vert
2	125.232k	37.7	+9.7	-0.1			-59.1	-11.8	25.6	-37.4	Horiz



Test Setup Photos

Spurious Radiated Emissions

Test Data

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

Customer: **Ingersoll Rand**
Specification: **15.209 Radiated Emissions**
Work Order #: **92315** Date: 3/19/2012
Test Type: **Maximized Emissions** Time: 16:51:02
Equipment: **Prox Reader** Sequence#: 1
Manufacturer: Ingersoll Rand Tested By: Michael Rauch Jr.
Model: PR10
S/N: E0001

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN01184	Spectrum Analyzer	8568B	5/4/2011	5/4/2013
	AN01183	Spectrum Analyzer Display	85662A	5/4/2011	5/4/2013
T1	AN00226	Loop Antenna	6502	7/8/2011	7/8/2013
T2	ANP01017	Cable		3/16/2012	3/16/2014

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Prox Reader*	Ingersoll Rand	PR10	E0001

Support Devices:

Function	Manufacturer	Model #	S/N
Dual Tracking DC Power Supply	Topwards Electronic instruments CO. LTD.	4303	918520

Test Conditions / Notes:

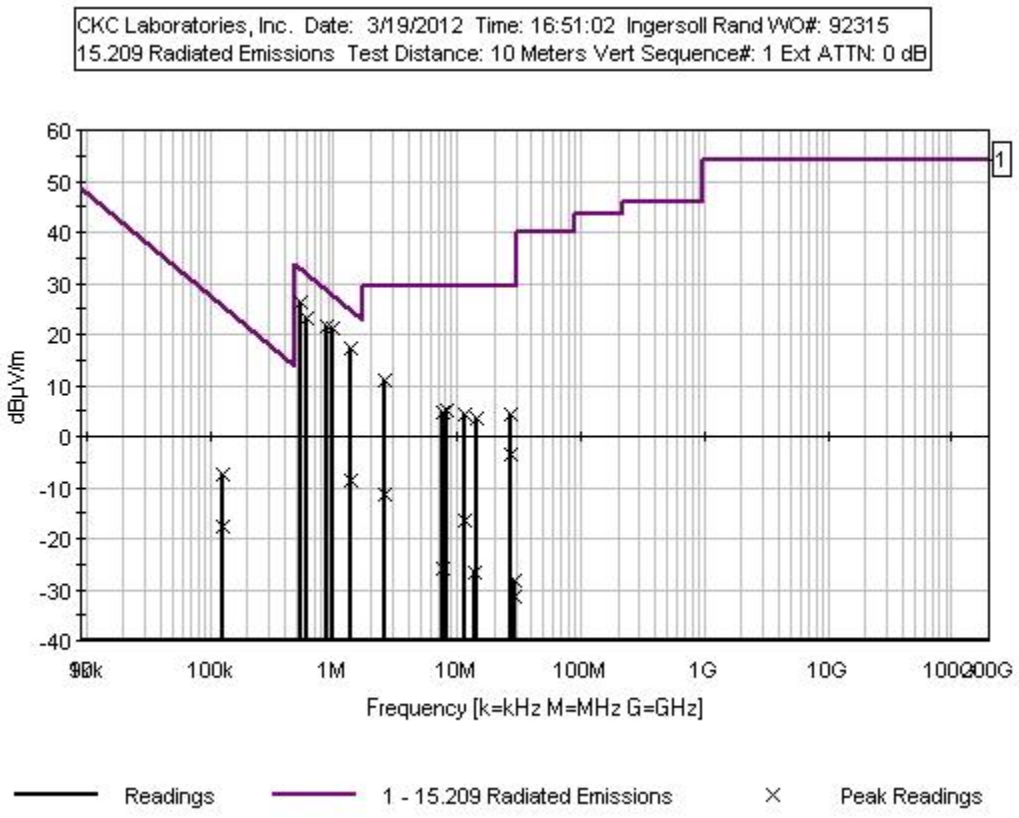
EUT set up a wooden table in the center of flush mounted turntable.
EUT support equipment is located on top of the turntable.
Frequencies investigated: 9kHz to 30MHz
TX Freq: 125kHz
RBW used in accordance with CISPR 16, VBW is greater than RBW
Temperature = 16°C
Relative Humidity = 51%
Pressure = 97.7 kPa

Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 10 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	982.553k	30.3	+10.2	+0.0			-19.1	21.2	27.7	-6.5	Horiz
2	550.182k	35.3	+10.2	+0.0			-19.1	26.3	32.8	-6.5	Horiz
3	1.381M	26.6	+10.1	-0.2			-19.1	17.4	24.7	-7.3	Vert

4	873.040k	30.2	+10.4	+0.0	-19.1	21.4	28.8	-7.4	Vert
5	602.720k	32.1	+10.2	+0.0	-19.1	23.1	32.0	-8.9	Vert
6	2.623M	20.4	+9.9	-0.3	-19.1	10.9	29.5	-18.6	Vert
7	8.140M	15.7	+9.2	+0.0	-19.1	5.2	29.5	-24.3	Horiz
8	7.627M	15.2	+9.3	-0.6	-19.1	4.8	29.5	-24.7	Vert
9	27.125M	18.6	+6.2	+0.0	-19.1	4.5	29.5	-25.0	Horiz
10	11.503M	14.5	+9.6	-0.7	-19.1	4.3	29.5	-25.2	Vert
11	14.134M	13.2	+10.4	-0.8	-19.1	3.7	29.5	-25.8	Vert
12	27.126M	10.6	+6.2	+0.0	-19.1	-3.5	29.5	-33.0	Vert
13	125.313k	42.0	+9.7	+0.0	-59.1	-7.5	25.6	-33.1	Vert
14	1.375M	0.4	+10.1	-0.2	-19.1	-8.8	24.8	-33.6	Horiz
15	2.625M	-1.7	+9.9	-0.3	-19.1	-11.2	29.5	-40.7	Horiz
16	126.518k	32.0	+9.7	+0.0	-59.1	-17.5	25.6	-43.1	Horiz
17	11.500M	-6.4	+9.6	-0.7	-19.1	-16.6	29.5	-46.1	Horiz
18	7.625M	-15.3	+9.3	-0.6	-19.1	-25.7	29.5	-55.2	Horiz
19	14.125M	-17.3	+10.4	-0.8	-19.1	-26.8	29.5	-56.3	Horiz
20	29.625M	-13.5	+5.4	-1.2	-19.1	-28.4	29.5	-57.9	Vert
21	29.625M	-16.6	+5.4	-1.2	-19.1	-31.5	29.5	-61.0	Horiz


CKC Laboratories, Inc. Date: 3/19/2012 Time: 16:51:02 Ingersoll Rand WO#: 92315
15.209 Radiated Emissions Test Distance: 10 Meters Vert Sequence#: 1 Ext ATTN: 0 dB
dBµV/m
60
50
40
30
20
10
0
-10
-20
-30
-40
1
90k
100k
1M
10M
100M
1G
10G
100200G
Frequency [k=kHz M=MHz G=GHz]
Readings
1 - 15.209 Radiated Emissions
Peak Readings

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • 425-402-1717

Customer: **Ingersoll Rand**
Specification: **15.209 Radiated Emissions**
Work Order #: **92315** Date: 3/13/2012
Test Type: **Maximized Emissions** Time: 15:52:41
Equipment: **Prox Reader** Sequence#: 1
Manufacturer: Ingersoll Rand Tested By: Michael Rauch Jr.
Model: PR10
S/N: E0001

***Test Equipment*:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN01183	Spectrum Analyzer Display	85662A	5/4/2011	5/4/2013
	AN01184	Spectrum Analyzer	8568B	5/4/2011	5/4/2013
T1	AN00062	Preamp	8447D	6/23/2010	6/23/2012
T2	ANMA10M	Cable		5/10/2011	5/10/2013
T3	AN00851	Biconilog Antenna	CBL6111C	3/14/2012	3/14/2014

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Prox Reader*	Ingersoll Rand	PR10	E0001

Support Devices:

Function	Manufacturer	Model #	S/N
Dual Tracking DC Power Supply	Topwards Electronic instruments CO. LTD.	4303	918520

Test Conditions / Notes:

EUT set up a wooden table in the center of flush mounted turntable.
EUT support equipment is located on top of the turntable.
Frequencies investigated: 30MHz to 1000MHz
TX Freq: 125kHz
RBW used in accordance with CISPR 16, VBW is greater than RBW
Temperature = 17°C
Relative Humidity = 51%
Pressure = 97.7 kPa

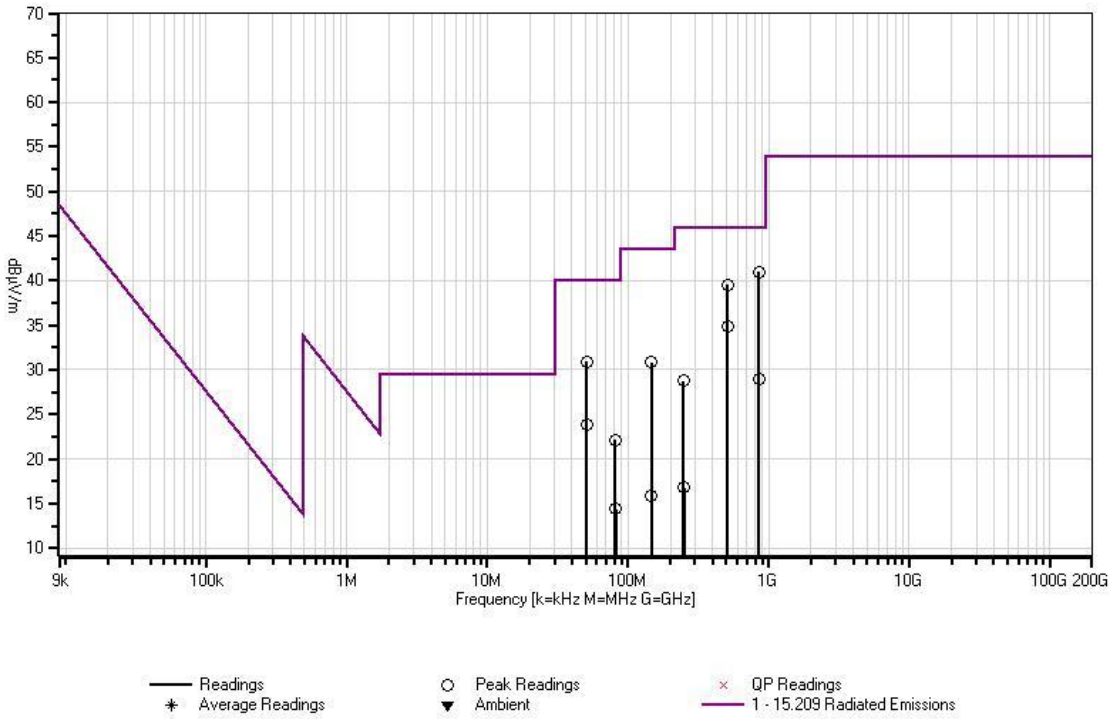
Ext Attn: 0 dB

Measurement Data: Reading listed by margin. Test Distance: 10 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	853.204M	31.6	-29.8	+7.1	+21.6		+10.5	41.0	46.0	-5.0	Horiz
2	508.933M	37.0	-30.5	+5.3	+17.2		+10.5	39.5	46.0	-6.5	Horiz
3	51.110M	41.2	-30.9	+1.6	+8.5		+10.5	30.9	40.0	-9.1	Vert
4	509.590M	32.3	-30.5	+5.3	+17.2		+10.5	34.8	46.0	-11.2	Vert
5	147.019M	36.2	-30.6	+2.7	+12.0		+10.5	30.8	43.5	-12.7	Horiz

6	51.062M	34.1	-30.9	+1.6	+8.5	+10.5	23.8	40.0	-16.2	Horiz
7	853.180M	19.5	-29.8	+7.1	+21.6	+10.5	28.9	46.0	-17.1	Vert
8	248.913M	34.7	-30.0	+3.6	+10.0	+10.5	28.8	46.0	-17.2	Horiz
9	81.097M	33.4	-30.8	+2.0	+7.0	+10.5	22.1	40.0	-17.9	Horiz
10	81.810M	25.6	-30.8	+2.0	+7.1	+10.5	14.4	40.0	-25.6	Vert
11	147.300M	21.3	-30.6	+2.7	+12.0	+10.5	15.9	43.5	-27.6	Vert
12	249.890M	22.7	-30.0	+3.6	+10.0	+10.5	16.8	46.0	-29.2	Vert

CKC Laboratories, Inc. Date: 3/13/2012 Time: 15:52:41 Ingersoll Rand WO#: 92315
15.209 Radiated Emissions Test Distance: 10 Meters Horiz Sequence#: 1 Ext ATTN: 0 dB



Test Setup Photos

RSS-210

99 % Bandwidth

Test Conditions / Setup

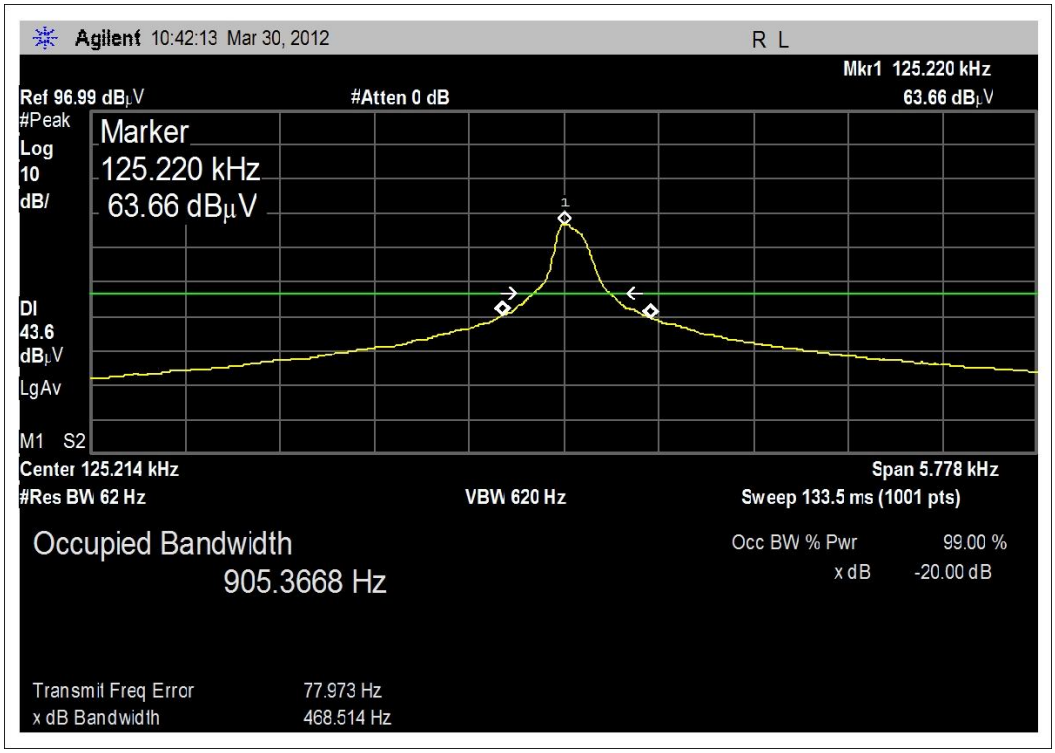
The EUT set up a wooden table in the center of flush mounted turntable. The EUT support equipment is located on top of the turntable.
Frequencies investigated: 9k to 30MHz
TX Freq: 125kHz
RBW used in accordance with CISPR 16, VBW is greater than RBW
Temperature = 16°C
Relative Humidity = 51%
Pressure = 97.7 kPa

Engineer Name: M. Rauch Jr.

Test Equipment

Asset/Serial #	Description	Model	Manufacturer	Cal Date	Cal Due
AN01184	Spectrum Analyzer	8568B	HP	5/4/2011	5/4/2013
AN01183	Spectrum Analyzer Display	85662A	HP	5/4/2011	5/4/2013
AN00226	Loop Antenna	6502	EMCO	7/8/2011	7/8/2013
ANP01017	Cable		Andrews	3/16/2012	3/16/2014

Test Data


Agilent 10:42:13 Mar 30, 2012
R L
Mkr1 125.220 kHz
Ref 96.99 dBµV
#Atten 0 dB
63.66 dBµV
#Peak
Log
10
dB/
Marker
125.220 kHz
63.66 dBµV
Dl
43.6
dBµV
LgAv
M1 S2
Center 125.214 kHz
Span 5.778 kHz
#Res BW 62 Hz
VBW 620 Hz
Sweep 133.5 ms (1001 pts)
Occupied Bandwidth
905.3668 Hz
Occ BW % Pwr 99.00 %
x dB -20.00 dB
Transmit Freq Error 77.973 Hz
x dB Bandwidth 468.514 Hz

Test Setup Photos

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

Unless otherwise indicated, the following configuration parameters are used for equipment setup: 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 dBµV/m, the spectrum analyzer reading in dBµV was corrected by using the following formula. This reading was then compared to the applicable specification limit.

SAMPLE CALCULATIONS		
	Meter reading	(dBµV)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dBµV/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. Unless otherwise specified, 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 "positive peak" detector mode. Whenever a "quasi-peak" or "average" reading was recorded, the measurement was annotated with a "QP" or an "Ave" on the appropriate rows of the data sheets. In cases where quasi-peak or average limits were employed and data exists for multiple measurement types for the same frequency then the peak measurement was retained in the report for reference, however the numbering for the affected row was removed and an arrow or carrot ("^") was placed in the far left-hand column indicating that the row above takes precedence for comparison to the limit. 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 or receiver recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature called "peak hold," the measurement device had the ability to measure intermittent 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

Quasi-peak measurements were taken using the quasi-peak detector when the true peak values exceeded or were within 2 dB of a quasi-peak specification limit. Additional QP measurements may have been taken at the discretion of the operator.

Average

Average measurements were taken using the average detector when the true peak values exceeded or were within 2 dB of an average specification limit. Additional average measurements may have been taken at the discretion of the operator. If the specification or test procedure requires trace averaging, then the averaging was performed using 100 samples or as required by the specification. All other average measurements are performed using video bandwidth averaging. 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.