HONEYWELL ACCESS SYSTEM TEST REPORT

FOR THE

ACCESS CONTROL RFID CONTROLLER, DR4220 READER

FCC PART 15 SUBPART C SECTIONS 15.207, 15.209 AND RSS-210

COMPLIANCE

DATE OF ISSUE: MARCH 10, 2006

PREPARED FOR:

Honeywell Access System
135 West Forest Hill Avenue
Oak Creek, WI 53154

P.O. No.: 246313
W.O. No.: 82870

PREPARED BY:

Mary Ellen Clayton
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Date of test: February 6 - March 8, 2006

Report No.: FC06-013

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ADMINISTRATIVE INFORMATION

DATE OF TEST:	February 6 - March 8, 2006
DATE OF RECEIPT:	February 6, 2006
MANUFACTURER:	Honeywell Access System 135 West Forest Hill Avenue Oak Creek, WI 53154
REPRESENTATIVE:	Ken Haas
TEST LOCATION:	CKC Laboratories, Inc. 110 Olinda Place Brea, CA 92823
TEST METHOD:	ANSI C63.4 (2003), RSS-210 and RSS GEN
PURPOSE OF TEST:	To demonstrate the compliance of the Access Control RFID Controller, DR4220 Reader with the requirements for FCC Part 15 Subpart C Sections 15.207 & 15.209 and RSS-210 devices.

FCC TO CANADA STANDARD CORRELATION MATRIX

Canadian Standard	Canadian Section	FCC Standard	FCC Section	Test Description
RSS GEN	7.1.4	47CFR	15.203	Antenna Connector Requirements
RSS GEN	7.2.1	47CFR	15.35(c)	Pulsed Operation
RSS GEN	7.2.2	47CFR	15.207	AC Mains Conducted Emissions Requirement
RSS 210	2.1	47CFR	15.215(c)	Frequency Stability Recommendation
RSS 210	2.2	47CFR	15.205	Restricted Bands of Operation
RSS 210	2.6	47CFR	15.209	General Radiated Emissions Requirement
	IC 3172-A		90473	Site File No.

CONDITIONS FOR COMPLIANCE

No modifications to the EUT were necessary to comply.

APPROVALS

Steve Behm, Director of Engineering Services

QUALITY ASSURANCE:

Joyce Walker, Quality Assurance Administrative Manager

TEST PERSONNEL:

Eddie Wong, EMC Engineer

Stuart Yamamoto, EMC Engineer

FCC 15.31(m) Number Of Channels
This device operates on a single channel.

FCC 15.33(a) Frequency Ranges Tested
15.207 Conducted Emissions: 150 kHz – 30 MHz
15.209 Radiated Emissions: 9 kHz - 1000 MHz

FCC SECTION 15.35: ANALYZER BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	9 kHz	150 kHz	200 Hz
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz

FCC 15.203 Antenna Requirements
The antenna is an integral part of the EUT and is non-removable; therefore the EUT complies with Section 15.203 of the FCC rules.

EUT Operating Frequency
The EUT was operating at 132 kHz.

Temperature And Humidity During Testing
The temperature during testing was within +15°C and + 35°C.
The relative humidity was between 20% and 75%.

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The customer declares the EUT tested by CKC Laboratories was representative of a production unit.

EQUIPMENT UNDER TEST

Access Control RFID Controller

Manuf: Honeywell Access System
Model: DR4220 Reader
Serial: 01606009
FCC ID: C4PDR4220

PERIPHERAL DEVICES

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

Star Controller

Manuf: Nexsentry
Model: Nextwatch
Serial: NA

Power Supply

Manuf: Schlage Electronics
Model: 902_PI
Serial: 92238

Laptop

Manuf: Gateway
Model: Solo5150
Serial: BC599030987

REPORT OF MEASUREMENTS

The following tables report the worst case emissions levels recorded during the tests performed on the EUT. All readings taken were peak readings unless otherwise stated. The data sheets from which the emissions tables were compiled are contained in Appendix C.

Table 1: FCC 15.207 Six Highest Conducted Emission Levels

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS HPF dB	Att dB	Cable dB	Lisn dB	CORRECTED READING dBµV	SPEC LIMIT dBµV	MARGIN dB	NOTES
0.171816	48.9	0.4	5.8	0.0	0.1	55.2	64.9	-9.7	WQ
0.174725	47.1	0.4	5.8	0.0	0.0	53.3	64.7	-11.4	BQ
0.881457	29.6	0.1	5.8	0.1	0.0	35.6	46.0	-10.4	W
0.885710	30.3	0.1	5.8	0.1	0.1	36.4	46.0	-9.6	B
2.897248	29.6	0.1	5.8	0.2	0.1	35.8	46.0	-10.2	W
29.993150	33.6	0.3	5.9	0.5	1.3	41.6	50.0	-8.4	B

Test Method: ANSI C63.4 (2003)
Spec Limit: FCC Part 15 Subpart B Section 15.207

NOTES: B = Black Lead
W = White Lead

COMMENTS: The EUT is placed on the wooden table. The EUT send a 132kHz signal to an access card which returns a response at 66kHz. The EUT receives the signal and sends the data to a remote Star controller, which communicated with a support laptop. Note: The EUT operates in Transmit mode only. 28VDC from a 110V/60Hz Power supply. 21°C, 52% relative humidity.

Table 2: FCC 15.209 Six Highest Radiated Emission Levels

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Amp dB	Cable dB	dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
144.014	43.3	10.9	-27.6	2.4		29.0	43.5	-14.5	V
147.485	40.9	10.7	-27.6	2.4		26.4	43.5	-17.1	V
149.965	44.2	10.5	-27.6	2.4		29.5	43.5	-14.0	V
201.777	37.2	7.9	-27.6	2.8		20.3	43.5	-23.2	H
313.875	32.4	13.4	-27.5	3.6		21.9	46.0	-24.1	H
924.750	23.7	24.9	-27.1	6.7		28.2	46.0	-17.8	H

Test Method: ANSI C63.4 (2003)
Spec Limit: FCC Part 15 Subpart B Section 15.209
Test Distance: 3 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization

COMMENTS: The EUT is placed on the wooden table. The EUT send a 132kHz signal to an access card which returns a response at 66kHz. The EUT receives the signal and sends the data to a remote Star controller, which communicated with a support laptop. Note: The EUT operates in Transmit mode only. Frequency range of measurement = 9 kHz - 1 GHz. Frequency 9 kHz - 150 kHz RBW=200 Hz, VBW=200 Hz; 150 kHz - 30 MHz RBW=9 kHz, VBW=9 kHz; 30 MHz - 1000 MHz RBW=120 kHz, VBW=120 kHz. 21°C, 52% relative humidity. Note: Noise floor level recorded.

FCC 15.209 CARRIER EMISSIONS

Data was gathered for test distance extrapolation in accordance with 15.31(f). A linear regression algorithm was used to calculate the expected field strength readings based on measurements at 20,25 and 30 meters. A graph is provided demonstrating compliance to the applicable limits. Linear regression data is also provided for reference.

	Linear Distance	Corrected Reading	Result
Measured Data	20.00	89.40	--
Measured Data	25.00	84.29	--
Measured Data	30.00	79.44	--
FCC 15.209	300.00	25.20	Limit
Extrapolated Result	300.00	23.00	PASS

Nonlinear Regression

```
[Variables]
x = col(2)
y = col(3)
reciprocal_y = 1/abs(y)
reciprocal_ysquare = 1/y^2
'Automatic Initial Parameter Estimate Functions
F(q)=ape(x,y,1,0,1)
[Parameters]
y0 = F(0)[1] "Auto {{previous: 163.14}}
a = F(0)[2] "Auto {{previous: -5.65818}}
[Equation]
f=y0+a*x
fit f to y with weight reciprocal_ysquare
"fit f to y
"fit f to y with weight reciprocal_y
[Constraints]
[Options]
tolerance=0.000100
stepsize=100
iterations=100
```

R = 0.99906699 Rsqr = 0.99813484 Adj Rsqr = 0.99626969

Standard Error of Estimate = 0.0036

	Coefficient	Std. Error	t	P
y0	163.1398	951.3044	0.1715	0.8919
a	-5.6582	67.9135	-0.0833	0.9471

Analysis of Variance:

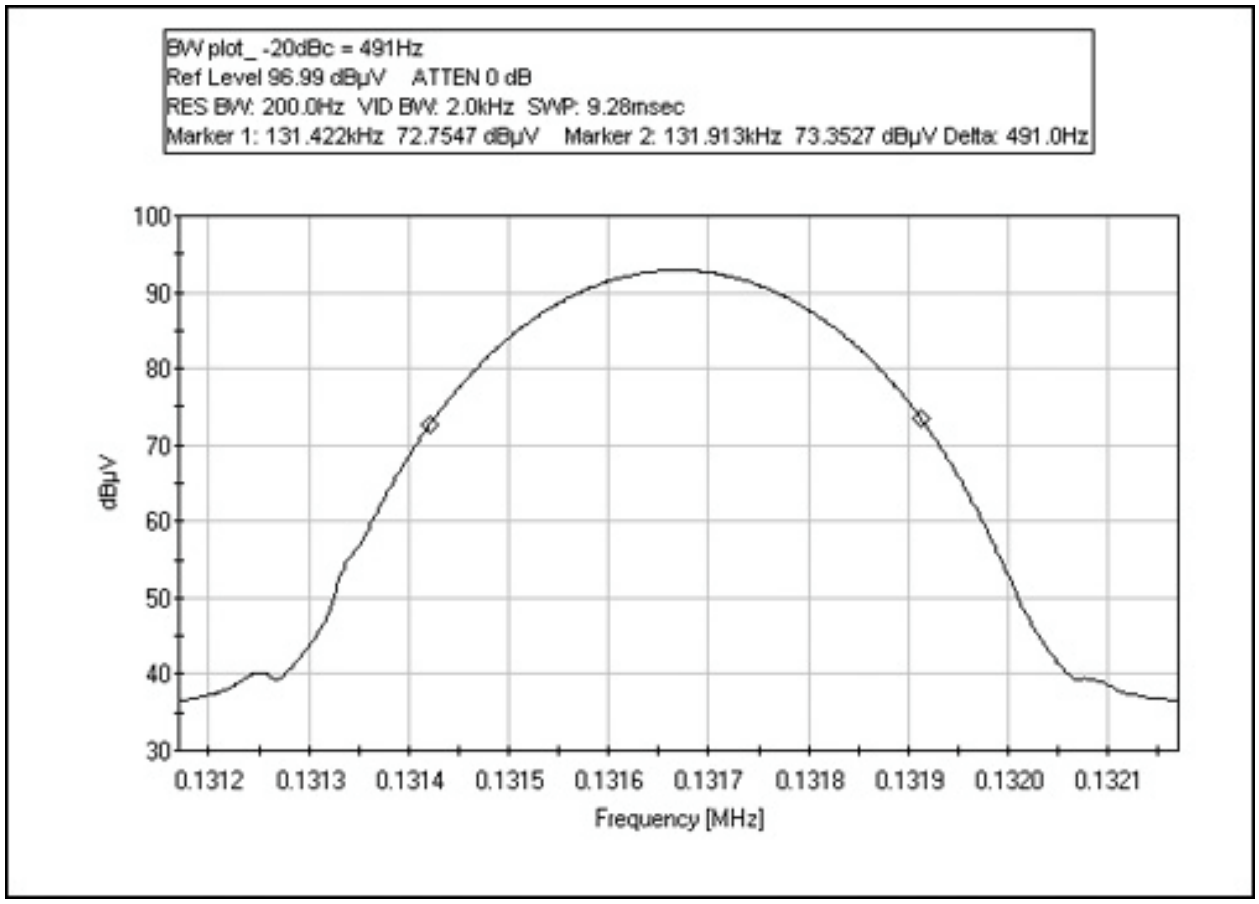
	DF	SS	MS	F	P
Regression	1	0.0069	0.0069	535.1485	0.0275
Residual	1	0.0000	0.0000		
Total	2	0.0070	0.0035		

Regression Diagnostics:

Row	Predicted	Wtd Resid	Wtd Std Resid
1	89.5252	-0.0014	-0.3887
2	84.0418	0.0029	0.8175
3	79.5616	-0.0015	-0.4250

-20dBc BANDWIDTH PLOT

Test Conditions: The EUT is placed on the wooden table. The EUT send a 132kHz signal to an access card which returns a response at 66kHz. The EUT receives the signal and sends the data to a remote Star controller, which communicated with a support laptop. Note : The EUT operates in Transmit mode only.



EUT SETUP

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the photographs in Appendix A. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables. The corrected data was then compared to the applicable emission limits to determine compliance.

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

The radiated and conducted emissions data of the EUT was taken with the HP Spectrum Analyzer. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in Table A.

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 in Table A. This reading was then compared to the applicable specification limit to determine compliance.

TABLE A: 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 in Appendix B were used to collect both the radiated and conducted emissions data. For radiated measurements from 9 kHz to 30 MHz, the magnetic loop antenna was used. For frequencies from 30 to 1000 MHz, the biconilog antenna was used. The horn antenna was used for frequencies above 1000 MHz. Conducted emissions tests required the use of the FCC type LISNs.

The HP spectrum analyzer was used for all measurements. Table B shows the analyzer bandwidth settings that were used in designated frequency bands. For conducted emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used. A 10 dB external attenuator was also used during conducted tests, with internal offset correction in the analyzer. During radiated testing, the measurements were made with 0 dB of attenuation, a reference level of 97 dBµV, and a vertical scale of 10 dB per division.

SPECTRUM ANALYZER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the 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 six highest readings, this is indicated as a "Q" or an "A" in the appropriate table. 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 test engineer recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature of the analyzer called "peak hold," the analyzer had the ability to measure transients or low duty cycle transient emission peak levels. In this mode the analyzer 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 HP Quasi-Peak Adapter for the HP Spectrum Analyzer. The detailed procedure for making quasi peak measurements contained in the HP Quasi-Peak Adapter manual were followed.

Average

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

EUT TESTING

Mains Conducted Emissions

During conducted emissions testing, the EUT was located on a wooden table measuring approximately 80 cm high, 1 meter deep, and 1.5 meters in length. One wall of the room where the EUT was located has a minimum 2 meter by 2 meter conductive plane. The EUT was mounted on the wooden table 40 cm away from the conductive plane, and 80 cm from any other conductive surface.

The vertical metal plane used for conducted emissions was grounded to the earth. Power to the EUT was provided through a LISN. The LISN was grounded to the ground plane. All other objects were kept a minimum of 80 cm away from the EUT during the conducted test.

The LISNs used were 50 µH-/+50 ohms. A 30 to 50 second sweep time was used for automated measurements in the frequency bands of 150 kHz to 500 kHz, and 500 kHz to 30 MHz. All readings within 20 dB of the limit were recorded, and those within 6 dB of the limit were examined with additional measurements using a slower sweep time.

Radiated Emissions

The EUT was mounted on a nonconductive, rotating table 80 cm above the conductive grid. The nonconductive table dimensions were 1 meter by 1.5 meters.

During the preliminary radiated scan, the EUT was powered up and operating in its defined FCC test mode. For radiated measurements from 9 kHz to 30 MHz, the magnetic loop antenna was used. The frequency range of 30 MHz to 1000 MHz was scanned with the biconilog antenna located about 1.5 meter above the ground plane in the vertical polarity. During this scan, the turntable was rotated and all peaks at or near the limit were recorded. A scan of the FM band from 88 to 110 MHz was then made using a reduced resolution bandwidth and frequency span. The biconilog antenna was changed to the horizontal polarity and the above steps were repeated. Care was taken to ensure that no frequencies were missed within the FM and TV bands. An analysis was performed to determine if the signals that were at or near the limit were caused by an ambient transmission. If unable to determine by analysis, the equipment was powered down to make the final determination if the EUT was the source of the emission.

A thorough scan of all frequencies was made manually using a small frequency span, rotating the turntable and raising and lowering the antenna from one to four meters as needed. The test engineer maximized the readings with respect to the table rotation, antenna height, and configuration of EUT. Maximizing of the EUT was achieved by monitoring the spectrum analyzer on a closed circuit television monitor.

APPENDIX A

TEST SETUP PHOTOGRAPHS

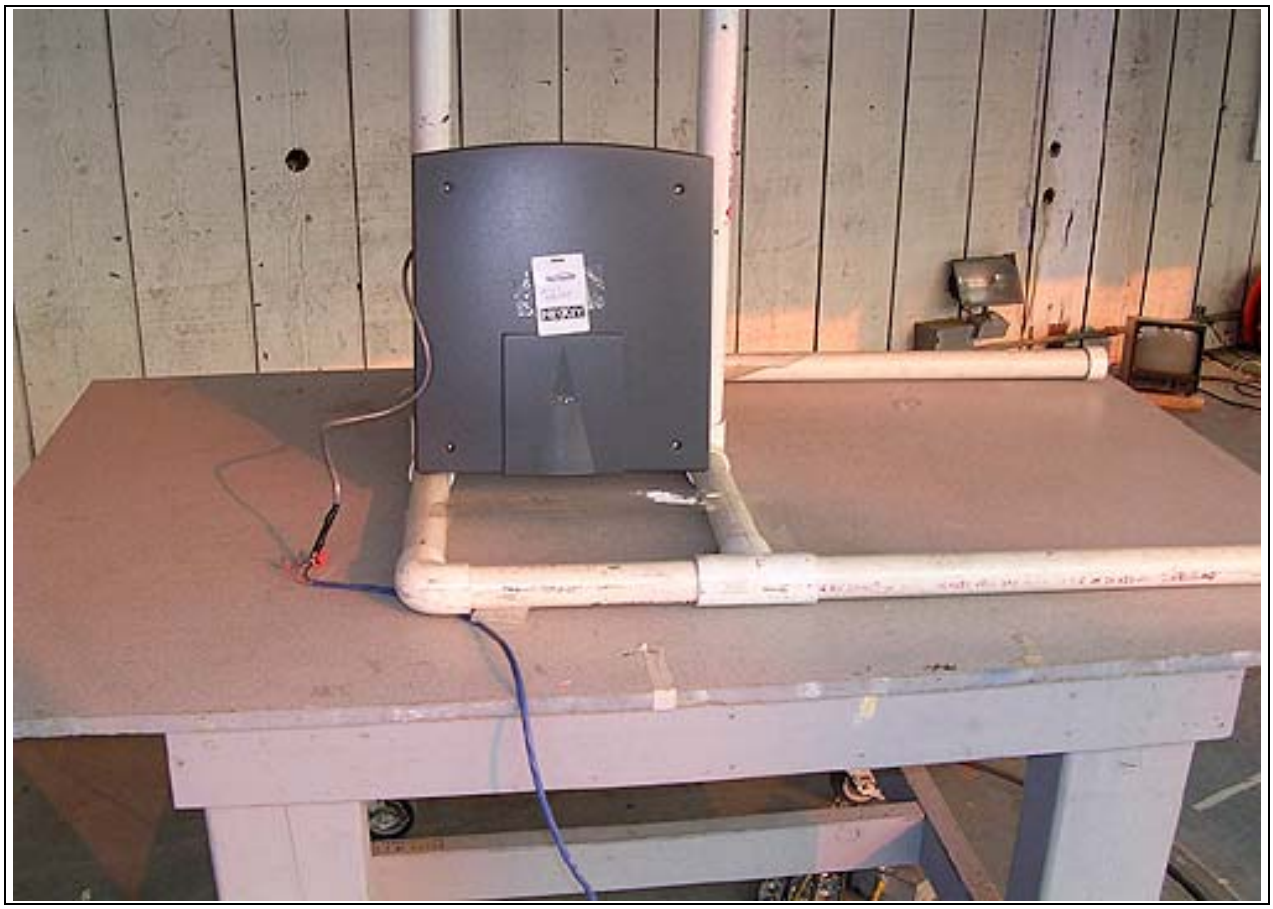
PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS

Mains Conducted Emissions - Front View

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS

Mains Conducted Emissions - Side View

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions - Front View and Occupied Bandwidth

PHOTOGRAPH SHOWING RADIATED EMISSIONS

Radiated Emissions - Back View

APPENDIX B

TEST EQUIPMENT LIST

Conducted Emissions

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02672	Agilent	E4446A	US44300438	011405	011407
Conducted Cable	04358	Harbour Ind	RG142	Cable # 21	070204	070206
150kHZ HPF	02610	TTE	HB9615-150k-50-720B	G7755	013006	013008
6dB Attenuator	P05267	Weinschel	18W	(none)	092805	092807
LISN	00847	EMCO	3816/2NM	1104	120804	120806
LISN	00276, 00277, 00278	Solar	8028-50-TS-24BNC	B2	091505	091507

Radiated Emissions

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02672	Agilent	E4446A	US44300438	011405	011407
Loop Antenna	00314	EMCO	6502	2014	062804	062806
Biconilog Antenna	01995	Chase	CBL6111C	2451	080105	080107
Pre-amp	00309	HP	8447D	1937A02548	071404	071406
Antenna cable	NA	NA	RG214	Cable#15	010305	010307
Pre-amp to SA cable	NA	Pasternack	RG223/U	Cable#10	051605	051606

Occupied Bandwidth

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer	02672	Agilent	E4446A	US44300438	011405	011407

APPENDIX C:

MEASUREMENT DATA SHEETS

Test Location: CKC Laboratories, Inc. •110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **Honeywell Access System**
Specification: **FCC 15.207 COND [AVE]**
Work Order #: **82870** Date: 2/6/2006
Test Type: **Conducted Emissions** Time: 15:38:20
Equipment: **Access Control RFID Controller** Sequence#: 54
Manufacturer: Honeywell Access System Tested By: E. Wong
Model: DR4220 Reader 110V 60Hz
S/N: 01606009

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

Function	Manufacturer	Model #	S/N
Access Control RFID Controller*	Honeywell Access System	DR4220 Reader	01606009

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Gateway	Solo5150	BC599030987
Star Controller	Nexsentry	Nextwatch	NA
Power Supply	Schlage Electronics	902_PI	92238

Test Conditions / Notes:

The EUT is placed on the wooden table. The EUT send a 132kHz signal to an access card which returns a response at 66kHz. The EUT receives the signal and sends the data to a remote Star controller, which communicated with a support laptop. Note: The EUT operates in Transmit mode only. 28VDC from a 110V/60Hz Power supply. 21°C, 52% relative humidity.

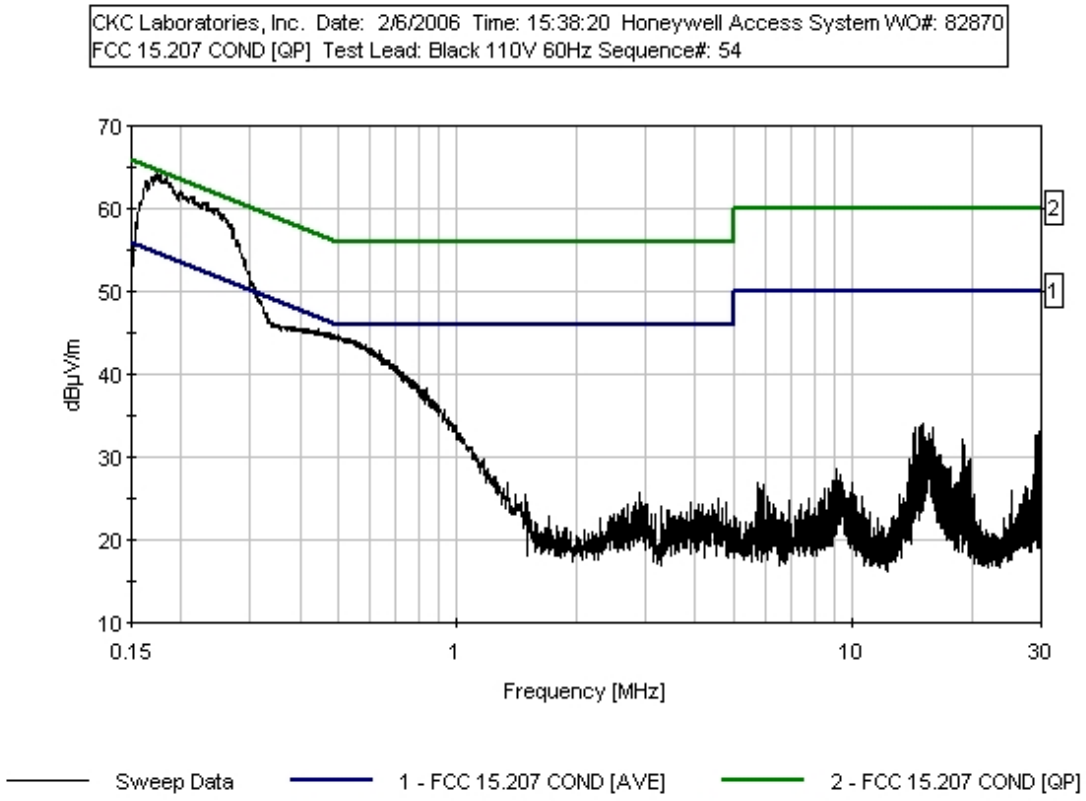
Transducer Legend:

T1=150kHz HPF Asset 02610	T2=6dB Attenuator P05267 092807
T3=Cable #21 Conducted Site A 070206	T4=(L1) Insertion Loss 00847 EMCO 3816/2NM

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	29.993M	33.6	+0.3	+5.9	+0.5	+1.3	+0.0	41.6	50.0	-8.4	Black
2	885.710k	30.3	+0.1	+5.8	+0.1	+0.1	+0.0	36.4	46.0	-9.6	Black
3	174.725k QP	47.1	+0.4	+5.8	+0.0	+0.0	+0.0	53.3	64.7	-11.4	Black
^	174.725k	58.3	+0.4	+5.8	+0.0	+0.0	+0.0	64.5	54.7	+9.8	Black
5	15.121M	27.3	+0.2	+5.8	+0.3	+0.5	+0.0	34.1	50.0	-15.9	Black
6	14.932M	27.0	+0.2	+5.8	+0.3	+0.5	+0.0	33.8	50.0	-16.2	Black
7	15.058M	26.9	+0.2	+5.8	+0.3	+0.5	+0.0	33.7	50.0	-16.3	Black
8	14.752M	26.8	+0.2	+5.8	+0.3	+0.5	+0.0	33.6	50.0	-16.4	Black
9	15.914M	26.7	+0.2	+5.8	+0.3	+0.6	+0.0	33.6	50.0	-16.4	Black

10	14.436M	26.7	+0.2	+5.8	+0.3	+0.5	+0.0	33.5	50.0	-16.5	Black
11	29.630M	25.1	+0.3	+5.9	+0.5	+1.3	+0.0	33.1	50.0	-16.9	Black
12	14.310M	26.1	+0.2	+5.8	+0.3	+0.5	+0.0	32.9	50.0	-17.1	Black
13	174.725k Ave	18.8	+0.4	+5.8	+0.0	+0.0	+0.0	25.0	54.7	-29.7	Black



Test Location: CKC Laboratories, Inc. •110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **Honeywell Access System**
Specification: **FCC 15.207 COND [AVE]**
Work Order #: **82870** Date: 2/6/2006
Test Type: **Conducted Emissions** Time: 15:44:22
Equipment: **Access Control RFID Controller** Sequence#: 55
Manufacturer: Honeywell Access System Tested By: E. Wong
Model: DR4220 Reader 110V 60Hz
S/N: 01606009

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

Function	Manufacturer	Model #	S/N
Access Control RFID Controller*	Honeywell Access System	DR4220 Reader	01606009

Support Devices:

Function	Manufacturer	Model #	S/N
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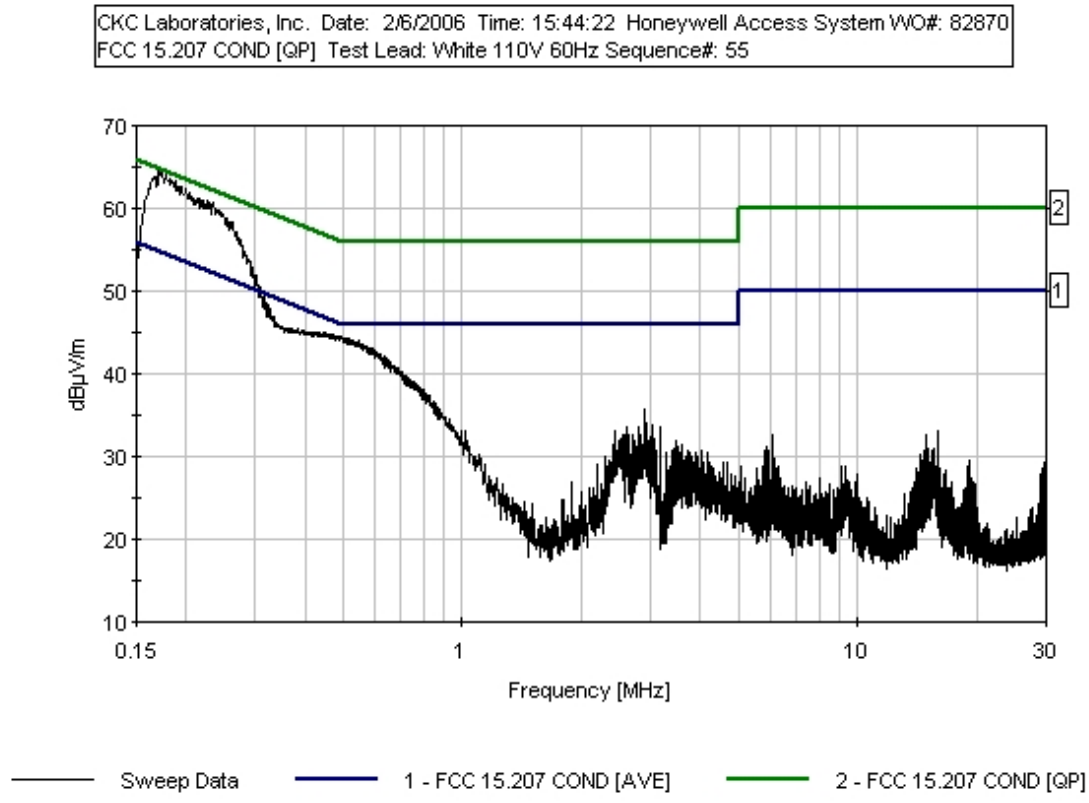
T3=Cable #21 Conducted Site A 070206	T4=(L2) Insertion Loss 00847 EMCO 3816/2NM

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	171.816k QP	48.9	+0.4	+5.8	+0.0	+0.1	+0.0	55.2	64.9	-9.7	White
^	171.816k	58.4	+0.4	+5.8	+0.0	+0.1	+0.0	64.7	54.9	+9.8	White
3	2.897M	29.6	+0.1	+5.8	+0.2	+0.1	+0.0	35.8	46.0	-10.2	White
4	881.457k	29.6	+0.1	+5.8	+0.1	+0.0	+0.0	35.6	46.0	-10.4	White
5	2.936M	27.8	+0.1	+5.8	+0.2	+0.1	+0.0	34.0	46.0	-12.0	White
6	3.033M	27.5	+0.1	+5.8	+0.2	+0.1	+0.0	33.7	46.0	-12.3	White
7	2.595M	27.4	+0.1	+5.8	+0.2	+0.1	+0.0	33.6	46.0	-12.4	White
8	2.795M	27.4	+0.1	+5.8	+0.2	+0.1	+0.0	33.6	46.0	-12.4	White
9	3.161M	27.4	+0.1	+5.8	+0.2	+0.1	+0.0	33.6	46.0	-12.4	White

10	2.438M	26.9	+0.1	+5.8	+0.2	+0.1	+0.0	33.1	46.0	-12.9	White
11	2.634M	26.5	+0.1	+5.8	+0.2	+0.1	+0.0	32.7	46.0	-13.3	White
12	2.697M	26.5	+0.1	+5.8	+0.2	+0.1	+0.0	32.7	46.0	-13.3	White
13	2.876M	26.5	+0.1	+5.8	+0.2	+0.1	+0.0	32.7	46.0	-13.3	White
14	2.540M	26.4	+0.1	+5.8	+0.2	+0.1	+0.0	32.6	46.0	-13.4	White
15	2.561M	26.4	+0.1	+5.8	+0.2	+0.1	+0.0	32.6	46.0	-13.4	White
16	2.838M	26.4	+0.1	+5.8	+0.2	+0.1	+0.0	32.6	46.0	-13.4	White
17	171.816k Ave	20.0	+0.4	+5.8	+0.0	+0.1	+0.0	26.3	54.9	-28.6	White



Test Location: CKC Laboratories, Inc. •110 N. Olinda Place • Brea, CA 92823 • (714) 993-6112

Customer: **Honeywell Access System**
Specification: **FCC 15.209**
Work Order #: **82870** Date: 2/6/2006
Test Type: **Radiated Scan** Time: 14:15:42
Equipment: **Access Control RFID Controller** Sequence#: 53
Manufacturer: Honeywell Access System Tested By: E. Wong
Model: DR4220 Reader
S/N: 01606009

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

Function	Manufacturer	Model #	S/N
Access Control RFID Controller*	Honeywell Access System	DR4220 Reader	01606009

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	Gateway	Solo5150	BC599030987
Star Controller	Nexsentry	Nextwatch	NA
Power Supply	Schlage Electronics	902_PI	92238

Test Conditions / Notes:

The EUT is placed on the wooden table. The EUT send a 132kHz signal to an access card which returns a response at 66kHz. The EUT receives the signal and sends the data to a remote Star controller, which communicated with a support laptop. Note: The EUT operates in Transmit mode only. Frequency range of measurement = 9 kHz - 1 GHz. Frequency 9 kHz - 150 kHz RBW=200 Hz, VBW=200 Hz; 150 kHz - 30 MHz RBW=9 kHz, VBW=9 kHz; 30 MHz - 1000 MHz RBW=120 kHz, VBW=120 kHz. 21°C, 52% relative humidity. Note: Noise floor level recorded.

Transducer Legend:

T1=6502 Active Loop Antenna_062806	T2=Cable #15, Site A, 010307
T3=dBuV to dBuA conversion factor	T4=Bilog 2451 080107
T5=Cable #10 051606	T6=Cable #15, Site A, 010307
T7=Preamp 8447D 071406	

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2 T6	T3 T7	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	149.965M	44.2	+0.0 +0.2	+0.0 +2.2	+0.0 -27.6	+10.5	+0.0	29.5	43.5	-14.0	Vert
2	144.014M	43.3	+0.0 +0.2	+0.0 +2.2	+0.0 -27.6	+10.9	+0.0	29.0	43.5	-14.5	Vert
3	147.485M	40.9	+0.0 +0.2	+0.0 +2.2	+0.0 -27.6	+10.7	+0.0	26.4	43.5	-17.1	Vert
4	924.750M	23.7	+0.0 +0.6	+0.0 +6.1	+0.0 -27.1	+24.9	+0.0	28.2	46.0	-17.8	Horiz

5	201.777M	37.2	+0.0 +0.2	+0.0 +2.6	+0.0 -27.6	+7.9	+0.0	20.3	43.5	-23.2	Horiz
6	313.875M	32.4	+0.0 +0.3	+0.0 +3.3	+0.0 -27.5	+13.4	+0.0	21.9	46.0	-24.1	Horiz
7	13.871M	21.8	+10.8 +0.0	+0.6 +0.0	-51.5 +0.0	+0.0	+0.0	-18.3	49.5	-67.8	Paral
8	17.621M	9.4	+10.5 +0.0	+0.7 +0.0	-51.5 +0.0	+0.0	+0.0	-30.9	49.5	-80.4	Paral