CKC LABORATORIES, INC. Testing the Future

ACCREDITED
Certicate Numbers
803.01 - 803.06
EMC/SAFETY

ADDENDUM TO FC03-055

FOR THE

DORADO BY HID COMBINATION READER MAGNETIC STRIPE & PROXIMITY, 240

FCC PART 15 SUBPART C SECTIONS 15.207 & 15.209 AND RSS 210

COMPLIANCE

DATE OF ISSUE: AUGUST 25, 2003

PREPARED FOR:

HID Corporation
9292 Jeronimo Road
Irvine, CA 92618-1905

P.O. No.: 10001411
W.O. No.: 80731

PREPARED BY:

Mary Ellen Clayton
CKC Laboratories, Inc.
5473A Clouds Rest
Mariposa, CA 95338

Date of test: August 15-21, 2003

Report No.: FC03-055A

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ADMINISTRATIVE INFORMATION

DATE OF TEST:	August 15-21, 2003
DATE OF RECEIPT:	August 15, 2003
PURPOSE OF TEST:	To demonstrate the compliance of the Dorado by HID Combination Reader Magnetic Stripe & Proximity, 240 with the requirements for FCC Part 15 Subpart C Sections 15.207 & 15.209 and RSS 210 devices. **Addendum A** is to revise the test distance on page 9.
TEST METHOD:	ANSI C63.4 (1992) & RSS 212
MANUFACTURER:	HID Corporation 9292 Jeronimo Road Irvine, CA 92618-1905
REPRESENTATIVE:	Frank de Vall
TEST LOCATION:	CKC Laboratories, Inc. 5473A Clouds Rest Mariposa, CA 95338

SUMMARY OF RESULTS

As received, the HID Corporation Dorado by HID Combination Reader Magnetic Stripe & Proximity, 240 was found to be fully compliant with the following standards and specifications:

FCC PART 15 SUBPART C	CANADA RSS 210
15.203	6.2.2(o)(e)(2)
15.207	6.6
15.209	6.2.1
ANSI C63.4 (1992) method	RSS 212 method
FCC Site No. 90477	Industry of Canada File No. IC 3082-B

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

Mike Wilkinson, Lab Manager

TEST PERSONNEL:

Randy Clark, EMC Engineer

FCC 15.31(e) Voltage Variations

FREQUENCY kHz	CORRECTED READING dBµV/m 85%	CORRECTED READING dBµV/m 100%	CORRECTED READING dBµV/m 115%	SPEC LIMIT dBµV/m
124.9	-2.2	-2.1	-2.1	25.7

Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart C Section 15.31(e)
Test Distance: No Distance

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

FCC 15.33(a) Frequency Ranges Tested
15.207 Conducted: 150 kHz – 30 MHz
15.209 Radiated: 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.

FCC 15.205 Restricted Bands
The fundamental operating frequency lies outside the restricted bands and therefore complies with the requirements of Section 15.205 of the FCC rules. Any spurious emission coming from the EUT was investigated to determine if any portion lies inside the restricted band. If any portion of a spurious emissions signal was found to be within a restricted band, investigation was performed to ensure compliance with Section 15.209.

Eut Operating Frequency
The EUT was operating at 125 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 Magnetic Stripe & Proximity Card Reader for Access Control tested by CKC Laboratories was a production unit.

The following model has been tested by CKC Laboratories: **240**

The following additional models are identical electrically to the one which was tested, or any differences between them do not affect their EMC characteristics, and therefore they comply to the level of testing equivalent to the tested models.

Model **230** is the same product as the 240 with no keypad.

EQUIPMENT UNDER TEST

Dorado by HID Combination Reader Magnetic Stripe & Proximity

Manuf: HID Corporation
Model: 240
Serial: 0316
FCC ID: pending

PERIPHERAL DEVICES

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

DC Power Supply

Manuf: Topward Electric Instruments Co., Ltd.
Model: TPS-2000
Serial: 920035
FCC ID: NA

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 Lisn dB	dB	dB	dB	CORRECTED READING dBµV	SPEC LIMIT dBµV	MARGIN dB	NOTES
0.526329	34.4	0.1				34.5	46.0	-11.5	W
0.546327	35.0	0.1				35.1	46.0	-10.9	W
0.611776	35.1	0.1				35.2	46.0	-10.8	W
1.478706	39.6	0.2				39.8	46.0	-6.2	W
4.315781	33.8	0.3				34.1	46.0	-11.9	W
4.506256	39.8	0.3				40.1	46.0	-5.9	W

Test Method: ANSI C63.4 (1992) NOTES: W = White Lead
Spec Limit: FCC Part 15 Subpart C Section 15.207

COMMENTS: EUT is a combination reader with magnetic strip and proximity options operating on a fundamental frequency of 125kHz. Equipment is +12 VDC powered by an external power supply. The equipment is attached to a wooden upright support structure to simulate normal installation. A proximity card is in the field of the EUT. Frequency Range Investigated: 150kHz to 30MHz.

Table 2: FCC 15.209 Fundamental Emission Levels

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	dB	Corr. dB	dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
0.125	48.3	9.6		-60.0		-2.1	25.7	-27.8	V
0.125	48.3	9.6		-60.0		-2.1	25.7	-27.8	V
0.125	48.2	9.6		-60.0		-2.2	25.7	-27.9	V
0.125	48.2	9.6		-60.0		-2.2	25.7	-27.9	V
0.125	48.1	9.6		-60.0		-2.3	25.7	-28.0	V
0.125	41.2	9.6		-60.0		-9.2	25.7	-34.9	H

Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart C Section 15.209
Test Distance: 10 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization

COMMENTS: EUT is a combination reader with magnetic strip and proximity options operating on a fundamental frequency of 125kHz. Equipment is +12 VDC powered by an external power supply. The equipment is attached to a wooden upright support structure to simulate normal installation. A proximity card is in the field of the EUT. Frequency Range Investigated: Carrier. Test distance correction factor used in accordance with 15.31 of 40dB / decade to correct data for comparison to the 15.209 limit. Voltage variations performed at ±15% of nominal input voltage. Additional readings are taken at the manufacturer's stated maximum and minimum input voltages.

Table 3: FCC 15.209 Six Highest Radiated Emission Levels: 9 kHz - 30 MHz

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	dB	Cable dB	Corr dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
0.250	38.6	9.6		0.1	-60.0	-11.7	19.6	-31.3	V
0.375	37.4	9.6		0.1	-60.0	-12.9	16.1	-29.0	V
0.625	9.8	9.6		0.0	-20.0	-0.6	31.7	-32.3	V
0.876	1.6	9.7		0.1	-20.0	-8.6	28.7	-37.3	V
1.126	3.3	9.8		0.2	-20.0	-6.7	26.5	-33.2	V
1.501	3.4	9.7		0.2	-20.0	-6.7	24.0	-30.7	V

Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart C Section 15.209
Test Distance: 10 Meters

NOTES: V = Vertical Polarization

COMMENTS: EUT is a combination reader with magnetic strip and proximity options operating on a fundamental frequency of 125kHz. Equipment is +12 VDC powered by an external power supply. The equipment is attached to a wooden upright support structure to simulate normal installation. A proximity card is in the field of the EUT. Frequency Range Investigated: 9kHz to 30MHz. Test distance correction factor used in accordance with 15.31 of 40dB / decade to correct data for comparison to the 15.209 limit. **Data represents ambient noise floor readings.**

Table 4: FCC 15.209 Six Highest Radiated Emission Levels: 30 MHz - 1000 MHz

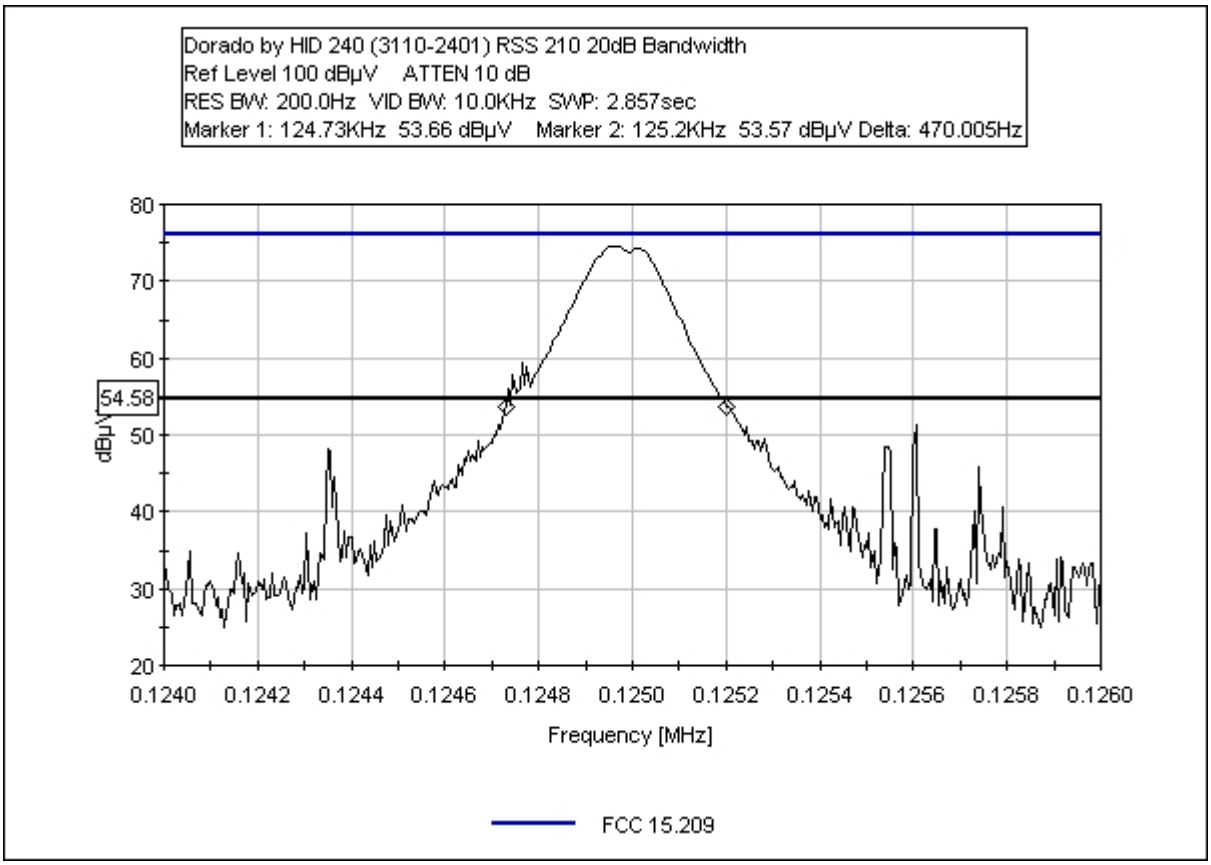
FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Amp dB	dB	dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
62.230	39.9	6.0	-27.3			18.6	40.0	-21.4	V
63.100	41.3	6.0	-27.3			20.0	40.0	-20.0	V
65.980	44.1	5.9	-27.2			22.8	40.0	-17.2	V
67.480	44.2	5.8	-27.2			22.8	40.0	-17.2	V
69.480	46.0	5.7	-27.2			24.5	40.0	-15.5	V
71.850	46.9	5.9	-27.2			25.6	40.0	-14.4	V

Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart C Section 15.209
Test Distance: 3 Meters

NOTES: V = Vertical Polarization

COMMENTS: EUT is a combination reader with magnetic strip and proximity options operating on a fundamental frequency of 125kHz. Equipment is +12 VDC powered by an external power supply. The equipment is attached to a wooden upright support structure to simulate normal installation. A proximity card is in the field of the EUT. Frequency Range Investigated: 30MHz to 1000MHz.

RSS 210 OCCUPIED BANDWIDTH PLOT



MEASUREMENT UNCERTAINTY

TEST	HIGHEST UNCERTAINTY
Radiated Emissions	+/- 2.94 dB
Conducted Emissions	+/- 1.56 dB

Note: Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2. Statements of compliance are based on the nominal values 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. 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. Above 150 kHz, a 0.15 µF series capacitor was added in-line prior to connecting the analyzer to restore the proper impedance for the range. 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 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

INFORMATION ABOUT THE EQUIPMENT UNDER TEST

INFORMATION ABOUT THE EQUIPMENT UNDER TEST	
Test Software/Firmware:	NA
CRT was displaying:	NA
Power Supply Manufacturer:	NA
Power Supply Part Number:	-
AC Line Filter Manufacturer:	NA
AC Line Filter Part Number:	-

I/O Wires	
Type	#
5-24 VDC	Red
LED Control A	Brown
Data “1” Output	White
Data “0” Output	Green
COMMON (Gnd.)	Black
LED Control B	Yellow

CRYSTAL OSCILLATORS	
Type	Freq In MHz
Crystal	16.000

PRINTED CIRCUIT BOARDS				
Function	Model & Rev	Clocks, MHz	Layers	Location
All	Assy 2100-0718	16.000	2	
	Rev. 1			

CABLE INFORMATION

Cable #:		Cable(s) of this type:	
Cable Type:		Shield Type:	
Construction:	Individual wires	Length In Meters:	0.27
Connected To End (1):		Connected To End (2):	
Connector At End (1):		Connector At End (2):	
Shield Grounded At (1):		Shield Grounded At (2):	
Part Number:		Number of Conductors:	
Notes and/or description:			

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

PHOTOGRAPH SHOWING RADIATED EMISSIONS

Radiated Emissions - Back View

APPENDIX B

TEST EQUIPMENT LIST

15.207 conducted emissions

Description	*Asset #*	*Manufacturer*	*Model #*	*Serial #*	*Cal Date*	*Cal Due*
Spectrum Analyzer, 9kHz to 26.5 GHz	02111	HP	8593EM	3624A00159	5/12/03	5/11/05
LISN Set	00374	Solar	8028-50-TS-24-BNC	901235 & 903750	7/8/03	7/7/05

Fundamental emissions: 15.209

Description	*Asset #*	*Manufacturer*	*Model #*	*Serial #*	*Cal Date*	*Cal Due*
Antenna, Loop	00226	EMCO	6502	1074	5/21/03	5/20/05
Spectrum Analyzer, 9kHz to 26.5 GHz	02111	HP	8593EM	3624A00159	5/12/03	5/11/05
Digital Multimeter	01241	Radio Shack	22-183	NA	9/3/02	9/3/03
Power Supply, DC	00762	HP	6205C	2228A01775	6/5/03	6/4/05

Spurious emissions: 15.209

Description	*Asset #*	*Manufacturer*	*Model #*	*Serial #*	*Cal Date*	*Cal Due*
Antenna, Biconilog	01991	Chase	CBL6111C	2456	12/13/02	12/12/04
Preamp	00099	HP	8447D	1937A02604	3/7/03	3/6/04
Spectrum Analyzer, 9kHz to 26.5 GHz	02111	HP	8593EM	3624A00159	5/12/03	5/11/05

APPENDIX C:

MEASUREMENT DATA SHEETS

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Dorado by HID**
Specification: **FCC 15.207 - AVE**
Work Order #: **80731** Date: 08/20/2003
Test Type: **Conducted Emissions** Time: 11:09:52 AM
Equipment: **Combination Reader** Sequence#: 8
Manufacturer: Dorado by HID Tested By: Randal Clark
Model: 240 (3110-2401) 120V 60Hz
S/N: 0316

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

Function	Manufacturer	Model #	S/N
Combination Reader*	Dorado by HID	240 (3110-2401)	0316

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments Co., Ltd	TPS-2000	920035

Test Conditions / Notes:

EUT is a combination reader with magnetic strip and proximity options operating on a fundamental frequency of 125kHz. Equipment is +12 VDC powered by an external power supply. The equipment is attached to a wooden upright support structure to simulate normal installation. A proximity card is in the field of the EUT. Frequency Range Investigated: 150kHz to 30MHz.

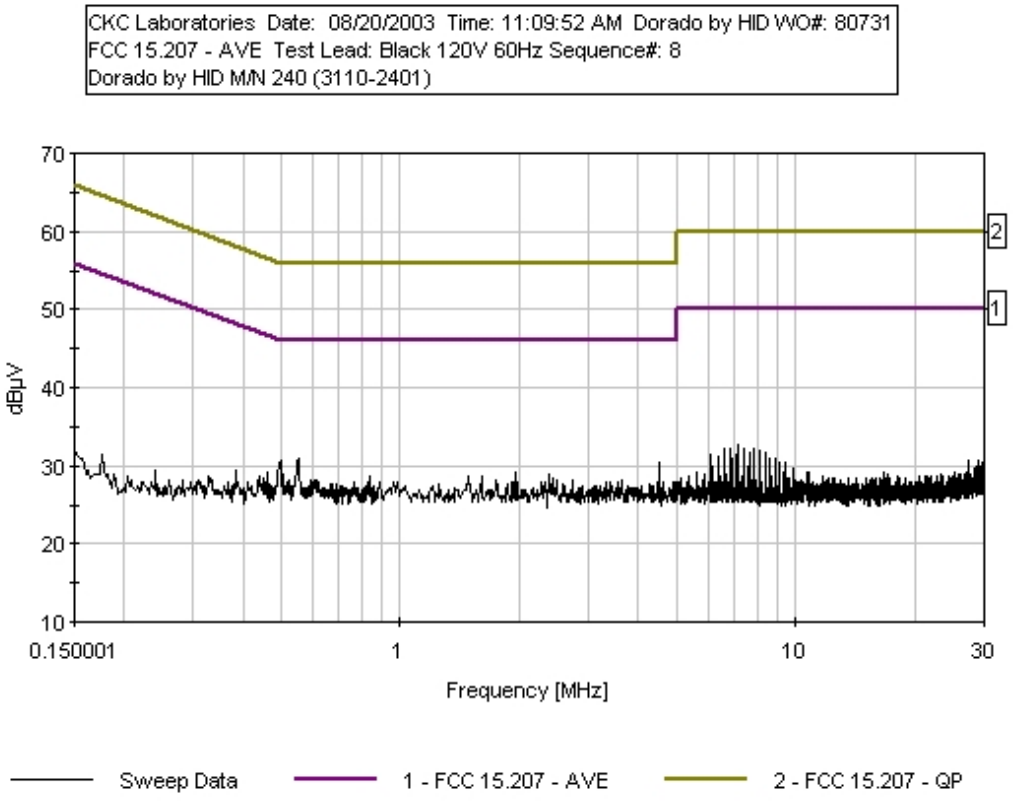
Transducer Legend:

T1=LISN-00374BK SN235

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

#	Freq MHz	Rdng dBµV	T1 dB	dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	4.506M	30.3	+0.1				+0.0	30.4	46.0	-15.6	Black
2	7.123M	32.5	+0.2				+0.0	32.7	50.0	-17.3	Black
3	7.373M	32.1	+0.2				+0.0	32.3	50.0	-17.7	Black
4	6.622M	32.1	+0.1				+0.0	32.2	50.0	-17.8	Black
5	7.875M	32.0	+0.2				+0.0	32.2	50.0	-17.8	Black
6	6.872M	32.0	+0.1				+0.0	32.1	50.0	-17.9	Black
7	8.125M	31.7	+0.2				+0.0	31.9	50.0	-18.1	Black
8	8.386M	31.5	+0.2				+0.0	31.7	50.0	-18.3	Black
9	7.624M	31.4	+0.2				+0.0	31.6	50.0	-18.4	Black
10	6.120M	31.3	+0.1				+0.0	31.4	50.0	-18.6	Black

11	6.371M	31.1	+0.1	+0.0	31.2	50.0	-18.8	Black
12	8.877M	30.8	+0.2	+0.0	31.0	50.0	-19.0	Black
13	29.879M	29.3	+1.7	+0.0	31.0	50.0	-19.0	Black
14	8.637M	30.7	+0.2	+0.0	30.9	50.0	-19.1	Black
15	27.484M	29.4	+1.3	+0.0	30.7	50.0	-19.3	Black
16	29.126M	29.1	+1.6	+0.0	30.7	50.0	-19.3	Black
17	9.368M	30.3	+0.2	+0.0	30.5	50.0	-19.5	Black
18	9.118M	30.1	+0.2	+0.0	30.3	50.0	-19.7	Black
19	29.626M	28.7	+1.6	+0.0	30.3	50.0	-19.7	Black
20	16.677M	28.7	+0.5	+0.0	29.2	50.0	-20.8	Black



Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Dorado by HID**
Specification: **FCC 15.207 - AVE**
Work Order #: **80731** Date: 08/20/2003
Test Type: **Conducted Emissions** Time: 11:14:39 AM
Equipment: **Combination Reader** Sequence#: 9
Manufacturer: Dorado by HID Tested By: Randal Clark
Model: 240 (3110-2401) 120V 60Hz
S/N: 0316

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

Function	Manufacturer	Model #	S/N
Combination Reader*	Dorado by HID	240 (3110-2401)	0316

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments Co., Ltd	TPS-2000	920035

Test Conditions / Notes:

EUT is a combination reader with magnetic strip and proximity options operating on a fundamental frequency of 125kHz. Equipment is +12 VDC powered by an external power supply. The equipment is attached to a wooden upright support structure to simulate normal installation. A proximity card is in the field of the EUT. Frequency Range Investigated: 150kHz to 30MHz.

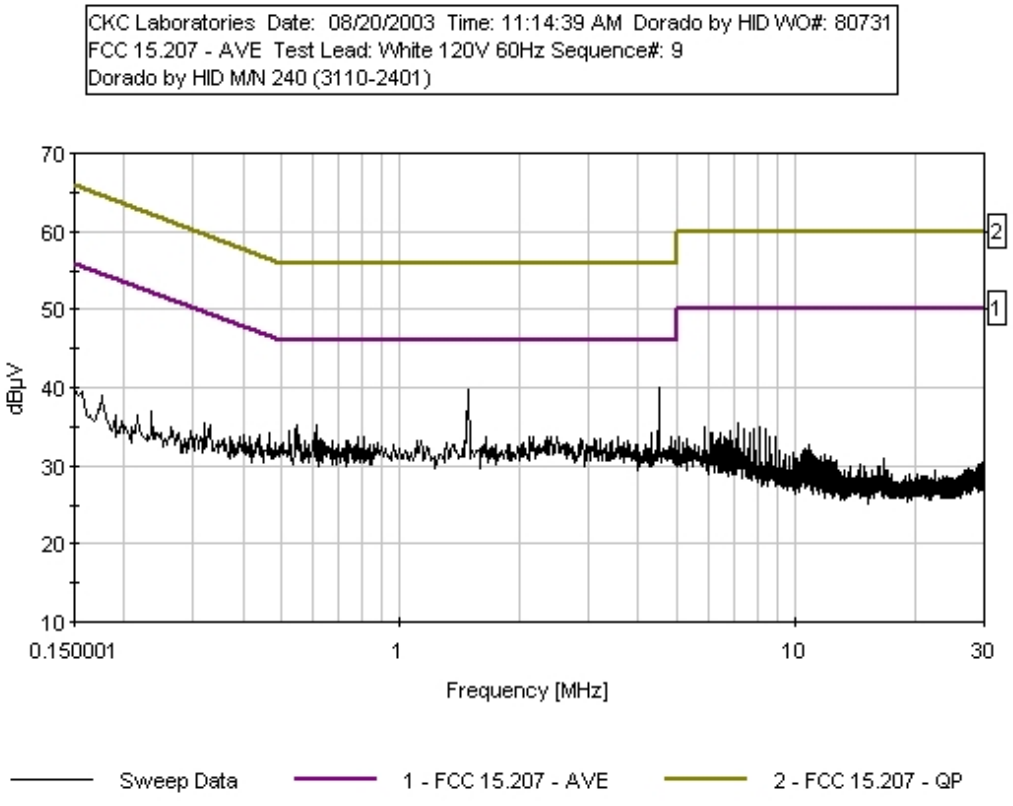
Transducer Legend:

T1=LISN-00374WH SN750

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

#	Freq MHz	Rdng dBµV	T1 dB	dB	dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	4.506M	39.8	+0.3				+0.0	40.1	46.0	-5.9	White
2	1.479M	39.6	+0.2				+0.0	39.8	46.0	-6.2	White
3	611.776k	35.1	+0.1				+0.0	35.2	46.0	-10.8	White
4	546.327k	35.0	+0.1				+0.0	35.1	46.0	-10.9	White
5	526.329k	34.4	+0.1				+0.0	34.5	46.0	-11.5	White
6	4.316M	33.8	+0.3				+0.0	34.1	46.0	-11.9	White
7	2.160M	33.6	+0.2				+0.0	33.8	46.0	-12.2	White
8	3.564M	33.5	+0.3				+0.0	33.8	46.0	-12.2	White
9	1.639M	33.5	+0.2				+0.0	33.7	46.0	-12.3	White
10	464.517k	34.1	+0.1				+0.0	34.2	46.6	-12.4	White

11	7.123M	35.1	+0.4	+0.0	35.5	50.0	-14.5	White
12	5.880M	34.7	+0.3	+0.0	35.0	50.0	-15.0	White
13	8.125M	34.6	+0.4	+0.0	35.0	50.0	-15.0	White
14	235.448k	36.9	+0.1	+0.0	37.0	52.3	-15.3	White
15	7.373M	34.3	+0.4	+0.0	34.7	50.0	-15.3	White
16	7.875M	34.2	+0.4	+0.0	34.6	50.0	-15.4	White
17	8.376M	34.2	+0.4	+0.0	34.6	50.0	-15.4	White
18	6.872M	34.2	+0.3	+0.0	34.5	50.0	-15.5	White
19	7.624M	33.9	+0.4	+0.0	34.3	50.0	-15.7	White
20	6.431M	33.9	+0.3	+0.0	34.2	50.0	-15.8	White



Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Dorado by HID**
Specification: **FCC 15.209**
Work Order #: **80731** Date: 08/15/2003
Test Type: **Radiated Scan** Time: 13:55:54
Equipment: **Combination Reader** Sequence#: 2
Manufacturer: Dorado by HID Tested By: Randal Clark
Model: 240 (3110-2401)
S/N: 0316

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

Function	Manufacturer	Model #	S/N
Combination Reader*	Dorado by HID	240 (3110-2401)	0316

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments Co., Ltd	TPS-2000	920035

Test Conditions / Notes:

EUT is a combination reader with magnetic strip and proximity options operating on a fundamental frequency of 125kHz. Equipment is +12 VDC powered by an external power supply. The equipment is attached to a wooden upright support structure to simulate normal installation. A proximity card is in the field of the EUT. Frequency Range Investigated: Carrier. Test distance correction factor used in accordance with 15.31 of 40dB / decade to correct data for comparison to the 15.209 limit. Voltage variations performed at ±15% of nominal input voltage. Additional readings are taken at the manufacturer's stated maximum and minimum input voltages.

Transducer Legend:

T1=Mag Loop - Site B - AN 00226 - 9kHz-30M	T2=15.31 10m 40dB/Dec Correction

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	124.960k	48.3	+9.6	-60.0			+0.0	-2.1	25.7	-27.8	Vert
									+15% of nominal input voltage		
2	124.945k	48.3	+9.6	-60.0			+0.0	-2.1	25.7	-27.8	Vert
3	124.960k	48.2	+9.6	-60.0			+0.0	-2.2	25.7	-27.9	Vert
									Maximum rated input voltage		
4	124.963k	48.2	+9.6	-60.0			+0.0	-2.2	25.7	-27.9	Vert
									-15% of nominal input voltage		
5	124.945k	48.1	+9.6	-60.0			+0.0	-2.3	25.7	-28.0	Vert
									Minimum rated input voltage		
6	125.000k	41.2	+9.6	-60.0			+0.0	-9.2	25.7	-34.9	Horiz

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Dorado by HID**
Specification: **FCC 15.209**
Work Order #: **80731** Date: 08/15/2003
Test Type: **Radiated Scan** Time: 14:46:25
Equipment: **Combination Reader** Sequence#: 4
Manufacturer: Dorado by HID Tested By: Randal Clark
Model: 240 (3110-2401)
S/N: 0316

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

Function	Manufacturer	Model #	S/N
Combination Reader*	Dorado by HID	240 (3110-2401)	0316

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments Co., Ltd	TPS-2000	920035

Test Conditions / Notes:

EUT is a combination reader with magnetic strip and proximity options operating on a fundamental frequency of 125kHz. Equipment is +12 VDC powered by an external power supply. The equipment is attached to a wooden upright support structure to simulate normal installation. A proximity card is in the field of the EUT. Frequency Range Investigated: 9kHz to 30MHz Test distance correction factor used in accordance with 15.31 of 40dB / decade to correct data for comparison to the 15.209 limit. **Data represents ambient noise floor readings**.

Transducer Legend:

T1=Mag Loop - Site B - AN 00226 - 9kHz-30M T2=Cable - 10 Meter
T3=15.31 10m 40dB/Dec Correction

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	375.198k	37.4	+9.6	+0.1	-60.0		+0.0	-12.9	16.1	-29.0	Vert
2	1.501M	3.4	+9.7	+0.2	-20.0		+0.0	-6.7	24.0	-30.7	Vert
3	250.098k	38.6	+9.6	+0.1	-60.0		+0.0	-11.7	19.6	-31.3	Vert
4	625.398k	9.8	+9.6	+0.0	-20.0		+0.0	-0.6	31.7	-32.3	Vert
5	1.126M	3.3	+9.8	+0.2	-20.0		+0.0	-6.8	26.5	-33.3	Vert
6	875.598k	1.6	+9.7	+0.1	-20.0		+0.0	-8.7	28.7	-37.4	Vert
7	2.001M	1.8	+9.6	+0.2	-20.0		+0.0	-8.4	29.5	-37.9	Vert
8	1.751M	1.0	+9.6	+0.2	-20.0		+0.0	-9.2	29.5	-38.7	Vert

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Dorado by HID**
Specification: **FCC 15.209**
Work Order #: **80731** Date: 08/20/2003
Test Type: **Radiated Scan** Time: 10:23:09
Equipment: **Combination Reader** Sequence#: 6
Manufacturer: Dorado by HID Tested By: Randal Clark
Model: 240 (3110-2401)
S/N: 0316

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

Function	Manufacturer	Model #	S/N
Combination Reader*	Dorado by HID	240 (3110-2401)	0316

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments Co., Ltd	TPS-2000	920035

Test Conditions / Notes:

EUT is a combination reader with magnetic strip and proximity options operating on a fundamental frequency of 125kHz. Equipment is +12 VDC powered by an external power supply. The equipment is attached to a wooden upright support structure to simulate normal installation. A proximity card is in the field of the EUT. Frequency Range Investigated: 30MHz to 1000MHz.

Transducer Legend:

T1=Amp - S/N 604	T2=Bilog Site B

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	71.850M	46.9	-27.2	+5.9			+0.0	25.6	40.0	-14.4	Vert
2	69.480M	46.0	-27.2	+5.7			+0.0	24.5	40.0	-15.5	Vert
3	65.980M	44.1	-27.2	+5.9			+0.0	22.8	40.0	-17.2	Vert
4	67.480M	44.2	-27.2	+5.8			+0.0	22.8	40.0	-17.2	Vert
5	63.100M	41.3	-27.3	+6.0			+0.0	20.0	40.0	-20.0	Vert
6	62.230M	39.9	-27.3	+6.0			+0.0	18.6	40.0	-21.4	Vert
7	59.480M	38.8	-27.3	+6.2			+0.0	17.7	40.0	-22.3	Vert
8	72.600M	36.6	-27.2	+6.0			+0.0	15.4	40.0	-24.6	Horiz
9	72.900M	35.8	-27.2	+6.0			+0.0	14.6	40.0	-25.4	Horiz
10	71.200M	35.7	-27.2	+5.8			+0.0	14.3	40.0	-25.7	Horiz

11	123.650M	33.6	-27.2	+11.1		+0.0	17.5	43.5	-26.0	Horiz
12	68.350M	35.2	-27.2	+5.8		+0.0	13.8	40.0	-26.2	Horiz
13	70.150M	35.3	-27.2	+5.7		+0.0	13.8	40.0	-26.2	Horiz
14	68.900M	35.0	-27.2	+5.7		+0.0	13.5	40.0	-26.5	Horiz
15	64.850M	34.5	-27.2	+5.9		+0.0	13.2	40.0	-26.8	Horiz
16	66.700M	34.2	-27.2	+5.8		+0.0	12.8	40.0	-27.2	Horiz
17	125.600M	32.3	-27.2	+11.2		+0.0	16.3	43.5	-27.2	Horiz
18	121.030M	31.9	-27.2	+11.0		+0.0	15.7	43.5	-27.8	Horiz
19	124.080M	31.4	-27.2	+11.1		+0.0	15.3	43.5	-28.2	Horiz
20	69.800M	33.2	-27.2	+5.7		+0.0	11.7	40.0	-28.3	Horiz