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Atlas Compliance & Engineering, Inc.

FCC
Test Report

FCC CFR 47 Part 15.207 and 15.209 COMPLIANCE

CDVI
31 Ave du General Leclerc
PANTIN 93500 FRANCE

Product:
Access Control Proximity Reader and Keypad
Model:
DGPROX

Test Report Number: 0134CDVdgprox_subc_1
Date of Report: September 24, 2001

ACCREDITED

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Scope of Accreditation

American Association for Laboratory Accreditation

SCOPE OF ACCREDITATION TO ISO/IEC GUIDE 25-1990 AND EN 45001

ATLAS COMPLIANCE & ENGINEERING, INC.
726 Hidden Valley Road / 675 Sycamore Drive
Royal Oaks, CA 95076 / Milpitas, CA 95035
Bruce K. Smith Phone: 831 761 2223

ELECTRICAL (EMC)

Valid to: December 31, 2001 Certificate Number: 1007-01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following electromagnetic compatibility tests:

Tests:	Standard(s):
Milpitas Facility	
Emissions (Conducted)	CFR 47, FCC Parts 15 (using ANSI C63.4) & 18 (using FCC MP-5); AS/NZS 3548; CISPR 22 (1993, 1997); CISPR 11; EN 55011; EN 55013; EN 55014-1; EN 55015; EN 55022; EN 55103-1; EN 50081-1; EN 50081-2; ICES 001 & 003 (Issue 3); C108.8-M1983; C108.6-M91; CNS 13438; VCCI
Immunity	EN 55014-2; EN 55020; EN 55024; EN 55103-2; EN 50082-1; EN 50082-2
Electrostatic Discharge (ESD)	EN 61000-4-2
Radiated Immunity	EN 61000-4-3
Electrical Fast Transient/Burst	EN 61000-4-4
Surge Immunity (Power Lines Only)	EN 61000-4-5
Conducted Immunity	EN 61000-4-6
Power Frequency Magnetic Field Immunity	EN 61000-4-8
Voltage Dips, Short Interruptions, and Line Voltage Variations	EN 61000-4-11
Current Harmonics	EN 61000-3-2
Voltage Fluctuations & Flicker	EN 61000-3-3
Safety	UL 1950; EN 60950; IEC 60950
Royal Oaks Facility	
Emissions	CFR 47 Part 15 B & C (using ANSI C63.4)& 18 (using FCC MP-5); CISPR 22 (1993, 1997); CISPR 11; C108.8-M1983; C108.6-M91; ICES 001 & 003 (Issue 3); AS/NZS 3548; EN 55011; EN 55013; EN 55014-1; EN 55015; EN 55022; EN 55103-1; EN 50081-1; EN 50081-2; CNS 13438; VCCI V-1, V-2, V-3, V-4 (1999)
Safety	UL 1950; EN 60950; IEC 60950

On materials and products related to the following:
Industrial, Scientific, and Medical (ISM) Equipment; Information Technology Equipment (ITE); Household Appliances; Electric Tools and Similar Apparatus; Radio Frequency Devices; Digital Apparatus; Broadcast Receivers and Associated Equipment; Electrical Lighting and Similar Equipment; Professional Audio, Video, Audio-Visual and Entertainment Lighting Control Apparatus; and Electrical/Electronic Equipment. Revised 3/21/00

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General Information

Test Report Number:	0134CDVdgprox_subc_1
Date Product Tested:	August 7, 2001
Date of Report:	September 24, 2001
Applicant:	CDVI 31 Ave du General Leclerc PANTIN 93500 FRANCE
Contact Person	Eric Assouline
Equipment Tested:	Access Control Proximity Reader and Keypad
Trade Name:	DGPROX
Model:	DGPROX
Purpose Of Test:	To demonstrate the compliance of the Access Control Proximity Reader and Keypad, DGPROX, with the requirements of FCC CFR 47 Part 15 Rules and Regulations to the limits of Subpart C 15.207 and 15.209 using the procedure stated in ANSI C63.4-1992.
Frequency Range Investigated:	9 kHz to 1000 MHz
Test Site Locations:	OATS Atlas Compliance & Engineering, Inc. 726 Hidden Valley Road Watsonville, California 95076
Test Personnel:	Bruce Smith EMC Engineer

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Test Equipment

The following list contains the test equipment that was utilized in making the measurements in this report.

Description _ Model	Serial	Manufacturer	Calibrated	Calibration Due
BiLog Antenna_CBL6141	4034	Chase Electronics Ltd.	7/6/01	7/6/02
Biconical Antenna _ SAS 200/540	272	A.H. Systems	12/8/00	12/8/01
Log Periodic Antenna _ SAS 200/510	061	A.H. Systems	12/13/00	12/13/01
Active Loop Antenna_6502	9108-2669	EMCO	12/5/00	12/5/01
LISN _ 3825/2	9007-1683	EMCO	7/2/01	7/2/02
LISN _ 4825/2	9808-1088	EMCO	7/2/01	7/2/02
Pre amp 100 kHz - 1300 MHz _ 8447D	2944A08506	HP	2/28/01	2/28/02
EMI Test Receiver 9 kHz - 2500 MHz _ ESPC	DE15934 845296/024	Rohde & Schwarz	3/6/01	3/6/02
EMI Test Receiver 9 kHz - 2500 MHz _ ESPC	DE14459	Rohde & Schwarz	9/21/00	9/21/01

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Test Configuration

Customer:	CDVI
Test Date:	August 7, 2001
Specification:	FCC CRF 47 Part 15.209 Limits, ANSI C63.4-1992 Methods

EUT Description / Note:

The EUT, DGPROX, an Access Control Proximity Reader and Keypad, was tested connected to a DC power adapter. The port connections from the EUT to push buttons and door strikes were connected to 22 AWG wires and positioned on the table. The EUT was attached to a vertical mount, as it would be in a normal installation.

EUT Support Program

The DGPROX reader was constantly operating waiting for a valid access card.

EUT Modifications for Compliance

There were no modifications performed on the EUT. The test results state the emission levels of the EUT in the condition as it was received on June 14, 2001.

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EUT Support Devices

Table 1 - Support Equipment Used For Test

Model:	Description:	S/N	FCC ID#
MGT12500R	MG Electronics, Plug In Class 2 Fully Regulated Power Supply, 12VDC 500mA	N/A	N/A
GR	CDVI Electric strike door latch	N/A	N/A

I/O Ports and Cables

Table 2 - EUT Port Termination's

I/O Port	Cable Type	Length	Connector	Termination
V	22 AWG	6 FT	Terminal Strip	Power Supply, Strike
12	22 AWG	6 FT	Terminal Strip	Power Supply, C
0	22 AWG	6 FT	Terminal Strip	Strike
C	22 AWG	3 IN	Terminal Strip	12, Power Supply
T			Terminal Strip	
5			Terminal Strip	
3			Terminal Strip	
B	22 AWG	6 FT	Terminal Strip	None
M	22 AWG	6 FT	Terminal Strip	None
E			Terminal Strip	
1			Terminal Strip	
2			Terminal Strip	

Table 3 - Host Port Termination's

I/O Port	Cable Type	Length	Connector	Termination
Not Applicable				

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Equipment Under Test

The photographs below show the condition of the EUT for test.

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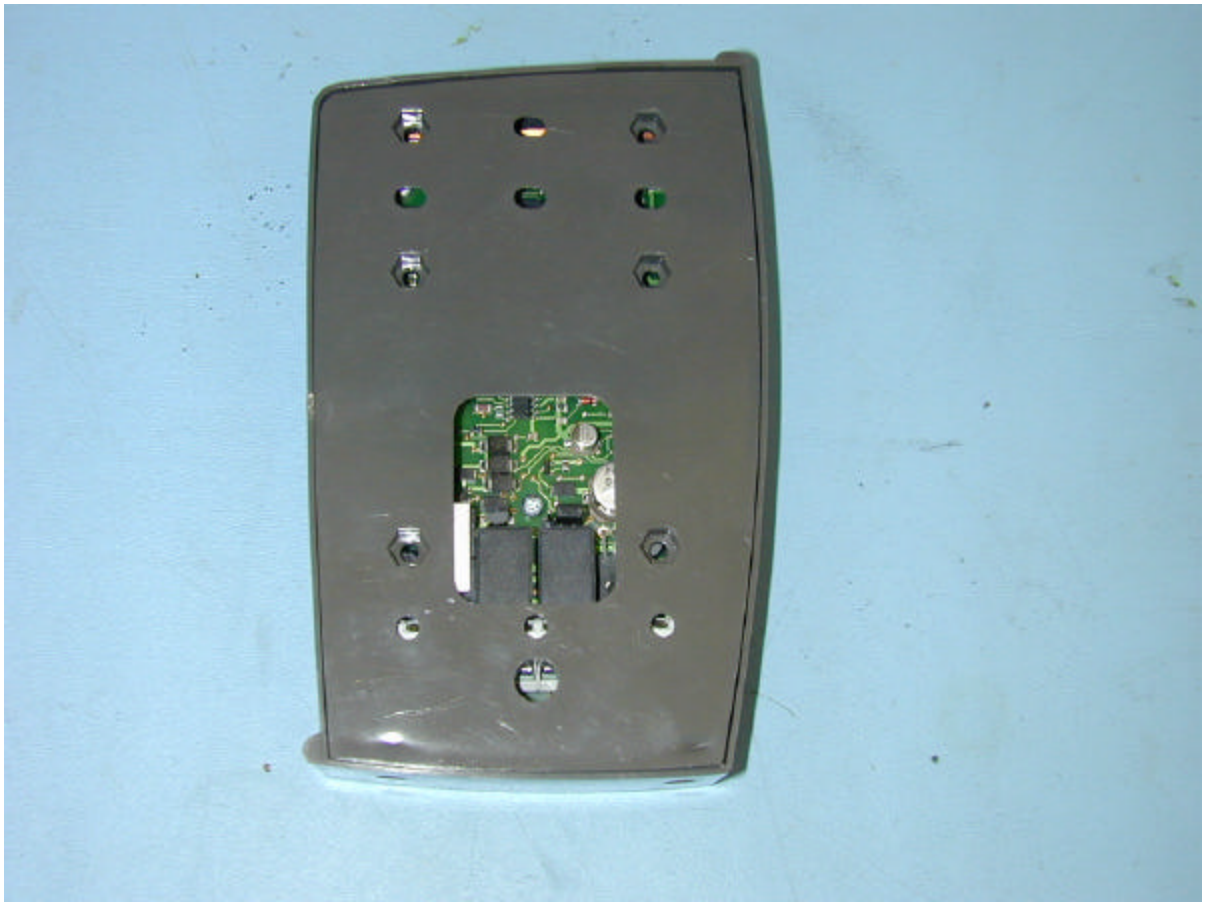
Production products will be potted.



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Power Adapter.

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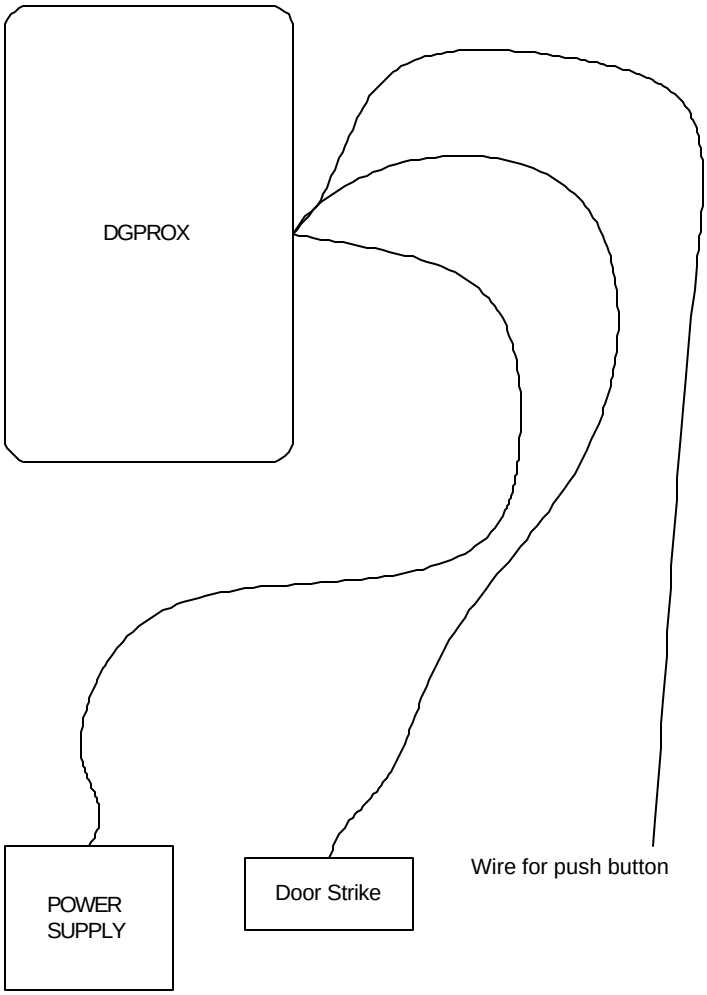
Equipment Block Diagram

Following is the block diagram of the test setup. Refer to TEST CONFIGURATION pages for port connections and information.

Figure 1 - Test Setup Diagram



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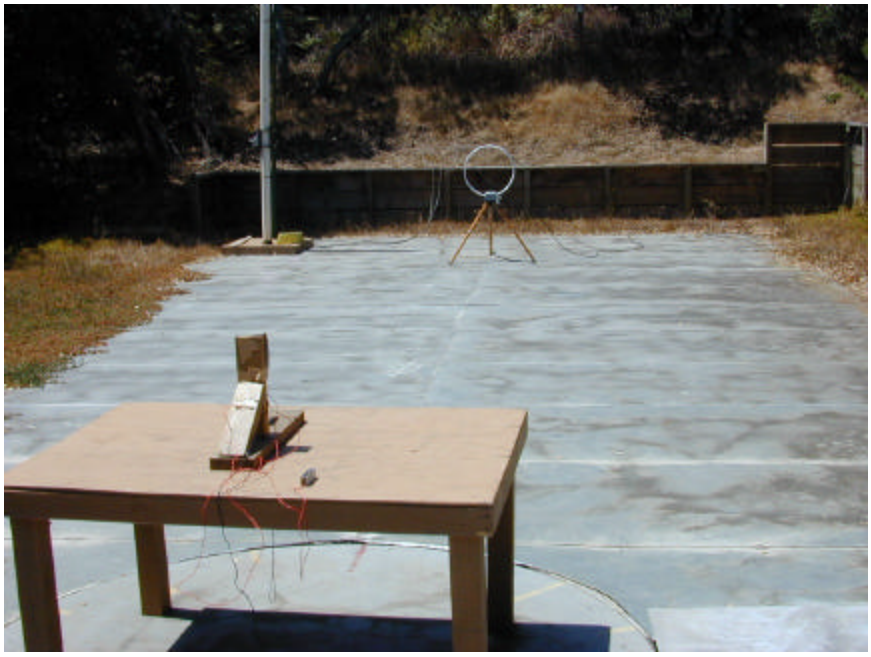
Test Setup (Radiated Emissions)

The photographs below show worst case setup for radiated emission testing.



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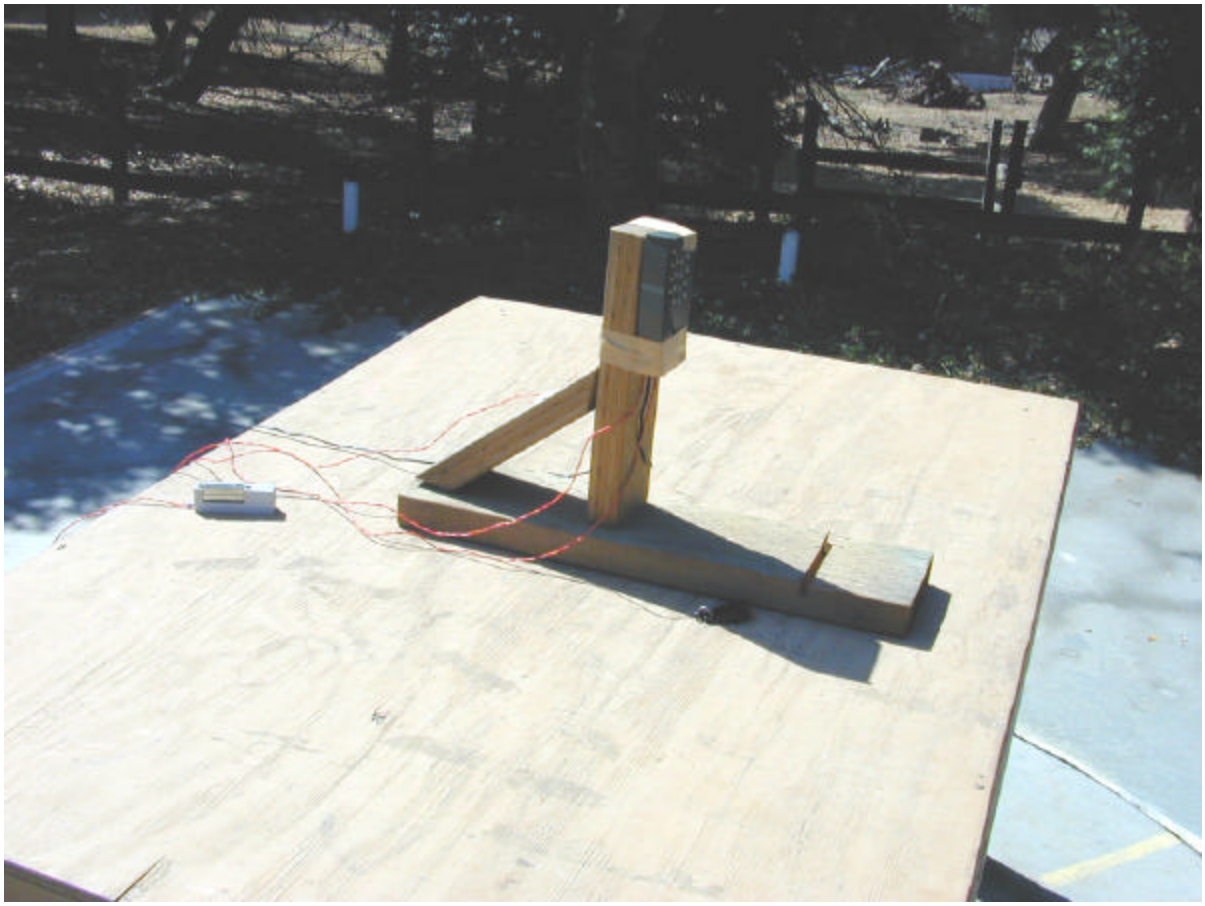

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Test Setup (Conducted Emissions)

The photograph below shows worst case setup for line conducted testing.

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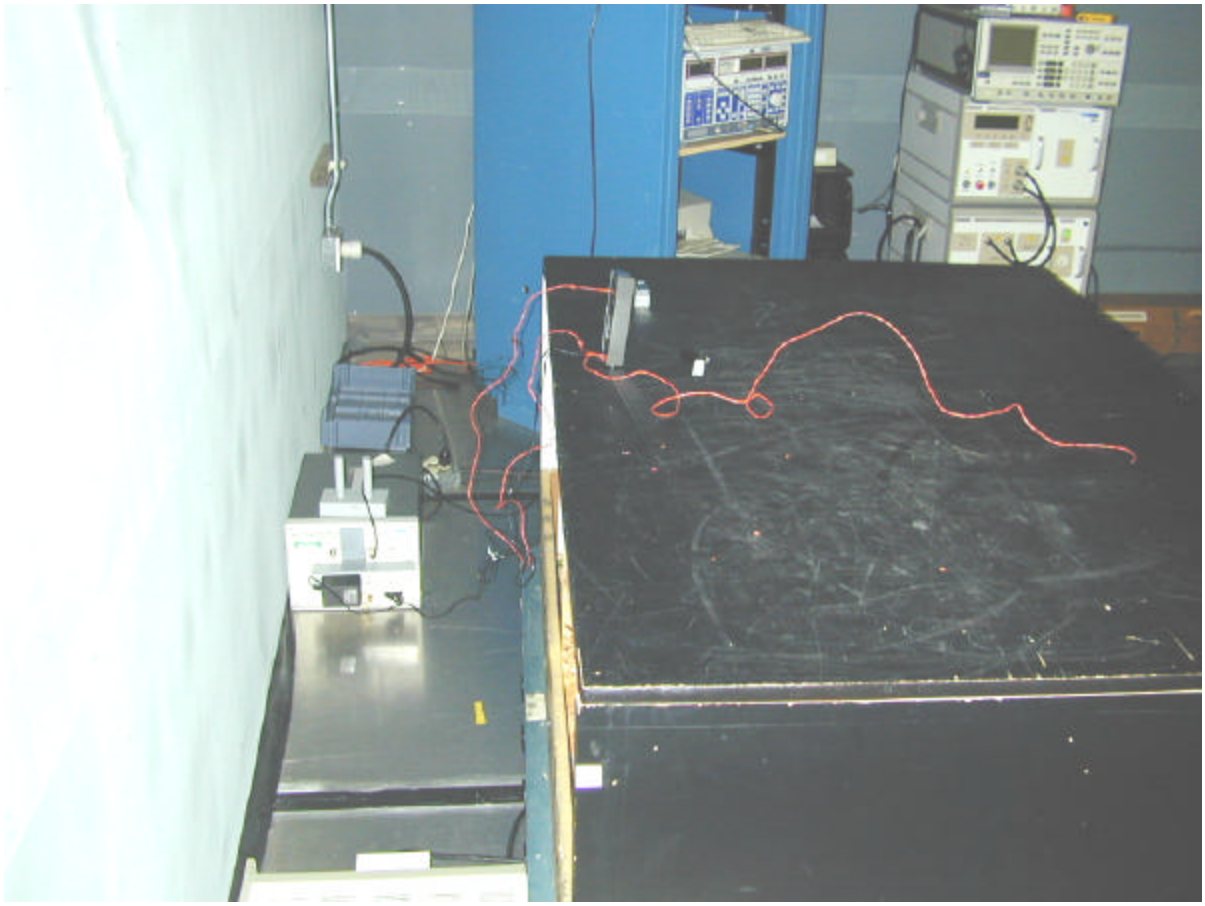

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Test Methods for Emissions

The test procedure stated in ANSI C63.4-1992 was used to collect the test data. The radiated emission data of the EUT was taken with the Rohde & Schwarz EMI Test Receiver. Incorporating the application of correction factors programmed into the Test Receiver and verified for distance, antenna, cable loss, and amplifier gain, the data was reduced as shown in the Sample Calculations. These correction factors are available upon request. The corrected data was then compared to the emission limits to determine compliance.

During radiated emission testing, the EUT was placed on a nonconductive rotating table 0.8 meter above the conductive grid. The nonconductive table dimensions were 1 meter deep by 1.5 meters wide at 0.8 meter high. The EUT is centered on the tabletop and the measurement antenna was placed 3 or 10 meters from the EUT as noted in the test data.

For radiated emissions testing, scans in the frequency range of 9 kHz to 1000 MHz were made. Each frequency between 9 kHz and 150 kHz was measured at a bandwidth of 200 Hz, between 150 kHz and 30 MHz was measured at a bandwidth of 10 kHz and between 30 MHz and 1000 MHz was measured at a bandwidth of 120 kHz. Measurements were made employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz and 110-490 kHz, which employed an average detector. All readings within 10 dB of the limits were recorded, and those emissions were then measured using the appropriate detector and bandwidth for a 2-second measurement time.

Measurements were made at a distance of 10 meters and 3 meters and pursuant to section 15.31-(f) (2) the measurement results were extrapolated to the specified distance by making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor of 40dB/decade.

Conducted Emission Testing

For the conducted emissions testing, the EMCO LISN, Model No. 3825/2, was used for the EUT and the EMCO LISN, Model No. 4825/2, was used for the support equipment. During conducted emission testing the EUT was located on a wooden test bench measuring 0.8 meter high, 1 meter deep, and 1.5 meters in width. The vertical conducting surface was 0.4 meter from the back of the test bench. The LISNs were placed on the ground plane of the test area in accordance with ANSI C63.4-1992.

The metal plane used for conducted emission testing was grounded to the earth by a heavy gage braided wire attached to the plane. All other objects were kept a minimum of 1 meter away from the EUT during the conducted test.

For conducted emissions testing a scan of the frequency band 450 kHz to 30 MHz was made stepping every 5 kHz. Each frequency was measured at a bandwidth of 10 kHz for 20 msec. Due to the narrow specification of a 6 dB drop, the 10 kHz bandwidth

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meets the requirements of CISPR 16, band B (150 kHz to 30 MHz) and VDE 0876 as well as of various military standards that require tolerances of 10% for a 10 kHz measurement bandwidth. All readings within 25 dB of the limits were recorded, and those emissions were then measured using the CISPR quasi-peak detector at a bandwidth of 10 kHz for a 2 second measurement time. All emissions within 6 dB of the limit were examined with additional measurements to ensure compliance with the FCC 15.207 limits. The results of the conducted emissions test are shown in Tables 8 and 9 and Figures 3 and 4.

Temperature and Humidity

The ambient temperature of the actual EUT was within the range of 10° to 40° C (50° to 104° F) unless the particular equipment requirements specify testing over a different temperature range. The humidity levels were within the range of 10% to 90% relative humidity unless the EUT operating requirements call for a different level.

Sample Calculations

An example of how the EMI Test Receiver reading is converted using correction factors is given for the emissions recorded in Table 6. These correction factors are programmed into the EMI Test Receiver and verified. For radiated emissions in dBµV/m, the EMI Test Receiver reading in dBµV is corrected by using the following formula:

Meter Reading (dBµV)
+ Antenna Factor (dB)
+ Cable Loss (dB)
= Corrected Reading (dBµV/m)

This reading is then compared to the applicable specification limits and the difference will determine compliance. For conducted emissions, no correction factors are needed when a 50 µH LISN is used.

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FCC Part 15 Subpart C 15.207 and 15.209 Limits

Table 4 - Radiated Emission Limits, General Requirements

Frequency MHz	Field Strength μV/m	Measurement Distance Meters
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30	30
30 – 88	100	3
88 – 216	150	3
216 – 960	200	3
Above 960	500	3

Table 5 - Conducted Limits

Frequency MHz	Limit Quasi-Peak dBμV	Limit μV
0.45-30	48	250

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closest point of any part of the device or system.
3. The level of any unwanted emissions from an intentional radiator operating under these general provisions shall not exceed the level of the fundamental emission.
4. The emission limits shown are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

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Report of Measurements Radiated Data

The following table reports the results of the radiated measurements for the Access Control Proximity Reader and Keypad, DGPROX.

Table 6 - Radiated Emission Level

15.209 Limit dBµV/m	Fundamental Frequency kHz	Level dBµV/m	Detector	Test Distance	Corrected Level dBµV/m	Margin dB	Antenna
25.25 @ 300 meters	131.2	95.85	AV	3	-22.69	47.94	Loop

15.209 Limit dBµV/m	Unwanted Frequency kHz	Level dBµV	Detector	Test Distance	Corrected Level dBµV	Margin dB	Antenna
19.22 @ 300 meters	262.4	52.97	AV	3	-65.57	84.79	Loop
15.70 @ 300 meters	393.6	54.91	AV	3	-63.63	79.33	Loop
33.20 @ 30 meters	524.8	48.02	QP	3	-11.25	44.45	Loop
31.27 @ 30 meters	656.0	45.98	QP	3	-13.29	44.56	Loop
29.68 @ 30 meters	787.2	41.51	QP	3	-17.76	47.44	Loop
28.34 @ 30 meters	918.4	40.49	QP	3	-18.78	47.12	Loop
27.18 @ 30 meters	1049.6	55.73	QP	3	-3.54	30.72	Loop
26.16 @ 30 meters	1180.8	37.87	QP	3	-21.40	47.56	Loop
25.25 @ 30 meters	1312.0	42.25	QP	3	-17.02	42.27	Loop

Test Method: ANSI C63.4-1992
Spec Limit: FCC 15.209
No other emissions were observed.

Note: AV = Average
QP = Quasi Peak

COMMENTS: System continuously running. Ambient temperature 67°F and relative humidity of 47%. Test distance of 3 meters was due to the presents of ambient radio noise. Corrected levels are extrapolated at 59.27 dB/decade derived by taking measurements at two distances at one radial (see 15.31 (f)(2)).

Calculation of limit at 131.2 kHz:
Limit in microvolts/meter
2400/131.2=18.293µV/m at 300 meters
Convert to dbµV
20 Log 18.293µV/m = 25.25dBµV/m at 300 meters

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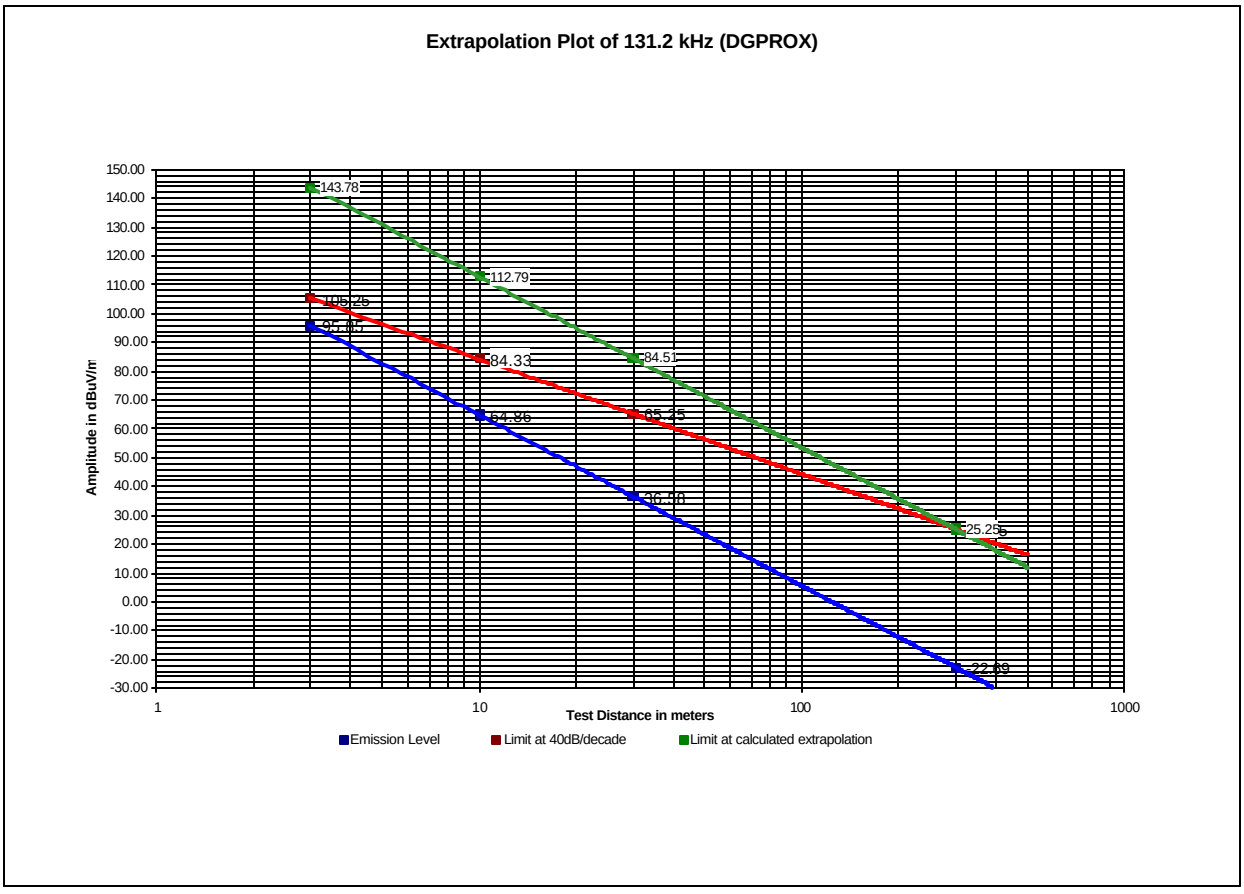
Calculation of extrapolation factor at 131.2 kHz, 3 meter to 10 meter distance:
The reading level in dB at 10 meter subtracted from the level in dB at 3 meter
95.85-64.86 = 30.99
Subtract the log of the two distances
Log (10)-Log (3) =
1-0.477121 = 0.522879
Divide the ratio of the readings by the ratio of the distance
30.99/0.522879 = 59.27
Actual Extrapolation Factor derived from measurements at 3 meters and 10 meters on fundamental frequency
59.27 dB/decade
Levels at 3 and 10 meters were measured, levels at 30 and 300 meters are calculated.

Table 7 – 131.2 kHz Extrapolation Factor Data

Distance in meters	3	10	30	300
Level dBuV/m	95.85	64.86	36.58	-22.69
Limit dBuV/m (40dB/decade)	105.25	84.33	65.25	25.25
Limit dBuV/m (59.27dB/decade)	143.78	112.79	84.51	25.25

Figure 2 - Extrapolation Factor Plot



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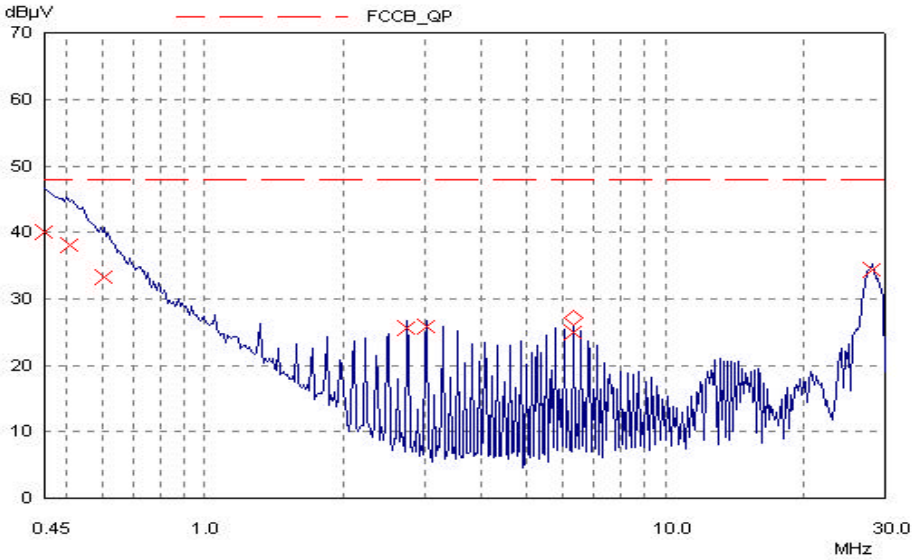
Conducted Data for FCC Part 15.207(a), Line

Figure 3 - Line Scan



Pre-Scan Settings:

Start Freq.	Stop Freq.	Step	IF BW	Detector	Scan-Time	Atten.
0.45MHz	30MHz	5kHz	10kHz	PK	20msec	0dB

Blue Trace: Peak Measurement

Final Measurement: x = QP at 2 second measurement time.

Table 8 - Line Scan Data

Freq. MHz	Level dBµV	Detector	Limit dBµV	Margin dB	Phase	PE
0.45	40.14	QP	48.00	7.86	L1	gnd
0.51	38.22	QP	48.00	9.78	L1	gnd
0.605	33.29	QP	48.00	14.71	L1	gnd
2.76	25.53	QP	48.00	22.47	L1	gnd
3.025	25.83	QP	48.00	22.17	L1	gnd
6.31	25.07	QP	48.00	22.93	L1	gnd
28.27	34.29	QP	48.00	13.71	L1	gnd

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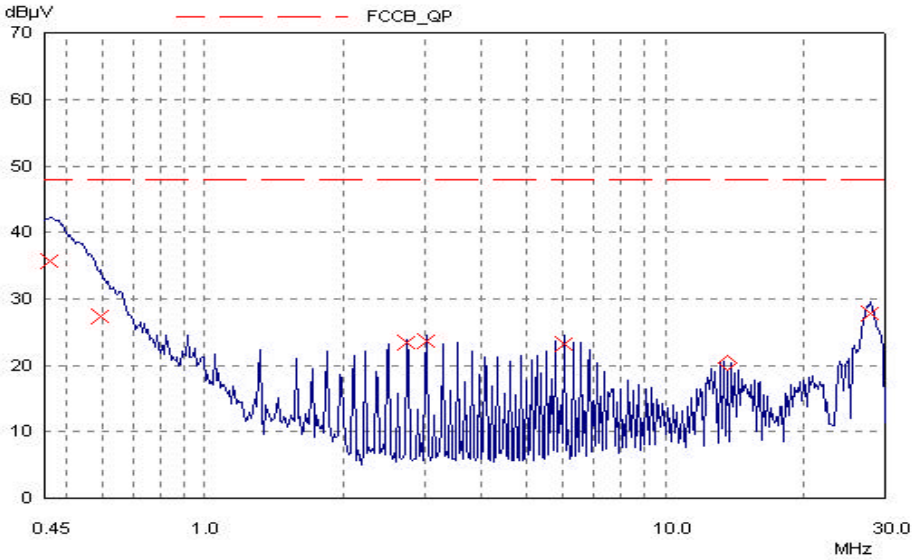
Conducted Data for FCC Part 15.207(a), Neutral

Figure 4 - Neutral Scan



Pre-Scan Settings:

Start Freq.	Stop Freq.	Step	IF BW	Detector	Scan-Time	Atten.
0.45MHz	30MHz	5kHz	10kHz	PK	20msec	0dB

Blue Trace: Peak Measurement

Final Measurement: x = QP at 2 second measurement time.

Table 9 - Neutral Scan Data

Freq. MHz	Level dBµV	Detector	Limit dBµV	Margin dB	Phase	PE
0.46	35.63	QP	48.00	12.37	N	gnd
0.595	27.30	QP	48.00	20.70	N	gnd
2.76	23.38	QP	48.00	24.62	N	gnd
3.025	23.77	QP	48.00	24.23	N	gnd
6.05	23.12	QP	48.00	24.88	N	gnd
28.01	27.78	QP	48.00	20.22	N	gnd

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COMPLIANCE VERIFICATION REPORT

TEST CERTIFICATE

APPLICANT:	CDVI 31 Ave du General Leclerc PANTIN 93500 FRANCE
Trade Name:	Access Control Proximity Reader and Keypad
Model:	DGPROX

I HEREBY CERTIFY THAT:

The measurements shown in this report were made in accordance with the procedures indicated and that the energy emitted by this equipment, as received, was found to be within the FCC CFR 47 Part 15 Subpart C section 15.209 for Radiated emissions and FCC CFR 47 Part 15 Subpart C section 15.207 for Conducted emissions. Additionally, it should be noted that the results in this report apply only to the items tested, as identified herein.

I FURTHER CERTIFY THAT:

On the basis of the measurements taken at the test site, the equipment tested is capable of operation in compliance with the requirements set forth in FCC CFR 47 Part 15.207 and 15.209 Rules and Regulations.

On this Date: September 24, 2001

_____	_____
Printed Name	
_____	_____
Bruce Smith	Signature
Atlas Compliance & Engineering, Inc.	CDVI Representative