



ADDENDUM TO FC02-039A

FOR THE

FLEXPASS™ KEYPAD READER

FCC PART 15 SUBPART C SECTIONS 15.207 AND 15.209

COMPLIANCE

DATE OF ISSUE: AUGUST 23, 2002

PREPARED FOR:

Indala Corporation
6850 B Santa Teresa Blvd.
San Jose, CA 95119-1205

P.O. No.: 14001012
W.O. No.: 78696

PREPARED BY:

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Date of test: April 3-8, 2002

Report No.: FC02-039B

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CKC Laboratories, Inc. has received Certificates of Accreditation from the following agencies:

A2LA (USA); BSMI (Taiwan); Nemko (Norway); and GOST (Russia).

CKC Laboratories, Inc has received test site Registration Acceptance from the following agencies:

FCC (USA); VCCI (Japan); and Industry Canada.

CKC Laboratories, Inc. has received Letters of Acceptance through an MRA for the following agencies:

ACA/NATA (Australia); SABS (South Africa); SWEDAC (Sweden); Radio Communications Agency (RA); HOKLAS (Hong Kong); Bakom (Swiss); BIPT (Belgium); Denmark Telestyrelsen; RvA (Netherlands); SEE (Luxembourg) SITTEL (Bolivia); and UKAS (UK).

ADMINISTRATIVE INFORMATION

DATE OF TEST:

April 3-8, 2002

DATE OF RECEIPT:

April 3, 2002

PURPOSE OF TEST:

To demonstrate the compliance of the Proximity Access Control Reader, ARK-501 with the requirements for FCC Part 15 Subpart C Sections 15.207 and 15.209 devices. The purpose of Addendum A is to change the name to FlexPass™ Keypad Readers and clarify the voltage variation testing. The purpose of Addendum B is to revise the fundamental data sheet.

TEST METHOD:

ANSI C63.4 (1992)

MANUFACTURER:

Indala Corporation
6850 B Santa Teresa Blvd.
San Jose, CA 95119-1205

REPRESENTATIVE:

Geoffrey Day

TEST LOCATION:

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

SUMMARY OF RESULTS

As received, the Indala Corporation FlexPass™ Keypad Readers was found to be fully compliant with the following standards and specifications:

United States

- FCC Part 15 Subpart C Sections 15.207 and 15.209
- ANSI C63.4 (1992) method

FCC vs. Canadian RSS-210 Matrix

PART 15	Canada RSS-210
15.209	6.2.1
15.207	6.6

Industry of Canada File No. IC 3082-D

CONDITIONS FOR COMPLIANCE

No modifications to the EUT were necessary to comply.

APPROVALS

QUALITY ASSURANCE:

TEST PERSONNEL:



Steve Behm, Manager of Engineering Services



Randy Clark, EMC Engineer



Joyce Walker, Quality Assurance Administrative Manager



Chuck Kendall, EMC/Lab Manager

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The EUT tested by CKC Laboratories was a production unit. The product evaluated is a 125 kHz proximity access control reader known as the Indala FlexPass™ Keypad Reader.

The following model has been tested by CKC Laboratories: ARK-501

The FP5061M FlexPass Keypad Reader consists of the ARK-501 (compliance model designation) with the core electronics comprising of identical electronics and integral antenna for all related FlexPass™ Keypad Reader product series. The following additional models are electrically identical to the device tested, or any differences between them do not affect their EMC characteristics, thus comply to the level of testing equivalent to the tested model. The Models for this family consist of the following part number sequence: FP506cf, where the “b” represents a specific bezel and the “f” represents a format as specified in the following chart:

FP506cf

Color (c)	Format (f)
1 = Black	B = buffered
7 = Beige	M = 3x4 matrix

15.31(e) Voltage Variations

DC input voltage variations were performed in accordance with 15.31(e) and no change in output power or frequency deviation was detected.

15.31(m) Number Of Channels

This device operates on a single channel.

15.33(a) Frequency Ranges Tested

15.207 Conducted Emissions: 450 kHz – 30 MHz

15.209 Radiated Emissions: 9 kHz – 1000 MHz

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.

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.

Mode Of Operation

The EUT operates in continuous mode.

Eut Operating Frequency

The EUT was operating at 125 kHz.

EQUIPMENT UNDER TEST

FlexPass™ Keypad Readers

Manuf: Indala Corporation
Model: ARK-501
Serial: N*040302-001
FCC ID: E9UARK501 (pending)

PERIPHERAL DEVICES

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

Power Supply

Manuf: Topward
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 FlexPass™ Keypad Readers. 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: Fundamental Highest Emission Levels									
FREQUENCY MHz	METER READING dBμV	CORRECTION FACTORS				CORRECTED READING dBμV/m	SPEC LIMIT dBμV/m	MARGIN dB	NOTES
		Ant dB	15.31 dB	Cable dB					
0.125	70.0	10.1	-80.0	0.0		0.1	25.7	-25.6	V
0.125	60.5	10.1	-80.0	0.0		-9.4	25.7	-35.1	H

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

NOTES: H = Horizontal Polarization
 V = Vertical Polarization

COMMENTS: EUT is a proximity access control reader operating on 125kHz powered by 12VDC through an external power supply. Test Distance correction factor used IAW 15.31 40dB/Decade.

Table 2: Highest Radiated Emission Levels - 9 kHz - 30 MHz

FREQUENCY MHz	METER READING dB μ V	CORRECTION FACTORS				CORRECTED READING dB μ V/m	SPEC LIMIT dB μ V/m	MARGIN dB	NOTES
		Ant dB	15.31 dB	Cable dB					
0.249	43.5	10.0	-80.0	0.1		-26.4	19.7	-46.1	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 proximity access control reader operating on 125kHz powered by 12VDC through an external power supply. Test Distance correction factor used IAW 15.31 40dB/Decade.

Table 3: Six Highest Radiated Emission Levels - 30-1000 MHz

FREQUENCY MHz	METER READING dB μ V	CORRECTION FACTORS				CORRECTED READING dB μ V/m	SPEC LIMIT dB μ V/m	MARGIN dB	NOTES
		Ant dB	Amp dB	Cable dB					
71.050	24.3	7.9	-26.8	1.6		7.0	40.0	-33.0	H
71.520	34.1	7.8	-26.8	1.6		16.7	40.0	-23.3	V
73.480	35.4	7.6	-26.8	1.7		17.9	40.0	-22.1	V
73.550	24.1	7.6	-26.8	1.7		6.6	40.0	-33.4	H
148.300	22.5	13.0	-26.5	2.4		11.4	43.5	-32.1	H
148.380	28.3	13.0	-26.5	2.4		17.2	43.5	-26.3	V

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

NOTES: H = Horizontal Polarization
V = Vertical Polarization

COMMENTS: EUT is a proximity access control reader operating on 125kHz powered by 12VDC through an external power supply. Power supply is positioned on the ground plane with the EUT shield wire attached to ground. Frequency Range Investigated: 30-1000MHz

Table 4: Six Highest Conducted Emission Levels - 15.207

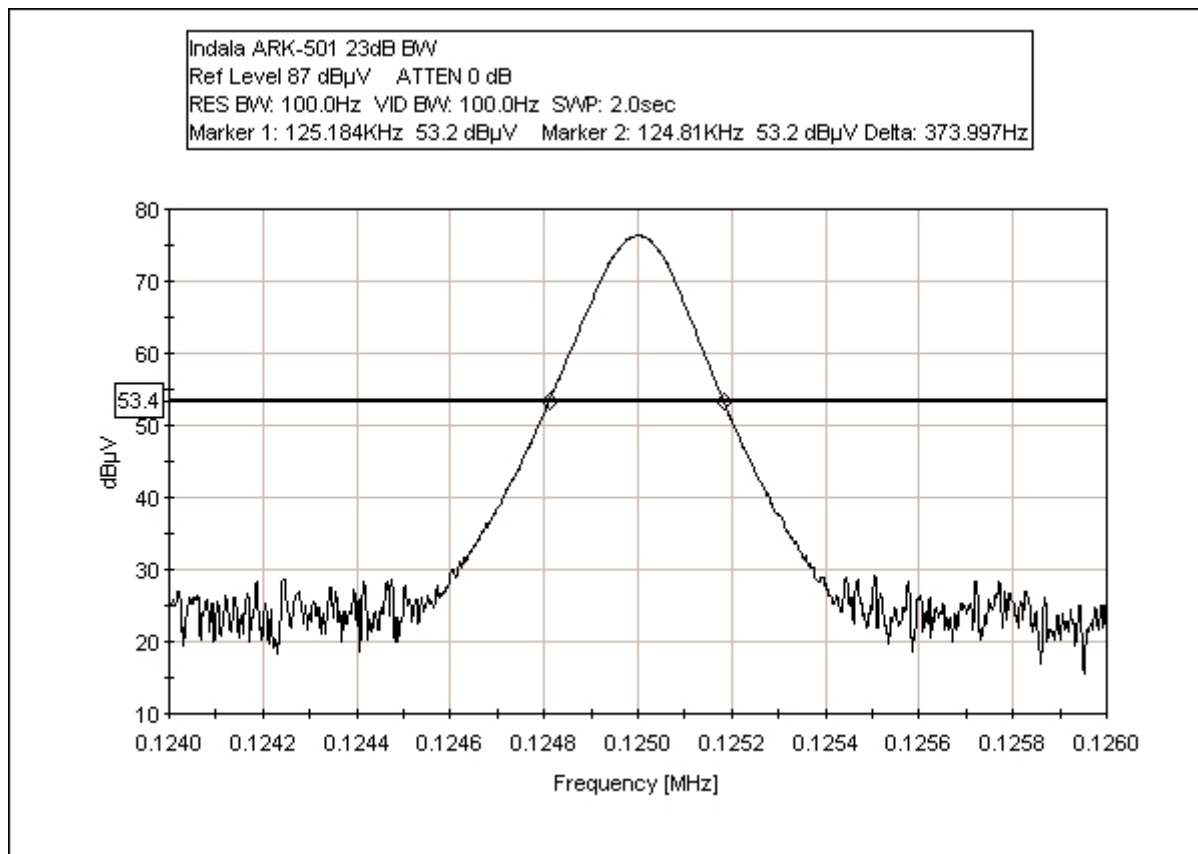
FREQUENCY MHz	METER READING dB μ V	CORRECTION FACTORS				CORRECTED READING dB μ V	SPEC LIMIT dB μ V	MARGIN dB	NOTES
		Lisn dB		Cable dB					
0.487611	37.6	0.4		0.1		38.1	48.0	-9.9	B
0.489283	37.2	0.6		0.1		37.9	48.0	-10.1	W
0.971539	37.1	0.3		0.1		37.5	48.0	-10.5	B
8.007240	36.7	2.1		0.2		39.0	48.0	-9.0	B
8.027712	36.7	2.1		0.2		39.0	48.0	-9.0	W
8.942128	32.0	4.9		0.2		37.1	48.0	-10.9	B

Test Method: ANSI C63.4 (1992)
Spec Limit: FCC Part 15 Subpart C Section 15.207

NOTES: B = Black Lead
W = White Lead

COMMENTS: EUT is a proximity access control reader operating on 125kHz powered by 12VDC through an external power supply. Power supply is positioned on the ground plane with the EUT shield wire attached to ground.

99% Bandwidth



TEMPERATURE AND HUMIDITY DURING TESTING

The temperature during testing was within +15°C and + 35°C.

The relative humidity was between 20% and 75%.

MEASUREMENT UNCERTAINTY

Measurement uncertainty associated with data in this report is a $\pm 2.94\text{dB}$ for radiated and $\pm 1.56\text{dB}$ for conducted emissions.

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 FlexPass™ Keypad Readers, 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 $\text{dB}\mu\text{V}/\text{m}$, the spectrum analyzer reading in $\text{dB}\mu\text{V}$ 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	($\text{dB}\mu\text{V}$)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	($\text{dB}\mu\text{V}/\text{m}$)

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 the FlexPass™ Keypad Readers. For radiated measurements from 9 kHz to 30 MHz, the magnetic loop antenna was used. For radiated measurements below 300 MHz, the biconical antenna was used. For frequencies from 300 to 1000 MHz, the log periodic 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.

FCC SECTION 15.35: TABLE B: ANALYZER BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	450 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

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 for the FlexPass™ Keypad Readers.

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

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 88 MHz was scanned with the biconical antenna located about 1.5 meter above the ground plane in the vertical configuration. During this scan, the turntable was rotated and all peaks at or near the limit were recorded. The frequency range of 100 to 300 MHz was then scanned in the same manner using the biconical antenna and the peaks recorded. Lastly, a scan of the FM band from 88 to 110 MHz was made, using a reduced resolution bandwidth and frequency span. The biconical antenna was changed to the horizontal polarity and the above steps were repeated. After changing to the log periodic antenna in the horizontal configuration, the frequency range of 300 to 1000 MHz was scanned. The log periodic antenna was changed to the vertical polarity and the frequency range of 300 to 1000 MHz was again scanned. 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. Photographs showing the final worst case configuration of the EUT are contained in Appendix A.

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.

For conducted emissions testing, a 30 to 50 second sweep time was used for automated measurements in the frequency bands of 450 kHz to 1.705 MHz, 1.705 MHz to 3 MHz, and 3 MHz to 30 MHz. All readings within 20 dB of the limit were recorded. At frequencies where the recorded emissions were close to the limit, further investigation was performed manually at a slower sweep rate.

APPENDIX A

TEST SETUP PHOTOGRAPHS

PHOTOGRAPH SHOWING RADIATED EMISSIONS



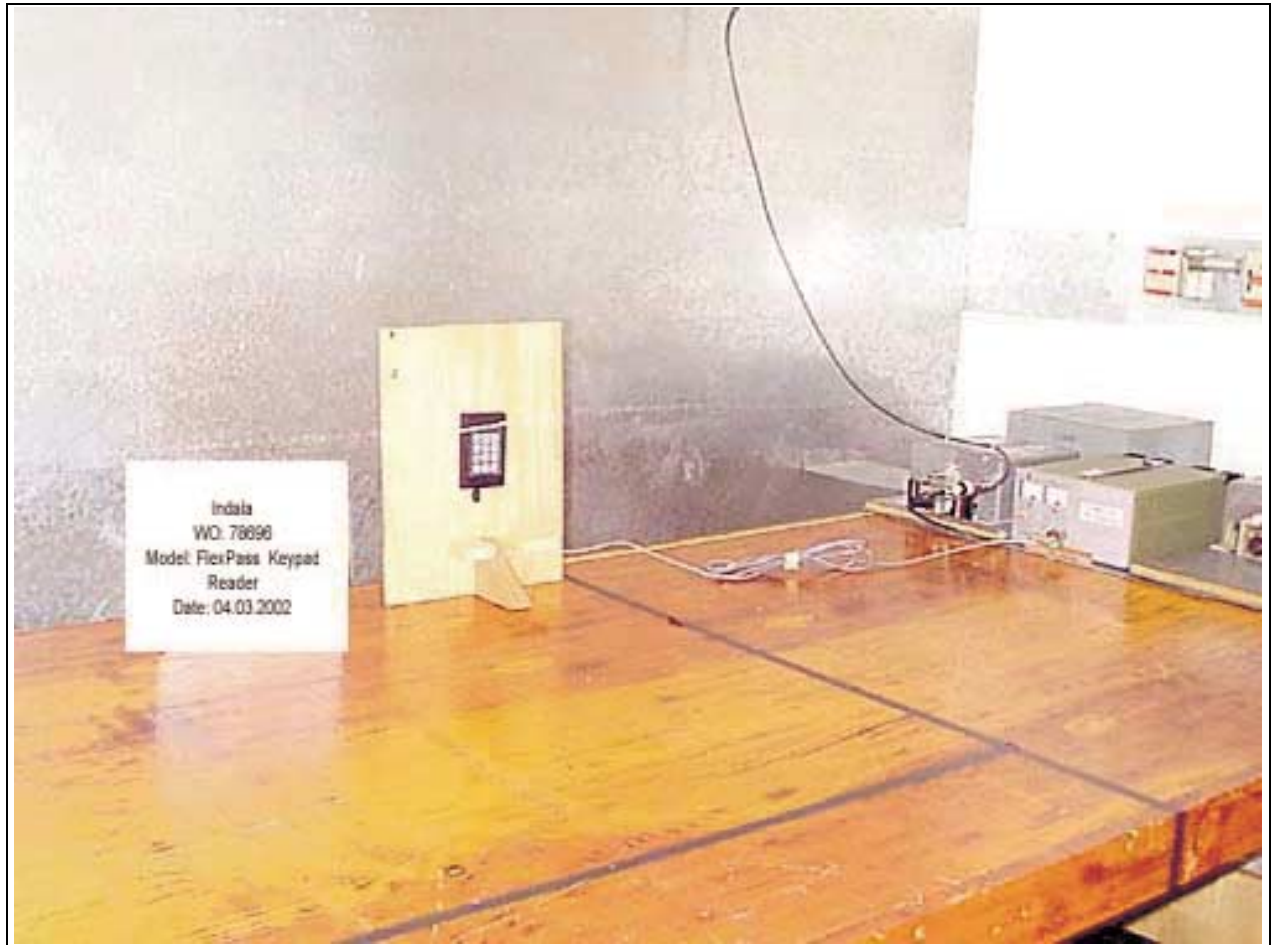
Radiated Emissions - Front View

PHOTOGRAPH SHOWING RADIATED EMISSIONS



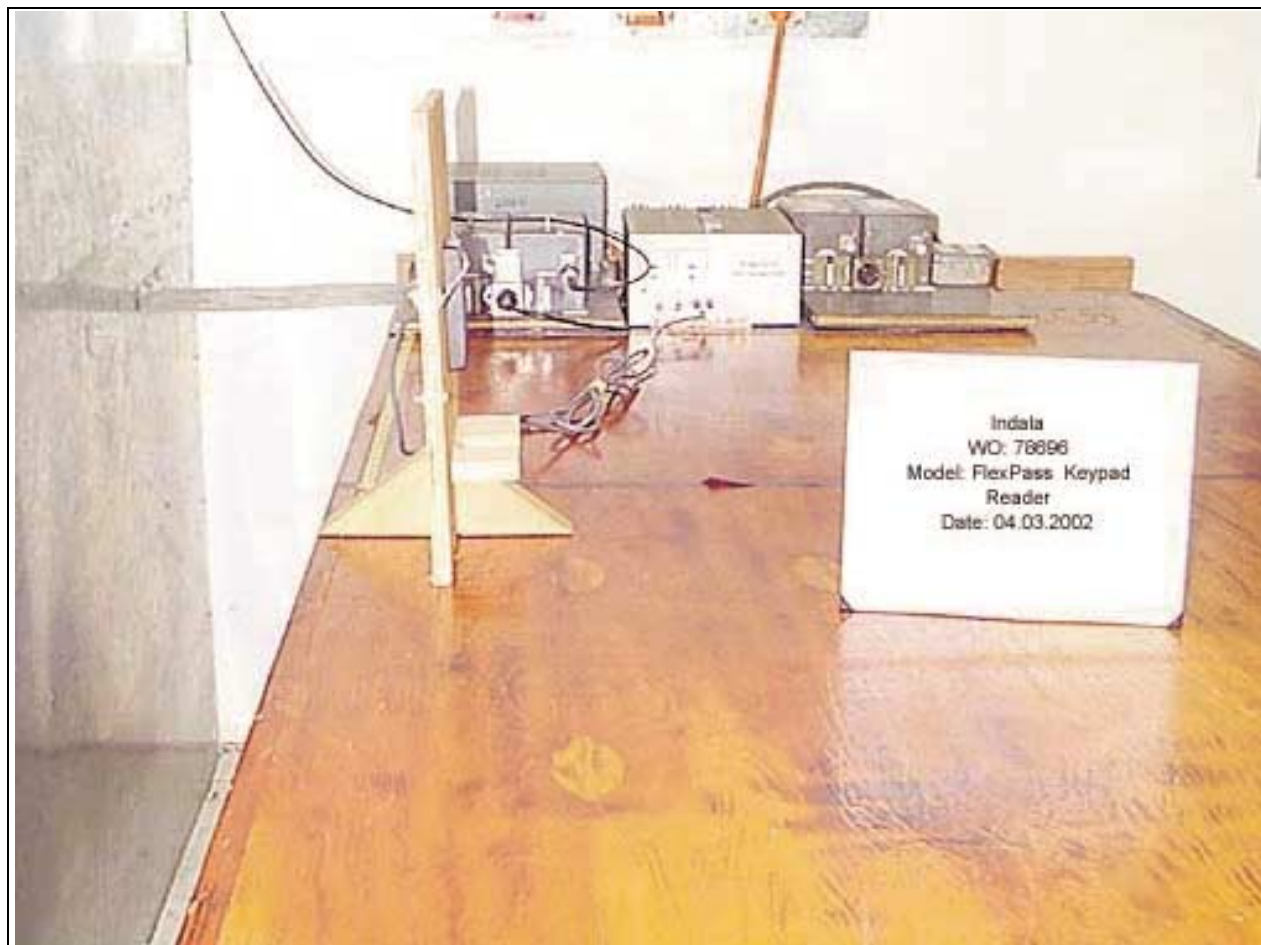
Radiated Emissions - Back View

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS



Mains Conducted Emissions - Front View

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS



Mains Conducted Emissions – Side View

APPENDIX B

TEST EQUIPMENT LIST

Fundamental Measurements, BW, Voltage Variations and Spurious emissions 9kHz – 30MHz

<i>Equipment</i>	<i>Manufacturer</i>	<i>Model #</i>	<i>Serial #</i>	<i>Asset #</i>	<i>Cal Date</i>	<i>Cal Due</i>
QP Adapter	HP	85650A	2811A01267	00478	1/30/02	1/30/03
S/A Display	HP	8566B	2403A08241	00489	1/30/02	1/30/03
Spectrum Analyzer	HP	8566B	2209A01404	00490	1/30/02	1/30/03
LISN's Set	Solar	8028-50-TS-24-BNC	855996, 992	02055	05/11/01	5/11/02
Antenna, Loop	EMCO	6502	1074	00226	5/31/2001	5/31/02

Spurious emissions 30MHz – 1000MHz

<i>Equipment</i>	<i>Manufacturer</i>	<i>Model #</i>	<i>Serial #</i>	<i>Asset #</i>	<i>Cal Date</i>	<i>Cal Due</i>
Antenna, Bicon	A&H	SAS-200/542	156	00225	12/06/01	12/6/02
Antenna, Log	A&H	SAS-200/510	154	01330	05/07/01	5/7/02
Preamplifier	HP	8447D	1937A02604	00099	3/21/02	3/21/03
QP Adapter	HP	85650A	2811A01267	00478	1/30/02	1/30/03
S/A Display	HP	8566B	2403A08241	00489	1/30/02	1/30/03

Conducted emissions:

<i>Equipment</i>	<i>Manufacturer</i>	<i>Model #</i>	<i>Serial #</i>	<i>Asset #</i>	<i>Cal Date</i>	<i>Cal Due</i>
QP Adapter	HP	85650A	2811A01267	00478	1/30/02	1/30/03
S/A Display	HP	8566B	2403A08241	00489	1/30/02	1/30/03
Spectrum Analyzer	HP	8566B	2209A01404	00490	1/30/02	1/30/03
LISN's Set	Solar	8028-50-TS-24-BNC	855996, 992	02055	05/11/01	5/11/02

APPENDIX C: MEASUREMENT DATA SHEETS

Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362

Customer: **Indala**
 Specification: **FCC 15.209**
 Work Order #: **78696**
 Test Type: **Maximized Emissions**
 Equipment: **Proximity Access Control Reader**
 Manufacturer: Indala Corporation
 Model: ARK-501
 S/N: N*040302-001

Date: 04/03/2002
 Time: 14:42:29
 Sequence#: 7
 Tested By: Randal Clark

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Proximity Access Control Reader*	Indala Corporation	ARK-501	N*040302-001

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Topward	TPS-2000	920035

Test Conditions / Notes:

EUT is a proximity access control reader operating on 125kHz powered by 12VDC through an external power supply. Test Distance correction factor used IAW 15.31 40dB/Decade.

Transducer Legend:

T1=Loop 1074	T2=15.31 3m 40dB/Dec Correction
T3=Cable - 10 Meter	

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

Measurement Data			Reading Notes by Margin			Test Distance: 2 meters					
#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar Ant
2	125.121k	70.0	+10.1	-80.0	0.0		+0.0	0.1	25.7	-25.6	Vert
3	125.126k	60.5	+10.1	-80.0	0.0		+0.0	-9.4	25.7	-35.1	Horiz

Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362

Customer: **Indala**
 Specification: **FCC 15.209**
 Work Order #: **78696** Date: 04/03/2002
 Test Type: **Maximized Emissions** Time: 14:42:29
 Equipment: **Proximity Access Control Reader** Sequence#: 8
 Manufacturer: Indala Corporation Tested By: Randal Clark
 Model: ARK-501
 S/N: N*040302-001

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Proximity Access Control Reader*	Indala Corporation	ARK-501	N*040302-001

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Topward	TPS-2000	920035

Test Conditions / Notes:

EUT is a proximity access control reader operating on 125kHz powered by 12VDC through an external power supply. Test Distance correction factor used IAW 15.31 40dB/Decade.

Transducer Legend:

T1=Loop 1074	T2=Cable - 10 Meter
T3=15.31 3m 40dB/Dec Correction	

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

#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	T3 dB	Dist dB	Table	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar Ant
1	248.800k	43.5	+10.0	+0.1	-80.0	+0.0		-26.4	19.7	-46.1	Vert

Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362

Customer: **Indala**
 Specification: **FCC 15.209**
 Work Order #: **78696**
 Test Type: **Radiated Scan**
 Equipment: **Proximity Access Control Reader**
 Manufacturer: Indala Corporation
 Model: ARK-501
 S/N: N*040302-001

Date: 04/10/2002
 Time: 10:42:20
 Sequence#: 29
 Tested By: Randal Clark

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Proximity Access Control Reader*	Indala Corporation	ARK-501	N*040302-001

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Topward	TPS-2000	920035

Test Conditions / Notes:

EUT is a proximity access control reader operating on 125kHz powered by 12VDC through an external power supply. Power supply is positioned on the ground plane with the EUT shield wire attached to ground. Frequency Range Investigated: 30-1000MHz.

Transducer Legend:

T1=Amp - S/N 604	T2=Bicon 156
T3=Cable - 10 Meter	

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

#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	T3 dB		Dist Table	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar Ant
1	73.480M	35.4	-26.8	+7.6	+1.7		+0.0	17.9	40.0	-22.1	Vert
2	71.520M	34.1	-26.8	+7.8	+1.6		+0.0	16.7	40.0	-23.3	Vert
3	148.380M	28.3	-26.5	+13.0	+2.4		+0.0	17.2	43.5	-26.3	Vert
4	148.300M	22.5	-26.5	+13.0	+2.4		+0.0	11.4	43.5	-32.1	Horiz
5	71.050M	24.3	-26.8	+7.9	+1.6		+0.0	7.0	40.0	-33.0	Horiz
6	73.550M	24.1	-26.8	+7.6	+1.7		+0.0	6.6	40.0	-33.4	Horiz

Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362

Customer: **Indala**
 Specification: **FCC 15.207**
 Work Order #: **78696**
 Test Type: **Conducted Emissions**
 Equipment: **Proximity Access Control Reader**
 Manufacturer: Indala Corporation
 Model: ARK-501
 S/N: N*040302-001

Date: 04/04/2002
 Time: 10:45:24 AM
 Sequence#: 15
 Tested By: Randal Clark
 120V 60Hz

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Proximity Access Control Reader*	Indala Corporation	ARK-501	N*040302-001

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Topward	TPS-2000	920035

Test Conditions / Notes:

EUT is a proximity access control reader operating on 125kHz powered by 12VDC through an external power supply. Power supply is positioned on the ground plane with the EUT shield wire attached to ground.

Transducer Legend:

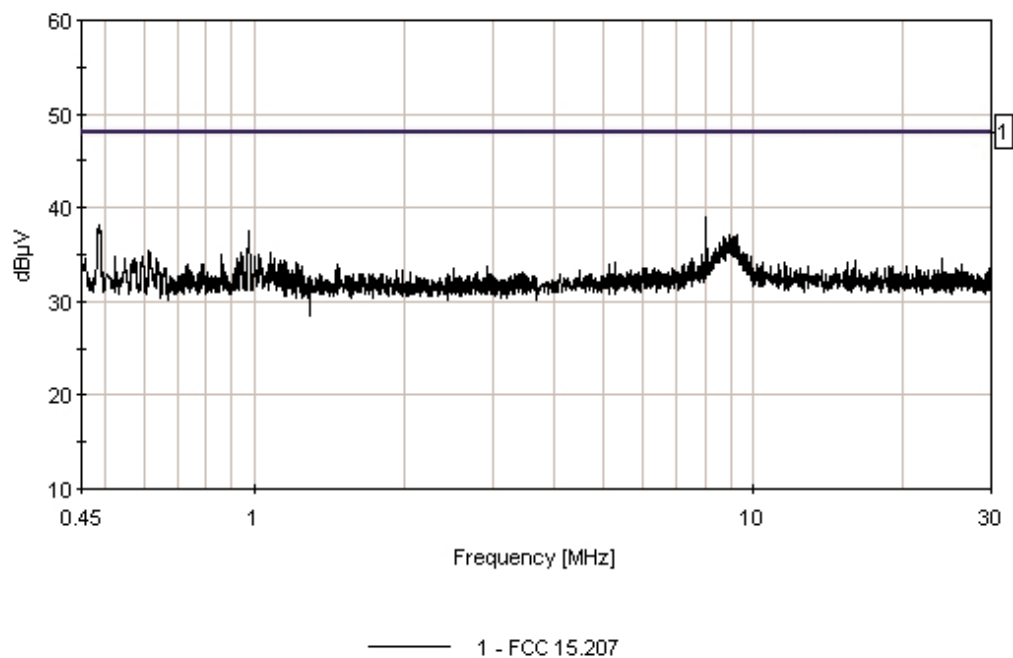
T1=Cable & Cap (Bench)	T2=LISN Insertion Loss s/n474
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Measurement Data: Reading listed by margin.

Test Lead: Black

#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	Dist dB	Table	Corr dB μ V	Spec dB μ V	Margin dB	Polar Ant
1	8.007M	36.7	+0.2	+2.1		+0.0	39.0	48.0	-9.0	Black
2	487.611k	37.6	+0.1	+0.4		+0.0	38.1	48.0	-9.9	Black
3	971.539k	37.1	+0.1	+0.3		+0.0	37.5	48.0	-10.5	Black
4	8.942M	32.0	+0.2	+4.9		+0.0	37.1	48.0	-10.9	Black
5	23.932M	33.5	+0.4	+0.6		+0.0	34.5	48.0	-13.5	Black
6	1.213M	33.8	+0.1	+0.3		+0.0	34.2	48.0	-13.8	Black
7	1.161M	33.7	+0.1	+0.3		+0.0	34.1	48.0	-13.9	Black
8	1.463M	33.6	+0.1	+0.3		+0.0	34.0	48.0	-14.0	Black
9	656.443k	33.1	+0.1	+0.3		+0.0	33.5	48.0	-14.5	Black

Indata VVO#: 78696 Date: 04/04/2002 Time: 10:45:24 AM
FCC 15.207 Test Lead: Black 120V 60Hz Sequence#: 15
ARK-501



Test Location: CKC Laboratories, Inc. • 5473A Clouds Rest • Mariposa, CA 95338 • 800-500-4362

Customer: **Indala**
 Specification: **FCC 15.207**
 Work Order #: **78696**
 Test Type: **Conducted Emissions**
 Equipment: **Proximity Access Control Reader**
 Manufacturer: Indala Corporation
 Model: ARK-501
 S/N: N*040302-001

Date: 04/04/2002
 Time: 10:51:48 AM
 Sequence#: 16
 Tested By: Randal Clark
 120V 60Hz

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Proximity Access Control Reader*	Indala Corporation	ARK-501	N*040302-001

Support Devices:

Function	Manufacturer	Model #	S/N
Power Supply	Topward	TPS-2000	920035

Test Conditions / Notes:

EUT is a proximity access control reader operating on 125kHz powered by 12VDC through an external power supply. Power supply is positioned on the ground plane with the EUT shield wire attached to ground.

Transducer Legend:

T1=Cable & Cap (Bench)	T2=LISN Insertion Loss s/n493
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Measurement Data: Reading listed by margin.

Test Lead: White

#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	Dist dB	Table	Corr dB μ V	Spec dB μ V	Margin dB	Polar Ant
1	8.028M	36.7	+0.2	+2.1		+0.0	39.0	48.0	-9.0	White
2	489.283k	37.2	+0.1	+0.6		+0.0	37.9	48.0	-10.1	White
3	972.375k	36.5	+0.1	+0.4		+0.0	37.0	48.0	-11.0	White
4	6.704M	32.9	+0.3	+3.1		+0.0	36.3	48.0	-11.7	White
5	617.996k	35.3	+0.1	+0.5		+0.0	35.9	48.0	-12.1	White
6	1.231M	35.4	+0.1	+0.3		+0.0	35.8	48.0	-12.2	White
7	572.027k	35.1	+0.1	+0.5		+0.0	35.7	48.0	-12.3	White
8	942.286k	34.5	+0.1	+0.4		+0.0	35.0	48.0	-13.0	White
9	999.121k	34.6	+0.1	+0.3		+0.0	35.0	48.0	-13.0	White
10	1.033M	34.6	+0.1	+0.3		+0.0	35.0	48.0	-13.0	White
11	1.165M	34.6	+0.1	+0.3		+0.0	35.0	48.0	-13.0	White

12	1.257M	34.3	+0.1	+0.3	+0.0	34.7	48.0	-13.3	White
13	1.011M	34.2	+0.1	+0.3	+0.0	34.6	48.0	-13.4	White
14	1.087M	34.2	+0.1	+0.3	+0.0	34.6	48.0	-13.4	White
15	16.011M	33.8	+0.3	+0.5	+0.0	34.6	48.0	-13.4	White
16	638.055k	33.9	+0.1	+0.5	+0.0	34.5	48.0	-13.5	White
17	1.322M	33.4	+0.1	+0.3	+0.0	33.8	48.0	-14.2	White

Indala WO#: 78696 Date: 04/04/2002 Time: 10:51:48 AM
FCC 15.207 Test Lead: White 120V 60Hz Sequence#: 16
ARK-501

