



**ADDENDUM TO INDALA TEST REPORT FC06-018**

**FOR THE**

**ASR-620++ LONG RANGE 125KHZ READER**

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

**COMPLIANCE**

**DATE OF ISSUE: MAY 22, 2006**

**PREPARED FOR:**

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

P.O. No.: 14003207  
W.O. No.: 84492

**PREPARED BY:**

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

Date of test: January 31 - February 1, 2006

**Report No.: FC06-018A**

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## ADMINISTRATIVE INFORMATION

**DATE OF TEST:** January 31 - February 1, 2006

**DATE OF RECEIPT:** January 31, 2006

**MANUFACTURER:** Indala  
6850 B Santa Teresa Blvd.  
San Jose, CA 95119-1205

**REPRESENTATIVE:** Steve Rose

**TEST LOCATION:** CKC Laboratories, Inc.  
5046 Sierra Pines Drive  
Mariposa, CA 95338

**TEST METHOD:** ANSI C63.4 (2003), RSS-210 and RSS-GEN

**PURPOSE OF TEST:** To demonstrate the compliance of the ASR-620++ Long Range 125kHz Reader with the requirements for FCC Part 15 Subpart C Sections 15.207 & 15.209 and RSS-210 devices.  
**Addendum A** is to revise the fundamental and 9kHz-30MHz data sheets and tables and add voltage variation data with no new testing.

**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 3082-D		784962	Site File No.

**CONDITIONS FOR COMPLIANCE**

No modifications to the EUT were necessary to comply.

**APPROVALS**

Steve Behm, Director of Engineering Services

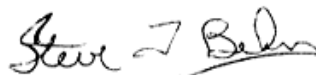
**QUALITY ASSURANCE:**




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Joyce Walker, Quality Assurance Administrative Manager

**TEST PERSONNEL:**




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Steve Behm, Director of Engineering Services and Quality Assurance

### FCC 15.31(e) Voltage Variations

FREQUENCY MHz	CORRECTED READING dB $\mu$ V/m 85%	CORRECTED READING dB $\mu$ V/m 100%	CORRECTED READING dB $\mu$ V/m 115%	SPEC LIMIT dB $\mu$ V/m
0.125	-0.3	Nominal	-0.5	25.7

Test Method: ANSI C63.4 (2003)  
 Spec Limit: FCC Part 15 Subpart C Section 15.31(e)  
 Test Distance: 10 meters  
 Tested By: Steve Behm

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

## **EQUIPMENT UNDER TEST**

### **Long Range 125kHz Reader**

Manuf: Indala  
Model: ASR-620++  
Serial: 001  
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

## 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 dB $\mu$ V	CORRECTION FACTORS				CORRECTED READING dB $\mu$ V	SPEC LIMIT dB $\mu$ V	MARGIN dB	NOTES
		Cable dB	Lisn dB	HPF dB	Att dB				
0.163090	22.7	0.1	0.3	1.5	10.2	34.8	55.3	-20.5	B
0.164544	22.6	0.1	0.3	1.4	10.2	34.6	55.2	-20.6	W
0.174725	29.8	0.1	0.3	0.5	10.2	40.9	54.7	-13.8	W
0.179088	21.5	0.1	0.3	0.4	10.2	32.5	54.5	-22.0	B
22.003780	16.5	0.5	0.4	0.2	10.3	27.9	50.0	-22.1	W
22.247030	17.5	0.5	0.4	0.2	10.3	28.9	50.0	-21.1	W

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

NOTES: B = Black Lead  
W = White Lead

COMMENTS: EUT is a long range reader with an operating frequency of 125kHz. EUT is mounted vertically on a non-conductive support to simulate normal installation. Temperature: 18°C, Relative Humidity: 38%. Frequency Range Investigated: 150kHz to 30MHz. Green and black DC wires are connected together to the black power supply lead. The power supply is bonded to earth.

**Table 2: FCC 15.209 Fundamental Emission Levels**

FREQUENCY MHz	METER READING dB $\mu$ V	CORRECTION FACTORS				CORRECTED READING dB $\mu$ V/m	SPEC LIMIT dB $\mu$ V/m	MARGIN dB	NOTES
		Cable dB	Ant dB	Corr dB					
0.125	88.8	0.1	10.2	-88.6		10.5	25.7	-15.2	P

Test Method: ANSI C63.4 (2003)  
Spec Limit: FCC Part 15 Subpart C Section 15.209  
Test Distance: 10 Meters

NOTES: P = Parallel

COMMENTS: EUT is a long range reader with an operating frequency of 125kHz. EUT is mounted vertically on a non-conductive support to simulate normal installation. Test distance correction factor used in accordance with 15.31 to correct test data for comparison to the limit. Temperature: 18°C, Relative Humidity: 38%. Frequency Range Investigated: Carrier. Green and black DC wires are connected together to the black power supply lead.

### Fall Off Calculations

Measurements were taken at 10, 15, 20 & 30 meters test distances. Using the following formula, the fall off/decade was achieved.

$$\text{Fall Off/Decade} = (10m_{\text{reading}} - 30m_{\text{reading}}) / \text{Log}(10/30) = -63.92\text{dB/Decade}$$

10m reading is 49.6  
30m reading is 19.1

Since the fall off is greater than the theoretical maximum of 60dB/Decade, 60dB/Decade was used to calculate the proper falloff of the measured reading.

$$\text{Correction Factor} = 60 * \text{Log}(\text{Distance reading taken at} / \text{Distance of interest}) = 60 * \text{Log}(10/300) = -88.62\text{dB}$$



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

FREQUENCY MHz	METER READING dB $\mu$ V	CORRECTION FACTORS				CORRECTED READING dB $\mu$ V/m	SPEC LIMIT dB $\mu$ V/m	MARGIN dB	NOTES
		Cable dB	Corr dB	Ant dB	Dist dB				
0.058	31.3	0.1	-60.0	10.6		-18.0	32.3	-50.3	P
1.762	21.6	0.4	-20.0	10.1		12.1	29.5	-17.4	P
29.635	2.1	1.2	-20.0	5.6		-11.1	29.5	-40.6	P

Test Method: ANSI C63.4 (2003)  
 Spec Limit: FCC Part 15 Subpart C Section 15.209  
 Test Distance: 10 Meters

NOTES: P = Parallel

COMMENTS: EUT is a long range reader with an operating frequency of 125kHz. EUT is mounted vertically on a non-conductive support to simulate normal installation. Test distance correction factor used in accordance with 15.31 to correct test data for comparison to the limit. Temperature: 18°C, Relative Humidity: 38%. Frequency Range Investigated: 9kHz to 30MHz. Green and black DC wires are connected together to the black power supply lead.

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

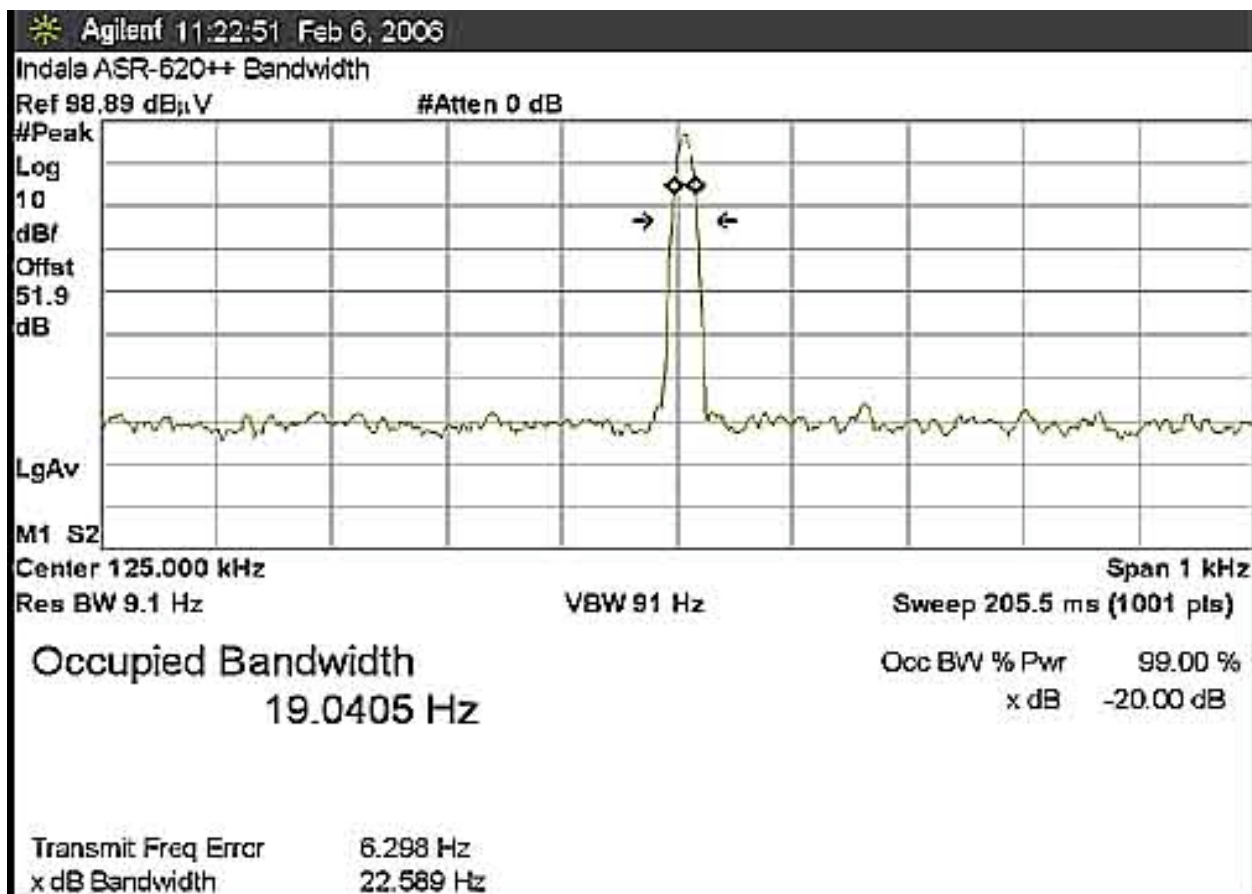
FREQUENCY MHz	METER READING dB $\mu$ V	CORRECTION FACTORS				CORRECTED READING dB $\mu$ V/m	SPEC LIMIT dB $\mu$ V/m	MARGIN dB	NOTES
		Ant dB	Amp dB	Cable dB	Dist dB				
60.000	32.2	6.1	-26.8	1.7	10.0	23.2	40.0	-16.8	H
60.010	46.4	6.1	-26.8	1.7	10.0	37.4	40.0	-2.6	VQ
86.882	43.0	7.7	-26.9	2.1	10.0	35.9	40.0	-4.1	V
87.255	42.7	7.7	-26.9	2.1	10.0	35.6	40.0	-4.4	V
134.382	36.0	11.0	-26.7	2.6	10.0	32.9	43.5	-10.6	V
186.757	26.7	8.2	-26.6	3.1	10.0	21.4	43.5	-22.1	V

Test Method: ANSI C63.4 (2003)  
 Spec Limit: FCC Part 15 Subpart C Section 15.209  
 Test Distance: 10 Meters

NOTES: H = Horizontal Polarization  
 V = Vertical Polarization  
 Q = Quasi Peak Reading

COMMENTS: EUT is a long range reader with an operating frequency of 125kHz. EUT is mounted vertically on a non-conductive support to simulate normal installation. Test distance correction factor used in accordance with 15.31 to correct test data for comparison to the limit. Temperature: 18°C, Relative Humidity: 38%. Frequency Range Investigated: 30MHz to 1000MHz. Green and black DC wires are connected together to the black power supply lead. The power supply is bonded to earth.

### OCCUPIED BANDWIDTH



## 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 dB $\mu$ V/m, the spectrum analyzer reading in dB $\mu$ V was corrected by using the following formula in Table A. This reading was then compared to the applicable specification limit to determine compliance.

<b>TABLE A: SAMPLE CALCULATIONS</b>		
	Meter reading	(dB $\mu$ V)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dB $\mu$ V/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 dB $\mu$ V, 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  $\mu$ H-/+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

**PHOTOGRAPH SHOWING FUNDAMENTAL EMISSIONS**



Fundamental Emissions

## APPENDIX B

### TEST EQUIPMENT LIST

*FCC15.31(e)*

Function	S/N	Calibration Date	Cal Due Date	Asset #
Spectrum Analyzer-AF	US44300407	01/12/2005	01/12/2007	02660
Voltmeter-AF	2905006	04/25/2006	04/25/2008	02369
Fluke 8520A				

*FCC 15.207*

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/12/2005	01/12/2007	02660
10 dB Attenuator 10W	None	08/18/2005	08/18/2007	P04255
LISN, 8028-50-TS-24-BNC	8379276, 280	06/03/2005	06/03/2007	1248 & 1249
150kHz HP Filter TTE	G7754	04/20/2004	04/20/2006	02608

*FCC 15.209 Fundamental and 9kHz – 30MHz*

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/12/2005	01/12/2007	02660
EMCO Loop Antenna	1074	05/13/2005	05/13/2007	00226

*FCC 15.209 30-1000 MHz*

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/12/2005	01/12/2007	02660
Chase CBL6111C Bilog	2456	06/07/2005	06/07/2007	01991
HP 8447D Preamp	1937A02604	03/11/2005	03/11/2007	00099

**APPENDIX C:**  
**MEASUREMENT DATA SHEETS**

Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Indala**  
 Specification: **FCC 15.207 - AVE**  
 Work Order #: **84492** Date: 1/31/2006  
 Test Type: **Conducted Emissions** Time: 10:37:08 AM  
 Equipment: **Long Range 125kHz Reader** Sequence#: 18  
 Manufacturer: Indala Tested By: Steve Behm  
 Model: ASR-620++ 120V 60Hz  
 S/N: 001

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

Function	Manufacturer	Model #	S/N
Long Range 125kHz Reader*	Indala	ASR-620++	001

**Support Devices:**

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

**Test Conditions / Notes:**

EUT is a long range reader with an operating frequency of 125kHz. EUT is mounted vertically on a non-conductive support to simulate normal installation. Temperature: 18°C, Relative Humidity: 38%. Frequency Range Investigated: 150kHz to 30MHz. Green and black DC wires are connected together to the black power supply lead. The power supply is bonded to earth.

**Transducer Legend:**

T1=Cable - Internal + cab	T2=LISN Insertion Loss s/n280
T3=HP Filter AN02608	T4=ATT 10d B Site D Conducted

**Measurement Data:**

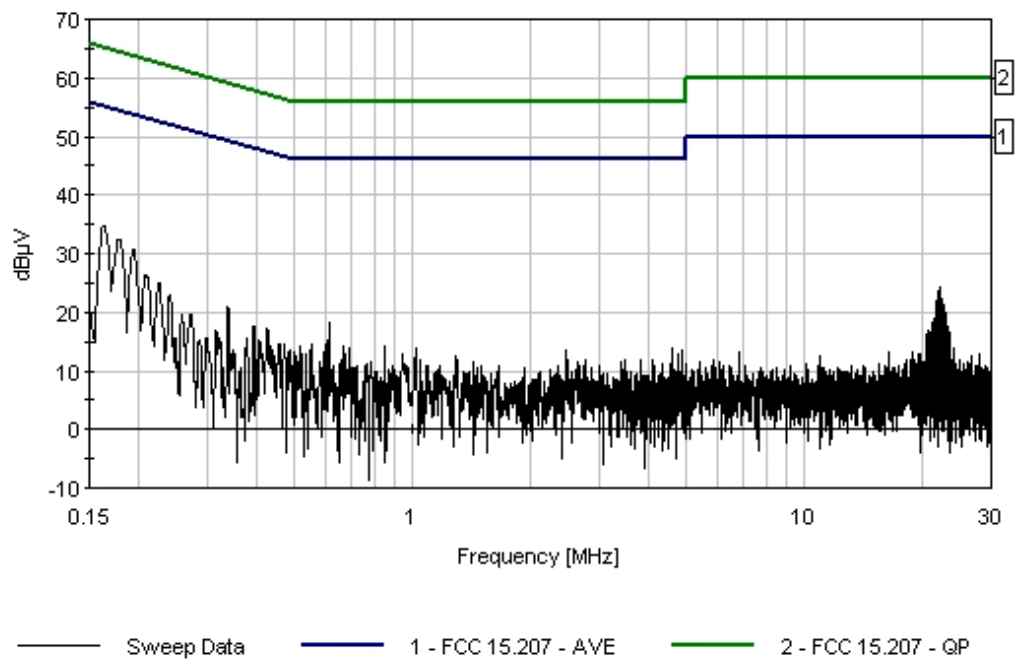
Reading listed by margin.

Test Lead: Black

#	Freq MHz	Rdng dB $\mu$ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB $\mu$ V	Spec dB $\mu$ V	Margin dB	Polar Ant
1	163.090k	22.7	+0.1	+0.3	+1.5	+10.2	+0.0	34.8	55.3	-20.5	Black
2	179.088k	21.5	+0.1	+0.3	+0.4	+10.2	+0.0	32.5	54.5	-22.0	Black
3	194.360k	19.9	+0.1	+0.3	+0.1	+10.2	+0.0	30.6	53.8	-23.2	Black
4	22.247M	12.8	+0.5	+0.4	+0.2	+10.3	+0.0	24.2	50.0	-25.8	Black
5	22.004M	12.2	+0.5	+0.4	+0.2	+10.3	+0.0	23.6	50.0	-26.4	Black
6	208.904k	15.5	+0.1	+0.3	+0.1	+10.2	+0.0	26.2	53.2	-27.0	Black
7	225.629k	14.0	+0.1	+0.3	+0.2	+10.3	+0.0	24.9	52.6	-27.7	Black
8	22.499M	10.9	+0.5	+0.4	+0.2	+10.3	+0.0	22.3	50.0	-27.7	Black
9	613.957k	7.2	+0.1	+0.2	+0.3	+10.3	+0.0	18.1	46.0	-27.9	Black

10	21.752M	10.7	+0.5	+0.4	+0.2	+10.3	+0.0	22.1	50.0	-27.9	Black
11	21.878M	10.6	+0.5	+0.4	+0.2	+10.3	+0.0	22.0	50.0	-28.0	Black
12	338.346k	10.1	+0.1	+0.2	+0.1	+10.3	+0.0	20.8	49.2	-28.4	Black
13	21.625M	9.8	+0.5	+0.4	+0.2	+10.3	+0.0	21.2	50.0	-28.8	Black
14	22.752M	9.8	+0.5	+0.4	+0.2	+10.3	+0.0	21.2	50.0	-28.8	Black
15	241.628k	12.1	+0.1	+0.3	+0.3	+10.3	+0.0	23.1	52.0	-28.9	Black

CKC Laboratories Date: 1/31/2006 Time: 10:37:08 AM Indala WO#: 84492  
 FCC 15.207 - AVE Test Lead: Black 120V 60Hz Sequence#: 18  
 Indala M/N ASR-620++



Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Indala**  
 Specification: **FCC 15.207 - AVE**  
 Work Order #: **84492** Date: 1/31/2006  
 Test Type: **Conducted Emissions** Time: 10:35:42 AM  
 Equipment: **Long Range 125kHz Reader** Sequence#: 17  
 Manufacturer: Indala Tested By: Steve Behm  
 Model: ASR-620++ 120V 60Hz  
 S/N: 001

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

Function	Manufacturer	Model #	S/N
Long Range 125kHz Reader*	Indala	ASR-620++	001

**Support Devices:**

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

**Test Conditions / Notes:**

EUT is a long range reader with an operating frequency of 125kHz. EUT is mounted vertically on a non-conductive support to simulate normal installation. Temperature: 18°C, Relative Humidity: 38%. Frequency Range Investigated: 150kHz to 30MHz. Green and black DC wires are connected together to the black power supply lead. The power supply is bonded to earth.

**Transducer Legend:**

T1=Cable - Internal + cab	T2=LISN Insertion Loss s/n280
T3=HP Filter AN02608	T4=ATT 10d B Site D Conducted

**Measurement Data:**

Reading listed by margin.

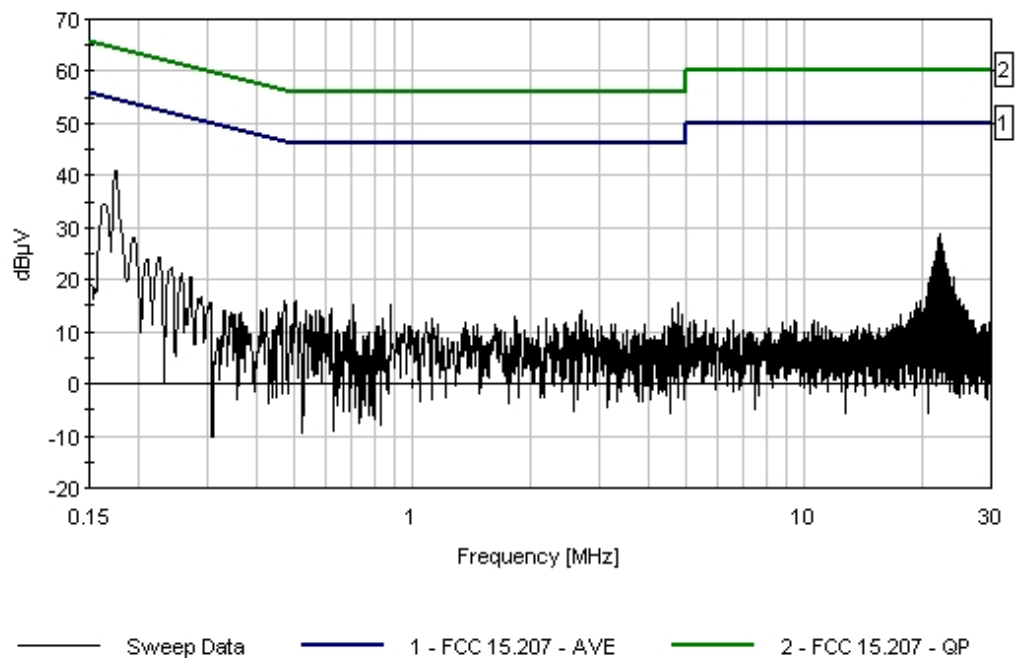
Test Lead: White

#	Freq MHz	Rdng dB $\mu$ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB $\mu$ V	Spec dB $\mu$ V	Margin dB	Polar Ant
1	174.725k	29.8	+0.1	+0.3	+0.5	+10.2	+0.0	40.9	54.7	-13.8	White
2	164.544k	22.6	+0.1	+0.3	+1.4	+10.2	+0.0	34.6	55.2	-20.6	White
3	22.247M	17.5	+0.5	+0.4	+0.2	+10.3	+0.0	28.9	50.0	-21.1	White
4	22.004M	16.5	+0.5	+0.4	+0.2	+10.3	+0.0	27.9	50.0	-22.1	White
5	22.130M	16.3	+0.5	+0.4	+0.2	+10.3	+0.0	27.7	50.0	-22.3	White
6	22.499M	15.6	+0.5	+0.4	+0.2	+10.3	+0.0	27.0	50.0	-23.0	White
7	21.878M	15.2	+0.5	+0.4	+0.2	+10.3	+0.0	26.6	50.0	-23.4	White
8	22.373M	15.1	+0.5	+0.4	+0.2	+10.3	+0.0	26.5	50.0	-23.5	White
9	21.625M	13.9	+0.5	+0.4	+0.2	+10.3	+0.0	25.3	50.0	-24.7	White



10	22.752M	13.9	+0.5	+0.4	+0.2	+10.3	+0.0	25.3	50.0	-24.7	White
11	21.752M	13.4	+0.5	+0.4	+0.2	+10.3	+0.0	24.8	50.0	-25.2	White
12	194.360k	17.3	+0.1	+0.3	+0.1	+10.2	+0.0	28.0	53.8	-25.8	White
13	22.625M	12.8	+0.5	+0.4	+0.2	+10.3	+0.0	24.2	50.0	-25.8	White
14	21.499M	12.1	+0.5	+0.4	+0.2	+10.3	+0.0	23.5	50.0	-26.5	White
15	23.004M	11.7	+0.5	+0.4	+0.2	+10.3	+0.0	23.1	50.0	-26.9	White

CKC Laboratories Date: 1/31/2006 Time: 10:35:42 AM Indala WO#: 84492  
 FCC 15.207 - AVE Test Lead: White 120V 60Hz Sequence#: 17  
 Indala M/N ASR-620++



Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Indala**  
 Specification: **FCC 15.209 9k-490KHz**  
 Work Order #: **84492** Date: 1/31/2006  
 Test Type: **Maximized Emissions** Time: 16:19:07  
 Equipment: **Long Range 125kHz Reader** Sequence#: 24  
 Manufacturer: Indala Tested By: S. Behm  
 Model: ASR-620++  
 S/N: 001

**Test Equipment:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
Agilent E4446A SA	US44300407	01/12/2005	01/12/2007	02660
EMCO Loop Antenna	1074	05/13/2005	05/13/2007	00226

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

Function	Manufacturer	Model #	S/N
Long Range 125kHz Reader*	Indala	ASR-620++	001

**Support Devices:**

Function	Manufacturer	Model #	S/N
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**Test Conditions / Notes:**

EUT is a long range reader with an operating frequency of 125kHz. EUT is mounted vertically on a non-conductive support to simulate normal installaion. Test distance correction factor used in accordance with 15.31 to correct test data for comparison to the limit. Temperature: 18°C, Relative Humidity: 38%. Frequency Range Investigated: Carrier. Green and black DC wires are connected together to the black power supply lead.

**Transducer Legend:**

T1=Cable - 10 Meter	T2=Mag Loop - AN 00226 - 9kHz-30M
T3=Fall Off Correction Factor	

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	Dist dB	Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	125.001k	88.8	+0.1	+10.2	-88.6	+0.0	10.5	25.7	-15.2	Paral	

Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Indala**  
 Specification: **FCC 15.209**  
 Work Order #: **84492** Date: 1/31/2006  
 Test Type: **Maximized Emissions** Time: 16:19:07  
 Equipment: **Long Range 125kHz Reader** Sequence#: 22  
 Manufacturer: Indala Tested By: S. Behm  
 Model: ASR-620++  
 S/N: 001

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

Function	Manufacturer	Model #	S/N
Long Range 125kHz Reader*	Indala	ASR-620++	001

**Support Devices:**

Function	Manufacturer	Model #	S/N
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**Test Conditions / Notes:**

EUT is a long range reader with an operating frequency of 125kHz. EUT is mounted vertically on a non-conductive support to simulate normal installaion. Test distance correction factor used in accordance with 15.31 to correct test data for comparison to the limit. Temperature: 18°C, Relative Humidity: 38%. Frequency Range Investigated: 9kHz to 30MHz. Green and black DC wires are connected together to the black power supply lead.

**Transducer Legend:**

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

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	Dist Table dB	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	1.762M	21.6	+0.4	-20.0	+10.1	+0.0	12.1	29.5	-17.4	Paral
2	29.635M	2.1	+1.2	-20.0	+5.6	+0.0	-11.1	29.5	-40.6	Paral
3	58.050k	31.3	+0.1	-60.0	+10.6	+0.0	-18.0	32.3	-50.3	Paral

Test Location: CKC Laboratories •4933 Sierra Pines Dr. • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **Indala**  
 Specification: **FCC 15.209**  
 Work Order #: **84492** Date: 1/31/2006  
 Test Type: **Maximized Emissions** Time: 15:34:18  
 Equipment: **Long Range 125kHz Reader** Sequence#: 21  
 Manufacturer: Indala Tested By: S. Behm  
 Model: ASR-620++  
 S/N: 001

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

Function	Manufacturer	Model #	S/N
Long Range 125kHz Reader*	Indala	ASR-620++	001

**Support Devices:**

Function	Manufacturer	Model #	S/N
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**Test Conditions / Notes:**

EUT is a long range reader with an operating frequency of 125kHz. EUT is mounted vertically on a non-conductive support to simulate normal installation. Test distance correction factor used in accordance with 15.31 to correct test data for comparison to the limit. Temperature: 18°C, Relative Humidity: 38%. Frequency Range Investigated: 30MHz to 1000MHz. Green and black DC wires are connected together to the black power supply lead. The power supply is bonded to earth.

**Transducer Legend:**

T1=Bilog Site D	T2=Amp - S/N 604
T3=Cable - 10 Meter	

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	Dist Table dB	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	60.010M	46.4	+6.1	-26.8	+1.7	+10.0	37.4	40.0	-2.6	Vert
	QP									
^	60.000M	47.7	+6.1	-26.8	+1.7	+10.0	38.7	40.0	-1.3	Vert
3	86.882M	43.0	+7.7	-26.9	+2.1	+10.0	35.9	40.0	-4.1	Vert
4	87.255M	42.7	+7.7	-26.9	+2.1	+10.0	35.6	40.0	-4.4	Vert
5	134.382M	36.0	+11.0	-26.7	+2.6	+10.0	32.9	43.5	-10.6	Vert
6	60.000M	32.2	+6.1	-26.8	+1.7	+10.0	23.2	40.0	-16.8	Horiz
7	186.757M	26.7	+8.2	-26.6	+3.1	+10.0	21.4	43.5	-22.1	Vert