



ELECTROMAGNETIC COMPATIBILITY (EMC) REPORT

EMISSIONS

Interlogix

Model AL-1263

FCC ID: CGG-AL-1623

December 2, 2002

Project No.: 02SC15191

Test Report No.: NC4969-120202

REPORT DIRECTORY

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1.0 General Information

1.1 Scope

Underwriters Laboratories Inc., authorizes the above named company to reproduce this Report, provided it is reproduced in its entirety. The data in this Report reflects only the items tested in the configurations and mode of operations described. All data recorded and photographs represents testing under the worst case conditions permitted by the requirements applied to the product. It is the manufacturer's responsibility to assure that additional production units are manufactured with identical electrical and mechanical components. Any modifications necessary for compliance made during testing must be implemented in all production units for compliance to be maintained.

Underwriters Laboratories Inc., shall have no liability for any deductions, inferences or generalizations drawn from this report. This report shall not be used by the client to claim product endorsement by NVLAP or any agency of the United States government

1.2 Purpose

Testing was performed to the following regulations:

Emissions Standards used: CFR 47 Part 15 Subpart B, CFR 47 Part 15 Subpart C

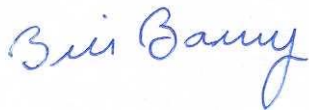
1.3 Test Results

☒ In Compliance

☐ Not in Compliance

1.4 Documentation Review/Approval

Tested By:



Bill Barry
Staff Engineer
International EMC Services
Department 3014A

Technical Review By:



Asim Tirmizi
Project Engineer
International EMC Services
Department 3014A

2.0 General Product Description

Applicant	: Interlogix
Manufactured By	: Same as Applicant
FCC ID	: CGG-AL-1623
Applicant Address	: 12345 SW Leveton Drive Tualitin, OR 97062
Applicant Contact	: Gene Hukkanen
Model/Type No.	: AL-1623
Date of Issue	: December 2, 2002
File No.	: NC4969
Test Report No.	: NC4969-120202
Project No.	: 02SC15191

Product Description

The product tested is a proximity card programmer. It is an intentional radiator operating at 125 kHz.

Equipment Size, Mobility, and Identification

Dimensions: 1-1/2 by 3 by 6 in.

Mobility: ☐ Hand-held ☒ Table-top ☐ Floor-standing
Serial No: 01053748

Electrical Ratings

	<u>Voltage</u> <u>[Volts]</u>	<u>Current or</u> <u>Power</u>	<u>Frequency</u> <u>[Hz]</u>	<u>Phase</u>
Eut	120	6.5 W	60	Single

Note: The unit operates at 9 Vdc which is generated by a separate power supply provided with the unit.

Test Voltage & Frequency

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

<u>Voltage</u>	<u>Frequency</u>
120 V	60 Hz

Clocks/Oscillators

Highest internal frequency does not exceed 108 MHz.

Equipment Type

☐ Prototype ☐ Pre-Production ☒ Production

Model Differences

Any other model(s) represented by the models tested in this investigation will be documented by the manufacturer.

Device Modifications

The following modifications were necessary for compliance: None

EUT and Peripherals

Description	Manufacturer	Model/Part #	Serial Number
EUT (main unit)	Interlogix	AL-1623	01053748
EUT (power supply)	LEI	280903003C0	0224
Laptop	Dell	PPS	02961

Cables

Cable Type	Shield	Length (meters)	Ferrite	Connector	Connection Point 1	Connection Point 2
Serial	Yes	15 m	N	DB-9	EUT	Laptop

2.1 Justification of Configuration

The EUT is provided in one configuration. The EUT serial port was connected to a laptop running software that was used to operate the EUT. The EUT was provided with an additional DB-9 port marked "Reader". No cable was connected to this port as the function of this port had not been implemented by the manufacturer at the time of testing.

2.2 EUT Operating Mode(s)

Equipment under test was operated during the measurement under the following conditions:

The EUT was placed in its standby state with a proximity card placed on top of the enclosure. The presence of the proximity card caused the unit to continuously transmit at 125 kHz. A laptop computer running custom software was used to operate the device.

3.0 Environmental Conditions in Test Lab

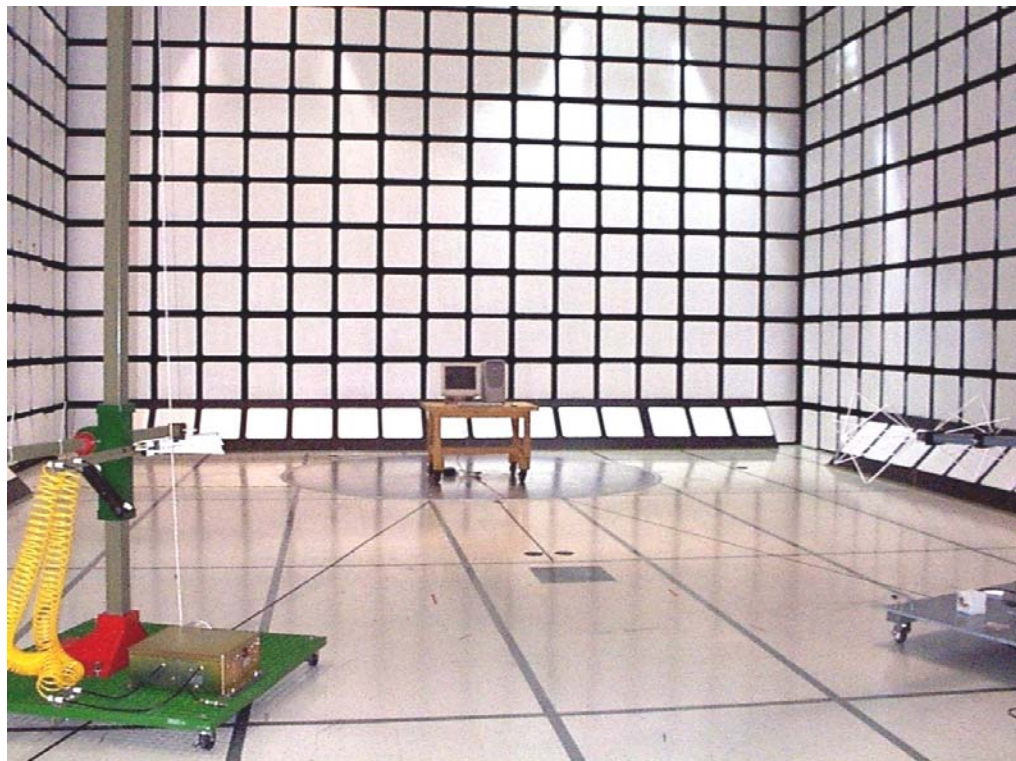
Temperature:	20-25 °C	Atmospheric Pressure:	680-1060 mbar
Relative Humidity:	30-60%		20.1-31.3 in. Hga

4.0 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the National Institute of Standards and Technology (NIST), therefore, all test data recorded in this report is traceable to NIST.

5.0 Test Facility

Underwriters Laboratories Inc.
1655 Scott Blvd.
Santa Clara, CA 95050
Phone: (408) 985-2400 x32905 Fax: (408) 556-6071



6.0 Accreditations and Authorizations



NVLAP: Recognized under the National Voluntary Laboratory Accreditation Program (NVLAP) for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC Guide 25 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results. The specific scope includes IEC/CISPR 22:1997, Amendment 1:1995, Amendment 2:1997, CNS 13438:1997, FCC Method - 47 CFR Part 15, AS/NZS 3548, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, and IEC 61000-4-11 testing.
NVLAP Lab code: 200252-0.



FCC: Details of the measurement facilities used for these tests have been filed with the Federal Communications Commission's Laboratory in Columbia, Maryland and accepted in a letter dated September 24, 1997 (Ref. No. 31040/SIT 1300F2).

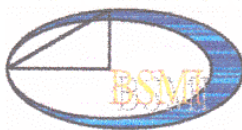


Industry Canada Industrie Canada

Industry of Canada: Accredited by Industry Canada for performance of radiated measurements. Our test site complies with RSP 100, Issue 7, Section 3.3.
File #: IC 2704



VCCI: Accepted as an Associate Member to the VCCI. The measurement facilities detailed in this test report have been registered in accordance with Regulations for Voluntary Control Measures, Article 8.
Registration Nos.: (Radiated Emissions) R-672, (Conducted Emissions) C-689.



BSMI: Accredited by BSMI (Bureau of Standards, Metrology and Inspection) in Taiwan.
License No.: SL2-IN-E-1027
Reference: IC 2704



ICASA: ICASA (Independent Communications Authority of South Africa) has appointed UL as a Designated Test Laboratory to test Telecommunications equipment for type approval in compliance with CISPR 22 to assist in fulfilling its mandate under section 54(1) of the Telecommunications Act, 1996 (Act 103 of 1996).



NIST/CAB: Validated by the European Commission as a U.S. Conformity Assessment Body (CAB) of the U.S.-EU Mutual Recognition Agreement (MRA) for the Electromagnetic Compatibility - Council Directive 89/336/EEC, Article 10 (2). Also validated for the Telecommunication Equipment-Council Directive 99/5/EC, Annex III and IV, Identification Number: 0983.

NIST/CAB: Provisioned to act as a U.S. Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the Asia Pacific Economic Cooperation (APEC) MRA between the American Institute in Taiwan (AIT) and the United States. Our laboratory is considered qualified to test equipment subject to the applicable EMC regulations of the Chinese Taipei Bureau of Standards, Metrology and Inspection (BSMI) which require testing to CNS 13438 (CISPR 22).

NIST/CAB: Recognized by the Infocomm Development Authority of Singapore (IDA) under the Asia Pacific Economic Cooperation Mutual Recognition Agreement (APEC MRA). Our laboratory is provisionally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA. Our scope of designation includes IDA TS EMC (CISPR 22), IEC 61000-4-2, -4-3, -4-4, -4-5, and -4-6.
U.S. Identifier Number: US0114

7.0 Emissions Test Regulations

The emissions tests were performed according to following regulations:

----- United States -----

CFR 47 Part 15 Subpart B and C : 2002

Code of Federal Regulations, Part 15, Radio Frequency Devices -
Intentional Radiators

7.1 Equipment Classifications



Class A Digital Device: *A digital device that is marketed for use in a commercial, industrial or business environment, exclusive of a device which is marketed for use by the general public or is intended to be used in the home.*



Class B Digital Device: *A digital device that is marketed for use in a residential environment notwithstanding use in commercial, business and industrial environments. Examples of such devices include, but are not limited to, personal computer, calculators, and similar electronic devices that are marketed for use by the general public.*

7.2 Field Strength Calculations

The field strength is calculated by adding the Transducer Factor (Antenna Factor) and Gain/Loss (Cable Loss, Preamp Gain) Factor to the Meter Reading. The basic equation with a sample calculation is as follows:

Field Strength = Meter Reading + Transducer Factor + Gain/Loss

Assume a receiver reading of 53.2 dBuV is obtained. The Transducer Factor of 5.1 dB and a Gain/Loss of -31 dB is added, giving a field strength of 27.3 dBuV.

$FS = 53.2 + 5.1 + (-31) = 27.3 \text{ dBuV}$

Use the following formula to convert dBμV to μV: $x = 10^{(y/20)}$, where x is the value in μV and y is the value in dBμV.

Level in uV = $10^{(27.3/20)} = 23.2 \text{ uV}$

7.3 Measurement Uncertainty

When a measurement is made the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. The following statement of measurement uncertainty is used to reflect the accuracy of the measured result as compared with its “true” value.

Uncertainty (dB)

Test Distance	Probability Distribution	Biconical Antenna			Log Periodic Antenna		
		10m +18 deg	10m -14 deg	3m	10m +18 deg	10m -14 deg	3m
Combined Standard Uncertainty $u_c(y)$	Normal	± 1.24	± 1.25	± 1.29	± 1.14	± 1.13	± 1.9
Expanded uncertainty U (level of confidence = 95%)	Normal (k = 2)	± 2.47	± 2.49	± 2.59	± 2.28	± 2.27	± 2.76

Conducted Voltage Emissions	Probability Distribution
Combined Standard Uncertainty $u_c(y)$	Normal
Expanded uncertainty U (level of confidence = 95%)	Normal (k = 2)
	± 1.08
	± 2.16

$u_c(y)$ = square root of the sum of squares of the individual standard deviation uncertainties.

U = combined standard uncertainty multiplied by the coverage factor: k. This defines an interval about the measured result that will encompass the true value with a confidence level of approximately 95%. If a higher level of confidence is required then k=3 (CL=97%) can be used.

“ISO Guide to the Expression of Uncertainty in Measurements” and ‘NIS81: The Treatment of Uncertainty in EMC Measurements” were the basis for determining the uncertainty levels of our measurements. Details of those calculations are available upon request.

7.4 Measurement Bandwidths

Frequency Range (MHz)	Peak Data BW (kHz)	Quasi-Peak Data BW (kHz)	Average Data BW (kHz)
0.01 - 0.15	1	3	0.2
0.15 - 30	10	9	100
30 - 1000	100	120	120
Above 1000	1000	N/A	1000

7.5 Conducted Voltage Emissions

Test Location

Ground Plane #1 (Test Station 5)

Date Tested: 11-19-2002

Test Instruments

Instrument	Manufacturer	Model	ID#	Last	Cal Next
Spectrum Analyzer	Hewlett-Packard	8546A	8098	11/13/2002	11/13/2003

Test Accessories

Instrument	Manufacturer	Model	ID#	Last	Cal Next
LISN	Electro-Metrics	EM-7820-1	8007	2/22/2002	2/22/2003
LISN	Electro-Metrics	EM-7820-1	8011	12/6/2001	12/6/2002
Transient Limiter	Com-Power	HZ-560	8137	3/12/2002	3/12/2003

UL Procedure

3314-LPG-004

FCC Part 15 Requirements

15.207, 15.107

Frequency Range of Measurement

150 kHz to 30 MHz

Test Results

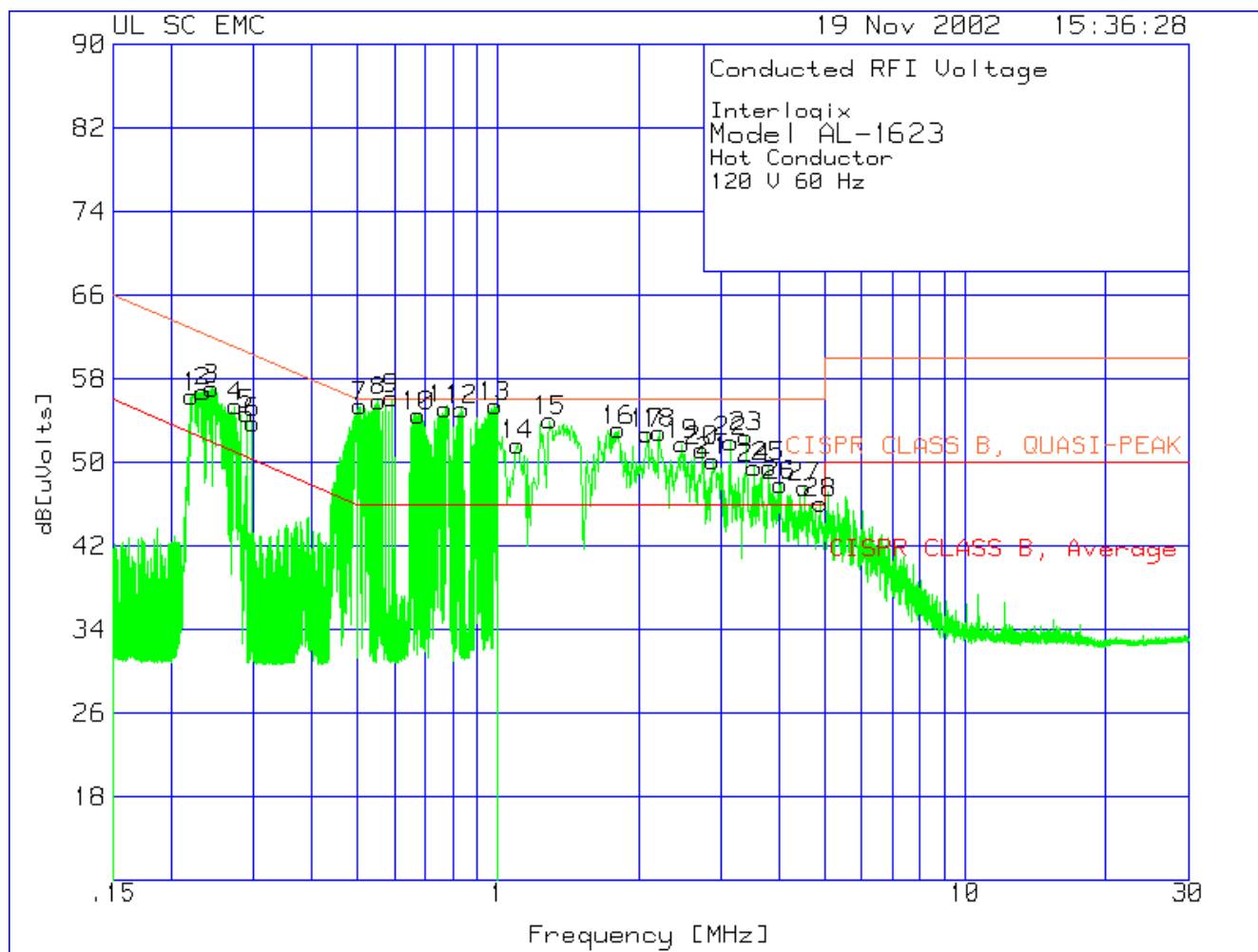
The Requirements are:

MET minimum margin to quasi-peak limit is 4.67 dB μ V at 0.593 MHz.
minimum margin to average limit is 9.83 dB μ V at 3.8 MHz.

Remarks

None.

Test Data



Interlogix
Model TS0870
Hot Conductor
120 V 60 Hz

No.	Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit:1	2
Range: 1 .15 - 1MHz -----							
1	.22046	45.75 pk	.09	10.41	56.25	62.8	52.8
				Margin [dB]		-6.55	3.45
2	.23393	46.29 pk	.09	10.39	56.77	62.31	52.31
				Margin [dB]		-5.54	4.46
3	.2439	46.56 pk	.1	10.38	57.04	61.96	51.96
				Margin [dB]		-4.92	5.08
4	.27358	44.89 pk	.1	10.37	55.36	61.01	51.01
				Margin [dB]		-5.65	4.35
5	.28998	44.16 pk	.1	10.33	54.59	60.52	50.52
				Margin [dB]		-5.93	4.07
6	.29803	43.32 pk	.1	10.35	53.77	60.3	50.3
				Margin [dB]		-6.53	3.47
7	.50641	44.97 pk	.15	10.24	55.36	56	46
				Margin [dB]		-.64	9.36
8	.55442	45.5 pk	.13	10.22	55.85	56	46
				Margin [dB]		-.15	9.85
9	.59221	45.7 pk	.17	10.22	56.09	56	46
				Margin [dB]		.09	10.09
10	.67526	44.11 pk	.16	10.2	54.47	56	46
				Margin [dB]		-1.53	8.47
11	.77216	44.72 pk	.17	10.22	55.11	56	46
				Margin [dB]		-.89	9.11
12	.83589	44.68 pk	.17	10.23	55.08	56	46
				Margin [dB]		-.92	9.08
13	.98404	44.96 pk	.22	10.2	55.38	56	46
				Margin [dB]		-.62	9.38
Range: 2 1 - 30MHz -----							
14	1.10127	41.22 pk	.23	10.21	51.66	56	46
				Margin [dB]		-4.34	5.66
15	1.28935	43.55 pk	.25	10.2	54	56	46
				Margin [dB]		-2	8
16	1.81018	42.55 pk	.31	10.21	53.07	56	46
				Margin [dB]		-2.93	7.07
17	2.08506	42.17 pk	.34	10.23	52.74	56	46
				Margin [dB]		-3.26	6.74
18	2.21527	42.24 pk	.35	10.22	52.81	56	46
				Margin [dB]		-3.19	6.81
19	2.47568	41.12 pk	.38	10.22	51.72	56	46
				Margin [dB]		-4.28	5.72
20	2.73609	40.52 pk	.4	10.23	51.15	56	46
				Margin [dB]		-4.85	5.15
21	2.888	39.5 pk	.42	10.22	50.14	56	46
				Margin [dB]		-5.86	4.14
22	3.14842	41.3 pk	.44	10.22	51.96	56	46
				Margin [dB]		-4.04	5.96

Interlogix
Model TS0870
Hot Conductor
120 V 60 Hz

No.	Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit:1	2
23	3.39436	41.75 pk	.47	10.23	52.45	56	46
				Margin [dB]		-3.55	6.45
24	3.53904	38.8 pk	.48	10.21	49.49	56	46
				Margin [dB]		-6.51	3.49
25	3.79945	38.81 pk	.5	10.25	49.56	56	46
				Margin [dB]		-6.44	3.56
26	4.01646	37.07 pk	.52	10.23	47.82	56	46
				Margin [dB]		-8.18	1.82
27	4.53006	36.8 pk	.55	10.26	47.61	56	46
				Margin [dB]		-8.39	1.61
28	4.89898	35.26 pk	.57	10.28	46.11	56	46
				Margin [dB]		-9.89	.11

LIMIT 1: CISPR CLASS B, QUASI-PEAK
LIMIT 2: CISPR CLASS B, Average
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
tm - Trace Math Result

Interlogix
Model TS0870
Hot Conductor
120 V 60 Hz

Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit:1	2
=====						
Range: 1 .15 - 1MHz						
.22046	2.28av	.1	10.4	12.78	62.8	52.8
			Margin [dB]:		-50.02	-40.02
.23393	5.85av	.1	10.4	16.35	62.3	52.3
			Margin [dB]:		-45.95	-35.95
.2439	5.7av	.1	10.4	16.2	62	52
			Margin [dB]:		-45.8	-35.8
.27358	24.94av	.1	10.4	35.44	61	51
			Margin [dB]:		-25.56	-15.56
.28998	29.82av	.1	10.3	40.22	60.5	50.5
			Margin [dB]:		-20.28	-10.28
.29803	29.65av	.1	10.3	40.05	60.3	50.3
			Margin [dB]:		-20.25	-10.25
.50641	9.23av	.1	10.2	19.53	56	46
			Margin [dB]:		-36.47	-26.47
.55442	17.53av	.1	10.2	27.83	56	46
			Margin [dB]:		-28.17	-18.17
.59221	20.13av	.2	10.2	30.53	56	46
			Margin [dB]:		-25.47	-15.47
.67526	13.88av	.2	10.2	24.28	56	46
			Margin [dB]:		-31.72	-21.72
.77216	8.99av	.2	10.2	19.39	56	46
			Margin [dB]:		-36.61	-26.61
.83589	23.48av	.2	10.2	33.88	56	46
			Margin [dB]:		-22.12	-12.12
.98404	18.27av	.2	10.2	28.67	56	46
			Margin [dB]:		-27.33	-17.33
Range: 2 1 - 30MHz						
1.10127	20.96av	.2	10.2	31.36	56	46
			Margin [dB]:		-24.64	-14.64
1.28935	22.57av	.3	10.2	33.07	56	46
			Margin [dB]:		-22.93	-12.93
1.81018	25.07av	.3	10.2	35.57	56	46
			Margin [dB]:		-20.43	-10.43
2.08506	16.3av	.3	10.2	26.8	56	46
			Margin [dB]:		-29.2	-19.2
2.21527	18.89av	.4	10.2	29.49	56	46
			Margin [dB]:		-26.51	-16.51
2.47568	19.97av	.4	10.2	30.57	56	46
			Margin [dB]:		-25.43	-15.43
2.73609	16.93av	.4	10.2	27.53	56	46
			Margin [dB]:		-28.47	-18.47
2.888	18.54av	.4	10.2	29.14	56	46
			Margin [dB]:		-26.86	-16.86
3.14842	16.35av	.4	10.2	26.95	56	46
			Margin [dB]:		-29.05	-19.05
3.39436	20.73av	.5	10.2	31.43	56	46
			Margin [dB]:		-24.57	-14.57

Interlogix
Model TS0870
Hot Conductor
120 V 60 Hz

Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit:1	2
3.53904	23.39av	.5	10.2	34.09	56	46
			Margin [dB]:		-21.91	-11.91
3.79945	25.37av	.5	10.3	36.17	56	46
			Margin [dB]:		-19.83	-9.83
4.01646	19.07av	.5	10.2	29.77	56	46
			Margin [dB]:		-26.23	-16.23
4.53006	15.42av	.6	10.3	26.32	56	46
			Margin [dB]:		-29.68	-19.68
4.89898	13.49av	.6	10.3	24.39	56	46
			Margin [dB]:		-31.61	-21.61

NOTE: "+" - Indicates an emission level in excess of the
applicable limit (s).

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection

LIMIT 1: CISPR CLASS B, QUASI-PEAK
LIMIT 2: CISPR CLASS B, Average
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

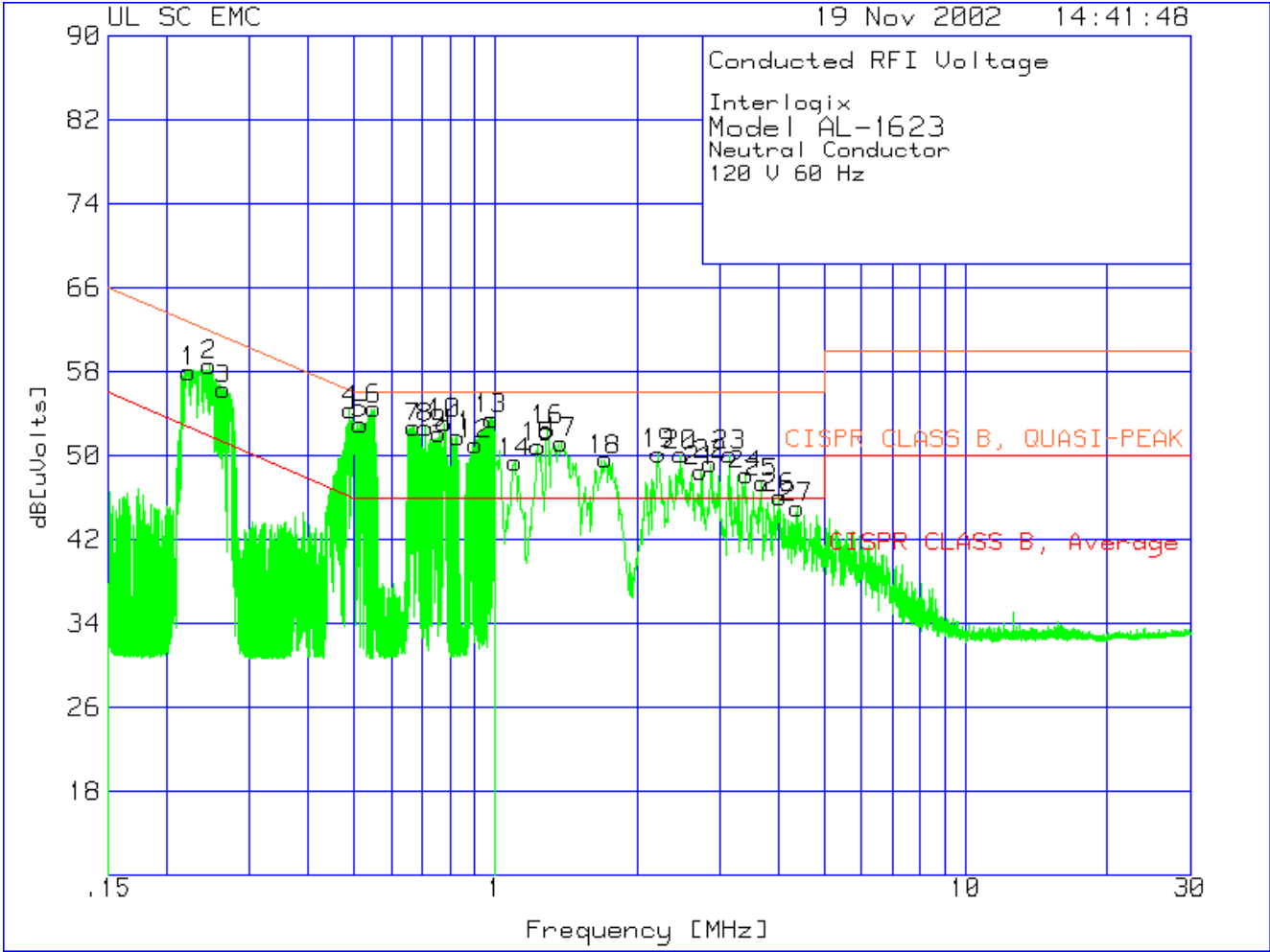
Interlogix
Model TS0870
Hot Conductor
120 V 60 Hz

Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit:1	2
=====						
Range: 1	.15 - 1MHz					
.50637	20.63qp	.1	10.2	30.93	56	46
			Margin [dB]:		-25.07	-15.07
.55429	34.8qp	.1	10.2	45.1	56	46
			Margin [dB]:		-10.9	-.9
.59262	40.93qp	.2	10.2	51.33	56	46
			Margin [dB]:		-4.67	5.33
.77862	20.97qp	.2	10.2	31.37	56	46
			Margin [dB]:		-24.63	-14.63
.9842	37.19qp	.2	10.2	47.59	56	46
			Margin [dB]:		-8.41	1.59

NOTE: "+" - Indicates an emission level in excess of the
applicable limit (s).

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection

LIMIT 1: CISPR CLASS B, QUASI-PEAK
LIMIT 2: CISPR CLASS B, Average
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE



Interlogix
Model TS0870
Neutral Conductor
120 V 60 Hz

Test No.	Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit:1	2
=====							
Range: 1 .15 - 1MHz -----							
1	.22283	47.53 pk	.09	10.39	58.01	62.71	52.71
				Margin [dB]		-4.7	5.3
2	.24652	48.12 pk	.1	10.38	58.6	61.87	51.87
				Margin [dB]		-3.27	6.73
3	.26461	45.89 pk	.1	10.34	56.33	61.29	51.29
				Margin [dB]		-4.96	5.04
4	.48995	43.91 pk	.15	10.25	54.31	56.17	46.17
				Margin [dB]		-1.86	8.14
5	.51614	42.62 pk	.14	10.25	53.01	56	46
				Margin [dB]		-2.99	7.01
6	.55205	44.09 pk	.12	10.22	54.43	56	46
				Margin [dB]		-1.57	8.43
7	.66841	42.31 pk	.17	10.2	52.68	56	46
				Margin [dB]		-3.32	6.68
8	.70943	42.31 pk	.15	10.2	52.66	56	46
				Margin [dB]		-3.34	6.66
9	.75957	41.69 pk	.17	10.23	52.09	56	46
				Margin [dB]		-3.91	6.09
10	.77902	42.69 pk	.17	10.21	53.07	56	46
				Margin [dB]		-2.93	7.07
11	.82965	41.41 pk	.17	10.23	51.81	56	46
				Margin [dB]		-4.19	5.81
12	.90709	40.65 pk	.2	10.2	51.05	56	46
				Margin [dB]		-4.95	5.05
13	.97755	43.06 pk	.22	10.2	53.48	56	46
				Margin [dB]		-2.52	7.48

Range: 2 1 - 30MHz -----							
14	1.10127	38.92 pk	.23	10.21	49.36	56	46
				Margin [dB]		-6.64	3.36
15	1.23148	40.36 pk	.25	10.23	50.84	56	46
				Margin [dB]		-5.16	4.84
16	1.28935	42.01 pk	.25	10.2	52.46	56	46
				Margin [dB]		-3.54	6.46
17	1.37615	40.74 pk	.26	10.23	51.23	56	46
				Margin [dB]		-4.77	5.23
18	1.70891	39.11 pk	.3	10.2	49.61	56	46
				Margin [dB]		-6.39	3.61
19	2.2225	39.61 pk	.35	10.23	50.19	56	46
				Margin [dB]		-5.81	4.19
20	2.47568	39.46 pk	.38	10.22	50.06	56	46
				Margin [dB]		-5.94	4.06
21	2.73609	37.88 pk	.4	10.23	48.51	56	46
				Margin [dB]		-7.49	2.51
22	2.8663	38.53 pk	.42	10.21	49.16	56	46
				Margin [dB]		-6.84	3.16

Interlogix
Model TS0870
Neutral Conductor
120 V 60 Hz

No.	Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit:1	2
23	3.14842	39.39 pk	.44	10.22	50.05	56	46
				Margin [dB]		-5.95	4.05
24	3.40883	37.47 pk	.47	10.23	48.17	56	46
				Margin [dB]		-7.83	2.17
25	3.68371	36.7 pk	.49	10.23	47.42	56	46
				Margin [dB]		-8.58	1.42
26	4.00923	35.28 pk	.52	10.23	46.03	56	46
				Margin [dB]		-9.97	.03
27	4.37815	34.24 pk	.54	10.25	45.03	56	46
				Margin [dB]		-10.97	-.97

LIMIT 1: CISPR CLASS B, QUASI-PEAK
LIMIT 2: CISPR CLASS B, Average
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
tm - Trace Math Result

Interlogix
Model TS0870
Neutral Conductor
120 V 60 Hz

Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit:1	2
=====						
Range: 1 .15 - 1MHz						
.22283	4.16av	.1	10.4	14.66	62.7	52.7
			Margin [dB]:		-48.04	-38.04
.24652	11.02av	.1	10.4	21.52	61.9	51.9
			Margin [dB]:		-40.38	-30.38
.26461	31.23av	.1	10.3	41.63	61.3	51.3
			Margin [dB]:		-19.67	-9.67
.48995	4.71av	.2	10.2	15.11	56.2	46.2
			Margin [dB]:		-41.09	-31.09
.51614	16.28av	.1	10.2	26.58	56	46
			Margin [dB]:		-29.42	-19.42
.55205	17.93av	.1	10.2	28.23	56	46
			Margin [dB]:		-27.77	-17.77
.66841	12.43av	.2	10.2	22.83	56	46
			Margin [dB]:		-33.17	-23.17
.70943	7.89av	.2	10.2	18.29	56	46
			Margin [dB]:		-37.71	-27.71
.75957	6.12av	.2	10.2	16.52	56	46
			Margin [dB]:		-39.48	-29.48
.77902	5.64av	.2	10.2	16.04	56	46
			Margin [dB]:		-39.96	-29.96
.82965	18.77av	.2	10.2	29.17	56	46
			Margin [dB]:		-26.83	-16.83
.90709	19.07av	.2	10.2	29.47	56	46
			Margin [dB]:		-26.53	-16.53
.97755	11.07av	.2	10.2	21.47	56	46
			Margin [dB]:		-34.53	-24.53
Range: 2 1 - 30MHz						
1.10127	18.91av	.2	10.2	29.31	56	46
			Margin [dB]:		-26.69	-16.69
1.23148	20.43av	.2	10.2	30.83	56	46
			Margin [dB]:		-25.17	-15.17
1.28935	22.87av	.3	10.2	33.37	56	46
			Margin [dB]:		-22.63	-12.63
1.37615	15.5av	.3	10.2	26	56	46
			Margin [dB]:		-30	-20
1.70891	15.92av	.3	10.2	26.42	56	46
			Margin [dB]:		-29.58	-19.58
2.2225	16.04av	.4	10.2	26.64	56	46
			Margin [dB]:		-29.36	-19.36
2.47568	16.56av	.4	10.2	27.16	56	46
			Margin [dB]:		-28.84	-18.84
2.73609	16.44av	.4	10.2	27.04	56	46
			Margin [dB]:		-28.96	-18.96
2.8663	15.87av	.4	10.2	26.47	56	46
			Margin [dB]:		-29.53	-19.53
3.14842	14.5av	.4	10.2	25.1	56	46
			Margin [dB]:		-30.9	-20.9

Interlogix
Model TS0870
Neutral Conductor
120 V 60 Hz

Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts]	Limit:1	2
3.40883	18.6av	.5	10.2	29.3	56	46
			Margin [dB]:		-26.7	-16.7
3.68371	24.58av	.5	10.2	35.28	56	46
			Margin [dB]:		-20.72	-10.72
4.00923	16.04av	.5	10.2	26.74	56	46
			Margin [dB]:		-29.26	-19.26
4.37815	18.01av	.5	10.3	28.81	56	46
			Margin [dB]:		-27.19	-17.19

NOTE: "+" - Indicates an emission level in excess of the
applicable limit (s).

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection

LIMIT 1: CISPR CLASS B, QUASI-PEAK
LIMIT 2: CISPR CLASS B, Average

Photograph



7.6 Radiated Electric Field Emissions

Test Location

10 Meter Semi-Anechoic Chamber (Test Station 2) (Last NSA: 3/19/02; Next NSA 3/19/03)

Date Tested: 11-19-2002

Test Instruments

Instrument	Manufacturer	Model	ID#	Last	Cal
					Next
Spectrum Analyzer	Hewlett-Packard	8566B	8034	4/11/2002	4/11/2003

Test Accessories

Instrument	Manufacturer	Model	ID#	Last	Cal
					Next
Biconical Antenna	Electro-Metrics	EM-6912A	8082	7/2/2002	7/2/2003
Log Periodic Antenna	Electro-Metrics	EM-6950	8083	7/2/2002	7/2/2003
0.6 m Loop Antenna (10 kHz to 30 MHz)	Electro-Metrics	EM-6872	8014	11/30/2001	11/30/2002
6dB Res Band Display	Hewlett-Packard	85662A	8031	4/11/2002	4/11/2003
Quasi-Peak Detector	Hewlett-Packard	59650A	8030	4/11/2002	4/11/2003
Switch Driver	Hewlett-Packard	11713A	8036	4/11/2002	4/11/2003
Preselector	Hewlett-Packard	85685A	8037	4/11/2002	4/11/2003
Pre-amplifier	Sonoma Instruments	310N	8085	11/30/2001	11/30/2002

UL Procedure

3314-LPG-013

FCC Part 15 Requirements

15.209, 15.109

Frequency Range of Measurement

0.01 MHz to 1 GHz

Measurement Distance

3 meters from 0.01 MHz to 30 MHz

10 meters from 30 MHz to 1 GHz

Test Results

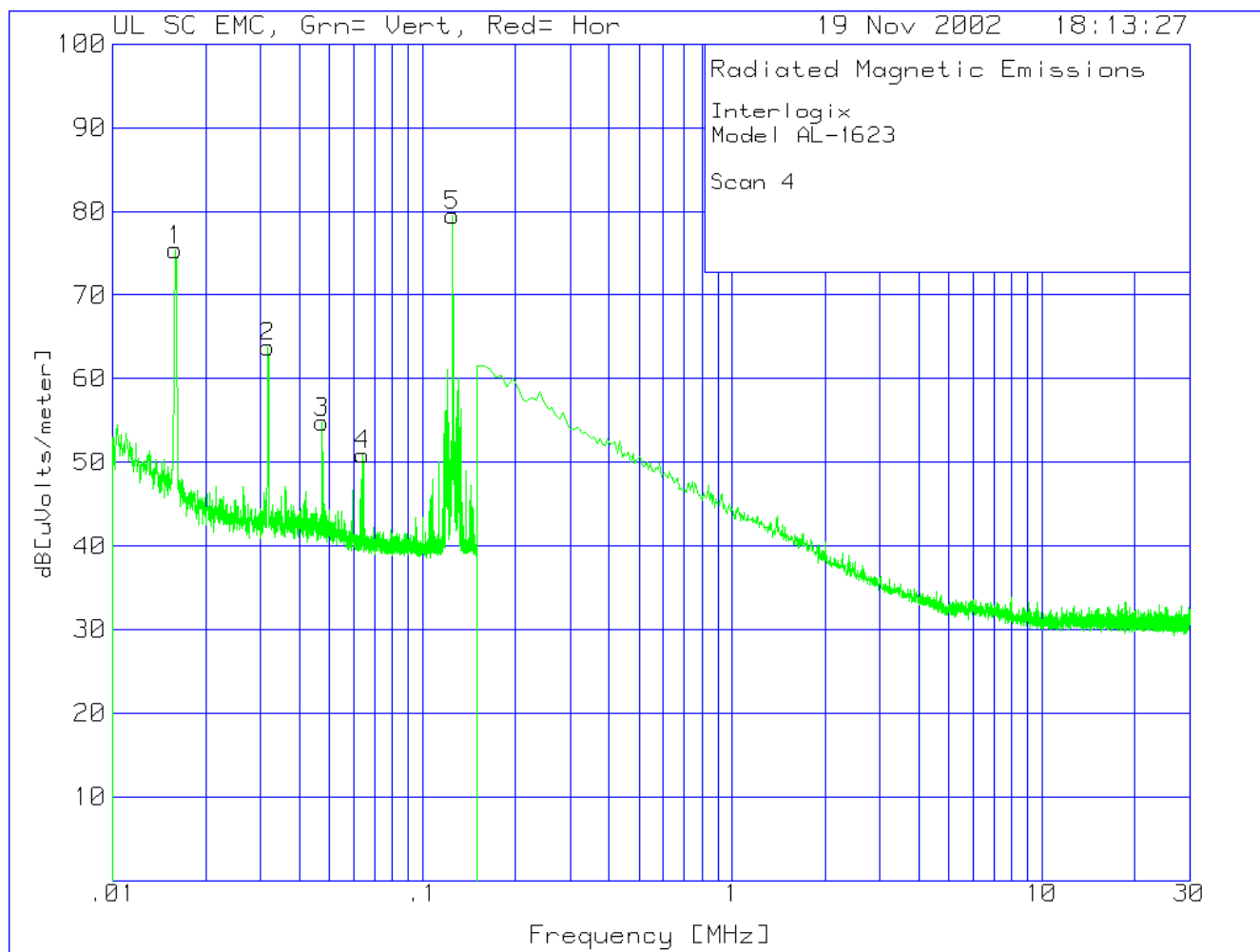
The requirements are:

MET minimum margin is greater than 10 dB ($\mu\text{V/m}$) at all frequencies.

Remarks:

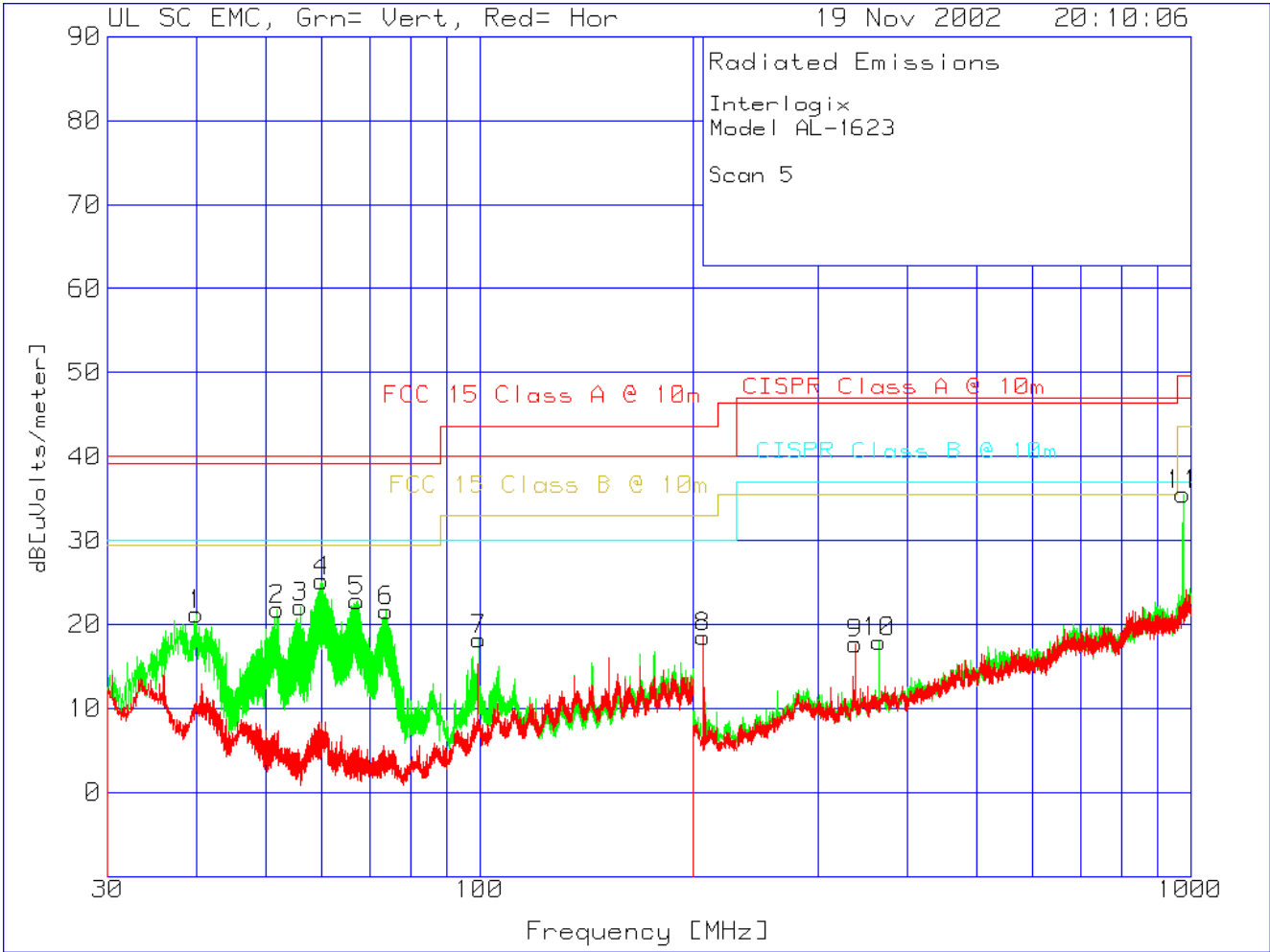
Measurements at 3 meters are extrapolated to 300 meters using -40 dB/decade correction factor. For measurements of fundamental, refer to Section 7.7. Photo shows sign indicating OEM model number TS0870 which was later changed by Interlogix to Model AL-1623.

Test Data



FCC 15.209 Spurious Emissions from 0.01-30 MHz:

Frequency, MHz	S/A Measurement dBuV (quasipeak)	Cable Loss dB	Antenna Factor dB/m	300 m correction	Corrected Measurement dBuV/m	Limit dBuV/m	Margin dB
0.0157	18.1	0.18	58.65	-80	-3.07	25.7	-28.77
0.0315	10.76	0.22	56.53	-80	-12.49	25.7	-38.19
0.0472	4.52	0.19	56.63	-80	-18.66	25.7	-44.36
0.064	2.27	0.16	57.1	-80	-20.47	25.7	-46.17



Interlogix
Model TS0870
Scan 5

No.	Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2
=====							
Range: 1 30 - 200MHz -----							
1	39.9375	39.12 pk	-31.32	13.4	21.2	40	39.08
	Azimuth:50	Height:100	Vert	Margin [dB]		-18.8	-17.88
2	51.956	44.51 pk	-31.21	8.5	21.8	40	39.08
	Azimuth:273	Height:100	Vert	Margin [dB]		-18.2	-17.28
3	55.9905	45.94 pk	-31.14	7.3	22.1	40	39.08
	Azimuth:187	Height:296	Vert	Margin [dB]		-17.9	-16.98
4	59.9825	49.18 pk	-31.08	7.1	25.2	40	39.08
	Azimuth:16	Height:296	Vert	Margin [dB]		-14.8	-13.88
5	67.2446	47.42 pk	-31.02	6.4	22.8	40	39.08
	Azimuth:273	Height:197	Vert	Margin [dB]		-17.2	-16.28
6	73.9545	45.56 pk	-30.96	7	21.6	40	39.08
	Azimuth:258	Height:197	Vert	Margin [dB]		-18.4	-17.48
7	99.7327	37.55 pk	-30.65	11.3	18.2	40	43.52
	Azimuth:232	Height:100	Vert	Margin [dB]		-21.8	-25.32

Range: 3 200 - 1000MHz -----							
10	364.8763	33.21 pk	-29.51	14.2	17.9	47	46.44
	Azimuth:225	Height:299	Vert	Margin [dB]		-29.1	-28.54
11	976.4177	37.64 pk	-26.74	24.6	35.5	47	49.54
	Azimuth:126	Height:199	Vert	Margin [dB]		-11.5	-14.04

Range: 4 200 - 1000MHz -----							
8	206.5951	37.68 pk	-30.35	11.17	18.5	40	43.52
	Azimuth:9	Height:398	Horz	Margin [dB]		-21.5	-25.02
9	337.8966	33.12 pk	-29.61	14.19	17.7	47	46.44
	Azimuth:242	Height:398	Horz	Margin [dB]		-29.3	-28.74

LIMIT 1: CISPR Class A @ 10m
LIMIT 2: FCC 15 Class A @ 10m

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
tm - Trace Math Result

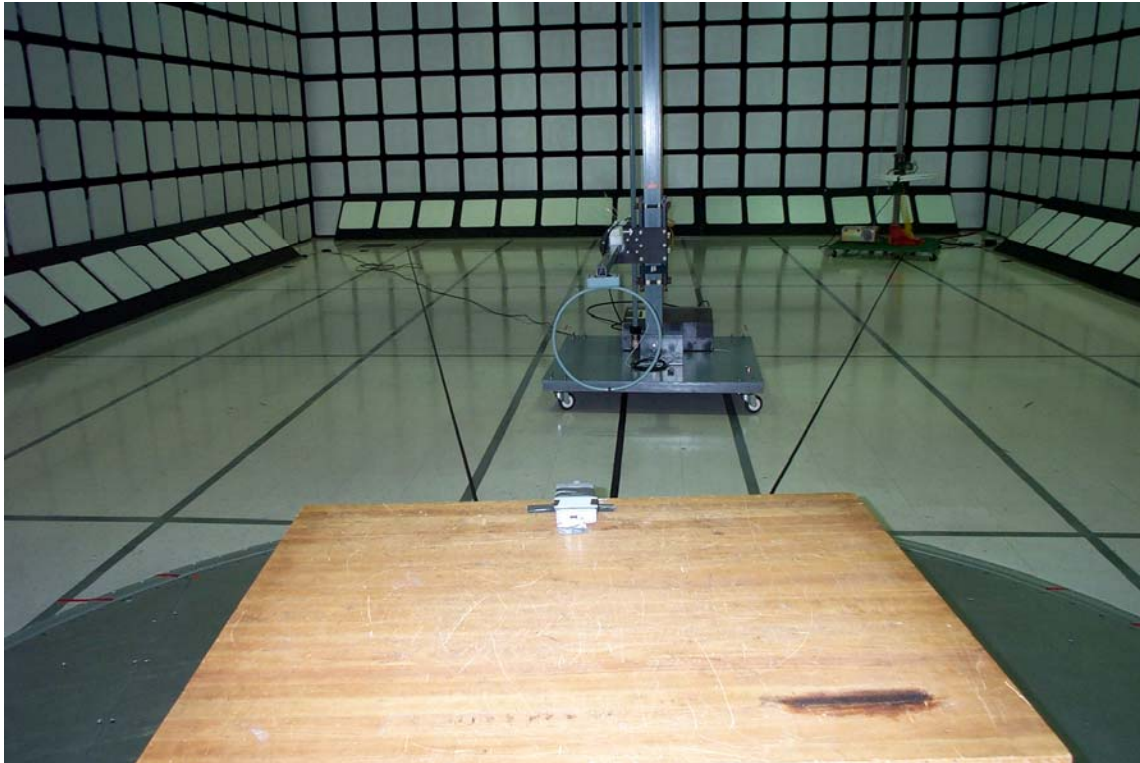
Interlogix
Model TS0870
Scan 5

Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2
=====						
Range: 1 30 - 200MHz						
59.9439	48.52 qp	-31.08	7.1	24.54	40	39.08
Azimuth: 40	Height:285	Vert		Margin [dB]:	-15.46	-14.54
Range: 3 200 - 1000MHz						
975.3068	20.69 qp	-26.76	24.6	18.53	47	49.54
Azimuth: 63	Height:187	Vert		Margin [dB]:	-28.47	-31.01

LIMIT 1: CISPR Class A @ 10m
LIMIT 2: FCC 15 Class A @ 10m

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - Average log detector

Photographs



7.7 Radiated Electric Field Fundamental Measurements

Test Location

Date Tested: 11-19-02

10 Meter Semi-Anechoic Chamber (Test Station 2) (Last NSA: 3/19/02; Next NSA 3/19/03)

Test Instruments

Instrument	Manufacturer	Model	ID#	Last	Cal Next
Spectrum Analyzer	Hewlett-Packard	8566B	8034	4/11/2002	4/11/2003

Test Accessories

Instrument	Manufacturer	Model	ID#	Last	Cal Next
0.6 m Loop Antenna (10 kHz to 30 MHz)	Electro-Metrics	EM-6872	8014	11/30/2001	11/30/2002
6dB Res Band Display	Hewlett-Packard	85662A	8031	4/11/2002	4/11/2003
Quasi-Peak Detector	Hewlett-Packard	59650A	8030	4/11/2002	4/11/2003
Switch Driver	Hewlett-Packard	11713A	8036	4/11/2002	4/11/2003
Preselector	Hewlett-Packard	85685A	8037	4/11/2002	4/11/2003

UL Procedure

The following measurements of the transmitter fundamental frequency were made:

1. Field Strength at 3 m with the unit operating at 120 V ac, 60 Hz.
2. Field Strength at 3 m with the unit operating at 102 V ac, 60 Hz
3. Field Strength at 3 m with the unit operating at 138 V ac, 60 Hz

Field strength measurements at 3 m were extrapolated to 300 m using -40dB/decade factor

The EUT was examined to determine the type antenna connection.

The fundamental frequency (including 20 dB bandwidth) was measured.

FCC Part 15 Requirements

15.203, 15.205, 15.209, 15.31(e), 15.31(m),

Frequency Range of Measurement

125 kHz

Measurement Distance

3 meters

Test Results

FCC 15.31(e) Voltage Variation and 15.209 at 125 kHz:

Supply Voltage 60 Hz	S/A Measurement dBuV (peak)	Cable Loss dB	Antenna Factor dB/m	300 m correction dB	Corrected Measurement dBuV/m	Limit dBuV/m	Margin dB
102 V ac	21.2	0.12	57.7	-80	-0.98	25.7	-26.68
120 V ac	20.5	0.12	57.7	-80	-1.68	25.7	-27.38
138 V ac	21.2	0.12	57.7	-80	-0.98	25.7	-26.68

15.31(m) Number of Channels: The EUT operates on one channel

15.203 Antenna Requirements: The EUT is provided with a integral non-detachable antenna.

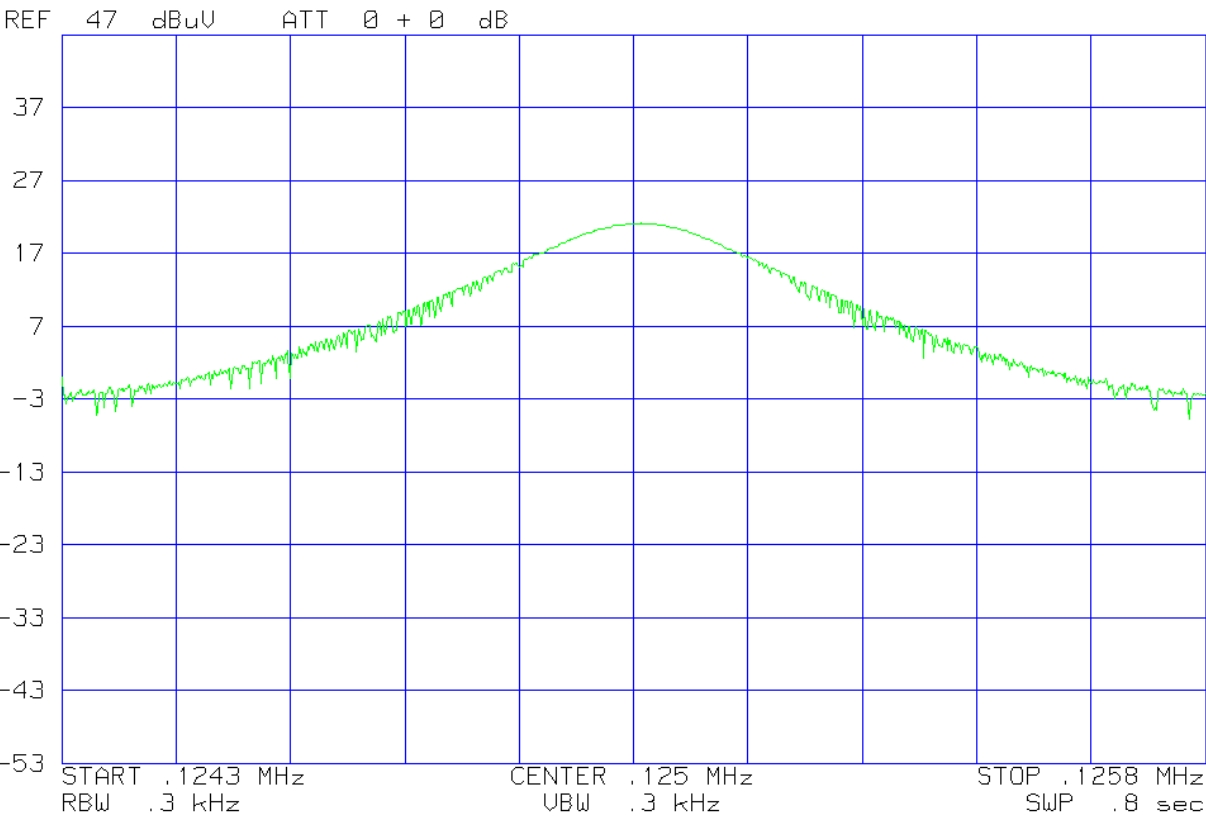
15.205 Restricted Bands of Operation: The 125 kHz fundamental frequency does not fall within a restricted band (20 dB bandwidth is less than 1.6 kHz)

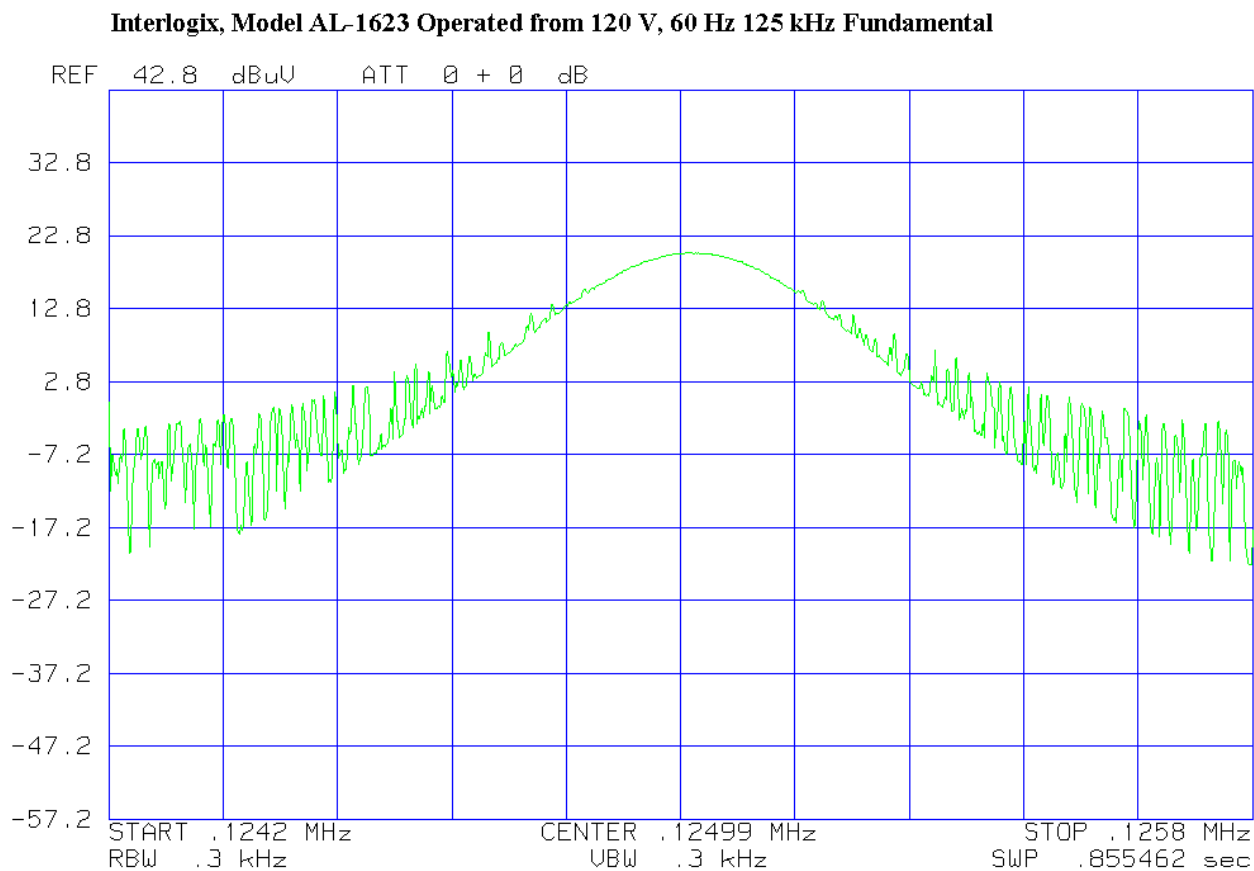
Remarks:

None.

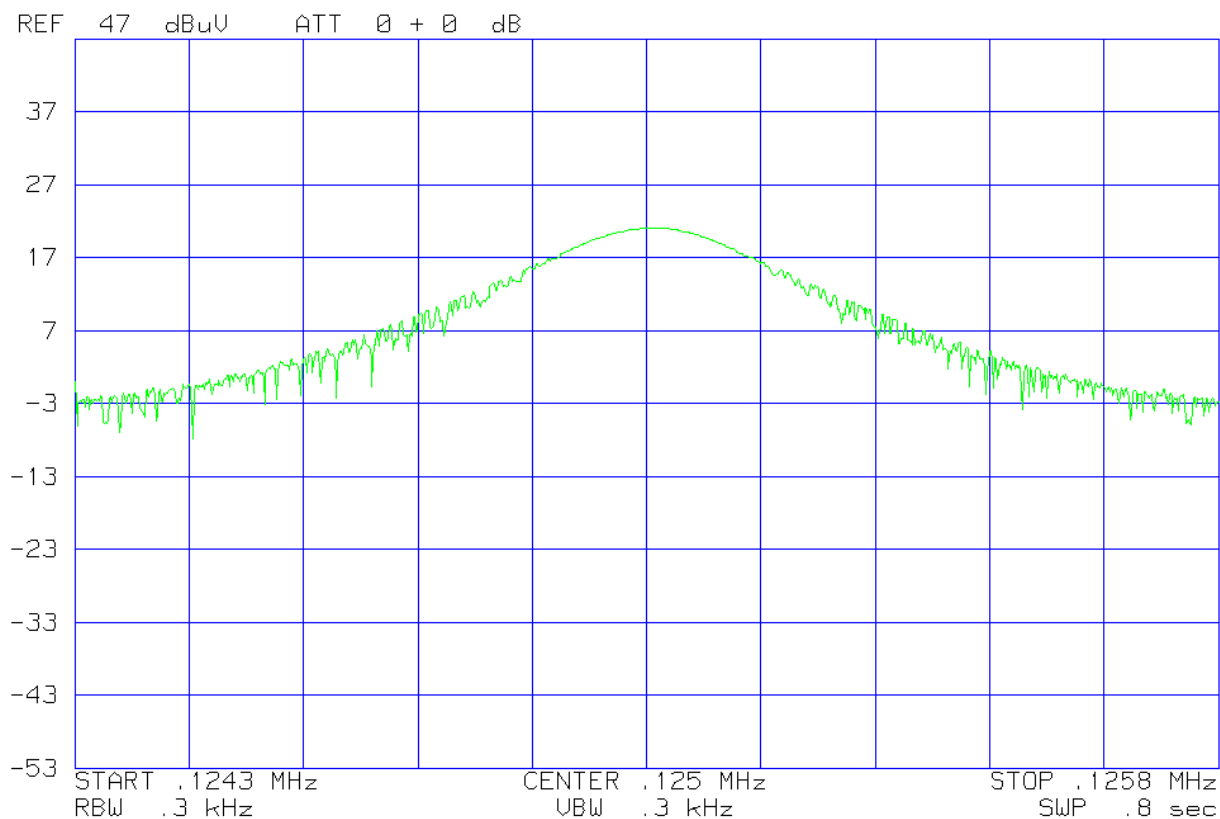
Test Data

Interlogix, Model AL-1623 Operated from 102 V, 60 Hz 125 kHz Fundamental





Interlogix, Model AL-1623 Operated from 138 V, 60 Hz 125 kHz Fundamental



Photograph

