



INTERNATIONAL ELECTRONICS TEST REPORT

FOR THE

PROXPAD PLUS

FCC PART 15 SUBPART C SECTIONS 15.107 & 15.209 AND RSS 210

COMPLIANCE

DATE OF ISSUE: AUGUST 12, 2003

PREPARED FOR:

International Electronics
427 Turnpike Street
Canton, MA 02021

P.O. No.: 12612
W.O. No.: 80960

PREPARED BY:

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

Date of test: August 5-11, 2003

Report No.: FC03-052

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ADMINISTRATIVE INFORMATION

DATE OF TEST: August 5-11, 2003

DATE OF RECEIPT: August 5, 2003

PURPOSE OF TEST: To demonstrate the compliance of the ProxPad Plus with the requirements for FCC Part 15 Subpart C Sections 15.207 & 15.209 and RSS 210 devices.

TEST METHOD: ANSI C63.4 (1992)

MANUFACTURER: International Electronics
427 Turnpike Street
Canton, MA 02021

REPRESENTATIVE: Chris Hentschel

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

SUMMARY OF RESULTS

As received, the International Electronics ProxPad Plus was found to be fully compliant with the following standards and specifications:

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

CONDITIONS FOR COMPLIANCE

No modifications to the EUT were necessary to comply.

APPROVALS

Steve Behm, Director of Engineering Services

QUALITY ASSURANCE:



Joyce Walker, Quality Assurance Administrative Manager

TEST PERSONNEL:



Mike Wilkinson, Lab Manager

FCC 15.31(e) Voltage Variations

FREQUENCY kHz	CORRECTED READING dB μ V/m 85%	CORRECTED READING dB μ V/m 100%	CORRECTED READING dB μ V/m 115%	SPEC LIMIT dB μ V/m 25.6
126.3	-4.3	-4.2	-4.0	

Test Method: ANSI C63.4 (1992)
 Spec Limit: FCC Part 15 Subpart C Section 15.31(e)
 Test Distance: 10 meters

FCC 15.31(m) Number Of Channels

This device operates on a single channel.

FCC 15.33(a) Frequency Ranges Tested

15.207 Conducted: 150 kHz – 30 MHz

15.209 Radiated: 9 kHz – 1000 MHz

FCC SECTION 15.35: ANALYZER BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	9 kHz	150 kHz	200 Hz
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz

FCC 15.203 Antenna Requirements

The antenna is an integral part of the EUT and is non-removable; therefore the EUT complies with Section 15.203 of the FCC rules.

FCC 15.205 Restricted Bands

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

Eut Operating Frequency

The EUT was operating at 126.3 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 EUT tested by CKC Laboratories was a production unit.

EQUIPMENT UNDER TEST

ProxPad Plus

Manuf: International Electronics
Model: ProxPad Plus
Serial: 02295116
FCC ID: pending

PERIPHERAL DEVICES

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

DC Power Supply

Manuf: Topward Electric Instruments
Model: TPS 2000
Serial: 920035
FCC ID: NA

Laptop Computer

Manuf: Toshiba
Model: PS277U-6M9J0
Serial: 80857756U
FCC ID: DoC

RS-232 to RS-485 Converter

Manuf: International Electronics
Model: P66626
Serial: NA
FCC ID: DoC

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 μ V	CORRECTION FACTORS				CORRECTED READING dB μ V	SPEC LIMIT dB μ V	MARGIN dB	NOTES
		Lisn dB	Cable dB	Cable dB	dB				
0.767393	34.6	0.2		0.0		34.8	46.0	-11.2	B
0.861929	34.0	0.3		0.0		34.3	46.0	-11.7	W
1.008843	33.4	0.3		0.1		33.8	46.0	-12.2	W
2.254972	32.8	0.4		0.3		33.5	46.0	-12.5	B
3.475583	33.0	0.4		0.3		33.7	46.0	-12.3	W
4.245376	33.2	0.4		0.4		34.0	46.0	-12.0	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: The EUT is connected to the laptop through the RS Converter and the computer is polling the EUT for information via customer software "test_485.exe". EUT is transmitting continuously with a card in close proximity. EUT is powered by 12VDC supplied by the support supply. Support power supply AC is connected to the LISN. Frequency range investigated was 150 kHz to 30 MHz.

Table 2: FCC 15.209 Fundamental Emission Levels

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				
0.1263	71.9	-50.4	-25.8	0.1		-4.2	25.6	-29.8

Test Method: ANSI C63.4 (1992)

NOTES: N = No Polarization

Spec Limit: FCC Part 15 Subpart C Section 15.209

Test Distance: 10 Meters

COMMENTS: The EUT is connected to the laptop through the RS Converter and the computer is polling the EUT for information via customer software "test_485.exe". EUT is transmitting continuously with a card in close proximity. EUT is powered by 12VDC supplied by the support supply.

Table 3: FCC 15.209 Spurious Emission Levels

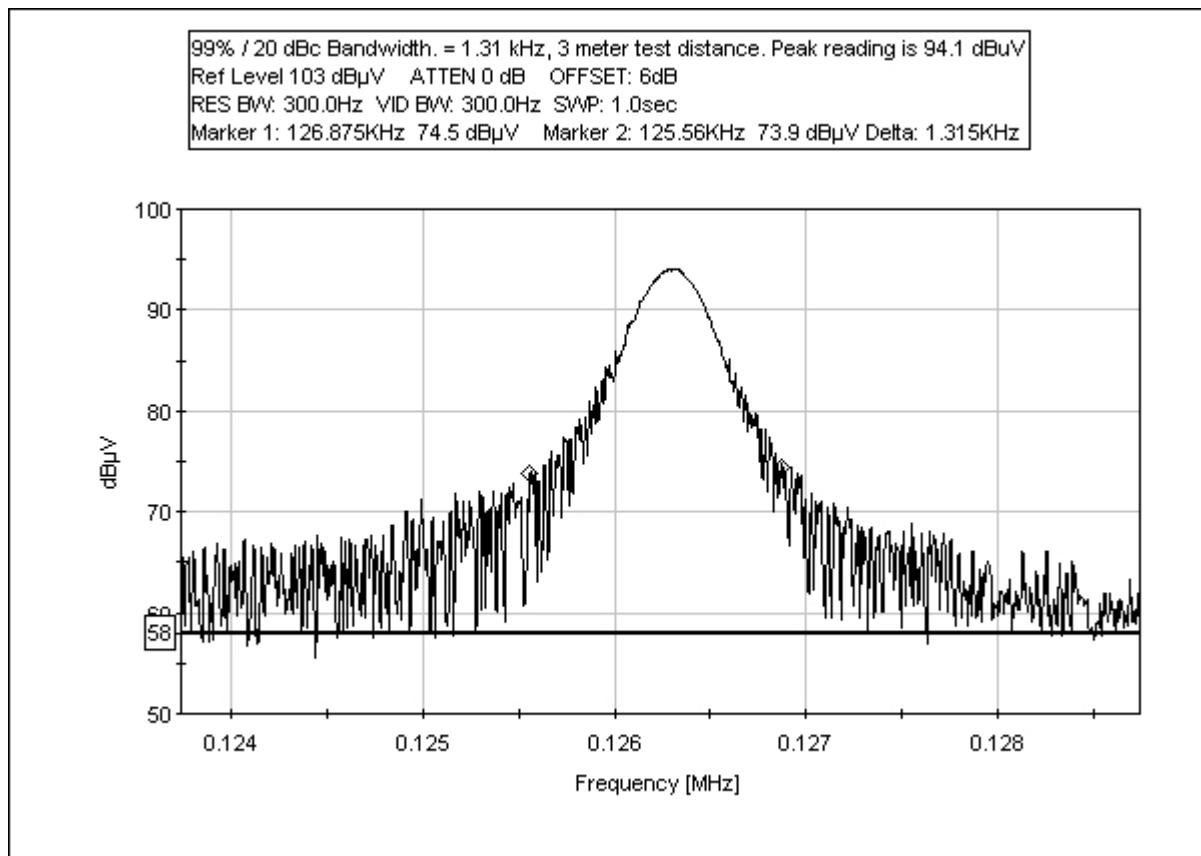
FREQUENCY MHz	METER READING dB μ V	CORRECTION FACTORS				CORRECTED READING dB μ V/m	SPEC LIMIT dB μ V/m	MARGIN dB	NOTES
		Ant dB	Amp dB	Cable dB	Dist dB				
0.505	47.1	-10.4	-27.7	0.2	0.0	9.2	33.5	-24.3	N
0.631	47.2	-10.4	-27.7	0.2	0.0	9.3	31.6	-22.3	N
32.811	30.9	17.5	-27.8	1.2	10.0	31.8	40.0	-8.2	VQ
131.089	35.7	11.7	-27.8	2.5	10.0	32.1	43.5	-11.4	V
411.500	34.9	16.5	-28.1	4.6	10.0	37.9	46.0	-8.1	V
976.400	33.5	24.5	-28.2	7.6	10.0	47.4	54.0	-6.6	V

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

NOTES:
 Q = Quasi Peak Reading
 V = Vertical Polarization
 N = No Polarization

COMMENTS: The EUT is connected to the laptop through the RS Converter and the computer is polling the EUT for information via customer software "test_485.exe". EUT is transmitting continuously with a card in close proximity. EUT is powered by 12VDC supplied by the support supply.

RSS 210 99% BANDWIDTH PLOT



MEASUREMENT UNCERTAINTY

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

Note: Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of $k=2$. Statements of compliance are based on the nominal values only.

EUT SETUP

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the photographs in Appendix A. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables. The corrected data was then compared to the applicable emission limits to determine compliance.

The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available I/O ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. I/O cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The radiated and conducted emissions data of the EUT was taken with the HP Spectrum Analyzer. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in Table A.

Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in $\text{dB}\mu\text{V}/\text{m}$, 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 radiated measurements from 9 kHz to 30 MHz, the magnetic loop antenna was used. For frequencies from 30 to 1000 MHz, the biconilog antenna was used. Conducted emissions tests required the use of the FCC type LISNs.

The HP spectrum analyzer was used for all measurements. Table B shows the analyzer bandwidth settings that were used in designated frequency bands. For conducted emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used. A 10 dB external attenuator was also used during conducted tests, with internal offset correction in the analyzer. During radiated testing, the measurements were made with 0 dB of attenuation, a reference level of 97 dB μ 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 μ H-/+50 ohms. Above 150 kHz, a 0.15 μ F series capacitor was added in-line prior to connecting the analyzer to restore the proper impedance for the range. A 30 to 50 second sweep time was used for automated measurements in the frequency bands of 150 kHz to 500 kHz, and 500 kHz to 30 MHz. All readings within 20 dB of the limit were recorded, and those within 6 dB of the limit were examined with additional measurements using a slower sweep time.

Radiated Emissions

The EUT was mounted on a nonconductive, rotating table 80 cm above the conductive grid. The nonconductive table dimensions were 1 meter by 1.5 meters.

During the preliminary radiated scan, the EUT was powered up and operating in its defined FCC test mode. For radiated measurements from 9 kHz to 30 MHz, the magnetic loop antenna was used. The frequency range of 30 MHz to 1000 MHz was scanned with the biconilog antenna located about 1.5 meter above the ground plane in the vertical polarity. During this scan, the turntable was rotated and all peaks at or near the limit were recorded. A scan of the FM band from 88 to 110 MHz was then made using a reduced resolution bandwidth and frequency span. The biconilog antenna was changed to the horizontal polarity and the above steps were repeated. Care was taken to ensure that no frequencies were missed within the FM and TV bands. An analysis was performed to determine if the signals that were at or near the limit were caused by an ambient transmission. If unable to determine by analysis, the equipment was powered down to make the final determination if the EUT was the source of the emission.

A thorough scan of all frequencies was made manually using a small frequency span, rotating the turntable as needed. The test engineer maximized the readings with respect to the table rotation, antenna height, and configuration of EUT. Maximizing of the EUT was achieved by monitoring the spectrum analyzer on a closed circuit television monitor.

APPENDIX A
INFORMATION ABOUT THE EQUIPMENT UNDER TEST

INFORMATION ABOUT THE EQUIPMENT UNDER TEST

Test Software/Firmware:

CRT was displaying:

Power Supply Manufacturer:

Power Supply Part Number:

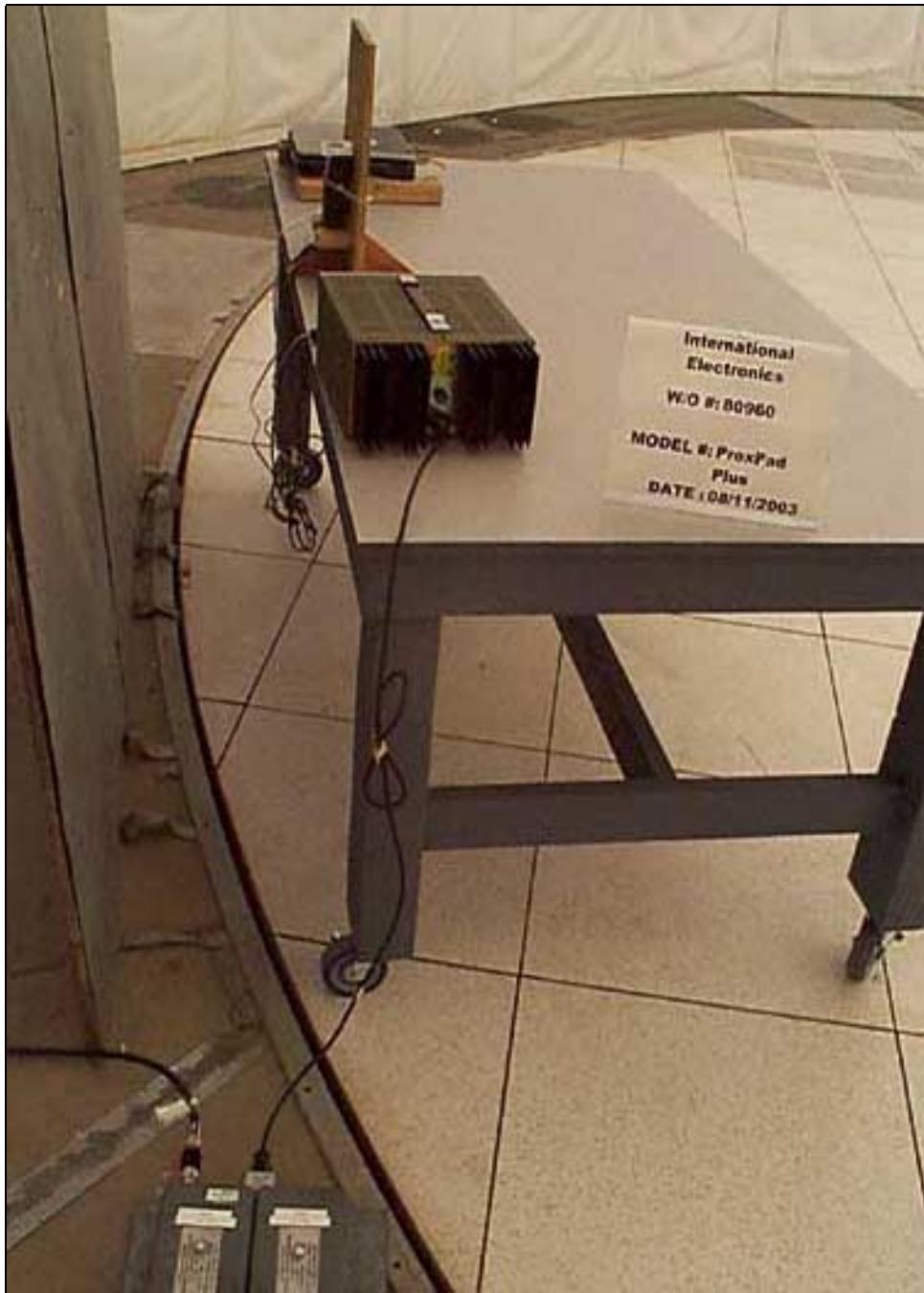
AC Line Filter Manufacturer:

AC Line Filter Part Number:

I/O PORTS	
Type	#

CRYSTAL OSCILLATORS	
Type	Freq In MHz
Xtal	7.3728
Xtal	4.00
Xtal	32.768 kHz

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS



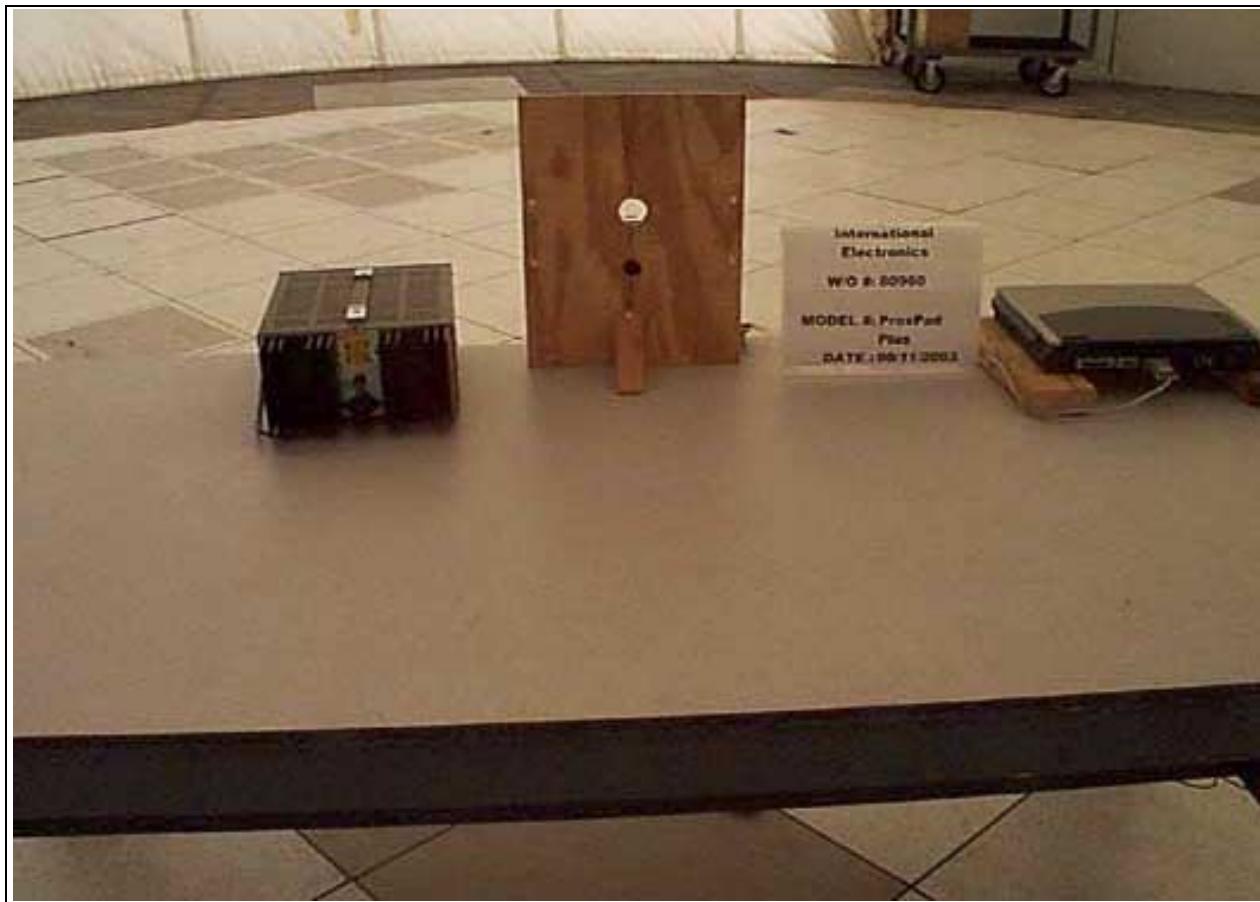
Mains Conducted Emissions - Side View

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions - Front View

PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions - Back View

APPENDIX B

TEST EQUIPMENT LIST

15.207 Conducted Emissions

Function	S/N	Calibration Date	Cal Due Date	Asset #
Spectrum Analyzer (Display)	2005A01550	02/25/2003	02/25/2004	1183
Spectrum Analyzer (RF Section)	2007A01066	02/25/2003	02/25/2004	1184
QP Adapter	2043A00104	02/25/2003	02/25/2004	69
8028-50-TS-24-BNC	8379276, 280	06/05/2003	06/05/2005	1248

15.31(e)/15.209 Radiated Emissions

Function	S/N	Calibration Date	Cal Due Date	Asset #
Magnetic Loop Antenna	1074	05/21/2003	05/21/2005	226
Spectrum Analyzer (Display)	2005A01550	02/25/2003	02/25/2004	1183
Spectrum Analyzer (RF Section)	2007A01066	02/25/2003	02/25/2004	1184
QP Adapter	2043A00104	02/25/2003	02/25/2004	69
PreAmp	1937A01933	03/07/2003	03/07/2004	205
Bilog Antenna Chase	2455	12/13/2002	12/13/2003	1992
CBL6111				

APPENDIX C:
MEASUREMENT DATA SHEETS

Test Location: CKC Laboratories • 5473A Clouds Rest • Mariposa CA, 95338 • (209) 966-5240

Customer: **International Electronics**
 Specification: **FCC 15.207 - AVE**
 Work Order #: **80960** Date: 08/11/2003
 Test Type: **Conducted Emissions** Time: 10:17:11 AM
 Equipment: **Proximity Reader** Sequence #: 1
 Manufacturer: International Electronics
 Model: ProxPad Plus
 S/N: 02295116
 Tested By: Mike Wilkinson
 120V 60Hz

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Proximity Reader*	International Electronics	ProxPad Plus	02295116

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments	TPS 2000	920035
RS-232 to RS-485 Converter	International Electronics	P66626	None
Laptop Computer	Toshiba	PS277U-6M9J0	80857756U

Test Conditions / Notes:

The EUT is connected to the laptop through the RS Converter and the computer is polling the EUT for information via customer software "test_485.exe". EUT is transmitting continuously with a card in close proximity. EUT is powered by 12VDC supplied by the support supply. Support power supply AC is connected to the LISN. Frequency range investigated was 150 kHz to 30 MHz.

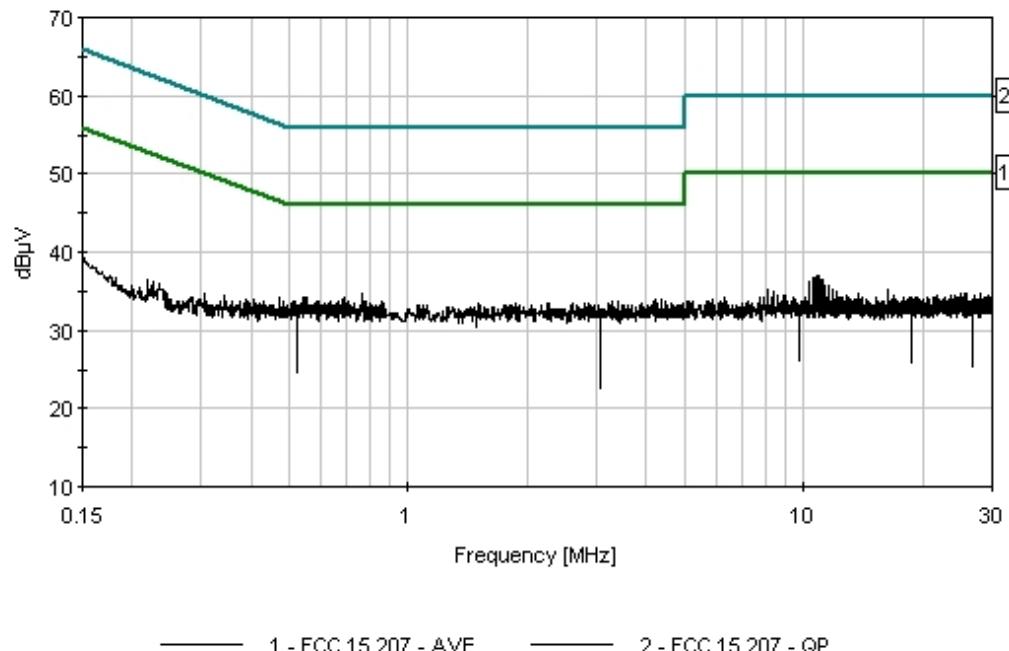
Transducer Legend:

T1=Cable SiteA Conducted	T2=LISN Insertion Loss s/n276
--------------------------	-------------------------------

Measurement Data:		Reading listed by margin.					Test Lead: Black				
#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	Dist Table	Corr dB μ V	Spec dB μ V	Margin dB	Polar Ant		
1	767.393k	34.6	+0.0	+0.2		+0.0	34.8	46.0	-11.2	Black	
2	4.245M	33.2	+0.4	+0.4		+0.0	34.0	46.0	-12.0	Black	
3	2.255M	32.8	+0.3	+0.4		+0.0	33.5	46.0	-12.5	Black	
4	10.878M	35.9	+0.6	+0.5		+0.0	37.0	50.0	-13.0	Black	
5	10.625M	35.5	+0.6	+0.5		+0.0	36.6	50.0	-13.4	Black	
6	11.121M	35.3	+0.6	+0.5		+0.0	36.4	50.0	-13.6	Black	
7	10.373M	35.1	+0.6	+0.5		+0.0	36.2	50.0	-13.8	Black	
8	11.616M	34.7	+0.6	+0.5		+0.0	35.8	50.0	-14.2	Black	
9	11.373M	34.5	+0.6	+0.5		+0.0	35.6	50.0	-14.4	Black	

10	8.139M	34.2	+0.5	+0.5	+0.0	35.2	50.0	-14.8	Black
11	16.400M	33.9	+0.8	+0.4	+0.0	35.1	50.0	-14.9	Black
12	25.923M	33.4	+1.0	+0.4	+0.0	34.8	50.0	-15.2	Black
13	27.986M	33.3	+1.1	+0.4	+0.0	34.8	50.0	-15.2	Black
14	21.734M	33.1	+0.9	+0.4	+0.0	34.4	50.0	-15.6	Black
15	150.000k	38.8	+0.0	+0.4	+0.0	39.2	56.0	-16.8	Black

CKC Laboratories Date: 08/11/2003 Time: 10:17:11 AM International Electronics WO#: 80960
 FCC 15.207 - AVE Test Lead: Black 120V 60Hz Sequence#: 1
 International Electronics M/N ProxPad Plus



Test Location: CKC Laboratories • 5473A Clouds Rest • Mariposa CA, 95338 • (209) 966-5240

Customer: **International Electronics**
 Specification: **FCC 15.207 - AVE**
 Work Order #: **80960** Date: 08/11/2003
 Test Type: **Conducted Emissions** Time: 10:21:52 AM
 Equipment: **Proximity Reader** Sequence #: 2
 Manufacturer: International Electronics Tested By: Mike Wilkinson
 Model: ProxPad Plus 120V 60Hz
 S/N: 02295116

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Proximity Reader*	International Electronics	ProxPad Plus	02295116

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments	TPS 2000	920035
RS-232 to RS-485 Converter	International Electronics	P66626	None
Laptop Computer	Toshiba	PS277U-6M9J0	80857756U

Test Conditions / Notes:

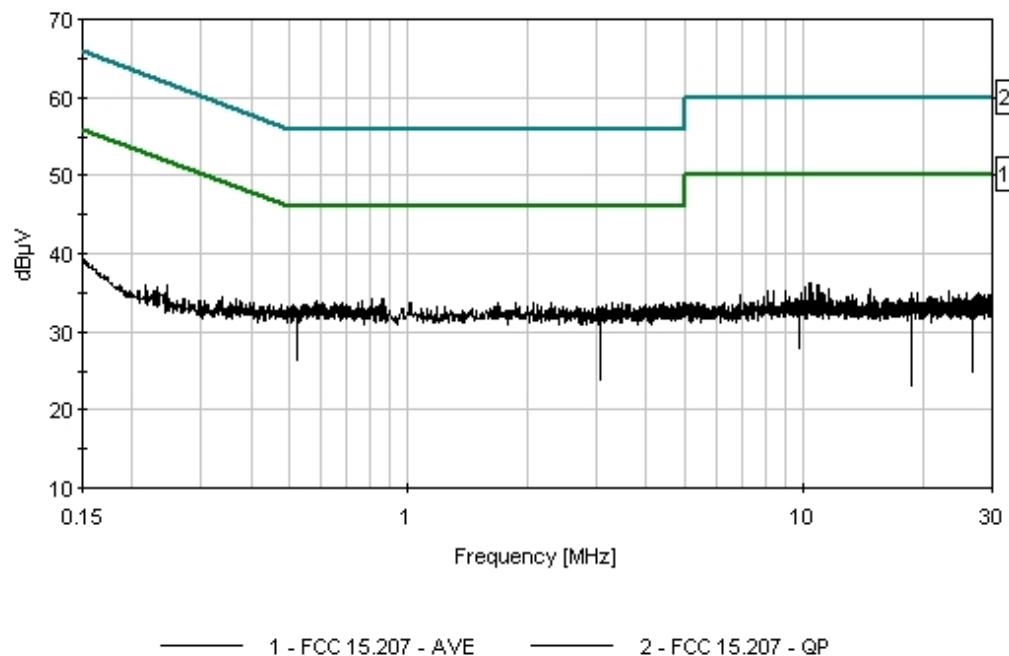
The EUT is connected to the laptop through the RS Converter and the computer is polling the EUT for information via customer software "test_485.exe". EUT is transmitting continuously with a card in close proximity. EUT is powered by 12VDC supplied by the support supply. Support power supply AC is connected to the LISN. Frequency range investigated was 150 kHz to 30 MHz.

Transducer Legend:

T1=Cable SiteA Conducted	T2=LISN Insertion Loss s/n276
--------------------------	-------------------------------

Measurement Data:			Reading listed by margin.									Test Lead: White		
#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	Margin dB	Dist Table	Corr dB μ V	Spec dB μ V	Margin dB	Polar Ant				
1	861.929k	34.0	+0.0	+0.3		+0.0	34.3	46.0	-11.7	White				
2	1.009M	33.4	+0.1	+0.3		+0.0	33.8	46.0	-12.2	White				
3	3.476M	33.0	+0.3	+0.4		+0.0	33.7	46.0	-12.3	White				
4	10.382M	35.0	+0.6	+0.5		+0.0	36.1	50.0	-13.9	White				
5	10.869M	34.8	+0.6	+0.5		+0.0	35.9	50.0	-14.1	White				
6	10.130M	34.6	+0.6	+0.5		+0.0	35.7	50.0	-14.3	White				
7	14.752M	34.3	+0.7	+0.4		+0.0	35.4	50.0	-14.6	White				
8	8.139M	34.3	+0.5	+0.5		+0.0	35.3	50.0	-14.7	White				
9	23.258M	33.7	+1.0	+0.4		+0.0	35.1	50.0	-14.9	White				

10	19.373M	33.7	+0.9	+0.4	+0.0	35.0	50.0	-15.0	White
11	27.670M	33.5	+1.1	+0.4	+0.0	35.0	50.0	-15.0	White
12	6.905M	33.7	+0.5	+0.4	+0.0	34.6	50.0	-15.4	White
13	244.536k	35.6	+0.0	+0.4	+0.0	36.0	51.9	-15.9	White
14	150.000k	38.8	+0.0	+0.4	+0.0	39.2	56.0	-16.8	White

CKC Laboratories Date: 08/11/2003 Time: 10:21:52 AM International Electronics WO#: 80960
FCC 15.207 - AVE Test Lead: White 120V 60Hz Sequence#: 2
International Electronics M/N ProxPad Plus


Test Location: CKC Laboratories • 5473A Clouds Rest • Mariposa CA, 95338 • (209) 966-5240

Customer: **International Electronics**
 Specification: **FCC 15.209/15.31(e)**
 Work Order #: **80960** Date: 08/05/2003
 Test Type: **Maximized Emissions** Time: 14:02:47
 Equipment: **Proximity Reader** Sequence #: 1
 Manufacturer: International Electronics
 Model: ProxPad Plus
 S/N: 02295116
 Tested By: Mike Wilkinson

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Proximity Reader*	International Electronics	ProxPad Plus	02295116

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments	TPS 2000	920035
RS-232 to RS-485 Converter	International Electronics	P66626	None
Laptop Computer	Toshiba	PS277U-6M9J0	80857756U

Test Conditions / Notes:

The EUT is connected to the laptop through the RS Converter and the computer is polling the EUT for information via customer software "test_485.exe". EUT is transmitting continuously with a card in close proximity. EUT is powered by 12VDC supplied by the support supply.

Transducer Legend:

T1=AMP S/N 1937A01933	T2=Cable Site A 10m
T3=Mag Loop - Site B - AN 00226 - 9kHz-30M	T4=15.31 10m 40dB/Dec Correction

Measurement Data:

Reading listed by margin.

Test Distance: 10 Meters

#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar Ant
1	126.351k	72.1	-25.8	+0.1	+9.6	-60.0	+0.0	-4.0	25.6	-29.6	Vert 13.8 VDC - 115%
2	126.361k	71.9	-25.8	+0.1	+9.6	-60.0	+0.0	-4.2	25.6	-29.8	Vert 12 VDC - Nominal
3	126.343k	71.8	-25.8	+0.1	+9.6	-60.0	+0.0	-4.3	25.6	-29.9	Vert 10.2 VDC - 85%

Test Location: CKC Laboratories • 5473A Clouds Rest • Mariposa CA, 95338 • (209) 966-5240

Customer: **International Electronics**
 Specification: **FCC 15.209**
 Work Order #: **80960** Date: 08/08/2003
 Test Type: **Maximized Emissions** Time: 15:03:16
 Equipment: **Proximity Reader** Sequence#: 1
 Manufacturer: International Electronics
 Model: ProxPad Plus
 S/N: 02295116
 Tested By: Mike Wilkinson

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Proximity Reader*	International Electronics	ProxPad Plus	02295116

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments	TPS 2000	920035
RS-232 to RS-485 Converter	International Electronics	P66626	None
Laptop Computer	Toshiba	PS277U-6M9J0	80857756U

Test Conditions / Notes:

The EUT is connected to the laptop through the RS Converter and the computer is polling the EUT for information via customer software "test_485.exe". EUT is transmitting continuously with a card in close proximity. EUT is powered by 12VDC supplied by the support supply.

Transducer Legend:

T1=AMP S/N 1937A01933	T2=Cable Site A 10m
T3=Mag Loop - Site B - AN 00226 - 9kHz-30M	T4=15.31 10m 40dB/Dec Correction

Measurement Data: Reading listed by margin.

Test Distance: 10 Meters

#	Freq MHz	Rdng dB μ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar Ant
1	126.361k	71.9	-25.8	+0.1	+9.6	-60.0	+0.0	-4.2	25.6	-29.8	None Fundamental

Test Location: CKC Laboratories • 5473A Clouds Rest • Mariposa CA, 95338 • (209) 966-5240

Customer: **International Electronics**
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Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Proximity Reader*	International Electronics	ProxPad Plus	02295116

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments	TPS 2000	920035
RS-232 to RS-485 Converter	International Electronics	P66626	None
Laptop Computer	Toshiba	PS277U-6M9J0	80857756U

Test Conditions / Notes:

The EUT is connected to the Laptop through the RS Converter and the computer is polling the EUT for information via customer software "test_485.exe". EUT is transmitting continuously with a card in close proximity. EUT is powered by 12VDC supplied by the support supply.

Transducer Legend:

T1=AMP S/N 1937A01933	T2=Bilog Site A
T3=Cable Site A 10m	T4=Mag Loop - Site B - AN 00226 - 9kHz-30M
T5=15.31 10m 40dB/Dec Correction	

<i>Measurement Data:</i>		Reading listed by margin.										Test Distance: 10 Meters		
		#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar	
					dB μ V	dB	dB	dB	dB	Table	dB μ V/m	dB μ V/m	dB	Ant
			MHz		T5									
1	976.400M			33.5	-28.2	+24.5	+7.6	+0.0	+10.0	47.4	54.0	-6.6	Vert	+0.0
2	411.500M			34.9	-28.1	+16.5	+4.6	+0.0	+10.0	37.9	46.0	-8.1	Vert	+0.0
3	32.811M		QP	30.9	-27.8	+17.5	+1.2	+0.0	+10.0	31.8	40.0	-8.2	Vert	+0.0
^	32.785M			34.5	-27.8	+17.5	+1.2	+0.0	+10.0	35.4	40.0	-4.6	Vert	+0.0
5	131.089M			35.7	-27.8	+11.7	+2.5	+0.0	+10.0	32.1	43.5	-11.4	Vert	+0.0
6	631.470k			47.2	-27.7	+0.0	+0.2	+9.6	+0.0	9.3	31.6	-22.3	None	-20.0
7	505.070k			47.1	-27.7	+0.0	+0.2	+9.6	+0.0	9.2	33.5	-24.3	None	-20.0

8	1.137M	39.0	-27.8 -20.0	+0.0	+0.2	+9.8	+0.0	1.2	26.4	-25.2	None
9	126.361k	71.9	-25.8 -60.0	+0.0	+0.1	+9.6	+0.0	-4.2	25.6	-29.8	None
10	7.374M	37.8	-27.8 -20.0	+0.0	+0.5	+9.1	+0.0	-0.4	29.5	-29.9	None
11	4.002M	28.5	-27.8 -20.0	+0.0	+0.4	+9.4	+0.0	-9.5	29.5	-39.0	None
12	252.630k	56.0	-26.8 -60.0	+0.0	+0.2	+9.6	+0.0	-21.0	19.6	-40.6	None
13	327.660k	53.4	-27.1 -60.0	+0.0	+0.2	+9.6	+0.0	-23.9	17.3	-41.2	None
14	229.550k	54.7	-26.6 -60.0	+0.0	+0.2	+9.5	+0.0	-22.2	20.4	-42.6	None
15	224.550k	54.0	-26.6 -60.0	+0.0	+0.2	+9.5	+0.0	-22.9	20.6	-43.5	None
16	3.159M	23.9	-27.8 -20.0	+0.0	+0.3	+9.5	+0.0	-14.1	29.5	-43.6	None
17	218.290k	52.2	-26.6 -60.0	+0.0	+0.2	+9.5	+0.0	-24.7	20.8	-45.5	None