EMISSION TEST REPORT

Report Number: 3173246BOX-001

Project Number: 3173246

Testing performed on the

Concealed Motion Detector

Model: CMD2A-F2

To

FCC Part 15 Subpart F – Ultra-Wideband Operation

For

UltraVision Security Systems

Test Performed by:	Test Authorized by:
Intertek – ETL SEMKO	UltraVision Security Systems
70 Codman Hill Road	88 Stiles Road
Boxborough, MA 01719	Salem, NH 03079

Prepared by: _____ Date: 03/09/09
Kouma Sinn, Sr. Project Engineer

Reviewed by: _____ Date: 03/09/09
Jeff Goulet, Engineering Team Leader, EMC

1.0 Job Description

1.1 Client Information:

This equipment under test (EUT) has been tested at the request of:

Company:	UltraVision Security Systems 88 Stiles Road Salem, NH 03079
Contact:	Jack O'Leary
Telephone:	(603) 685-0321
Fax:	(603) 898-1840
Email:	Olearyj@UltraVisionSecurity.com

1.2 Equipment Under Test:

Equipment Type:	Concealed Motion Detector
Model Number(s):	CMD2A-F2
Serial number(s):	9
Manufacturer:	UltraVision Security Systems
EUT receive date:	March 6, 2009
EUT received condition:	Production unit was received with no visible damage
Test start date:	January 14, 2009
Test end date:	March 6, 2009

Notes: Line-conducted emissions test was performed on January 14, 2009

1.3 Test Plan Reference: ANSI C63.4-2003

1.4 Test Configuration:

1.4.1 EUT Voltage Range:

The EUT powers from Server-8

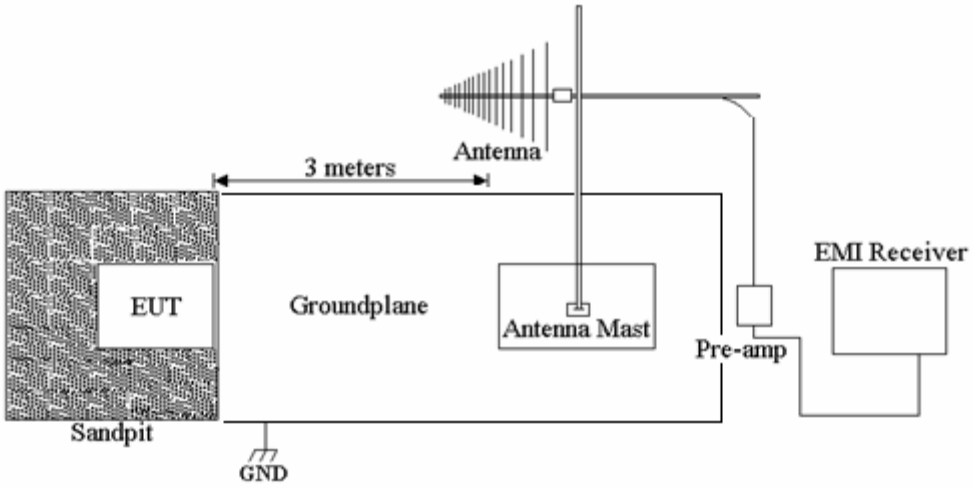
1.4.2 Cables:

Description	Shielding	Connector	Length (ft)	Qty.
CAT-5	None	Plastic	15	1
Data	None	Plastic	15	1
Data	None	Plastic	50	1
Server-8 AC Cord	None	Plastic	6.5	1
Laptop AC Cord	None	Plastic	6.5	1
Laptop AC Adapter	None	Plastic	6.5	1

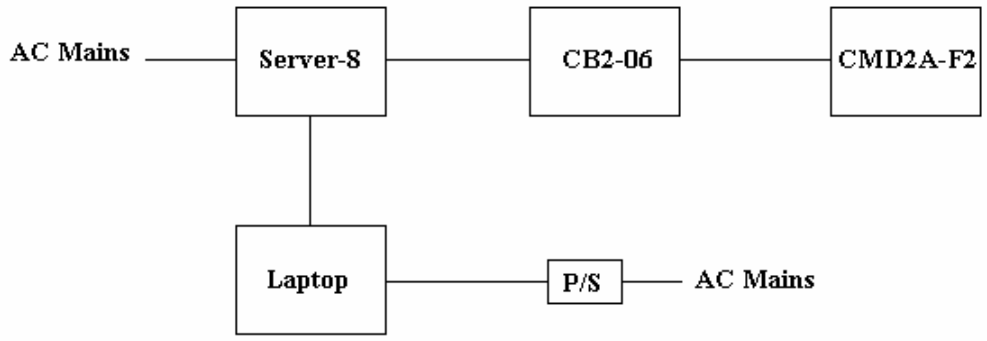
1.4.3 Support Equipment:

Description	Manufacturer	Model	Serial No.
Laptop	Lenovo	8922	L3-LB509 07/86
Laptop AC Adapter	Lenovo	92P1160	2007.09
Server	UltraVision Security Systems	Server-8	Not Labeled
Connector Box	UltraVision Security Systems	CB2-06	Not Labeled

1.4.4 Block Diagram:



Note: EUT was buried 6 inches under the sand.



Notes: EUT Configuration

1.5 Mode(s) of Operation:

The EUT was continuous transmitting and collecting data during testing.

1.6 Modifications Required For Compliance:

None

2.0 Test Summary:

TEST STANDARD	RESULTS	
FCC Part 15 Subpart F – Ultra-Wideband Operation		
SUB-TEST	**TEST PARAMETER**	**PASS/FAIL**
Radiated Emissions	Per Standard Specifications	Pass
Highest Radiated Emission	The peak level of the emissions contained within a 50 MHz bandwidth centered on the frequency at which the highest radiated emission occurs, f_M. That limit is 0 dBm EIRP.	Pass
Line-Conducted Emissions	Per Standard Specifications	Pass
10 dB Bandwidth	The UWB bandwidth is the frequency band bounded by the points that are 10 dB below the highest radiated emission, as based on the complete transmission system including the antenna. The fractional bandwidth shall be equal to or greater than 0.20 or has a UWB bandwidth equal to or greater than 500 MHz, regardless of the fractional bandwidth.	Pass

REVISION SUMMARY – The following changes have been made to this Report:

Date	Project No.	Project Handler	Page(s)	Item	**Description of Change**

3.0 Sample Calculations:

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG
Where FS = Field Strength in dBμV/m
RA = Receiver Amplitude (including preamplifier) in dBμV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows.

Assume a receiver reading of 52.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving a field strength of 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 52.0 dBμV
AF = 7.4 dB/m
CF = 1.6 dB
AG = 29.0 dB
FS = 32 dBμV/m

Level in μV/m = [10(32 dBμV/m)/20] = 39.8 μV/m

The following is how net line-conducted readings were determined:

NF = RF + LF + CF + AF
Where NF = Net Reading in dBμV
RF = Reading from receiver in dBμV
LF = LISN Correction Factor in dB
CF = Cable Correction Factor in dB
AF = Attenuator Loss Factor in dB

To convert from dBμV to μV or mV the following was used:

$UF = 10^{(NF / 20)}$ where UF = Net Reading in μV

Example:

NF = RF + LF + CF + AF = 28.5 + 0.2 + 0.4 + 20.0 = 49.1 dBμV
$UF = 10^{(48.1\ dB\mu V / 20)}$ = 254 μV/m

4.0 Measurement Uncertainty:

Compliance of the product is based on the measured value. However, the measurement uncertainty is included for informational purposes.
The expanded uncertainty (k = 2) for radiated emissions from 30 to 1000 MHz has been determined to be:

±3.5 dB at 10m and ±3.8 dB at 3m

The expanded uncertainty (k = 2) for mains conducted emissions from 150 kHz to 30 MHz has been determined to be:

±2.6 dB

The expanded uncertainty (k = 2) for telecom port conducted emissions from 150 kHz to 30 MHz has been determined to be:

±3.2 for ISN and voltage probe measurements
±3.1 for current probe measurements

5.0 Site Description:

Test Site(s): 1 (Sandpit)

Our OATS are 3m and 10m sheltered emissions measurement ranges located in a light commercial environment in Boxborough, Massachusetts. They meet the technical requirements of ANSI C63.4-2003 and CISPR 22:1993/EN 55022:1994 for radiated and conducted emission measurements. The shelter structure is entirely fiberglass and plastic, with outside dimensions of 33 ft x 57 ft. The structure resembles a quonset hut with a center ceiling height of 16.5 ft.

The testing floor is covered by a galvanized sheet metal groundplane that is earth-grounded via copper rods around the perimeter of the site. The joints between individual metal sheets are bridged with a 2 inch wide metal strips to provide low RF impedance contact throughout. The sheets are screwed in place with stainless steel, round-head screws every three inches. Site illumination and HVAC are provided from beneath the ground reference plane through flush entry ports, the port covers are electrically bonded to the ground plane.

A flush metal turntable with 12 ft. diameter and 5000 lb. load capacity (12,000 lb. in Site 3) is provided for floor-standing equipment. A wooden table 80 cm high is used for table-top equipment. The turntable is electrically connected to the ground plane with three copper straps. The straps are connected to the turntable at the center of it with ground braid. The copper strap is directly connected to the groundplane at the edges of the turntable. The turntable is located on the south end of the structure and the antennas are mounted 3 and 10 meters away to the north. The antenna mast is a non-conductive with remote control of antenna height and polarization. The antenna height is adjustable from 1 to 4 meters.

All final radiated emission measurements are performed with the testing personnel and measurement equipment located below the ground reference plane. The site has a full basement underneath the turntable where support equipment may be remotely located. Operation of the antenna, turntable and equipment under test is controlled by remote controls that manipulate the antenna height and polarization and with a turntable control. Test personnel are located below the ellipse when measurements are performed, however the site maintains the ability of having personnel manipulate cables while monitoring test equipment. Ambient radiated emissions are 6 dB or more below the relevant FCC emission limits.

AC mains power is brought to the equipment under test through a power line filter, to remove ambient conducted noise. 50 Hz (240 VAC single phase), 60 Hz power (120 VAC single phase, 208 VAC three phase), and 60 Hz (480 VAC three phase) are available. Conducted emission measurements are performed with a Line Impedance Stabilization Network (LISN) or Artificial Mains Network (AMN) bonded to the ground reference plane. A removable vertical groundplane (2 meter X 2 meter area) is used for line-conducted measurements for table top equipment. The vertical groundplane is electrically connected to the reference groundplane.

Sandpit

The sandpit test site used during testing was made in according with FCC Part 15F. The test site was constructed with a dimension of 16.40ft x 16.40ft x 30inches deep. The whole area was filled with dry sand. The equipment under test (EUT) was placed 6 inches under the sand while the receiving antenna was placed at a distance of 3m from the closest point of the EUT. A groundplane with a dimension of 15.75ft x 19.50ft was placed between the EUT and receiving antenna and connected to earth ground via a ground rod.

6.0 Testing Procedure

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.4 (2003).

All support equipment was remotely located. The EUT was placed 6 inches under the sand 3 meters away from the receiving antenna with groundplane in between.

Initial testing was performed to maximize the emissions. The system was rotated every 45° and cables were oriented to get the worst emissions, the antenna height was varied from 1 meter to 4 meters above the ground, and the antenna polarization was changed. The EUT azimuth of maximum emissions was recorded. The worst-case orientation will be used in the final testing. The EUT was buried 6 inches under the sand in the worst-case orientation.

Test Results: Pass

Test Standard: FCC Part 15 Subpart F – Ultra-Wideband Operation

Test: Radiated Emissions

Performance Criterion: Not Applicable

EUT Operating Voltage: EUT powers from Server-8

Test Environment:

Environmental Conditions During Testing:	Ambient (°C):	See data tables	Humidity (%):	See data tables	Pressure (hPa):	See data tables
Pretest Verification Performed:	Yes		Equipment under Test:		CMD2A-F2	
Test Engineer(s):	Kouma Sinn		EUT Serial Number:		9	

Maximum Test Disturbance Parameters: Emissions below specified limits

Test Equipment Used:

TEST EQUIPMENT LIST					
Item	**Equipment Type**	**Make**	**Model No.**	**Serial No.**	**Next Cal. Due**
1	Digital 4 Line Barometer	Mannix	0ABA116	BAR3	06/01/2009
2	9kHz to 3GHz EMI Test Receiver	Rohde & Schwartz	ESCI 1166.5950K03	100067	02/17/2010
3	100MHz-40GHz Preamp	MITEQ	NSP4000-NFG	1260417	03/27/2009
4	High Frequency Cable 40GHz	Megaphase	TM40 K1K1 197	CBL028	12/10/2009
5	40GHz Cable	Megaphase	TM40-K1K1-197	7030801 001	06/05/2009
6	ANTENNA	EMCO	3142	9701-1116	12/02/2009
7	High Frequency Cable 40GHz	Megaphase	TM40 K1K1 80	CBL030	12/10/2009
8	HORN ANTENNA	EMCO	3115	9610-4980*	02/25/2010
9	100MHz-40GHz Preamp	MITEQ	NSP4000-NFG	1260417	03/27/2009

Software Utilized:

Name	Manufacturer	Version
EXCEL 2000	Microsoft Corporation	9.0.6926 SP-3
EMI BOXBOROUGH	Intertek	2/07/05 Revision

Test Details:

Test Point	Standard Limit (as published)	Compliance Level	Pass/Fail N/A	Comment
Around the EUT	Per Standard	Per Standard	Pass	None

Test Results:

Radiated Emissions (30-960MHz)

Company: UltraVision Security Systems
Model #: CMD2A-F2
Serial #: 9
Engineers: Kouma Sinn
Project #: 3173246
Standard: FCC Part 15 Subpart F
Receiver: R&S ESCI (ROS002)
PreAmp: PRE9 03-27-09.txt
PreAmp Used? (Y or N): N

Location: Sandpit
Date(s): 03/06/09
Limit Distance (m): 3
Test Distance (m): 3
Voltage/Frequency: DC Powered

Antenna & Cables: N
Antenna: LOG1 12-02-2009 V3.txt
Cable(s): CBL028 12-10-09.txt
Barometer: BAR3

Bands: N, LF, HF, SHF
LOG1 12-02-2009 H3.txt
MEG001 06-05-09.txt

Temp/Humidity/Pressure: 13C 35% 1012mbar

Frequency Range: 30-960MHz

Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	
QP	V	37.566	14.7	13.0	0.8	0.0	0.0	28.6	40.0	-11.4	120/300 kHz	
QP	V	45.768	17.7	9.8	0.9	0.0	0.0	28.4	40.0	-11.6	120/300 kHz	
QP	V	47.000	18.0	9.4	0.9	0.0	0.0	28.2	40.0	-11.8	120/300 kHz	
QP	V	47.800	23.3	9.1	0.9	0.0	0.0	33.3	40.0	-6.7	120/300 kHz	
QP	V	48.436	19.6	8.8	0.9	0.0	0.0	29.3	40.0	-10.7	120/300 kHz	
QP	V	64.680	14.5	7.9	1.0	0.0	0.0	23.5	40.0	-16.5	120/300 kHz	
QP	V	86.260	11.9	7.8	1.2	0.0	0.0	20.9	40.0	-19.1	120/300 kHz	
QP	H	108.454	17.8	8.7	1.4	0.0	0.0	27.9	43.5	-15.6	120/300 kHz	
QP	H	121.000	20.5	8.0	1.5	0.0	0.0	30.0	43.5	-13.5	120/300 kHz	
QP	H	133.956	25.3	8.0	1.6	0.0	0.0	34.8	43.5	-8.7	120/300 kHz	
QP	H	145.988	28.6	8.9	1.6	0.0	0.0	39.2	43.5	-4.3	120/300 kHz	
QP	H	156.048	25.5	9.8	1.7	0.0	0.0	37.0	43.5	-6.5	120/300 kHz	
QP	H	164.820	25.9	10.1	1.7	0.0	0.0	37.7	43.5	-5.8	120/300 kHz	
QP	H	180.922	20.8	10.7	1.8	0.0	0.0	33.3	43.5	-10.2	120/300 kHz	
QP	H	192.096	19.0	10.4	1.9	0.0	0.0	31.3	43.5	-12.2	120/300 kHz	
QP	H	203.000	18.3	10.6	2.0	0.0	0.0	30.9	43.5	-12.6	120/300 kHz	
QP	H	224.070	14.8	11.5	2.1	0.0	0.0	28.4	46.0	-17.6	120/300 kHz	
QP	H	257.900	15.9	12.6	2.2	0.0	0.0	30.6	46.0	-15.4	120/300 kHz	
QP	H	300.000	19.3	14.3	2.4	0.0	0.0	36.0	46.0	-10.0	120/300 kHz	
QP	H	316.398	24.6	14.7	2.5	0.0	0.0	41.8	46.0	-4.2	120/300 kHz	
QP	H	334.142	25.9	15.2	2.6	0.0	0.0	43.6	46.0	-2.4	120/300 kHz	
QP	H	348.000	24.4	15.5	2.6	0.0	0.0	42.6	46.0	-3.4	120/300 kHz	
QP	H	373.024	19.0	16.1	2.8	0.0	0.0	37.8	46.0	-8.2	120/300 kHz	
QP	H	407.980	14.5	16.4	2.9	0.0	0.0	33.8	46.0	-12.2	120/300 kHz	
QP	H	434.000	12.2	16.6	3.0	0.0	0.0	31.8	46.0	-14.2	120/300 kHz	
QP	H	464.000	10.5	17.4	3.1	0.0	0.0	31.1	46.0	-14.9	120/300 kHz	
QP	H	481.974	9.2	17.8	3.2	0.0	0.0	30.2	46.0	-15.8	120/300 kHz	
QP	H	493.000	7.2	17.9	3.2	0.0	0.0	28.3	46.0	-17.7	120/300 kHz	
QP	H	516.916	6.4	18.4	3.3	0.0	0.0	28.1	46.0	-17.9	120/300 kHz	
QP	H	541.000	4.3	18.9	3.4	0.0	0.0	26.6	46.0	-19.4	120/300 kHz	
QP	H	557.000	3.7	19.1	3.5	0.0	0.0	26.3	46.0	-19.7	120/300 kHz	
QP	H	588.000	2.4	19.5	3.6	0.0	0.0	25.5	46.0	-20.5	120/300 kHz	
QP	H	608.000	1.4	20.0	3.7	0.0	0.0	25.1	46.0	-20.9	120/300 kHz	
QP	H	628.000	-1.3	20.6	3.8	0.0	0.0	23.1	46.0	-22.9	120/300 kHz	NF
QP	H	663.000	-1.7	21.5	4.0	0.0	0.0	23.8	46.0	-22.2	120/300 kHz	NF
QP	H	689.000	-2.7	22.0	4.1	0.0	0.0	23.4	46.0	-22.6	120/300 kHz	NF
QP	H	734.000	-3.1	21.9	4.3	0.0	0.0	23.1	46.0	-22.9	120/300 kHz	NF
QP	H	768.000	-2.8	22.4	4.4	0.0	0.0	24.0	46.0	-22.0	120/300 kHz	NF
QP	H	827.000	-3.3	22.7	4.7	0.0	0.0	24.1	46.0	-21.9	120/300 kHz	NF
QP	H	900.000	-1.7	23.6	5.2	0.0	0.0	27.1	46.0	-18.9	120/300 kHz	NF
QP	H	923.000	-3.3	23.7	5.3	0.0	0.0	25.7	46.0	-20.3	120/300 kHz	NF
QP	H	951.000	-2.3	23.6	5.3	0.0	0.0	26.7	46.0	-19.3	120/300 kHz	NF
QP	H	960.000	-2.4	23.8	5.4	0.0	0.0	26.8	46.0	-19.2	120/300 kHz	NF

Test Results Continued:

Radiated Emissions (960MHz-18GHz)

Company: UltraVision Security Systems
Model #: CMD2A-F2
Serial #: 9
Engineers: Kouma Sinn
Project #: 3173246
Standard: FCC Part 15 Subpart F
Receiver: R&S ESCI (ROS002)
PreAmp: PRE9 03-27-09.txt
PreAmp Used? (Y or N): Y
Date(s): 03/06/09
Location: Sandpit
Limit Distance (m): 3
Test Distance (m): 1
Voltage/Frequency: DC Powered

Antenna & Cables: LF Bands: N, LF, HF, SHF
Antenna: HORN3 V1m 02-25-10.txt HORN3 H1m 02-25-10.txt
Cable(s): CBL030 12-10-09.txt CBL028 12-10-09.txt
Barometer: BAR3
Temp/Humidity/Pressure: 19C 29% 1008mbar
Frequency Range: 960M-18G

Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth	
RMS	V	960.000	29.2	24.0	4.3	29.1	9.5	18.8	41.9	-23.1	1/3MHz	
RMS	V	966.650	31.3	24.0	4.3	29.1	9.5	20.9	41.9	-21.0	1/3MHz	
RMS	V	975.070	31.2	24.1	4.3	29.1	9.5	20.9	41.9	-21.0	1/3MHz	
RMS	V	991.740	30.3	24.2	4.3	29.1	9.5	20.1	41.9	-21.8	1/3MHz	
RMS	V	1577.000	29.6	26.3	5.6	29.1	9.5	22.9	41.9	-19.0	1/3MHz	
RMS	V	2551.000	29.2	29.2	7.4	29.2	9.5	27.1	53.9	-26.8	1/3MHz	
RMS	V	3000.000	28.5	30.5	8.0	29.2	9.5	28.2	53.9	-25.7	1/3MHz	NF
RMS	V	4000.000	28.5	33.1	9.0	29.3	9.5	31.8	53.9	-22.1	1/3MHz	NF
RMS	V	6000.000	29.4	35.7	9.1	28.9	9.5	35.8	53.9	-18.1	1/3MHz	NF
RMS	V	9000.000	27.1	38.8	10.7	27.7	9.5	39.4	53.9	-14.5	1/3MHz	NF
RMS	V	11000.000	25.6	39.2	12.5	27.4	9.5	40.4	43.9	-3.5	1/3MHz	NF
RMS	V	13000.000	25.6	40.5	13.6	27.5	9.5	42.6	43.9	-1.3	1/3MHz	NF
1164-1240MHz, 1559-1610MHz, Sweep Auto = 150ms												
RMS	V	1164.000	2.6	24.8	4.7	29.1	9.5	-6.5	31.9	-38.4	1/3kHz	NF
RMS	V	1200.000	2.8	24.9	4.8	29.1	9.5	-6.1	31.9	-38.0	1/3kHz	NF
RMS	V	1225.000	2.0	25.0	4.9	29.1	9.5	-6.8	31.9	-38.7	1/3kHz	NF
RMS	V	1240.000	2.5	25.1	4.9	29.1	9.5	-6.2	31.9	-38.1	1/3kHz	NF
RMS	V	1559.000	2.5	26.2	5.6	29.1	9.5	-4.3	31.9	-36.2	1/3kHz	NF
RMS	V	1600.000	3.4	26.4	5.7	29.1	9.5	-3.2	31.9	-35.1	1/3kHz	NF
RMS	V	1605.000	4.5	26.4	5.7	29.1	9.5	-2.1	31.9	-34.0	1/3kHz	NF
RMS	V	1610.000	4.0	26.4	5.7	29.1	9.5	-2.6	31.9	-34.5	1/3kHz	NF

Setup Photo 1

Setup Photo 2

Setup Photo 3

Setup Photo 4

Test Results: Pass

Test Standard: FCC Part 15 Subpart F – Ultra-Wideband Operation

Test: Highest Radiated Emission Above 960MHz

Performance Criterion: Not Applicable

EUT Operating Voltage: EUT powers from Server-8

Test Environment:

Environmental Conditions During Testing:	Ambient (°C):	See data table	Humidity (%):	See data table	Pressure (hPa):	See data table
Pretest Verification Performed:	Yes		Equipment under Test:		CMD2A-F2	
Test Engineer(s):	Kouma Sinn		EUT Serial Number:		9	

Maximum Test Disturbance Parameters: The peak level of the emissions contained within a 50 MHz bandwidth centered on the frequency at which the highest radiated emission occurs, f_M. That limit is 0 dBm EIRP.

Test Equipment Used:

TEST EQUIPMENT LIST					
Item	**Equipment Type**	**Make**	**Model No.**	**Serial No.**	**Next Cal. Due**
1	Digital 4 Line Barometer	Mannix	0ABA116	BAR3	06/01/2009
2	9kHz to 3GHz EMI Test Receiver	Rohde & Schwartz	ESCI 1166.5950K03	100067	02/17/2010
3	100MHz-40GHz Preamp	MITEQ	NSP4000-NFG	1260417	03/27/2009
4	High Frequency Cable 40GHz	Megaphase	TM40 K1K1 197	CBL028	12/10/2009
5	40GHz Cable	Megaphase	TM40-K1K1-197	7030801 001	06/05/2009
6	ANTENNA	EMCO	3142	9701-1116	12/02/2009
7	High Frequency Cable 40GHz	Megaphase	TM40 K1K1 80	CBL030	12/10/2009
8	HORN ANTENNA	EMCO	3115	9610-4980*	02/25/2010
9	100MHz-40GHz Preamp	MITEQ	NSP4000-NFG	1260417	03/27/2009

Software Utilized:

Name	Manufacturer	Version
EXCEL 2000	Microsoft Corporation	9.0.6926 SP-3
EMI BOXBOROUGH	Intertek	2/07/05 Revision

Test Details:

Test Point	Standard Limit (as published)	Compliance Level	Pass/Fail N/A	Comment
Around the EUT	Per Standard	Per Standard	Pass	See notes

Notes: The limit is 0 dBm EIRP which is 95 dBuV/m in field strength. The resolution bandwidth of 3 MHz is used. The new limit is 95.2-20*LOG[(ResBW in MHz)/50MHz] = 95.2-24.437 = 70.763 dBuV/m

Test Results:

Highest Radaited Emission Above 960MHz

Company:	UltraVision Security Systems			Antenna & Cables:	LF	Bands: N, LF, HF, SHF	
Model #:	CMD2A-F2			Antenna:	HORN3 V1m 02-25-10.txt	HORN3 H1m 02-25-10.txt	
Serial #:	9			Cable(s):	CBL030 12-10-09.txt	CBL028 12-10-09.txt	
Engineers:	Kouma Sinn	Location:	Sandpit	Barometer:	BAR3		
Project #:	3173246	Date(s):	03/06/09				
Standard:	FCC Part 15 Subpart F			Temp/Humidity/Pressure:	19C	29%	1008mbar
Receiver:	R&S ESCI (ROS002)	Limit Distance (m):	3				
PreAmp:	PRE9 03-27-09.txt	Test Distance (m):	1				
PreAmp Used? (Y or N):	Y	Voltage/Frequency:	DC Powered	Frequency Range:	960M-18G		

Net = Reading (dBuV/m) + Antenna Factor (dB1/m) + Cable Loss (dB) - Preamp Factor (dB) - Distance Factor (dB)

Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor, RB = Restricted Band; Bandwidth denoted as RBW/VBW

Detector Type	Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Distance Factor dB	Net dB(uV/m)	Limit dB(uV/m)	Margin dB	Bandwidth
PK	V	974.750	44.6	24.1	4.3	29.1	9.5	34.3	70.8	-36.5	3/3MHz

Test Results: Pass

Test Standard: Basic Standard FCC Part 15 Subpart F – Ultra-Wideband Operation

Test: Line-Conducted Emissions

Performance Criterion: Not Applicable

EUT Operating Voltage: EUT powers from server-8

Test Environment:

Environmental Conditions During Testing:	Ambient (°C):	21	Humidity (%):	29	Pressure (hPa):	1012
Pretest Verification Performed:	Yes		Equipment under Test:		CMD2A-F2	
Test Engineer(s):	Kouma Sinn		EUT Serial Number:		9	

Maximum Test Disturbance Parameters: Emissions below specified limits

Test Equipment Used:

TEST EQUIPMENT LIST					
Item	**Equipment Type**	**Make**	**Model No.**	**Serial No.**	**Next Cal. Due**
1	4 Line Digital Barometer *	Mannix	0ABA116	SAF291	01/30/2009
2	LISN, 50uH, .01 - 50MHz, 24A	Solar Electronics	9252-50-R-24-BNC	955107	06/05/2009
3	Attenuator, 10dB	Mini Circuits	10dB, 50 ohm	DS12	03/04/2009
4	CABLE, BNC/BNC	Alpha	RG58B/U	CBL310E	03/04/2009
5	EMI Receiver with 85420E RF Filter Section S/N 3705A00230 On Loan from Littleton	Hewlett Packard	8542E	3906A00273	03/06/2009

Software Utilized:

Name	Manufacturer	Version
EXCEL 2000	Microsoft Corporation	9.0.6926 SP-3
EMI BOXBOROUGH	Intertek	2/07/05 Revision

Test Results:

Conducted Emissions

Company: UltraVision Security Systems
Model #: CMD2A-F2
Serial #: 9
Engineer(s): Kouma Sinn
Project #: 3170131
Standard: FCC Part 15/Cispr22 Class B
Barometer: SAF291 Temp/Humidity/Pressure: 21C 29% 1012mbar
Voltage/Frequency: 120V/60Hz
Location: Shielded Enclosure
Date: 01/14/09
Frequency Range: 150kHz-30MHz
Attenuator: DS12 03-04-09.txt

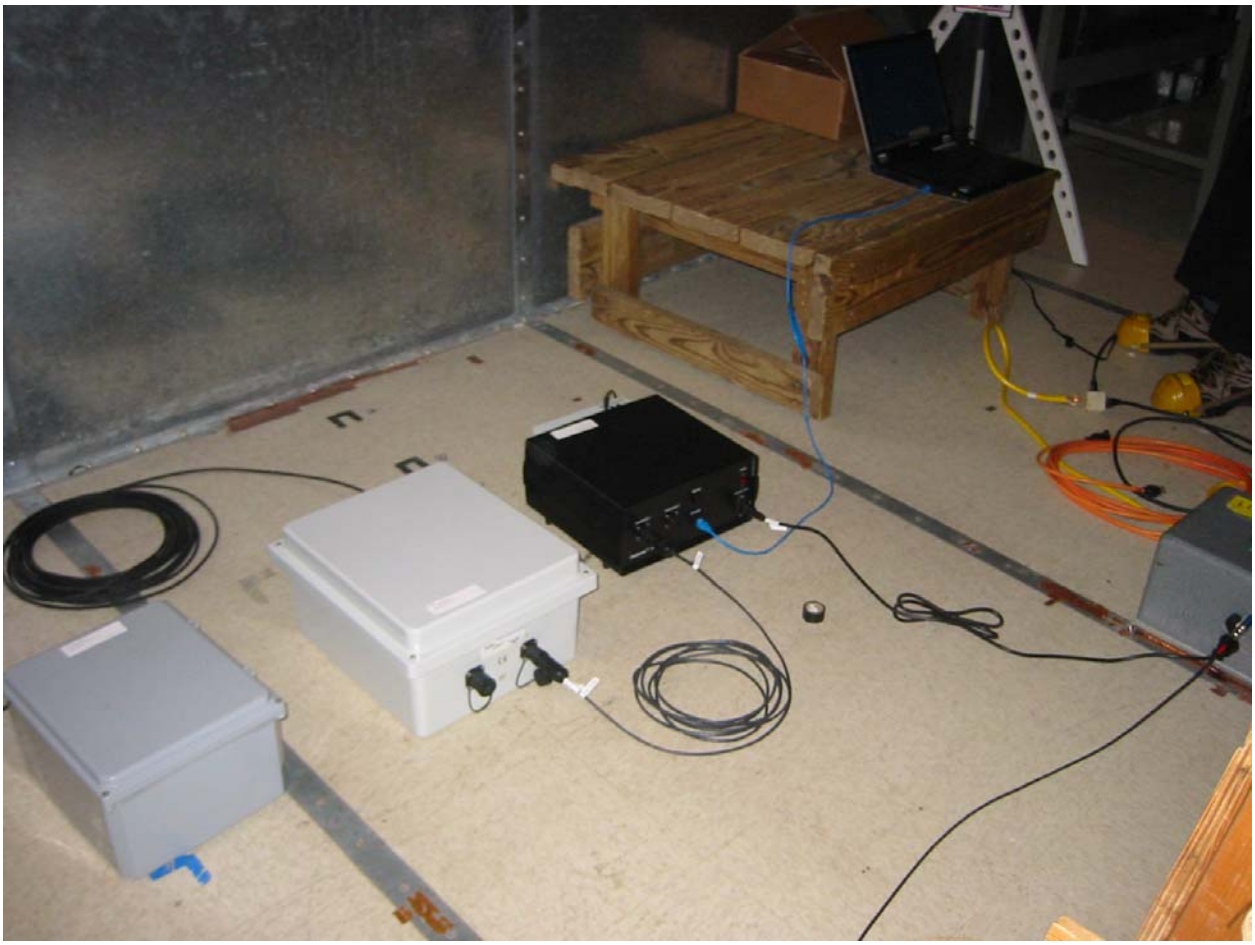
Receiver: 145-092
Cable: CBL310E 3-04-09.txt
LISN 1: LISN13(1) 06_05_09.TXT
LISN 2: LISN13(2) 06_05_09.TXT
LISN 3: NONE.
LISN 4: NONE.

Net is the sum of worst-case lisn, cable, & attenuator losses, and initial reading, factors are not shown
Peak: PK Quasi-Peak: QP Average: AVG RMS: RMS; NF = Noise Floor; Bandwidth denoted as RBW/VBW

Detector Type	Frequency MHz	Reading Line 1 dB(uV)	Reading Line 2 dB(uV)	Reading Line 3 dB(uV)	Reading Line 4 dB(uV)	Net dB(uV)	QP Limit dB(uV)	Margin dB	Bandwidth
QP	0.150	15.6	21.6			31.9	66.0	-34.1	9/30 kHz
QP	0.187	35.1	34.8			45.4	64.2	-18.8	9/30 kHz
QP	0.249	26.1	25.1			36.4	61.8	-25.4	9/30 kHz
QP	0.310	25.2	27.3			37.6	60.0	-22.4	9/30 kHz
QP	0.372	33.6	33.5			43.9	58.5	-14.6	9/30 kHz
QP	0.495	16.8	16.6			27.2	56.1	-28.9	9/30 kHz
QP	12.140	21.2	20.1			31.8	60.0	-28.2	9/30 kHz
QP	14.000	20.3	19.9			31.0	60.0	-29.0	9/30 kHz
QP	18.240	24.8	24.5			35.5	60.0	-24.5	9/30 kHz
QP	20.500	12.0	10.0			22.7	60.0	-37.3	9/30 kHz
QP	21.910	16.2	14.3			26.9	60.0	-33.1	9/30 kHz
QP	28.990	9.3	15.7			26.6	60.0	-33.4	9/30 kHz

Detector Type	Frequency MHz	Reading Line 1 dB(uV)	Reading Line 2 dB(uV)	Reading Line 3 dB(uV)	Reading Line 4 dB(uV)	Net dB(uV)	Average Limit dB(uV)	Margin dB	Bandwidth
AVG	0.150	-1.9	11.5			21.8	56.0	-34.2	9/30 kHz
AVG	0.187	27.5	28.5			38.8	54.2	-15.4	9/30 kHz
AVG	0.249	17.4	15.7			27.7	51.8	-24.1	9/30 kHz
AVG	0.310	20.6	21.8			32.1	50.0	-17.9	9/30 kHz
AVG	0.372	30.5	30.5			40.8	48.5	-7.7	9/30 kHz
AVG	0.495	14.0	14.7			25.1	46.1	-21.0	9/30 kHz
AVG	12.140	17.6	16.5			28.2	50.0	-21.8	9/30 kHz
AVG	14.000	16.9	15.8			27.6	50.0	-22.4	9/30 kHz
AVG	18.240	23.2	18.3			33.9	50.0	-16.1	9/30 kHz
AVG	20.500	9.0	7.8			19.7	50.0	-30.3	9/30 kHz
AVG	21.910	13.1	11.4			23.8	50.0	-26.2	9/30 kHz
AVG	28.990	4.6	9.5			20.4	50.0	-29.6	9/30 kHz

Line-Conducted Emissions Photo 1



Test Results: Pass

Test Standard: FCC Part 15 Subpart F – Ultra-Wideband Operation

Test: 10 dB Bandwidth

Performance Criterion: Not Applicable

EUT Operating Voltage: Powered from server-8

Test Environment:

Environmental Conditions During Testing:		Ambient (°C):	13	Humidity (%):	35	Pressure (hPa):	1012
Pretest Verification Performed:		Yes		Equipment under Test:		CMD2A-F2	
Test Engineer(s):	Kouma Sinn			EUT Serial Number:		9	

Maximum Test Disturbance Parameters: The UWB bandwidth is the frequency band bounded by the points that are 10 dB below the highest radiated emission, as based on the complete transmission system including the antenna. The fractional bandwidth shall be equal to or greater than 0.20 or has a UWB bandwidth equal to or greater than 500 MHz, regardless of the fractional bandwidth.

Test Equipment Used:

TEST EQUIPMENT LIST					
Item	**Equipment Type**	**Make**	**Model No.**	**Serial No.**	**Next Cal. Due**
1	Digital 4 Line Barometer	Mannix	0ABA116	BAR3	06/01/2009
2	9kHz to 3GHz EMI Test Receiver	Rohde & Schwartz	ESCI 1166.5950K03	100067	02/17/2010
3	100MHz-40GHz Preamp	MITEQ	NSP4000-NFG	1260417	03/27/2009
4	High Frequency Cable 40GHz	Megaphase	TM40 K1K1 197	CBL028	12/10/2009
5	40GHz Cable	Megaphase	TM40-K1K1-197	7030801 001	06/05/2009
6	ANTENNA	EMCO	3142	9701-1116	12/02/2009
7	High Frequency Cable 40GHz	Megaphase	TM40 K1K1 80	CBL030	12/10/2009
8	HORN ANTENNA	EMCO	3115	9610-4980*	02/25/2010
9	100MHz-40GHz Preamp	MITEQ	NSP4000-NFG	1260417	03/27/2009

Software Utilized:

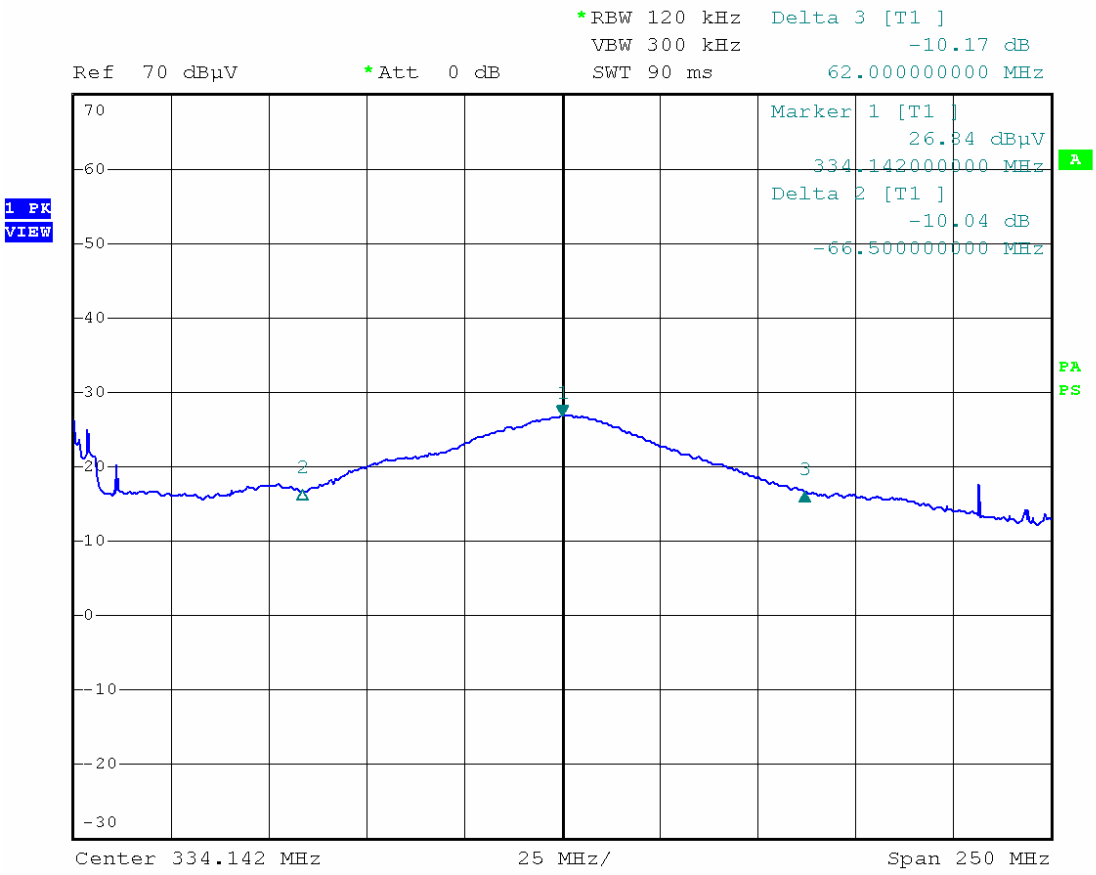
None

Test Details:

Test Point	Standard Limit (as published)	Compliance Level	Pass/Fail N/A	Comment
Highest Peak	Per Standard	Per Standard	Pass	Fractional BW > 0.20

Test Results:

10dB Bandwidth



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F_C = 334.142MHz
F_L = 267.642MHz
F_H = 396.142MHz
Fractional B_{BW} = $2(F_H - F_L)/((F_H + F_L)$
Fractional B_{BW} = 257/663.784
Fractional B_{BW} = 0.3871