





Curtis-Straus LLC, a wholly owned subsidiary of BV CPS

# Test Report

Report No	EK1259-1
Client	airPointe Don Proulx
Address	35E Industrial Way Rochester, NH 03867
Phone	603-994-2200
Items tested	ID-R1000
Standards	47 CFR FCC Part 15
Test Dates	September 23, 2010
FCC ID	WUS00027
Prepared by	 Edward Breen – Test Engineer
Authorized by	 John Underwood – EMC Manager
Issue Date	<u>12/1/2010</u>
Conditions of Issue	This Test Report is issued subject to the conditions stated in the 'Conditions of Testing' section on page 23 of this report.

Curtis-Straus LLC is accredited by the American Association for Laboratory Accreditation for the specific scope of accreditation under Certificate Number 1627-01. This report may contain data which is not covered by the A2LA accreditation.



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REV 11-MAR-10 (SC)



## Summary

On September 23, 2010 we tested the ID-R1000 for compliance with the following requirements:

### EMC Emissions:

- 47 CFR FCC Part 15 Class B emissions requirements (USA)

We found that the product met the above requirements without modification. Don Proulx from airPointe was present during the testing. The test sample was received in good condition. The sample was received on September 23, 2010.

This report supports an application for certification of a receiver. The CRUSH RF receive range is 300-348MHz.

Please note that the EUT was tested in 2 power modes, using an external AC/DC supply and using Power-Over-Ethernet.

Issue No.	Reason for change	Date Issued
1	Original Release	December 2, 2010

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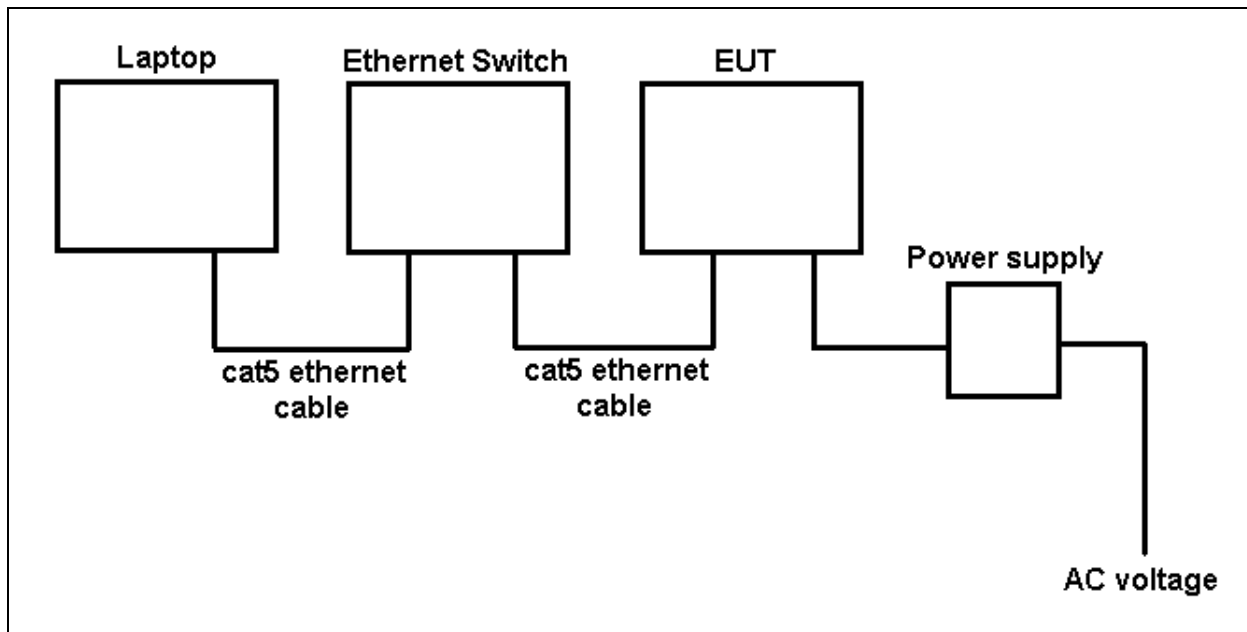
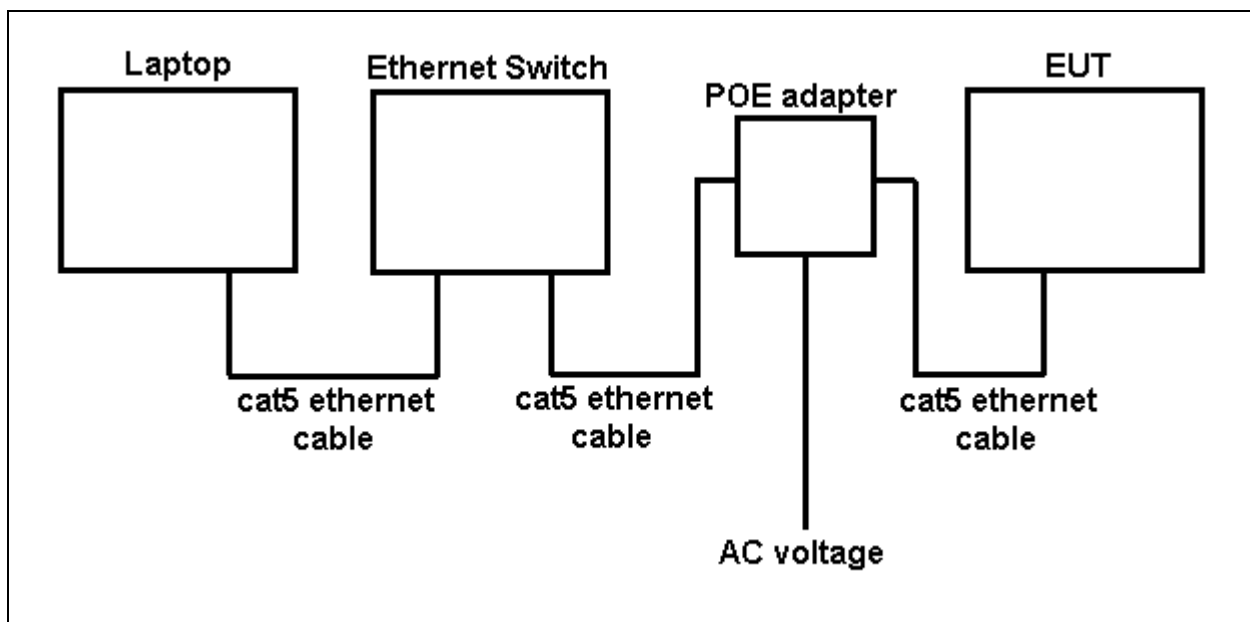


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**Product Tested****Configuration Documentation**

EUT Configuration											
<b>Work Order:</b> K1259 <b>Company:</b> airPointe <b>Company Address:</b> 35E Industrial Way Rochester, NH 03867 <b>Contact:</b> Don Proulx <b>Person Present:</b> Don Proulx											
<b>MN</b>						<b>SN</b>					
<b>EUT:</b>		ID-R1000						sample 1			
<b>Power Supply:</b>		GS18U48						R091255282			
<b>EUT Description:</b> Reader											
<b>EUT Max Frequency:</b> 492MHz											
<b>EUT Min Frequency:</b> 25MHz											
<b>Support Equipment:</b>						<b>SN</b>					
Sony Laptop		PCG51211L						27516330 3050019			
D-Link POE Adapter		DWL-P200						F370174001985			
Trendnet 10/100 Ethernet Switch		TE100-S8P						CA06468P07104			
<b>EUT Ports:</b>											
Port Label	Port Type	No. of ports	No. Populated	Cable Type	Shielded	Ferrites	Length	Max Length	In/Out	NEBS Type	Unpopulated Reason
AC Power	Power AC	1	1	2-wire AC	no	none	0m	0m	in		Not used for POE mode
DC Power (from Brick)	Power DC	1	1	2-wire DC	no	1, molded	2m	2m	in		Not used for POE mode
Ethernet	Ethernet	1	1	cat5	no	none	10m	100m	in		
<b>Software / Operating Mode Description:</b>											
EUT is in receive mode waiting for a transmission from an RF tag while pinging between itself and the support laptop											

**Block Diagram****AC voltage configuration****Power Over Ethernet configuration**

**Compliance Statement**

TEST	RESULT	STANDARD	TEST LEVEL	MARGIN	COMMENTS
<b><i>Radiated Emissions</i></b>	PASS	47 CFR FCC Part 15	Class B	-3.2 dB @ 59.1 MHz	
<b><i>AC Mains Conducted Emissions</i></b>	PASS	47 CFR FCC Part 15	Class B	-6.5 dB @ 10.41 MHz	

**Modifications Required for Compliance**

There were no modifications required for compliance.

**RADIATED EMISSIONS****Test Method:**

In accordance with the following:

- c63.4 2009

**Results:**

TEST	RESULT	TEST LEVEL	MARGIN	COMMENTS
<i><b>Radiated Emissions</b></i>	PASS	Class B	-3.2 dB @ 59.1 MHz	

## Radiated Emissions Data Table(s):

Table 1

Radiated Emissions Table												
Date: 23-Sep-10			Company: Airpointe				Work Order: K1259					
Engineer: John Cushing			EUT Desc: ID-R1000				EUT Operating Voltage/Frequency: 120V/60Hz or POE					
Temp: 25.6°C			Humidity: 34%				Pressure: 1018mBar					
Frequency Range: 30-1000MHz							Measurement Distance: 3 m					
Notes: peak readings							EUT Max Freq: 492MHz					
Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBμV/m)	---			FCC Class B		
							Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)
120V/60Hz			---	---	---	---	---	---	---	---	---	---
v	59.1	51.2	22.6	7.7	0.5	36.8	---	---	---	40.0	-3.2	Pass
h	78.5	39.7	22.6	8.4	0.6	26.1	---	---	---	40.0	-13.9	Pass
v	90.625	48.7	22.6	8.1	0.6	34.8	---	---	---	43.5	-8.7	Pass
v	124.575	43.3	22.6	14.4	0.7	35.8	---	---	---	43.5	-7.7	Pass
v	187.625	40.9	22.6	11.6	0.8	30.7	---	---	---	43.5	-12.8	Pass
h	282.2	38.5	22.6	13.7	1.0	30.6	---	---	---	46.0	-15.4	Pass
v	599.875	38.4	21.9	19.3	1.5	37.3	---	---	---	46.0	-8.7	Pass
h	750.225	34.4	22.5	21.1	1.7	34.7	---	---	---	46.0	-11.3	Pass
POE			---	---	---	---	---	---	---	---	---	---
v	56.675	47.2	22.6	7.6	0.5	32.7	---	---	---	40.0	-7.3	Pass
v	90.625	48.8	22.6	8.1	0.6	34.9	---	---	---	43.5	-8.6	Pass
v	124.575	44.1	22.6	14.4	0.7	36.6	---	---	---	43.5	-6.9	Pass
v	187.625	37.3	22.6	11.6	0.8	27.1	---	---	---	43.5	-16.4	Pass
h	282.2	39.4	22.6	13.7	1.0	31.5	---	---	---	46.0	-14.5	Pass
v	434.975	34.5	22.1	16.9	1.2	30.5	---	---	---	46.0	-15.5	Pass
v	599.875	37.9	21.9	19.3	1.5	36.8	---	---	---	46.0	-9.2	Pass
v	750.225	35.8	22.5	21.1	1.7	36.1	---	---	---	46.0	-9.9	Pass
Table Result: Pass							by -3.2 dB		Worst Freq: 59.1 MHz			
Test Site: EMI Chamber 2			Cable 1: Asset #1506			Cable 2: Asset #1508						
Analyzer: Asset #1328			Preamp: Blue			Antenna: Red-White						

Rev: 23-Sep-2010

## Spectrum Analyzers / Receivers / Preselectors

SA EMI Chamber (1328)

Range

9kHz-13.2 GHz

MN

E4405B

Mfr

Agilent

SN

MY44210241

Asset

1328

Cat

I

Calibration Due

16-Dec-2010

## Radiated Emissions Sites

EMI Chamber 2

FCC Code

719150

IC Code

2762A-7

VCCI Code

R-3033, G-107

Cat

I

Calibration Due

15-Feb-2011

## Preamps / Couplers Attenuators / Filters

Blue

Range

0.009-2000MHz

MN

ZFL-1000-LN

Mfr

CS

SN

N/A

Asset

759

Cat

II

Calibration Due

6-Apr-2011

## Antennas

Red-White Bilog

Range

30-2000MHz

MN

JB1

Mfr

Sunol

SN

A091604-1

Asset

1105

Cat

I

Calibration Due

17-Dec-2010

## Meteorological Meters

Temp./Humidity/Atm. Pressure Gauge

CHAMBER2 Thermohyrometer

MN

7400 Perception II

Mfr

Davis

SN

N/A

Asset

965

Cat

I

Calibration Due

6-Apr-2011

35519-044

Control Company

72457639

1347

II

18-Aug-2011

## Cables

Asset #1506

Asset #1508

Range

9kHz - 18GHz

9kHz - 26.5GHz

Mfr

Florida RF

Florida RF

Cat

II

16-Aug-2011

20-Apr-2011

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.



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Table 2

Radiated Emissions Table														
Date: 23-Sep-10 Engineer: John Cushing Temp: 25.6 °C					Company: Airpointe EUT Desc: ID-R1000 Humidity: 34%					Work Order: K1259 EUT Operating Voltage/Frequency: 120V/60Hz or POE Pressure: 1018mBar				
Frequency Range: 1-5GHz										Measurement Distance: 3 m				
Notes:										EUT Max Freq: 492MHz				
Antenna Polarization (H/V)	Frequency (MHz)	Peak Reading (dBμV)	Average Reading (dBμV)	Preamp Factor (dB)	Antenna Factor (dBm)	Cable Factor (dB)	Adjusted Peak Reading (dBμV/m)	Adjusted Avg Reading (dBμV/m)	CISPR Class B High Frequency - Peak			FCC Class B High Frequency - Average		
									Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)	Limit (dBμV/m)	Margin (dB)	Result (Pass/Fail)
120V/60Hz														
V	1000.0	37.3	37.3	22.5	24.6	2.1	41.5	41.5	67.5	-26.0	Pass	54.0	-12.5	Pass
H	1124.0	34.0	34.0	21.3	26.0	2.3	41.0	41.0	70.0	-29.0	Pass	54.0	-13.0	Pass
H	1251.0	35.3	35.3	20.9	25.9	2.0	42.3	42.3	70.0	-27.7	Pass	54.0	-11.7	Pass
V	1874.0	31.9	31.9	20.3	27.8	2.7	42.1	42.1	70.0	-27.9	Pass	54.0	-11.9	Pass
H	2061.0	32.6	32.6	21.1	28.0	2.8	42.3	42.3	70.0	-27.7	Pass	54.0	-11.7	Pass
V	2358.0	31.0	31.0	21.3	28.6	2.9	41.2	41.2	70.0	-28.8	Pass	54.0	-12.8	Pass
POE														
V	1000.0	35.9	35.9	22.5	24.6	2.1	40.1	40.1	67.5	-27.4	Pass	54.0	-13.9	Pass
H	1124.0	33.4	33.4	21.3	26.0	2.3	40.4	40.4	70.0	-29.6	Pass	54.0	-13.6	Pass
V	1630.0	31.3	31.3	20.3	26.2	2.5	39.7	39.7	70.0	-30.3	Pass	54.0	-14.3	Pass
H	1866.0	32.0	32.0	20.2	27.7	2.7	42.2	42.2	70.0	-27.8	Pass	54.0	-11.8	Pass
H	2061.0	32.0	32.0	21.1	28.0	2.8	41.7	41.7	70.0	-28.3	Pass	54.0	-12.3	Pass
V	2455.0	32.4	32.4	21.4	29.0	3.2	43.2	43.2	70.0	-26.8	Pass	54.0	-10.8	Pass
Table Result: Pass by -10.8 dB Worst Freq: 2455.0 MHz														
Test Site: EMI Chamber 2 Analyzer: Asset #1328					Cable 1: Asset #1506 Preamp: Asset #1517					Cable 2: Asset #1508 Antenna: Black Horn				

Rev: 23-Sep-2010

<b>Spectrum Analyzers / Receivers / Preselectors</b>		<b>Range</b>	<b>MN</b>	<b>Mfr</b>	<b>SN</b>	<b>Asset</b>	<b>Cat</b>	<b>Calibration Due</b>
SA EMI Chamber (1328)		9kHz-13.2 GHz	E4405B	Agilent	MY44210241	1328	I	16-Dec-2010
<b>Radiated Emissions Sites</b>		<b>FCC Code</b>	<b>IC Code</b>	<b>VCCI Code</b>			<b>Cat</b>	<b>Calibration Due</b>
EMI Chamber 2		719150	2762A-7	R-3033, G-107			I	15-Feb-2011
<b>Preamps / Couplers Attenuators / Filters</b>		<b>Range</b>	<b>MN</b>	<b>Mfr</b>	<b>SN</b>	<b>Asset</b>	<b>Cat</b>	<b>Calibration Due</b>
1517 HF Preamp		1-18GHz	CS	CS	N/A	1517	II	1-Jun-2011
<b>Antennas</b>		<b>Range</b>	<b>MN</b>	<b>Mfr</b>	<b>SN</b>	<b>Asset</b>	<b>Cat</b>	<b>Calibration Due</b>
Black Horn		1-18GHz	3115	EMCO	9703-5148	56	I	6-Jul-2011
<b>Meteorological Meters</b>			<b>MN</b>	<b>Mfr</b>	<b>SN</b>	<b>Asset</b>	<b>Cat</b>	<b>Calibration Due</b>
Temp./Humidity/Atm. Pressure Gauge			7400 Perception II	Davis	N/A	965	I	6-Apr-2011
CHAMBER2 Thermohygrometer			35519-044	Control Company	72457639	1347	II	18-Aug-2011
<b>Cables</b>		<b>Range</b>		<b>Mfr</b>			<b>Cat</b>	<b>Calibration Due</b>
Asset #1506		9kHz - 18GHz		Florida RF			II	16-Aug-2011
Asset #1508		9kHz - 26.5GHz		Florida RF			II	20-Apr-2011

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

## Radiated Emissions Modifications:

None



**Radiated Emissions Setup Photograph(s):**

**See test set up exhibits**



## Radiated Emissions Testing Overview

REV 22-SEP-05

Digital and microprocessor based devices use radio frequency (RF) digital signals for timing purposes. An unintentional consequence of this signal usage is that a certain amount of RF energy is radiated from the device into the local environment. This radiated RF energy has the potential to interfere with constructive uses of the RF spectrum such as television broadcasting, police and fire radio, and the like. In order to reduce the likelihood that a device will interfere with these services, it is required that the amplitudes of radiated RF signals from the device are kept below an allowable level.

These RF signals decrease in strength as the distance from the source increases. Thus if the potential victim of interference, e.g. a TV receiver, is far enough from the radiator, e.g. a computer, then no interference will occur. For certain environments it is appropriate to expect that potential interference victims will be located at least a minimum distance from the radiator. For the residential environment this distance is generally accepted to be 10 meters while in the commercial environment the accepted distance is 30 meters. The allowable emissions levels are therefore specified to protect equipment which is located further than that distance from the radiator. In general, radiation from the Equipment Under Test (EUT) is measured at 3 or 10 meters to ensure that it is at or below allowable levels.

Measurements of the radiated energy are made by recording the field strength indicated by an antenna placed at a specific distance from the device. Most devices do not radiate the RF energy in a predictable manner. The emitted energy may vary with changes in operating mode, physical configuration, or orientation. During the measurement process these parameters are varied to confirm that the emissions will remain below the allowable levels in the range of typical installations.

The extent of annoyance experienced by a person who is being affected by interference is related to the persistence of the interfering signal. For example, a low level steady whine from a receiver is considered to be more annoying than brief, loud, intermittent pops or clicks. This “human factor” is accounted for by the use of a “quasi-peak” detector in the receiver or spectrum analyzer which measures the signal from the measurement antenna. The detector is a weighted averaging filter with a fast charge time and a slow discharge time. Thus steady continuous signals will charge the quasi-peak detector fully while intermittent signals (those with pulse repetition rates less than 1kHz) are reported at a level which can be significantly below their peak level. It should be noted that most RF signals produced by digital devices are continuous in nature and thus the quasi-peak reading will be identical to the peak signal reading. To reduce the test time, the peak emission level is recorded for continuous wave signals as it is the same as the quasi-peak signal level.

Testing is performed according to test methods from ANSI C63.4 and CISPR 22.

The test site used for measuring radiated emissions follows the format developed internationally for a weather protected Open Area Test Site (OATS). An antenna mast is installed at the specified distance from a rotating table and is used to raise and lower the measuring antenna. The reference site is clear of reflecting objects, such as metal fences and buildings for an ellipse of twice the measurement test distance. Measuring equipment and personnel are present within the ellipse to facilitate cable manipulation, but measures are taken



to minimize the effects. Often preliminary radiated emissions measurements are made at alternate test sites which do not meet the clear space reference criteria. The data collected at alternate test sites is not considered conclusive unless the alternate site also complies with a volumetric site attenuation survey performed over the area that the EUT occupies. The EUT and measuring antenna mark the two foci of the ellipse. The ground plane is made of a combination of galvanized steel sheets and tight wire mesh electrically connected along the seams. This metal ground plane extends 1 meter beyond the furthest extent of the EUT and the measuring antenna. It also covers the area between the EUT and the measuring antenna. The hardware cloth is connected to the utility ground or to stakes driven into the earth for safety.

In order for accurate emissions measurements to be made the test site must possess propagation characteristics which fall within accepted norms. The site has been checked for suitability using techniques specified in American National Standards Institute (ANSI) document C63.4. This document details a procedure which measures the attenuation of the site which is the chief indicator of site acceptability. The theory behind site attenuation is quite simple. A transmitting antenna is set up at a fixed location at one end of the site with a receiving antenna at the other end. If a signal of some arbitrary amplitude is fed into the transmitting antenna, a lesser amount of signal ought to be measured at the receiving antenna. This difference in signal amplitude is known as the site attenuation, which should follow a predicted curve. Data that does not correspond to the predicted site attenuation curve points to a problem with either the equipment being used or the physical characteristics of the site.

Actual emissions measurements are taken with broadband biconical-log-periodic hybrid antennas calibrated in accordance with the standard site method detailed in ANSI C63.5. Emissions are measured with the receiving antenna oriented in horizontal and vertical polarization with respect to the ground plane. If measurements are made at other than the limit distance, then the readings obtained are scaled to the limit distance using an inverse relationship. The actual test distance used is noted in the report.

The antenna mast is capable of a varying the antenna height between 1 and 4 meters above the ground plane. The receiving antenna is moved over this range at each emission frequency in order to record the maximum observed signal. The mast is non-conductive and remotely controllable. The test distance is measured from the antenna center (marked during calibration) and the periphery of the EUT.

The Equipment Under Test (EUT) is rotated in order to maximize emissions during the test. For equipment intended to operate on a tabletop or desk radiated tests are conducted on a 0.8 meter high, non-conductive platform. Larger floor standing equipment is tested on a floor mounted rotatable platform. In some cases, large equipment on its own casters may be tested without a platform.

Since radiated emissions are a function of cable placement, the cable placement is varied to encompass typical configurations that an end user might encounter to determine the configuration resulting in maximum emissions. At least one cable for each I/O port type is attached to the EUT. If peripherals or modules are available, at least one of each available type is installed and noted in the report. Excess cable length beyond one meter is bundled in the center into a 30 to 40 cm bundle. Cables requiring non-standard lead dress are recorded in the report.



Network connections are simulated if necessary. Any simulator used matches the expected real network connection in terms of both functionality and impedance. For distributed systems, the support equipment may be placed at such a distance that it does not influence the measured emissions. If this option is used, such placement is noted in the test report.

The possible operating modes of the EUT are explored to determine the configuration which maximizes emissions. Software is investigated as well as different methods of displaying data if available. Data is recorded in the worst case operating mode.

At least the six highest emissions with respect to the limit are recorded. If less than six emissions are visible above the noise floor of the instrumentation, then noise floor measurements at six representative frequencies are recorded. The test report will document if noise floor readings are reported.

### FCC and European Norms Radiated Emissions Limits at 10 meters

Frequency (MHz)	FCC Class A	FCC Class B	CISPR Class A	CISPR Class B	Frequency (MHz)
30-88	39.1	29.5	40	30	30-88
88-216	43.5	33.1	40	30	88-216
216-230	46.4	35.6	40	30	216-230
230-960	46.4	35.6	47	37	230-960
960-1000	49.5	43.5	47	37	960-1000
1000+	49.5	43.5	N/A	N/A	1000+

At the transitions, the lower limit applies.  
Simple inverse scaling utilized to convert limits where appropriate.

### FCC and European Norms Radiated Emissions Limits at 3 meters

Frequency (MHz)	FCC Class A	FCC Class B	CISPR Class A	CISPR Class B	Frequency (MHz)
30-88	49.5	40	50.5	40.5	30-88
88-216	54	43.5	50.5	40.5	88-216
216-230	56.9	46	50.5	40.5	216-230
230-960	56.9	46	57.5	47.5	230-960
960-1000	60	54	57.5	47.5	960-1000
1000+	60	54	N/A	N/A	1000+

At the transitions, the lower limit applies.  
Simple inverse scaling utilized to convert limits where appropriate.

For CISPR and EU standards measurements are usually made over the frequency range of 30 MHz to 1GHz. Deviations are noted in the test report. For the FCC, the measurement range is based on the highest frequency signal present or used in the device. The following table details the frequency range of measurements performed.

FCC frequency range of radiated emissions measurements	
Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30 (No radiated measurements)
1.705-108	1000
108-500	2000
500-1000	5000
Above 1000	5 <sup>th</sup> harmonic of the highest frequency or 40 GHz, whichever is lower.

The test data is derived from the voltage on the spectrum analyzer. First the reading is corrected for gain factors associated with the use of preamps and loss in the cable. A factor in dB is subtracted from the reading to account for preamp gain, while a factor in dB is added to the signal to account for cable loss. A conversion is performed from the resulting voltage to field strength by multiplying the voltage by the antenna factor. Since antenna factor is expressed as a logarithm (dB/m), this operation takes the form of an addition (to multiply logarithmic numbers, you add them together). Thus:

$$\text{Field Strength (dBuV/m)} = \text{Voltage Reading (dBuV)} - \text{Preamp Gain (dB)} + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$$

When the levels of ambient radio signals such as local television stations are within 6 dB of the appropriate limit, the following steps may be taken to assure compliance:

1. The measurement bandwidth may be reduced. A check is made to see that peak readings are not affected. The use of a narrower bandwidth allows examination of emissions close to local ambient signals.
2. The antenna may be brought closer to the EUT to increase signal-to-ambient signal strength.
3. For horizontally polarized signals the axis of the test site may be rotated to discriminate against local ambients.

**CONDUCTED EMISSIONS****Test Method:**

In accordance with the following:

- 47 CFR FCC Part 15 & C63.4: 2009

**Results:**

TEST	RESULT	TEST LEVEL	MARGIN	COMMENTS
<i>AC Mains Conducted Emissions</i>	PASS	Class B	-6.5 dB @ 10.41 MHz	

## Conducted Emissions Data Table(s):

Table 3

## AC Mains Conducted Emissions

Date: 23-Sep-10			Company: Airpointe			Work Order: K1259				
Engineer: John Cushing			EUT Desc: ID-R1000			Test Site: CEMI5				
Temp: 23.0°C			Humidity: 37%			Pressure: 1018mBar				
Notes:										
Measurement Device: Asset #1494 LISN					EUT Operating Voltage/Frequency: 120V/60Hz					
Range: 0.15-30MHz					Spectrum Analyzer: Blue					
Frequency (MHz)	Q.P. Readings		Ave. Readings		Impedance Factor  (dB)	FCC/CISPR B		FCC/CISPR B		Overall Result  (Pass/Fail)
	QP1 (dBµV)	QP2 (dBµV)	AV1 (dBµV)	AV2 (dBµV)		qp Limit (dBµV)	qp Margin dB	AVE Limit (dBµV)	AVE Margin dB	
0.19	28.7	28.9	10.7	9.0	20.1	64.0	-15.0	54.0	-23.2	Pass
3.00	26.6	22.2	14.8	9.8	20.1	56.0	-9.3	46.0	-11.1	Pass
9.34	25.6	25.7	22.6	22.5	20.1	60.0	-14.2	50.0	-7.3	Pass
10.41	25.5	24.7	23.4	22.9	20.1	60.0	-14.4	50.0	-6.5	Pass
17.62	22.1	22.0	20.0	19.6	20.3	60.0	-17.6	50.0	-9.7	Pass
29.90	24.3	24.0	22.0	22.0	20.6	60.0	-15.1	50.0	-7.4	Pass
Table Result: Pass by -6.50 dB Worst Freq: 10.41 MHz										

Rev: 23-Sep-2010

## Spectrum Analyzers / Receivers / Preselectors

Blue

Range

9kHz-1.8GHz

MN

8591E

Mfr

Agilent

SN

3223A00227

Asset

70

Cat

I

Calibration Due

25-Jun-2011

## LISNs/Measurement Probes

230VAC LISN Asset 1494

Range

10kHz-50MHz

MN

9252-50-R-24-BNC

Mfr

Solar

SN

84715

Asset

1494

Cat

I

Calibration Due

13-Apr-2011

## Conducted Test Sites (Mains / Telco)

CEMI 5

FCC Code

719150

VCCI Code

C-3364, T-1579

Cat

III

Calibration Due

NA

## Meteorological Meters

Temp./Humidity/Atm. Pressure Gauge

CEMI5 Thermohygrometer

MN

7400 Perception II

Mfr

Davis

SN

N/A

Asset

965

Cat

I

Calibration Due

6-Apr-2011

## Cables

CEMI-05

Range

9kHz - 2GHz

Mfr

C-S

Cat

II

Calibration Due

6-Apr-2011

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.



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Table 4

AC Mains Conducted Emissions										
Date: 23-Sep-10			Company: Airpointe			Work Order: K1259				
Engineer: John Cushing			EUT Desc: ID-R1000			Test Site: CEMI5				
Temp: 23.0 °C			Humidity: 37%			Pressure: 1018mBar				
Notes:										
Measurement Device: Asset #1494 LISN						EUT Operating Voltage/Frequency: POE				
Range: 0.15-30MHz						Spectrum Analyzer: Blue				
Frequency (MHz)	Q.P. Readings		Ave. Readings		Impedance Factor (dB)	FCC/CISPR B		FCC/CISPR B		Overall Result (Pass/Fail)
	QP1 (dBµV)	QP2 (dBµV)	AV1 (dBµV)	AV2 (dBµV)		qp Limit (dBµV)	qp Margin dB	AVE Limit (dBµV)	AVE Margin dB	
0.18	13.4	12.7	13.1	11.9	20.1	64.3	-30.8	54.3	-21.1	Pass
17.70	21.2	20.2	19.3	18.7	20.3	60.0	-18.5	50.0	-10.4	Pass
18.24	21.7	18.2	20.9	20.2	20.3	60.0	-18.0	50.0	-8.8	Pass
19.70	21.0	20.4	16.0	19.6	20.3	60.0	-18.7	50.0	-10.1	Pass
23.13	21.5	20.2	19.5	18.6	20.4	60.0	-18.1	50.0	-10.1	Pass
26.60	19.6	19.0	18.2	17.3	20.5	60.0	-19.9	50.0	-11.3	Pass
27.20	20.4	13.6	8.4	7.9	20.5	60.0	-19.1	50.0	-21.1	Pass
Table Result: Pass by -8.80 dB Worst Freq: 18.24 MHz										

Rev: 23-Sep-2010

<b>Spectrum Analyzers / Receivers / Preselectors</b>		<b>Range</b>	<b>MN</b>	<b>Mfr</b>	<b>SN</b>	<b>Asset</b>	<b>Cat</b>	<b>Calibration Due</b>
Blue		9kHz-1.8GHz	8591E	Agilent	3223A00227	70	I	25-Jun-2011
<b>LISNs/Measurement Probes</b>		<b>Range</b>	<b>MN</b>	<b>Mfr</b>	<b>SN</b>	<b>Asset</b>	<b>Cat</b>	<b>Calibration Due</b>
230VAC LISN Asset 1494		10kHz-50MHz	9252-50-R-24-BNC	Solar	84715	1494	I	13-Apr-2011
<b>Conducted Test Sites (Mains / Telco)</b>		<b>FCC Code</b>		<b>VCCI Code</b>			<b>Cat</b>	<b>Calibration Due</b>
CEMI 5		719150		C-3364, T-1579			III	NA
<b>Meteorological Meters</b>			<b>MN</b>	<b>Mfr</b>	<b>SN</b>	<b>Asset</b>	<b>Cat</b>	<b>Calibration Due</b>
Temp./Humidity/Atm. Pressure Gauge			7400 Perception II	Davis	N/A	965	I	6-Apr-2011
CEMI5 Thermohygrometer			35519-044	Control Company	72457633	1341	II	18-Aug-2011
<b>Cables</b>		<b>Range</b>		<b>Mfr</b>			<b>Cat</b>	<b>Calibration Due</b>
CEMI-05		9kHz - 2GHz		C-S			II	6-Apr-2011

All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

**Conducted Emissions Modifications:**

None



**Conducted Emissions Setup Photograph(s):**

**See test set up exhibits**



## Measurement Uncertainty

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

Measurement	Expanded Uncertainty k=2	Maximum allowable uncertainty (ETSI)
Radiated Emissions (30-1000MHz)	5.6dB	N/A
Radiated Emissions (1-26.5GHz)	4.6dB	N/A
Radiated Emissions (above 26.5GHz)	4.9dB	N/A
Magnetic Radiated Emissions	5.6dB	N/A
Conducted Emissions	3.9dB	N/A
Telco Conducted Emissions (Current)	2.9dB	N/A
Telco Conducted Emissions (Voltage)	4.4dB	N/A
Electrostatic Discharge	11.5%	N/A
Radiated RF Immunity (Uniform Field)	1.6dB	N/A
Electrical Fast Transients	23.1%	N/A
Surge	23.1%	N/A
Conducted RF Immunity	3dB	N/A
Magnetic Immunity	12.8%	N/A
Dips and Interrupts	2.3V	N/A
Harmonics	3.5%	N/A
Flicker	3.5%	N/A
Radio frequency	$8.2 \times 10^{-8}$	$1 \times 10^{-7}$
RF power, conducted	0.7dB	0.75dB
Maximum frequency deviation:		
• Within 300Hz and 6kHz of audio frequency	• 1.2%	• 5%
• Within 6kHz and 25kHz of audio frequency	• 0.1dB	• 3dB
Adjacent channel power	1.9dB	3dB
Conducted spurious emission of transmitter, valid up to 12.75GHz	0.7dB	3dB
Conducted emission of receivers	0.7dB	1dB
Radiated emission of transmitter, valid up to 26.5GHz	5.6dB	6dB
Radiated emission of transmitter, valid up to 80GHz	5.6dB	6dB
Radiated emission of receiver, valid up to 26.5GHz	5.6dB	6dB
Radiated emission of receiver, valid up to 80GHz	5.6dB	6dB
RF level uncertainty for a given BER	0.7dB	1dB
Humidity	2.31%	5%
Temperature	0.6°C	1.0°C
Time	0.8%	10%
RF Power Density, Conducted	2.2dB	3dB
DC and low frequency voltages	1.29%	3%
Voltage (AC, <10kHz)	1.29%	2%
Voltage (DC)	0.23%	1%
The above reflects a 95% confidence level		

***Jurisdictional Labeling and Required Instruction Manual Inserts*****FCC Requirements****Required Equipment Authorization for Device Type**

Type of Device	Equipment Authorization Required
TV broadcast receiver	Verification
FM broadcast receiver	Verification
CB receiver	Declaration of Conformity or Certification
Superregenerative receiver	Declaration of Conformity or Certification
Scanning receiver	Certification
Radar detector	Certification
All other receivers subject to part 15	Declaration of Conformity or Certification
TV interface device	Declaration of Conformity or Certification
Cable system terminal device	Declaration of Conformity
Stand-alone cable input selector switch	Verification
Class B personal computers and peripherals	Declaration of Conformity or Certification
CPU boards and internal power supplies used with Class B personal computers	Declaration of Conformity or Certification
Class B personal computers assembled using authorized CPU boards or power supplies	Declaration of Conformity
Class B external switching power supplies	Verification
Other Class B digital devices & peripherals	Verification
Class A digital devices, peripherals & external switching power supplies	Verification
Access Broadband over Power Line (Access BPL)	Certification
All other devices	Verification

**FCC Required labeling for Verified Devices 47 CFR Part 15.19**

The specific labeling requirements for a device subject to the Verification or Certification procedure are contained in Section 15.19(a). These labelling requirements are:

- One of three compliance statements specified in Section 15.19(a);
- If the device is subject only to Verification include a label bearing a unique identifier - Section 2.954;
- If the device is subject to Certification (1) Section 2.925 contains information on identification of the equipment; (2) include a label bearing an FCC Identifier (FCC ID) - Section 2.926.

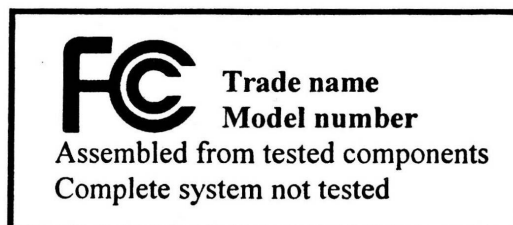
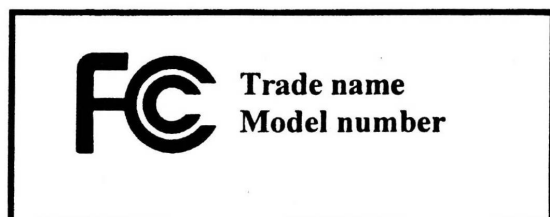
If the labeling area for the device is so small, and / or it is not practical to place the required statement on the device, then the statement can be placed in the user manual or product packaging - Section 15.19(a)(5). Generally, devices smaller than the palm of the hand are considered small. However, the device must still be labeled with the unique identifier (Verification) or the FCC ID (Certification).

**Declaration of Conformity (DoC):**

The labeling requirements for a device subject to the Declaration of Conformity (DoC) procedure are specified in Section 15.19(b). The label should include the FCC logo along with the Trade



Name and Model Number, which satisfies the unique identifier requirement of Section 2.1074 if it represents the identical equipment tested for DoC compliance. For personal computers assembled from authorized components, the following additional text must also be included: "Assembled from tested components," "Complete system not tested." When the device is so small and / or when it is not practical to place the required additional text on the device, the text may be placed in the user manual or pamphlet supplied to the user. However, the FCC logo, Trade Name, and Model Number must still be displayed on the device - Section 15.19(b)(3).



Part 15 Declaration of Conformity (DoC) Label Examples

### FCC Required Instruction Manual Inserts CFR 47 Part 15.21 and 15.105

Section 15.21 requires that in the user manual, the user shall be cautioned that changes / modifications not approved by the responsible party could void the user's authority to operate the equipment. The acceptable formats for user information dissemination are paper, computer disk or over the Internet. Where special accessories, such as shielded cables and/or special connectors, are required to comply with the emission limits, the instruction manual shall include appropriate instructions on the first page of the text describing the installation of the device (Section 15.27(a)).

For a Class A or Class B digital device (unintentional radiator), as well as any composite device that is both an intentional and unintentional radiator, the text specified in Section 15.105 must be placed in the user manual.

Devices authorized under the Declaration of Conformity (DoC) procedure must also include a compliance information statement (in the user manual or on a separate sheet) as required by Section 2.1077. The objective of this compliance statement is to allow the FCC to associate the equipment with the party responsible for compliance with the DoC requirements.

Devices certified as software defined radio that use an electronic labeling method to display the FCC ID must provide instructions in the user manual on how to access the electronic display (Section 2.925(e)).

Additional statements and information may be required for compliance to specific or general rule parts. The following is an example of some additional user information requirements. The party responsible for compliance must provide any additional statement(s) required.

- Kits - TV interface and Cable system terminal device marketed as Kits: Section 15.25 (d);
- TV interface devices, including cable system terminal devices: Section 15.115 (c) (5);
- Labeling of digital cable ready products: Section 15.123 - use of the term cable ready/compatible;
- External power amplifiers and antenna modifications: Section 15:204 (d) (2) – 1 notice of authorized amplifiers;
- Cordless telephones: Section 15.214 (c) & (d) (3) - privacy statement & security code statement;



- Cordless telephones: Section 15.233 (b) (2) (ii) - interference to TV;
- Cordless telephones: Section 15.233 (h) - cordless phones without digital security (Section 15.214);
- Professionally installed systems: Section 15.247 (c) (1) (iii);
- Operation within the Band 92-95 GHz: Section 15.257 (a) (4) - indoor use only;
- Unlicensed PCS: Section 15.311 - notification and coordination with UTAM, Inc.;
- RF exposure statements: Section 2.1091 (d) (3) - Mobile devices (a minimum separation distance may be required).

Our facility codes can be found in the *Test Equipment Used* Section starting on page 19.



## Conditions Of Testing

[Bureau Veritas Consumer Products Services, Inc., a Massachusetts corporation], and/or its affiliates (collectively, the "Company") will conduct, at the request of the Submitter ("Client"), the tests specified on the submitted Test Request Form or equivalent in accordance with, and subject to, the following terms and conditions (collectively, "**Conditions**"):

1. All orders for tests are subject to acceptance by the Company, and no order will constitute a binding commitment of the Company unless and until such order is accepted by it, as evidenced by the issuance of a written report ("**Test Report**") by the Company. The Test Report is issued solely by the Company, is intended for the exclusive use of Client and shall not be published, used for advertising purposes, copied or replicated for distribution to any other person or entity or otherwise publicly disclosed without the prior written consent of the Company. By submitting a request for services to the Company, Client consents to the disclosure to accreditation bodies of those records of Client relevant to the accreditation body's assessment of the Company's competence and compliance with relevant accreditation criteria. The Company shall not be liable for any loss or damage whatsoever resulting from the failure of the Company to provide its services within any time period for completion estimated by the Company. If Client anticipates using the Test Report in any legal proceeding, arbitration, dispute resolution forum or other proceeding, it shall so notify the Company prior to submitting the Test Report in such proceeding. The Company has no obligation to provide a fact or expert witness at such proceeding unless the Company agrees in advance to do so for a separate and additional fee.
2. The Test Report will set forth the findings of the Company solely with respect to the test samples identified therein. Unless specifically and expressly indicated in the Test Report, the results set forth in such Test Report are not intended to be indicative or representative of the quality or characteristics of the lot from which a test sample is taken, and Client shall not rely upon the Test Report as being so indicative or representative of the lot or of the tested product in general. The Test Report will reflect the findings of the Company at the time of testing only, and the Company shall have no obligation to update the Test Report after its issuance. The Test Report will set forth the results of the tests performed by the Company based upon the written information provided to the Company. The Test Report will be based solely on the samples and written information submitted to the Company by Client, and the Company shall not be obligated to conduct any independent investigation or inquiry with respect thereto.
3. The Company may, in its sole discretion, destroy samples which have been furnished to the Company for testing and which have not been destroyed in the course of testing. The Company may delegate the performance of all or a portion of the services contemplated hereunder to an affiliate, agent or subcontractor of the Company, and Client consents to such delegation.
4. These Conditions and the Test Report represent the entire understanding of the parties hereto with respect to the subject matter hereof and of the Test Report, and no modification, variance or extrapolation with respect thereto shall be permitted without the prior written consent of the Company.
5. The names, service marks, trademarks and copyrights of the Company and its affiliates, including the names "**BUREAU VERITAS**," "**BUREAU VERITAS CONSUMER PRODUCTS SERVICES**," "**BVCPS**," "**MTL**," "**ACTS**," "**MTL-ACTS**" and "**CURTIS-STRAUS**" (collectively, the "**Marks**") are and shall remain the sole property of the Company or its affiliates and shall not be used by Client except solely to the extent that Client obtains the prior written approval of the Company and then only in the manner prescribed by the Company. Client shall not contest the validity of the Marks or take any action that might impair the value or goodwill associated with the Marks or the image or reputation of the Company or its affiliates.
6. Payment in full shall be due 30 days after the date of invoice. Interest shall be due on overdue amounts from the due date until paid at an interest rate of 1.5% per month or, if less, the maximum rate permitted by law. The Company reserves the right, at any time and from time to time, to revoke any credit extended to Client. Client shall reimburse the Company for any costs it incurs in collecting past due amounts, including court costs and fees and expenses of attorneys and collection agencies. The Test Report may not be used or relied upon by Client if and for so long as Client fails to pay when due any invoice issued by the Company or any affiliate of it to Client or any affiliate or subsidiary of Client together with interest and penalties, if any, accrued thereon.
7. The Company disclaims any and all responsibility or liability arising out of or in connection with e-mail transmissions of such information.
8. Client understands and agrees that the Company is neither an insurer nor a guarantor, that the Company does not take the place of Client or any designer, manufacturer, agent, buyer, distributor or transportation or shipping company, and that the Company disclaims all liability in such capacities. Client further understands that if it seeks assurance against loss or damage, it should obtain appropriate insurance.
9. Client agrees that the Company, by providing the services, does not take the place of Client nor any third party, nor does the Company release them from any of their obligations, nor does the Company otherwise assume, abridge, abrogate or undertake to discharge any duty of any third party to Client or any duty of Client or any third party to any other third party, and Client will not release any third party from its obligations and duties with respect to the tested goods.
10. Client shall, on a timely basis, (a) provide adequate instructions to the Company in order to enable the Company to perform properly its services, (b) provide, or cause Client's suppliers and contractors to provide, the Company with all documents necessary to enable the Company to perform its services, (c) furnish the Company with all relevant information regarding Client's intended use and purposes of the tested goods, (d) advise the Company of essential dates and deadlines relevant to the tested goods and (e) fully exercise all rights and remedies available to Client against third parties in respect of the tested goods.
11. The Company shall undertake due care and ordinary skill in the performance of its services to Client, and the Company shall accept responsibility only where such skill has not been exercised and, even in such event, only to the extent of the limitation of liability set forth herein.
12. If Client desires to assert a claim arising from or relating to (i) the performance, purported performance or non-performance of any services by the Company or (ii) the sale, resale, manufacture, distribution or use of any tested goods, it must submit that claim to the Company in a writing that sets forth with particularity the basis for such claim within 60 days from discovery of the potential claim and not more than six months after the date of issuance of the Test Report to Client. Client waives any and all such claims including, without limitation, claims that the Test Report is inaccurate, incomplete or misleading or that additional or different testing is required, unless and then only to the extent that Client submits a written claim to the Company within both such time periods.
13. CLIENT SHALL, EXCEPT TO THE EXTENT OF COMPANY'S LIABILITY TO CLIENT HEREUNDER (WHICH IN NO EVENT SHALL EXCEED THE LIMITATION OF LIABILITY HEREIN), HOLD HARMLESS AND INDEMNIFY THE COMPANY, ITS



AFFILIATES AND THEIR RESPECTIVE DIRECTORS, OFFICERS, EMPLOYEES, AGENTS AND SUBCONTRACTORS AGAINST ALL ACTUAL OR ALLEGED THIRD PARTY CLAIMS FOR LOSS, DAMAGE OR EXPENSE OF WHATSOEVER NATURE AND HOWSOEVER ARISING FROM OR RELATING TO (i) THE PERFORMANCE, PURPORTED PERFORMANCE OR NON-PERFORMANCE OF ANY SERVICES BY THE COMPANY OR (ii) THE SALE, RESALE, MANUFACTURE, DISTRIBUTION OR USE OF ANY TESTED GOODS.

14. EXCEPT AS MAY OTHERWISE BE EXPRESSLY AGREED TO IN WRITING BY THE COMPANY AND NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN OR IN ANY TEST REPORT, NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE, IS MADE.

15. (A) IN NO EVENT WHATSOEVER SHALL THE COMPANY BE LIABLE FOR ANY CONSEQUENTIAL, SPECIAL, INCIDENTAL, EXEMPLARY OR PUNITIVE DAMAGES IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE TEST REPORT OR THE SERVICES PROVIDED BY THE COMPANY HEREUNDER, INCLUDING WITHOUT LIMITATION LOSS OF OR DAMAGE TO PROPERTY; LOSS OF INCOME, PROFIT OR USE; OR ANY CLAIMS OR DEMANDS MADE AGAINST CLIENT OR ANY OTHER PERSON BY ANY THIRD PARTY IN CONNECTION WITH, RELATING TO OR ARISING OUT OF THE SERVICES PROVIDED BY THE COMPANY HEREUNDER.

(B) NOTWITHSTANDING ANY PROVISION TO THE CONTRARY CONTAINED HEREIN, AND IN RECOGNITION OF THE RELATIVE RISKS AND BENEFITS TO CLIENT AND THE COMPANY ASSOCIATED WITH THE TESTING SERVICES CONTEMPLATED HEREBY, THE RISKS HAVE BEEN ALLOCATED SUCH THAT UNDER NO CIRCUMSTANCES WHATSOEVER SHALL THE LIABILITY OF THE COMPANY TO CLIENT OR ANY THIRD PARTY IN RESPECT OF ANY CLAIM FOR LOSS, DAMAGE OR EXPENSE, OF WHATSOEVER NATURE OR MAGNITUDE, AND HOWSOEVER ARISING, EXCEED AN AMOUNT EQUAL TO FIVE (5) TIMES THE AMOUNT OF THE FEES PAID TO THE COMPANY FOR THE SPECIFIC SERVICES WHICH GAVE RISE TO SUCH CLAIM OR U.S.\$10,000, WHICHEVER IS THE LESSER AMOUNT.

16. The Company shall not be liable for any loss or damage resulting from any delay or failure in performance of its obligations hereunder resulting directly or indirectly from any event of force majeure or any event outside the control of the Company. If any such event occurs, the Company may immediately cancel or suspend its performance hereunder without incurring any liability whatsoever to Client.

17. Company's services, including these Conditions, shall be governed by, and construed in accordance with, the local laws of the country where the Company performs the tests or, in the case of tests performed in the United States of America, the laws of Massachusetts without regard to conflicts of laws principles. If any aspect(s) of these Conditions is found to be illegal or unenforceable, the validity, legality and enforceability of all remaining aspects of these Conditions shall not in any way be affected or impaired thereby. Any proceeding related to the subject matter hereof shall be brought, if at all, in the courts of the country where the Company performs the tests or, in the case of tests performed in the United States of America, in the courts of Massachusetts. Client waives the right to interpose any counterclaim or setoffs of any nature in any litigation arising hereunder.

Rev.160009121(2)\_#684340 v13CS

