# Test Report

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

| | |
|---|---|
| Report No | EL0846-2 |
| Client | Mobile Aspects<br>Khang Le |
| Address | 24 South 18th Suite 300<br>Pittsburgh, PA 15203 |
| Phone | 412-325-1690 |
| Items tested | iRISCart 1.0 RFID supply cabinet system |
| FCC ID | R4FIRISCART10 |
| FRN | 0010877447 |
| Standards | FCC 47 CFR Part 15.225 |
| Test Dates | June 23rd, 24th, and August 5 th, 2011 |
| Results | As detailed within this report |
| Prepared by | John Cushing– Test Engineer |
| Authorized by | Mairaj Hussain – EMC Supervisor |
| Issue Date | August 11, 2011 |
| Conditions of Issue | This Test Report is issued subject to the conditions stated in the '*Conditions of Testing*' section on page 17 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.

ACCREDITED Cert No. 1627-01

## *Contents*



Form Final Report REV 8-18-08 (DW)

## *Summary*

This test report supports an application for certification of a transmitter operating pursuant to 47 CFR 15.225. The product is the Mobile Aspects iRISCart 1.0 RFID supply cabinet system. The transmitter operates at 13.56MHz.

The unit contains multiple antenna of the same design, which can be located at multiple heights within the cabinet. The transmitter can only operate on a single antenna at a time. The worst case antenna location was used for testing.

The transmitter used is the FEIG Electronic ID ISC.LRM2500-A/B Reader Module (FCC ID PJMLRM2500). Frequency stability was not performed on the iRISCart 1.0 because Mobile Aspects uses the FEIG radio with their antenna. The test report for the FEIG radio is attached with this application.

This test report also serves as a verification of the digital circuitry.

## *Test Methodology*

Radiated emission testing was performed according to the procedures specified in ANSI C63.4 (2003). Emissions were maximized by rotating the system around its vertical axis as well as varying the test antenna's height and polarity. EUT antenna was maximized separately by varying the height at which it was installed in the cabinet.

| | | |
|---|---|---|
| Frequency range investigated: | 0.009MHz – 10.6GHz | |
| Measurement distance: | 0.15 - 30MHz | Conducted |
| | 0.009 – 30MHz | 3m (loop antenna) |
| | 30MHz – 10.6GHz | 3m |

AC Line conducted emissions testing was performed with a 50Ω/50µH LISN.

### *Statement of Conformity*

The iRISCart 1.0 RFID supply cabinet system has been found to conform to the following parts of 47 CFR as detailed below:

| Part 2 | Part 15 | Comments |
|---|---|---|
| | 15.15(b) | There are no controls accessible to the user that vary the output power. |
| 2.925 | 15.19 | The label is shown in the label exhibit. |
| | 15.21 | Information to the user is shown in the instruction manual exhibit. |
| | 15.27 | No special accessories are required for compliance. |
| | 15.31(e) | Frequency stability and voltage variation were performed on the system. Please see attached test report for Feig radio. |
| | 15.203 | This product is professionally installed. |
| | 15.205<br>15.209 | The fundamental is not in a Restricted band and the spurious and harmonic emissions in the Restricted bands comply with the general emission limits of 15.209. |
| | 15.207 | The unit meets the AC conducted emissions requirements of 15.207. |
| | 15.225(a-d) | The unit complies with these requirements as shown in this test report |
| | 15.225(e) | See attached PJMLRM2500 Test Report for frequency stability test data (p 33). |

## EUT Configuration

**EUT Configuration**

**Work Order:** L0846
**Company:** Mobile Aspects
**Company Address:** 24 South 18th, Suite 300
Pittsburgh, PA 15203,
**Contact:** Khang Le
**Person Present:** Khang Le

| | MN | PN | SN |
|---|---|---|---|
| **EUT:** | iRISCart 1.0 | -- | Test Sample 1 |

**EUT Description:** Mobile Inventory Cabinet Using RFID Technology
**EUT Max Frequency:** 13.56 MHz (RFID Reader) and 2.4 GHz (PC)

| ***Support Equipment:*** | MN | SN |
|---|---|---|
| PC | OT7570 | 1XQ8L61 |

***EUT Ports:***

| Port Label | Port Type | No. of ports | No. Populated | Cable Type | Shielded | Ferrites | Length | Max Length | In/Out NEBS Type | Unpopulated Reason |
|---|---|---|---|---|---|---|---|---|---|---|
| AC Main | AC | 1 | All | 3-wire AC | No | None | 3m | 3m | In | |
| Ethernet | Ethernet | 1 | All | Cat5 | No | None | 10m | 100m | In | |

***Software / Operating Mode Description:***

Transmitting on the antenna at EUT's highest output power.

## *Fundamental Measurements*

### LIMITS

| Frequency Range (MHz) | Limit @ 30m (µV/m) | Limit @ 30m (dBµV/m) |
|---|---|---|
| 13.553-13.567 | 15,848 | 83.9 |
| 13.410-13.553<br>13.567-13.710 | 334 | 50.4 |
| 13.110-13.410<br>13.710-14.010 | 106 | 40.5 |

[15.225(a-c)]

**Note:** If Peak measurements meet Quasi-Peak limits, then Quasi-Peak measurements are not required.

The limits of 15.209 apply outside the range 13.110-14.010 MHz.

### MEASUREMENTS

**Radiated Emissions Table**

**Date:** 05-Aug-11 **Company:** Mobile Aspects **Work Order:** L0846
**Engineer:** John Cushing **EUT Desc:** iRISCart 1.0 **EUT Operating Voltage/Frequency:** 120V/60Hz
**Temp:** 24.4°C **Humidity:** 38% **Pressure:** 1011mBar
**Frequency Range:** 13.56MHz **Measurement Distance:** 3 m
**Notes:**

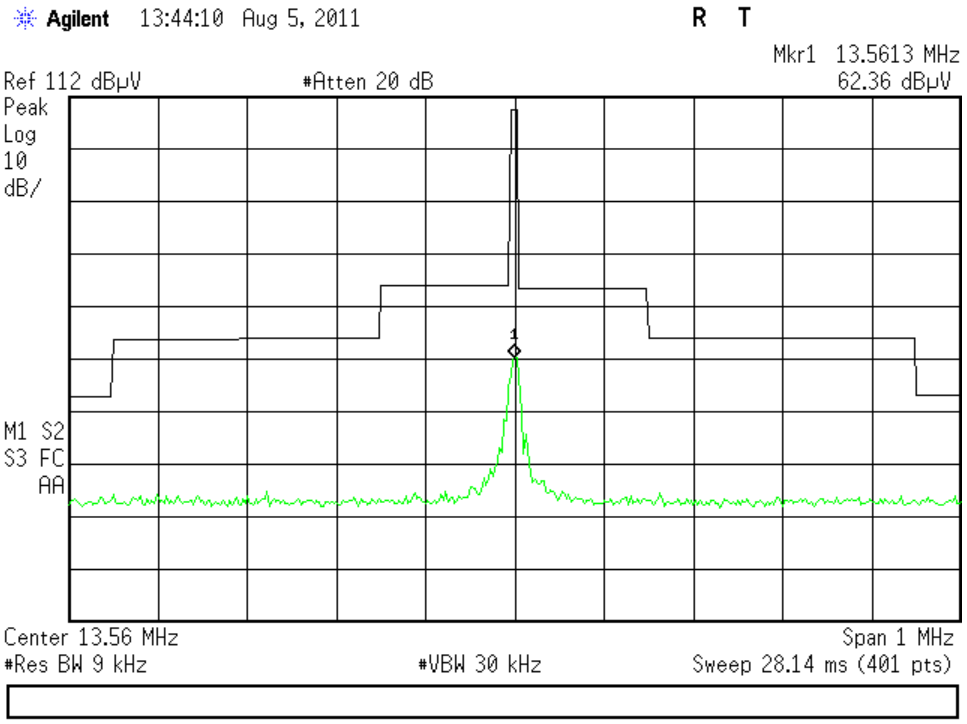
| Antenna Polarization (0° - 90°) | Frequency (MHz) | Reading (dBµV) | Preamp Factor (dB) | Antenna Factor (dB/m) | Cable Factor (dB) | Adjusted Reading (dBµV/m) | 47 CFR 15.225 Limit (dBµV/m) | Margin (dB) | Result (Pass/Fail) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 13.56 | 62.4 | 25.5 | 39.6 | 0.4 | 76.9 | 124.0 | -47.1 | Pass |
| 90 | 13.56 | 56.8 | 25.5 | 39.6 | 0.4 | 71.3 | 124.0 | -52.7 | Pass |

***Table Result:*** Pass by -47.1 dB ***Worst Freq:*** 13.56 MHz

**Test Site:** EMI Chamber 1 **Cable 1:** Asset #1505 **Cable 2:** MR-HIGH-21
**Analyzer:** Gold **Preamp:** Orange **Antenna:** Sm Loop (high)

No other emissions were detected in any of the other frequency ranges listed above.

## EMISSION MASK



## *Radiated Spurious Emissions*

### LIMITS

*"The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209"* [15.225(d)]

Bandwidth Settings:

| | |
|---|---|
| 0.009-30MHz | RBW= 9 kHz, VBW= 30 kHz |
| 30-140MHz | RBW= 120 kHz, VBW= 300 kHz |

"…Field strength of radiated emissions from *unintentional radiators* at a distance of 3 meters shall not exceed the following values: .etc *in § 15.109(a*)

Bandwidth Settings:

| | |
|---|---|
| 30-1000MHz | RBW= 120 kHz, VBW= 1 MHz |
| Above 1000MHz | RBW= 1 MHz, VBW= 3 MHz |

### MEASUREMENTS

### Intentional Radiator - 0.009 to 135.6 MHz

**Radiated Emissions Table**

**Date:** 23-Jun-11 **Company:** Mobile Aspects **Work Order:** L0846
**Engineer:** John Cushing **EUT Desc:** iRISCart 1.0 **EUT Operating Voltage/Frequency:** 120V/60Hz
**Temp:** 24.5℃ **Humidity:** 40% **Pressure:** 1006mBar
**Frequency Range:** .009-5MHz **Measurement Distance:** 3 m
**Notes:** **EUT Max Freq:** 2.4GHz

| Antenna Polarization (0° - 90°) | Frequency (MHz) | Reading (dBµV) | Preamp Factor (dB) | Antenna Factor (dB/m) | Cable Factor (dB) | Adjusted Reading (dBµV/m) | 47 CFR 15.209(a) Limit (dBµV/m) | Margin (dB) | Result (Pass/Fail) |
|---|---|---|---|---|---|---|---|---|---|
| NO EMISSIONS FOUND | | | --- | --- | --- | --- | --- | --- | --- |

***Table Result:*** --- by --- dB ***Worst Freq:*** --- MHz

**Test Site:** EMI Chamber 1 **Cable 1:** Asset #1505 **Cable 2:** Asset #1522
**Analyzer:** Asset #1328 **Preamp:** Blue **Antenna:** Lg Loop

**Radiated Emissions Table**

**Date:** 05-Aug-11 **Company:** Mobile Aspects **Work Order:** L0846
**Engineer:** John Cushing **EUT Desc:** iRISCart 1.0 **EUT Operating Voltage/Frequency:** 120V/60Hz
**Temp:** 24.4℃ **Humidity:** 38% **Pressure:** 1011mBar
**Frequency Range:** 5 - 30MHz **Measurement Distance:** 3 m
**Notes:**

| Antenna Polarization (0° - 90°) | Frequency (MHz) | Reading (dBµV) | Preamp Factor (dB) | Antenna Factor (dB/m) | Cable Factor (dB) | Adjusted Reading (dBµV/m) | 47 CFR 15.209 (a) Limit (dBµV/m) | Margin (dB) | Result (Pass/Fail) |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 27.12 | 18.9 | 25.4 | 38.0 | 0.5 | 32.0 | 69.5 | -37.5 | Pass |

***Table Result:*** Pass by -37.5 dB ***Worst Freq:*** 27.12 MHz

**Test Site:** EMI Chamber 1 **Cable 1:** Asset #1505 **Cable 2:** EMIR-HIGH-21
**Analyzer:** Gold **Preamp:** Orange **Antenna:** Sm Loop (high)

## Radiated Emissions Table

**Date:** 05-Aug-11 **Company:** Mobile Aspects **Work Order:** L0846
**Engineer:** John Cushing **EUT Desc:** iRISCart 1.0 **EUT Operating Voltage/Frequency:** 120V/60Hz
**Temp:** 24.4°C **Humidity:** 38% **Pressure:** 1011mBar
**Frequency Range:** 30 - 135.6MHz **Measurement Distance:** 3 m
**Notes:**

| Antenna Polarization (H / V) | Frequency (MHz) | Reading (dBµV) | Preamp Factor (dB) | Antenna Factor (dB/m) | Cable Factor (dB) | Adjusted Reading (dBµV/m) | 47 CFR 15.209 (a) Limit (dBµV/m) | Margin (dB) | Result (Pass/Fail) |
|---|---|---|---|---|---|---|---|---|---|
| H | 40.68 | 50.4 | 25.4 | 13.2 | 0.6 | 38.8 | 40.0 | -1.2 | Pass |
| H | 54.24 | 52.8 | 25.3 | 7.1 | 0.7 | 35.3 | 40.0 | -4.7 | Pass |
| H | 67.8 | 55.6 | 25.3 | 8.1 | 0.7 | 39.1 | 40.0 | -0.9 | Pass |
| H | 81.36 | 42.9 | 25.3 | 7.6 | 0.7 | 25.9 | 40.0 | -14.1 | Pass |
| H | 94.92 | 50.7 | 25.3 | 8.7 | 0.8 | 34.9 | 43.5 | -8.6 | Pass |
| H | 108.48 | 45.8 | 25.3 | 12.1 | 0.8 | 33.4 | 43.5 | -10.1 | Pass |
| H | 122.04 | 34.3 | 25.3 | 13.9 | 0.9 | 23.8 | 43.5 | -19.7 | Pass |
| H | 135.6 | 37.9 | 25.4 | 13.6 | 0.9 | 27.0 | 43.5 | -16.5 | Pass |

***Table Result:*** Pass by -0.9 dB ***Worst Freq:*** 67.8 MHz

**Test Site:** EMI Chamber 1 **Cable 1:** Asset #1505 **Cable 2:** EMIR-HIGH-21
**Analyzer:** Gold **Preamp:** Orange **Antenna:** Red-Black

# Unintentional Radiator - 135.6 – 12000 MHz

## Radiated Emissions Table

**Date:** 23-Jun-11 **Company:** Mobile Aspects **Work Order:** L0846
**Engineer:** John Cushing **EUT Desc:** iRISCart 1.0 **EUT Operating Voltage/Frequency:** 120V/60Hz
**Temp:** 24.5°C **Humidity:** 40% **Pressure:** 1006mBar
**Frequency Range:** 30-135.6MHz **Measurement Distance:** 3 m
**Notes:** **EUT Max Freq:** 2.4GHz

| 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) | FCC Class B Margin (dB) | FCC Class B Result (Pass/Fail) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V | 39.4 | 46.1 | 22.8 | 14.2 | 0.4 | 37.9 | | | | 40.0 | -2.1 | Pass |
| V | 50.98 | 53.1 | 22.9 | 7.7 | 0.4 | 38.3 | | | | 40.0 | -1.7 | Pass |
| V | 68.73 | 49.2 | 22.8 | 8.0 | 0.4 | 34.8 | | | | 40.0 | -5.2 | Pass |
| H | 94.9 | 34.1 | 22.8 | 8.7 | 0.5 | 20.5 | | | | 43.5 | -23.0 | Pass |
| V | 103.2 | 38.0 | 22.7 | 10.9 | 0.5 | 26.7 | | | | 43.5 | -16.8 | Pass |

***Table Result:*** Pass by -1.7 dB ***Worst Freq:*** 50.98 MHz

**Test Site:** EMI Chamber 1 **Cable 1:** Asset #1505 **Cable 2:** Asset #1522
**Analyzer:** Asset #1328 **Preamp:** Blue **Antenna:** Red-Black

## Radiated Emissions Table

**Date:** 23-Jun-11 **Company:** Mobile Aspects **Work Order:** L0846
**Engineer:** John Cushing **EUT Desc:** iRISCart 1.0 **EUT Operating Voltage/Frequency:** 120V/60Hz
**Temp:** 24.5°C **Humidity:** 40% **Pressure:** 1006mBar
**Frequency Range:** 135.6-1000MHz **Measurement Distance:** 3 m
**Notes:** **EUT Max Freq:** 2.4GHz

| 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) | FCC Class B Margin (dB) | FCC Class B Result (Pass/Fail) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V | 217.0 | 46.7 | 22.8 | 10.5 | 0.8 | 35.2 | | | | 46.0 | -10.8 | Pass |
| H | 300.0 | 40.8 | 22.8 | 13.3 | 0.9 | 32.2 | | | | 46.0 | -13.8 | Pass |
| H | 366.7 | 44.8 | 22.6 | 14.9 | 1.0 | 38.1 | | | | 46.0 | -7.9 | Pass |
| V | 452.9 | 36.3 | 22.8 | 16.8 | 1.2 | 31.5 | | | | 46.0 | -14.5 | Pass |

***Table Result:*** Pass by -7.9 dB ***Worst Freq:*** 366.7 MHz

**Test Site:** EMI Chamber 1 **Cable 1:** Asset #1505 **Cable 2:** Asset #1522
**Analyzer:** Asset #1328 **Preamp:** Blue **Antenna:** Red-Black

## Radiated Emissions Table

**Date:** 23-Jun-11 **Company:** Mobile Aspects **Work Order:** L0846
**Engineer:** John Cushing **EUT Desc:** iRISCart 1.0 **EUT Operating Voltage/Frequency:** 120V/60Hz
**Temp:** 24.5°C **Humidity:** 40% **Pressure:** 1006mBar
**Frequency Range:** 1-12GHz **Measurement Distance:** 1 m
**Notes:** **EUT Max Freq:** 2.4GHz

| Antenna Polarization (H / V) | Frequency (MHz) | Peak Reading (dBµV) | Average Reading (dBµV) | Preamp Factor (dB) | Antenna Factor (dB/m) | Cable Factor (dB) | Adjusted Peak Reading (dBµV/m) | Adjusted Avg Reading (dBµV/m) | FCC Class B High Frequency - Peak Limit (dBµV/m) | FCC Class B High Frequency - Peak Margin (dB) | FCC Class B High Frequency - Peak Result (Pass/Fail) | FCC Class B High Frequency - Average Limit (dBµV/m) | FCC Class B High Frequency - Average Margin (dB) | FCC Class B High Frequency - Average Result (Pass/Fail) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H | 1100.0 | 62.6 | 57.0 | 41.2 | 25.6 | 3.1 | 50.1 | 44.5 | 83.5 | -33.4 | Pass | 63.5 | -19.0 | Pass |
| H | 1811.5 | 59.08 | 54.2 | 37.8 | 28.2 | 3.7 | 53.2 | 48.3 | 83.5 | -30.3 | Pass | 63.5 | -15.2 | Pass |
| V | 1941.0 | 59.3 | 53.5 | 37.2 | 28.0 | 3.9 | 54.0 | 48.2 | 83.5 | -29.5 | Pass | 63.5 | -15.3 | Pass |
| H | 2005.0 | 57.3 | 50.2 | 37.0 | 28.2 | 4.0 | 52.5 | 45.4 | 83.5 | -31.0 | Pass | 63.5 | -18.1 | Pass |

***Table Result:*** Pass by -15.2 dB ***Worst Freq:*** 1811.5 MHz

**Test Site:** EMI Chamber 1 **Cable 1:** Asset #1505 **Cable 2:** EMIR-HIGH-14
**Analyzer:** Asset #1328 **Preamp:** Red-Blue **Antenna:** Orange Horn

## *AC Line Conducted Emission Measurements*

### LIMITS

| Frequency of emission (MHz) | Quasi-peak limit (dBµV) | Average limit (dBµV) |
|---|---|---|
| 0.15-0.5 | 66 to 56* | 56 to 46* |
| 0.5-5 | 56 | 46 |
| 5-30 | 60 | 50 |

*Decreases with the logarithm of the frequency.

[47 CFR 15.207(a)]

### MEASUREMENTS

**AC Mains Conducted Emissions**

**Date:** 24-Jun-11 **Company:** Mobile Aspects **Work Order:** L0846
**Engineer:** John Cushing **EUT Desc:** iRISCart 1.0 **Test Site:** CEMI1
**Temp:** 21.0℃ **Humidity:** 50% **Pressure:** 1006mBar
**Notes:**
**Measurement Device:** Asset #1495 LISN **EUT Operating Voltage/Frequency:** 120V/60Hz

**Range:** 0.15-30MHz **Spectrum Analyzer:** Black

| | Q.P. Readings | | Ave. Readings | | Impedance Factor | FCC/CISPR B | | FCC/CISPR B | | Overall |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency (MHz) | QP1 (dBµV) | QP2 (dBµV) | AV1 (dBµV) | AV2 (dBµV) | (dB) | qp Limit (dBµV) | qp Margin dB | AVE Limit (dBµV) | AVE Margin dB | Result (Pass/Fail) |
| Antenna on | | | | | | | | | | |
| 0.17 | 31.3 | 31.2 | 30.8 | 30.5 | 20.1 | 65.0 | -13.6 | 55.0 | -4.1 | Pass |
| 0.40 | 8.2 | 8.2 | 3.5 | 3.3 | 20.1 | 57.9 | -29.6 | 47.9 | -24.3 | Pass |
| 9.50 | 13.6 | 15.4 | 7.0 | 6.9 | 20.2 | 60.0 | -24.4 | 50.0 | -22.8 | Pass |
| 13.56 | 45.7 | 45.7 | | | | | | | | |
| 17.93 | 23.7 | 21.5 | 13.1 | 12.9 | 20.3 | 60.0 | -16.0 | 50.0 | -16.6 | Pass |
| 25.05 | 35.9 | 35.7 | 28.8 | 28.9 | 20.5 | 60.0 | -3.6 | 50.0 | -0.6 | Pass |
| 27.80 | 28.4 | 27.9 | 20.0 | 19.6 | 20.6 | 60.0 | -11.0 | 50.0 | -9.4 | Pass |
| Feed terminated with 50Ω | | | | | | | | | | |
| 13.56 | 34.8 | 35.1 | 24.6 | 25.0 | 20.2 | 60.0 | -4.7 | 50.0 | -4.8 | Pass |

***Table Result:*** Pass by -0.60 dB ***Worst Freq:*** 25.05 MHz

## *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 |
|---|---|---|
| Radiated Emissions (30-1000MHz)<br>NIST<br>CISPR | <br>5.6dB<br>4.6dB | <br>N/A<br>5.2dB (Ucispr) |
| 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<br>NIST<br>CISPR | <br>3.9dB<br>3.6dB | <br>N/A<br>3.6dB (Ucispr) |
| 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 (@ 2.4GHz) | $3.23 \times 10^{-8}$ | $1 \times 10^{-7}$ |
| RF power, conducted | 0.40dB | 0.75dB |
| Maximum frequency deviation:<br>• Within 300Hz and 6kHz of audio frequency / Within 6kHz and 25kHz of audio frequency | <br>3.4%<br>0.3dB | <br>5%<br>3dB |
| Adjacent channel power | 1.9dB | 3dB |
| Conducted spurious emission of transmitter, valid up to 12.75GHz | 2.39dB | 3dB |
| Conducted emission of receivers | 1.3dB | 3dB |
| Radiated emission of transmitter, valid up to 26.5GHz | 3.9dB | 6dB |
| Radiated emission of transmitter, valid up to 80GHz | 3.3dB | 6dB |
| Radiated emission of receiver, valid up to 26.5GHz | 3.9dB | 6dB |
| Radiated emission of receiver, valid up to 80GHz | 3.3dB | 6dB |
| Humidity | 2.37% | 5% |
| Temperature | 0.7°C | 1.0°C |
| Time | 4.1% | 10% |
| RF Power Density, Conducted | 0.4dB | 3dB |
| DC and low frequency voltages | 1.3% | 3% |
| Voltage (AC, <10kHz) | 1.3% | 2% |
| Voltage (DC) | 0.62% | 1% |
| The above reflects a 95% confidence level | | |

## *Test Equipment Used*

Rev: 9-Aug-2011

| Spectrum Analyzers / Receivers /Preselectors | Range | MN | Mfr | SN | Asset | Cat | Calibration Due |
|---|---|---|---|---|---|---|---|
| Black | 9kHz-12.8GHz | 8596E | Agilent | 3710A00944 | 337 | I | 12-Oct-2011 |
| Gold | 100Hz-26.5 GHz | E4407B | Agilent | MY45113816 | 1284 | I | Out of Service |
| SA EMI Chamber (1328) | 9kHz-13.2 GHz | E4405B | Agilent | MY44210241 | 1328 | I | 4-Mar-2012 |
| **Preamps /Couplers Attenuators / Filters** | **Range** | **MN** | **Mfr** | **SN** | **Asset** | **Cat** | **Calibration Due** |
| Blue | 0.009-2000MHz | ZFL-1000-LN | CS | N/A | 759 | II | 1-Jun-2012 |
| Orange | 0.009-2000MHz | ZFL-1000-LN | CS | N/A | 765 | II | 20-Jun-2012 |
| Red-Blue | 1-18GHz | PE2-38-218-4R5-17-15-SFF | CS | NA | 1257 | II | 8-Jun-2012 |
| **Cables** | **Range** | | **Mfr** | | | **Cat** | **Calibration Due** |
| Asset #1505 | 9kHz - 18GHz | | Florida RF | | | II | 18-Aug-2011 |
| Asset #1522 | 9kHz - 26.5GHz | | Florida RF | | | II | 17-Sep-2011 |
| REMI-High-14 | 9kHz - 26.5GHz | | C-S | | | II | 18-Jan-2012 |
| REMI-High-21 | 9kHz - 26.5GHz | | C-S | | | II | 18-Jan-2012 |
| **Antennas** | **Range** | **MN** | **Mfr** | **SN** | **Asset** | **Cat** | **Calibration Due** |
| Red-Black Bilog | 30-2000MHz | JB1 | Sunol | A091604-2 | 1106 | I | 3-Dec-2012 |
| Orange Horn | 1-18GHz | 3115 | EMCO | 0004-6123 | 390 | I | 27-Jul-2013 |
| Small Loop | 10kHz-30MHz | PLA-130/A | ARA | 1024 | 755 | I | 26-Mar-2012 |
| Large Loop | 20Hz-5MHz | 6511 | EMCO | 9704-1154 | 67 | I | 29-Mar-2012 |
| **Radiated Emissions Sites** | **FCC Code** | **IC Code** | **VCCI Code** | | | **Cat** | **Calibration Due** |
| EMI Chamber 1 | 17-Dec-3868 | 2762A-6 | R-3032, G-106 | | | I | 12-Mar-2013 |
| **Conducted Test Sites (Mains / Telco)** | **FCC Code** | | **VCCI Code** | | | **Cat** | **Calibration Due** |
| CEMI 1 | 719150 | | C-3360, T-1575 | | | III | NA |
| **LISNs/Measurement Probes** | **Range** | **MN** | **Mfr** | **SN** | **Asset** | **Cat** | **Calibration Due** |
| 230VAC LISN Asset 1495 | 10kHz-50MHz | 9252-50-R-24-BNC | Solar | 84716 | 1495 | I | 26-May-2012 |
| **Meteorological Meters** | | **MN** | **Mfr** | **SN** | **Asset** | **Cat** | **Calibration Due** |
| Temp./Humidity/Atm. Pressure Gauge | | 7400 Perception II | Davis | N/A | 965 | I | 4-Apr-2013 |
| Thermohygrometer | | 35519-044 | Control Company | 72457628 | 1337 | II | 8-Jan-2012 |

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

## 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

Verified devices must have the following label permanently affixed in a location accessible to the user:

*This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.*

No distinction is made between Class A or Class B devices on the label.

When the device is so small or for such use that it is not practicable to place label on it, the information shall be placed in a prominent location in the instruction manual supplied to the user or, alternatively, shall be placed on the container in which the device is marketed.

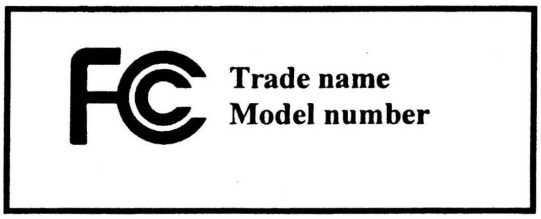
Where a device is constructed in two or more sections connected by wires and marketed together, the label is only required to be affixed to the main control unit.

## FCC Required labeling for Class B Personal Computers and Peripherals Devices 47 CFR Part 15.19 subject to Declaration of Conformity

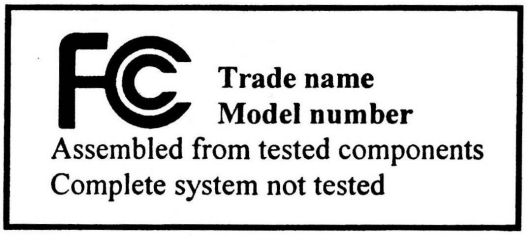
Personal computers and peripherals subject to authorization under a Declaration of Conformity shall be labeled as follows:

(1) The label shall be located in a conspicuous location on the device and shall contain the unique identification described in Section 2.1074 and the following logo:

(i) If the product is authorized based on testing of the product or system:




(ii) If the product is authorized based on assembly using separately authorized components and the resulting product is not separately tested:




(2) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (b)(1) of this section on it, such as for a CPU board or a plug-in circuit board peripheral device, the text associated with the logo may be placed in a prominent location in the instruction manual or pamphlet supplied to the user. However, the unique identification (trade name and model number) and the logo must be displayed on the device.

(3) The label shall not be a stick-on, paper label. The label on these products shall be permanently affixed to the product and shall be readily visible to the purchaser at the time of purchase, as described in Section 2.925(d). "Permanently affixed" means that the label is etched, engraved, stamped, silk-screened, indelibly printed, or otherwise permanently marked on a permanently attached part of the equipment or on a nameplate of metal, plastic, or other material fastened to the equipment by welding, riveting, or a permanent adhesive. The label must be designed to last the expected lifetime of the equipment in the environment in which the equipment may be operated and must not be readily detachable.

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

The user's manual must caution the user that changes or modifications not expressly approved by the manufacturer could void the user's FCC granted authority to operate the equipment. In addition the following information should be inserted:

(a) For a Class A digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

*Note: this equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.*

(b) For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

*Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:*

- *Reorient or relocate the receiving antenna.*
- *Increase the separation between the equipment and receiver.*
- *Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*
- *Consult the dealer or an experienced radio/TV technician for help.*

(c ) The provisions of paragraphs (a) and (b) of this section do not apply to digital devices exempted from the technical standards under the provisions of § 15.103.

(d ) For systems incorporating several digital devices, the statement shown in paragraph (a) or (b) of this section needs to be contained only in the instruction manual for the main control unit.

Our facility codes can be found in the *Test Equipment Used* Section starting on page 12.

## *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 were 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.

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