

# Class 2 Permissive Change Test Report

For Certified Equipment

MODEL: TRBLU24-00100 / BISMS02BI

FCC ID: PI403B

IC: 1931B-EUSB

FOR

**EZURIO LTD.**

Saturn House, Mercury Park

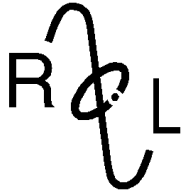
Wycombe Lane

Wooburn Green, HP10 0HH, United Kingdom

Test Report Number: 130619



NVLAP Lab Code 200087-0



## **ROGERS LABS, INC.**

4405 West 259<sup>th</sup> Terrace  
Louisburg, KS 66053  
Phone / Fax (913) 837-3214

# **Class 2 Permissive Change**

## **Test Report**

For

### **EZURIO LTD.**

Saturn House, Mercury Park  
Wycombe Lane  
Wooburn Green, HP10 0HH, United Kingdom

Model: TRBLU24-00100 / BISMS02BI

Spread Spectrum Transmitter

Frequency Range  
2404-2408 MHz

FCC ID: PI403B  
IC: 1931B-EUSB

Test Date: June 19, 2013

Certifying Engineer: *Scot D Rogers*  
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Rogers Labs, Inc.  
4405 W. 259th Terrace  
Louisburg, KS 66053  
Phone/Fax: (913) 837-3214  
Revision 1

EZURIO LTD. (Laird Technologies)  
Model: TRBLU24-00100 / BISMS02BI  
Test #: 130619  
Test to: FCC 15C (15.249), IC RSS-210  
File:Laird TRBLU24 00100 Class 2 Change 130619

SN: ENG1  
FCC ID#: PI403B  
IC: 1931B-EUSB  
Date: July 9, 2013  
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## Revisions

Revision 1, Issued July 9, 2013



## Executive Summary

The electromagnetic emissions compatibility tests required for demonstration of compliance with CFR47 Part 15C and Industry Canada RSS-210 have been conducted on the TRBLU24-00100 / BISMS02BI in compliance with the rules for Class Two permissible change to add alternative antenna option. The submitted exhibits and this document offer supporting information and demonstration of continued compliance for use of additional antenna. The results have been reviewed and found equipment remains in compliance with the regulations and requirements. Test procedures used are the established Methods of Measurement of Radio-Noise Emissions as described in the ANSI C63.4-2009.

## Opinion / Interpretation of Results

| Test Performed   | Minimum Margin (dB) | Results  |
|--|---------------------|----------|
| Antenna requirement per CFR 47 15.203                            | N/A                 | Complies |
| Restricted Bands (Tx) Emissions as per CFR 47 15.205 and RSS-210 | -10.9               | Complies |
| Radiated Emissions per CFR 47 15.247 and RSS-210 (harmonics)     | -9.7                | Complies |

## Environmental Conditions

Ambient Temperature      22.9° C  
Relative Humidity            45%  
Atmospheric Pressure      1014.8 mb

## Equipment Tested

| <u>Equipment</u> | <u>Model/Part#</u>        | <u>Serial Number</u> |
|------------------|---------------------------|----------------------|
| EUT              | TRBLU24-00100 / BISMS02BI | ENG1                 |
| *Antenna         | Linx M/N ANT.2.4-WRT-UFL  | N/A                  |
| Computer         | HP CRVSA-02T1-75          | TW24416178           |
| Power Supply     | HP 0950-4359              | 2X00661401           |

Test results in this report relate only to the items tested.

Note: \* External antenna evaluated and referenced for this permissible change

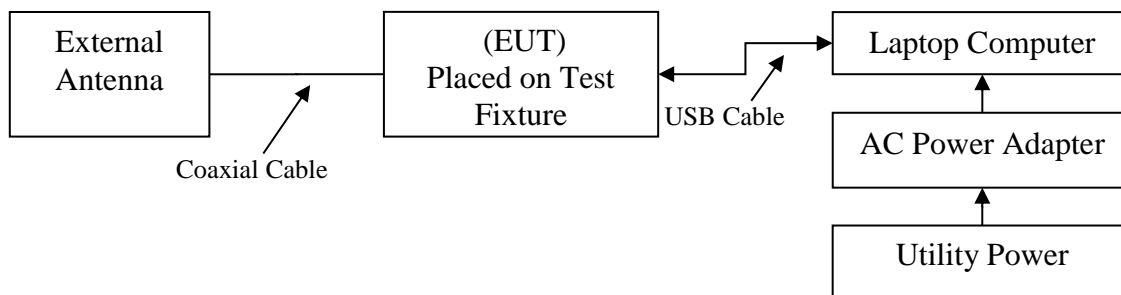
## Change to Equipment

There is no change to the original transmitter hardware or design. The EUT is a Bluetooth technology transmitter design offered in one of two Blue Tooth characteristic modes using identical hardware. The change from original equipment authorization offers alternative antenna option. The addition of the additional antenna offers flexibility for module mounting. All transmitter specifications remain as originally authorized. Testing was performed to verify the change in antenna continues to comply with applicable rules and requirements of the CFR Title 47 and Industry Canada RSS-210. The modification provided no change to the certified operating power or frequency band.

## Equipment and Cable Configuration

The EUT operates as a Bluetooth designed transceiver module. Manufacturer through use of interface test fixture provided interface and control for transmitter operation. The interface box provided the direct current power input and serial communications from the laptop computer system to the EUT. As requested by the manufacturer and required by regulations, the equipment was tested for emissions compliance using the available configurations with the worst-case data presented. Test results in this report relate only to the products described in this report.

### *EUT Configuration Options*



## List of Test Equipment

A Rohde and Schwarz ESU40 and/or Hewlett Packard 8591EM Spectrum Analyzer was used as the measuring device for the emissions testing of frequencies below 1 GHz. A Rohde and Schwarz ESU40 and/or Hewlett Packard 8562A Spectrum Analyzer was used as the measuring device for testing the emissions at frequencies above 1 GHz. The analyzer settings used are described in the following table. Refer to the annex for a complete list of test equipment.

| Analyzer Settings                 |          |                   |
|-----------------------------------|----------|-------------------|
| AC Line Conducted Emissions:      |          |                   |
| RBW                               | Video BW | Detector Function |
| 9 kHz                             | 30 kHz   | Peak/Quasi Peak   |
| Radiated Emissions 30-1000 MHz    |          |                   |
| RBW                               | Video BW | Detector Function |
| 100 kHz                           | 100 kHz  | Peak              |
| 120 kHz                           | 300 kHz  | Peak/Quasi Peak   |
| Radiated Emissions Above 1000 MHz |          |                   |
| RBW                               | Video BW | Detector Function |
| 1 MHz                             | 1 MHz    | Peak / Average    |

| <u>Equipment</u>                              | <u>Manufacturer</u> | <u>Model</u>      | <u>Band</u> | <u>Cal Date</u> | <u>Due</u> |
|---|---------------------|-------------------|-------------|-----------------|------------|
| <input checked="" type="checkbox"/> LISN      | Comp. Design        | FCC-LISN-2-MOD.CD | .15-30MHz   | 10/12           | 10/13      |
| <input type="checkbox"/> Antenna              | ARA                 | BCD-235-B         | 20-350MHz   | 10/12           | 10/13      |
| <input type="checkbox"/> Antenna              | EMCO                | 3147              | 200-1000MHz | 10/12           | 10/13      |
| <input checked="" type="checkbox"/> Antenna   | Com Power           | AH-118            | 1-18 GHz    | 10/12           | 10/13      |
| <input checked="" type="checkbox"/> Antenna   | Com Power           | AH-840            | 18-40 GHz   | 5/13            | 5/14       |
| <input checked="" type="checkbox"/> Antenna   | EMCO                | 6509              | .001-30 MHz | 10/12           | 10/13      |
| <input checked="" type="checkbox"/> Antenna   | Sunol               | JB-6              | 30-1000 MHz | 10/12           | 10/13      |
| <input checked="" type="checkbox"/> Antenna   | Standard            | FXRY638A          | 10-18 GHz   | 5/13            | 5/14       |
| <input type="checkbox"/> Antenna              | EMCO                | 3143              | 20-1200 MHz | 5/13            | 5/14       |
| <input type="checkbox"/> Analyzer             | HP                  | 8591EM            | 9kHz-1.8GHz | 5/13            | 5/14       |
| <input type="checkbox"/> Analyzer             | HP                  | 8562A             | 9kHz-110GHz | 5/13            | 5/14       |
| <input checked="" type="checkbox"/> Analyzer  | Rohde & Schwarz     | ESU40             | 20Hz-40GHz  | 5/13            | 5/14       |
| <input checked="" type="checkbox"/> Amplifier | Com-Power           | PA-010            | 100Hz-30MHz | 10/12           | 10/13      |
| <input checked="" type="checkbox"/> Amplifier | Com-Power           | CPPA-102          | 1-1000 MHz  | 10/12           | 10/13      |
| <input checked="" type="checkbox"/> Amplifier | Com-Power           | PA-22             | 0.5-22 GHz  | 10/12           | 10/13      |

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SN: ENG1  
 FCC ID#: PI403B  
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## Test Site Locations

|                   |   |
|-------------------|---|
| Conducted EMI     | The AC power line conducted emissions tests were performed in a shielded screen room located at Rogers Labs, Inc., 4405 W. 259 <sup>th</sup> Terrace, Louisburg, KS.    |
| Radiated EMI      | The radiated emissions tests were performed at the 3 meters, Open Area Test Site (OATS) located at Rogers Labs, Inc., 4405 W. 259 <sup>th</sup> Terrace, Louisburg, KS. |
| Site Registration | Refer to Annex for FCC Site registration Letter, Reference # 90910, and Industry Canada registration IC3041A-1  |

## Statement of Modifications and Deviations

No modifications to the EUT were required for the unit to demonstrate compliance with the CFR47 Part 15C or RSS-210 requirements. There were no deviations or exceptions to the specifications.

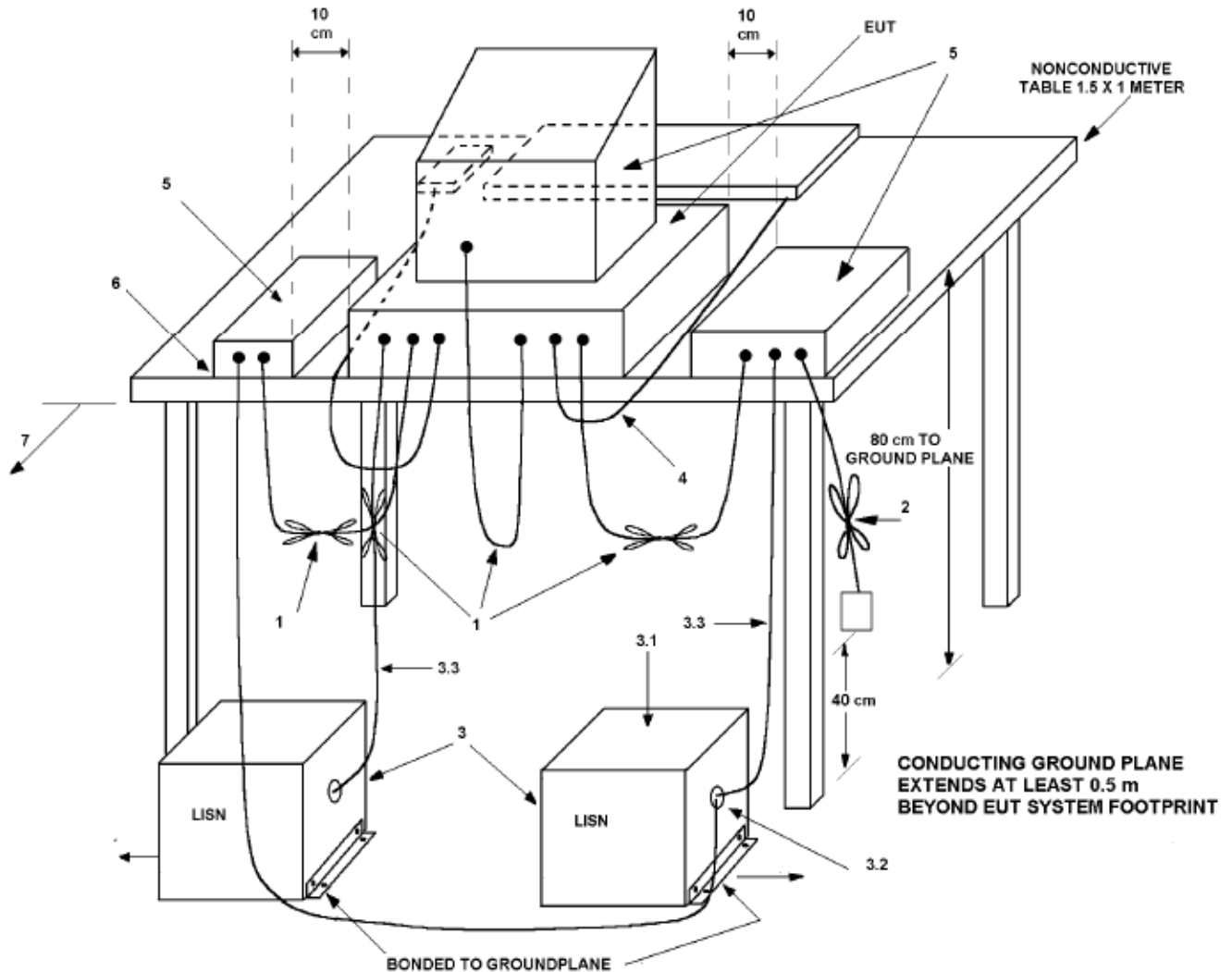
## Emissions Test Procedures

### *AC Line Conducted Emission Test Procedure*

Testing for the AC line-conducted emissions was performed as defined in sections 7.2.4 and 13.3 of ANSI C63.4-2009. The test setup, including the EUT was arranged in the test configurations as shown above. The test configuration was placed on a 1 x 1.5-meter wooden bench 0.8 meters high located in a screen room. The power lines of the system were isolated from the power source using a standard LISN with a 50- $\mu$ Hy choke. EMI was coupled to the spectrum analyzer through a 0.1  $\mu$ F capacitor internal to the LISN. The LISN was positioned on the floor beneath the wooden bench supporting the EUT. The power lines and cables were draped over the back edge of the table.



**Diagram 1 Test arrangement for Conducted emissions**



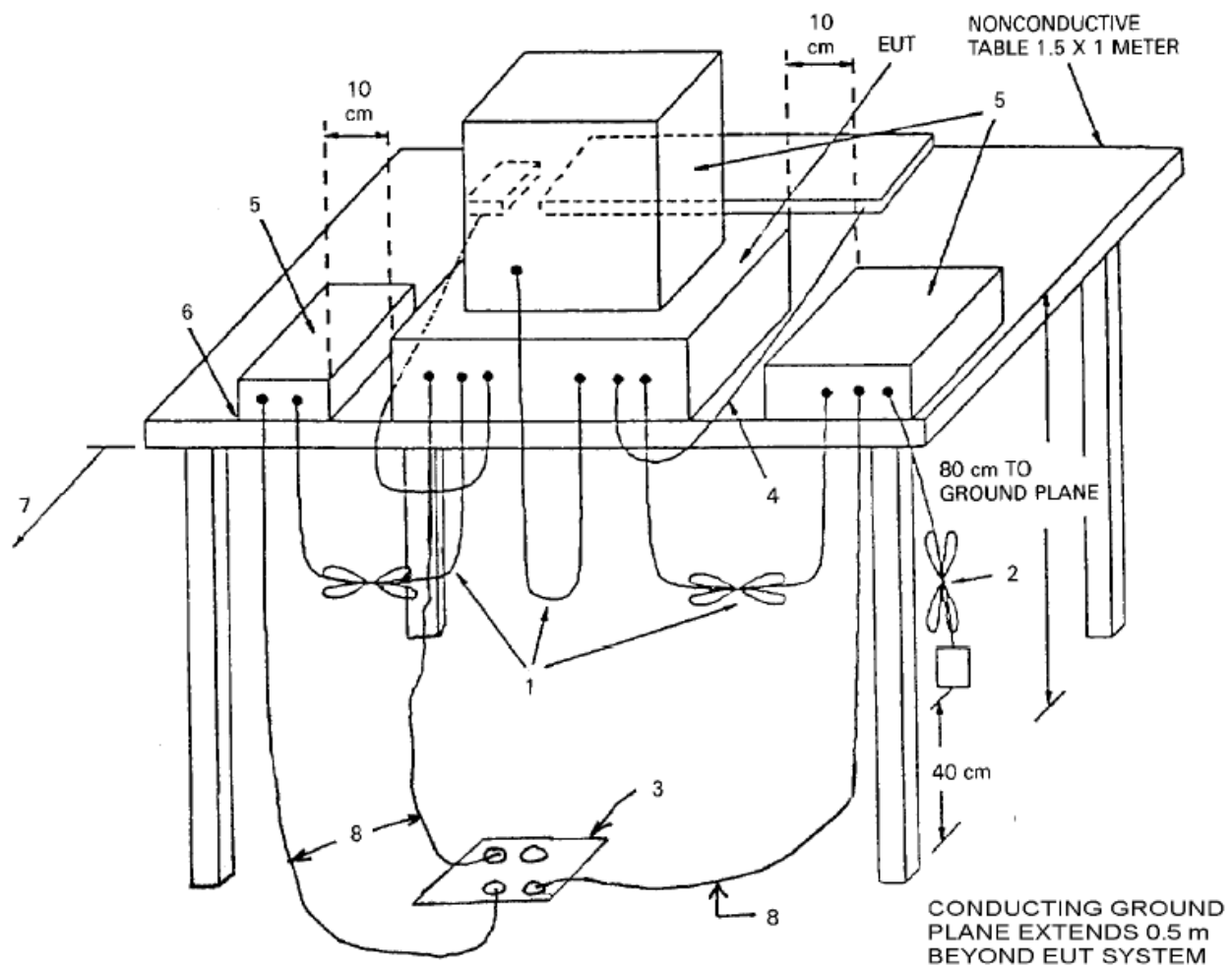
1. Interconnecting cables that hang closer than 40 cm to the ground plane were folded back and forth in the center forming a bundle 30 cm to 40 cm long.
2. Input/output (I/O) cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
3. EUT connected to one LISN. Unused LISN measuring port connectors are terminated into 50  $\Omega$  loads. LISN is placed on top of and bonded to reference ground plane.
  - 3.1 All other equipment powered from additional LISN(s).
  - 3.2 Multiple outlet strips can be used for multiple power cords of non-EUT equipment.
  - 3.3 LISN is positioned at least 80 cm from nearest part of EUT chassis.
4. Cables of hand-operated devices, such as keyboards, mice, and so on, shall be placed as for normal use.
5. Non-EUT components of EUT system being tested.
6. Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop.

7. Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane (see 5.2.2 for options).

**Radiated Emission Test Procedure**

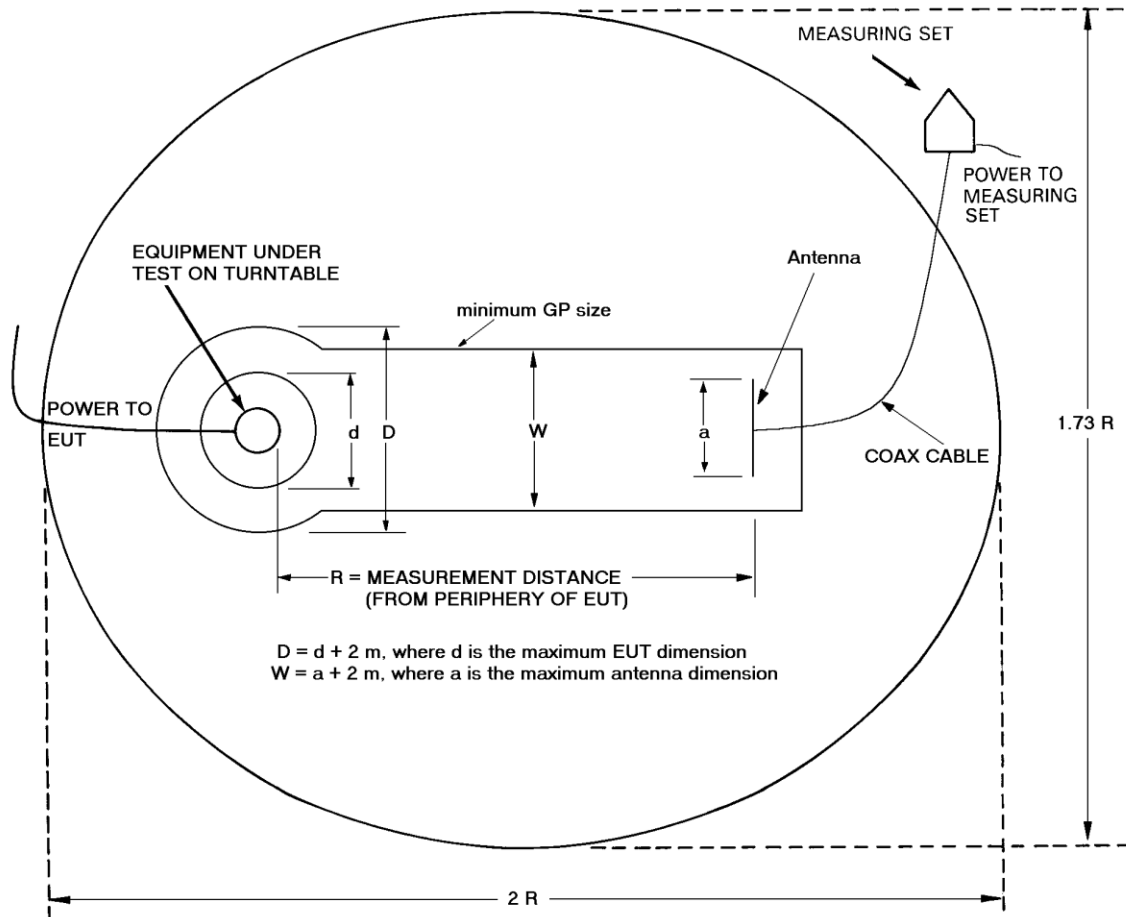
The EUT was placed on a rotating 1 x 1.5-meter wooden platform, 0.8 meters above the ground plane at a distance of 3 meters from the FSM antenna. Testing for the radiated emissions was performed as required by CFR47 15 and specified in sections 8 and 13.1.4 of ANSI C63.4-2009. EMI energy was maximized by equipment placement, raising and lowering the FSM antenna, changing the antenna polarization, and by rotating the turntable. Each emission was maximized before data was taken using a spectrum analyzer. Refer to photographs in the test setup exhibits for EUT placement during testing.

**Diagram 2 Test arrangement for radiated emissions of tabletop equipment**



1. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center, forming a bundle 30 cm to 40 cm long.
2. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated if required using the correct terminating impedance. The total length shall not exceed 1 m.
3. If LISNs are kept in the test setup for radiated emissions, it is preferred that they be installed under the ground plane with the receptacle flush with the ground plane.
4. Cables of hand-operated devices, such as keyboards, mice, and so on, shall be placed as for normal use.
5. Non-EUT components of EUT system being tested.
6. Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop (possibly center of table for transmitter equipment).
7. No vertical conducting plane used.
8. Power cords drape to the floor and are routed over to receptacle.

**Diagram 3 Test arrangement for radiated emissions tested on Open Area Test Site (OATS)**



AREA DIMENSIONS =

| R = 3m      | R = 10 m      | R = 30 m    |
|-------------|---------------|-------------|
| 6 m x 5.2 m | 20 m x 17.3 m | 60 m x 52 m |

## Restricted Bands of Operation

Spurious emissions falling in the restricted frequency bands of operation were measured at a distance of three meters on the OATS. The EUT utilizes frequency, determining circuitry, which generates harmonics falling in the restricted bands. Emissions were measured at the OATS, using appropriate antennas or pyramidal horns, amplification stages, and a spectrum analyzer. No other significant emission was observed which fell into the restricted bands of operation.

### ***Radiated Emissions in Restricted Bands Data (worst-case presented)***

| Frequency in MHz | Horizontal Peak (dBµV) | Horizontal Quasi-Peak (dBµV) | Horizontal Average (dBµV) | Vertical Peak (dBµV) | Vertical Quasi-Peak (dBµV) | Vertical Average (dBµV) | Limit @ 3m (dBµV/m) |
|------------------|------------------------|------------------------------|---------------------------|----------------------|----------------------------|-------------------------|---------------------|
| 2390.0           | 42.3                   | N/A                          | 29.9                      | 46.7                 | N/A                        | 32.6                    | 54.0                |
| 2483.5           | 43.2                   | N/A                          | 30.4                      | 44.8                 | N/A                        | 32.5                    | 54.0                |
| 4804.0           | 47.9                   | N/A                          | 35.8                      | 48.9                 | N/A                        | 37.5                    | 54.0                |
| 4882.0           | 48.8                   | N/A                          | 38.3                      | 47.0                 | N/A                        | 35.7                    | 54.0                |
| 4960.0           | 50.8                   | N/A                          | 43.1                      | 48.1                 | N/A                        | 36.2                    | 54.0                |
| 7206.0           | 48.4                   | N/A                          | 36.0                      | 48.7                 | N/A                        | 36.0                    | 54.0                |
| 7323.0           | 47.6                   | N/A                          | 33.8                      | 47.1                 | N/A                        | 33.8                    | 54.0                |
| 7440.0           | 46.6                   | N/A                          | 33.8                      | 46.9                 | N/A                        | 34.1                    | 54.0                |
| 12010.0          | 48.4                   | N/A                          | 35.9                      | 49.1                 | N/A                        | 35.9                    | 54.0                |
| 12205.0          | 48.2                   | N/A                          | 35.8                      | 48.5                 | N/A                        | 36.1                    | 54.0                |
| 12400.0          | 49.5                   | N/A                          | 36.9                      | 49.1                 | N/A                        | 36.5                    | 54.0                |

Quasi-Peak amplitude emissions are recorded above for frequency range below 1000 MHz.  
Average amplitude emissions are recorded above for frequency range above 1000 MHz.

### ***Summary of Results for Radiated Emissions in Restricted Bands***

The EUT demonstrated compliance with the radiated emissions requirements of CFR 47 Part 15C Intentional Radiators. The EUT demonstrated a minimum margin of -10.9 dB below the radiated emissions requirements in restricted frequency bands. Peak, Quasi-peak, and average amplitudes were checked for compliance with the regulations. Worst-case emissions are reported with other emissions found in the restricted frequency bands at least 20 dB below the requirements.



## Operation in the Band 2400 – 2483.5 MHz

The EUT was arranged in a typical equipment configuration and operated through all available modes with worst-case data recorded. Preliminary testing was performed in a screen room with the EUT positioned 1 meter from the FSM. Radiated emissions measurements were performed to identify the frequencies, which produced the highest emissions. Plots were made of the radiated frequency spectrum from 30 MHz to 25,000 MHz during preliminary testing. Each radiated emission was then maximized at the OATS location before final radiated emissions measurements were performed. Final data was taken with the EUT located at the OATS at a distance of 3 meters between the EUT and the receiving antenna. The frequency spectrum from 30 MHz to 25,000 MHz was searched for radiated emissions. Measured emission levels were maximized by EUT placement on the table, rotating the turntable through 360 degrees, varying the antenna height between 1 and 4 meters above the ground plane and changing antenna position between horizontal and vertical polarization. Antennas used were Broadband Biconical from 30 to 200 MHz, Biconilog from 30 to 1000 MHz, Log Periodic from 200 MHz to 1 GHz and or double Ridge or pyramidal horns and mixers from 1 GHz to 25 GHz, notch filters and appropriate amplifiers and external mixers were utilized. The peak and quasi-peak amplitude of the frequencies below 1000 MHz were measured using a spectrum analyzer. The peak and average amplitude of emissions above 1000 MHz including were measured using a spectrum analyzer. Data was recorded from the analyzer measurement result. Measurement data demonstrating compliance is presented in following tables.

**Transmitter Emissions Data**

**Table 1 General Radiated Emissions from EUT and support system**

| Frequency in MHz | Horizontal Peak (dBµV) | Horizontal Quasi-Peak (dBµV) | Horizontal Average (dBµV) | Vertical Peak (dBµV) | Vertical Quasi-Peak (dBµV) | Vertical Average (dBµV) | Limit @ 3m (dBµV/m) |
|------------------|------------------------|------------------------------|---------------------------|----------------------|----------------------------|-------------------------|---------------------|
| 48.0             | 33.0                   | 29.0                         | N/A                       | 37.4                 | 33.9                       | N/A                     | 40.0                |
| 66.2             | 39.9                   | 35.8                         | N/A                       | 34.4                 | 30.0                       | N/A                     | 40.0                |
| 66.6             | 39.9                   | 36.4                         | N/A                       | 36.5                 | 30.0                       | N/A                     | 40.0                |
| 66.8             | 34.3                   | 28.9                         | N/A                       | 32.7                 | 29.1                       | N/A                     | 40.0                |
| 97.7             | 36.3                   | 32.7                         | N/A                       | 38.9                 | 36.8                       | N/A                     | 43.5                |
| 99.2             | 32.9                   | 26.0                         | N/A                       | 35.4                 | 30.1                       | N/A                     | 43.5                |
| 103.4            | 39.3                   | 32.4                         | N/A                       | 34.5                 | 29.9                       | N/A                     | 43.5                |
| 132.0            | 40.6                   | 34.6                         | N/A                       | 38.7                 | 33.2                       | N/A                     | 43.5                |
| 133.0            | 40.1                   | 34.7                         | N/A                       | 41.7                 | 37.4                       | N/A                     | 43.5                |
| 157.0            | 38.4                   | 32.9                         | N/A                       | 32.1                 | 28.4                       | N/A                     | 43.5                |
| 159.5            | 39.5                   | 32.9                         | N/A                       | 31.6                 | 26.7                       | N/A                     | 43.5                |
| 164.2            | 39.7                   | 33.4                         | N/A                       | 31.9                 | 25.6                       | N/A                     | 43.5                |
| 164.8            | 39.1                   | 34.2                         | N/A                       | 32.3                 | 28.9                       | N/A                     | 43.5                |
| 230.8            | 34.5                   | 30.0                         | N/A                       | 27.2                 | 23.0                       | N/A                     | 46.0                |
| 250.0            | 36.0                   | 32.1                         | N/A                       | 31.3                 | 26.4                       | N/A                     | 46.0                |
| 266.2            | 44.0                   | 40.4                         | N/A                       | 28.3                 | 22.8                       | N/A                     | 46.0                |
| 455.7            | 42.0                   | 39.5                         | N/A                       | 42.6                 | 40.3                       | N/A                     | 46.0                |
| 665.6            | 43.2                   | 38.0                         | N/A                       | 45.2                 | 40.8                       | N/A                     | 46.0                |
| 930.1            | 41.9                   | 36.1                         | N/A                       | 38.4                 | 31.6                       | N/A                     | 46.0                |

Quasi-Peak amplitude emissions are recorded above for frequency range below 1000 MHz. Average amplitude emissions are recorded above for frequency range above 1000 MHz. Other emissions present had amplitudes at least 20 dB below the limit.

**Table 2 Transmitter Radiated Emission**

| Frequency in MHz | Horizontal Peak (dBμV) | Horizontal Average (dBμV) | Vertical Peak (dBμV) | Vertical Average (dBμV) | Limit @ 3m (dBμV/m) |
|------------------|------------------------|---------------------------|----------------------|-------------------------|---------------------|
| 2402.0           | 82.1                   | 82.0                      | 97.2                 | 97.1                    | --                  |
| 4804.0           | 47.9                   | 35.8                      | 48.9                 | 37.5                    | 54.0                |
| 7206.0           | 48.4                   | 36.0                      | 48.7                 | 36.0                    | 54.0                |
| 9608.0           | 48.4                   | 35.4                      | 49.9                 | 35.5                    | 54.0                |
| 12010.0          | 48.4                   | 35.9                      | 49.1                 | 35.9                    | 54.0                |
| 14412.0          | 55.4                   | 42.8                      | 55.2                 | 42.7                    | 54.0                |
| 16814.0          | 50.2                   | 37.4                      | 50.6                 | 37.4                    | 54.0                |
| 2441.0           | 83.4                   | 82.5                      | 96.4                 | 96.3                    | --                  |
| 4882.0           | 48.8                   | 38.3                      | 47.0                 | 35.7                    | 54.0                |
| 7323.0           | 47.6                   | 33.8                      | 47.1                 | 33.8                    | 54.0                |
| 9764.0           | 50.2                   | 37.8                      | 51.5                 | 37.8                    | 54.0                |
| 12205.0          | 48.2                   | 35.8                      | 48.5                 | 36.1                    | 54.0                |
| 14646.0          | 56.4                   | 44.0                      | 57.0                 | 44.3                    | 54.0                |
| 17087.0          | 51.9                   | 39.1                      | 52.0                 | 39.0                    | 54.0                |
| 2480.0           | 83.8                   | 83.6                      | 95.3                 | 95.2                    | --                  |
| 4960.0           | 50.8                   | 43.1                      | 48.1                 | 36.2                    | 54.0                |
| 7440.0           | 46.6                   | 33.8                      | 46.9                 | 34.1                    | 54.0                |
| 9920.0           | 50.0                   | 37.6                      | 51.0                 | 37.5                    | 54.0                |
| 12400.0          | 49.5                   | 36.9                      | 49.1                 | 36.5                    | 54.0                |
| 14880.0          | 54.0                   | 41.9                      | 54.2                 | 41.7                    | 54.0                |
| 17360.0          | 54.9                   | 42.5                      | 55.5                 | 42.5                    | 54.0                |

Quasi-Peak amplitude emissions are recorded above for frequency range of below 1000 MHz. Average amplitude emissions are recorded above for frequency range above 1000 MHz. Other emissions present had amplitudes at least 20 dB below the limit.



NVLAP Lab Code 200087-0

***Summary of Results for Transmitter Radiated Emissions of Intentional Radiator***

The EUT demonstrated compliance with the emission requirements of CFR47 Part 15.247 and RSS-210. The EUT demonstrated a minimum radiated harmonic emission margin of -9.7 dB below the requirement. There are no other significantly measurable emissions in the restricted bands other than those recorded in this report. Other emissions were present with amplitudes at least 20 dB below the requirements. The specifications of 15.247 and RSS-210 were met; there are no deviations or exceptions to the requirements.





NVLAP Lab Code 200087-0

## Annex

- Annex A Measurement Uncertainty Calculations
- Annex B Rogers Labs Test Equipment List
- Annex C Rogers Qualifications
- Annex D FCC Site Registration Letter
- Annex E Industry Canada Site Registration Letter



### **Annex A Measurement Uncertainty Calculations**

Measurement uncertainty calculations were made for the laboratory. Result of measurement uncertainty calculations are recorded below for AC line conducted and radiated emission measurements.

| Measurement Uncertainty                       | $U_{(E)}$ | $U_{(lab)}$ |
|---|-----------|-------------|
| 3 Meter Horizontal 30-200 MHz Measurements    | 2.08      | 4.16        |
| 3 Meter Vertical 30-200 MHz Measurements      | 2.16      | 4.33        |
| 3 Meter Vertical Measurements 200-1000 MHz    | 2.99      | 5.97        |
| 10 Meter Horizontal Measurements 30-200 MHz   | 2.07      | 4.15        |
| 10 Meter Vertical Measurements 30-200 MHz     | 2.06      | 4.13        |
| 10 Meter Horizontal Measurements 200-1000 MHz | 2.32      | 4.64        |
| 10 Meter Vertical Measurements 200-1000 MHz   | 2.33      | 4.66        |
| 3 Meter Measurements 1-6 GHz                  | 2.57      | 5.14        |
| 3 Meter Measurements 6-18 GHz                 | 2.58      | 5.16        |
| AC Line Conducted                             | 1.72      | 3.43        |



**Annex B Rogers Labs Test Equipment List**

| <u>Equipment</u>   | <u>Calibration Date</u> |
|--|-------------------------|
| Spectrum Analyzer: Rohde & Schwarz ESU40                               | 5/13                    |
| Spectrum Analyzer: HP 8562A, HP Adapters: 11518, 11519, and 11520      | 5/13                    |
| Mixers: 11517A, 11970A, 11970K, 11970U, 11970V, 11970W                 |                         |
| Spectrum Analyzer: HP 8591EM   | 5/13                    |
| Antenna: EMCO Biconilog Model: 3143                                    | 5/13                    |
| Antenna: Sunol Biconilog Model: JB6                                    | 10/12                   |
| Antenna: EMCO Log Periodic Model: 3147                                 | 10/12                   |
| Antenna: Antenna Research Biconical Model: BCD 235                     | 10/12                   |
| LISN: Compliance Design Model: FCC-LISN-2.Mod.cd, 50 µHy/50 ohm/0.1 µf | 10/12                   |
| R.F. Preamp PA-010   | 10/12                   |
| R.F. Preamp CPPA-102   | 10/12                   |
| R.F. Preamp PA-122   | 10/12                   |
| Cable assembly: (L1) consisting of Belden RG-58, HP11509A, CAT-3       | 10/12                   |
| Cable assembly: (L2) consisting of Belden RG-58, HP11509A, CAT-3       | 10/12                   |
| Cable: (L3) Belden 8268  | 10/12                   |
| Cable: Time Microwave: 4M-750HF290-750                                 | 10/12                   |
| Cable: Time Microwave: 10M-750HF290-750                                | 10/12                   |
| Antenna: EMCO 6509   | 10/12                   |
| Frequency Counter: Leader LDC825                                       | 2/13                    |
| Oscilloscope Scope: Tektronix 2230                                     | 2/13                    |
| Wattmeter: Bird 43 with 50 Ohm Load 8085                               | 2/13                    |
| Power Supplies: Sorensen SRL 20-25, SRL 40-25, DCR 150, DCR 140        | 2/13                    |
| R.F. Generators: HP 606A, HP 8614A, HP 8640B                           | 2/13                    |
| R.F. Power Amp 65W Model: 470-A-1010                                   | 2/13                    |
| R.F. Power Amp 50W M185- 10-501  | 2/13                    |
| R.F. Power Amp A.R. Model: 10W 1010M7                                  | 2/13                    |
| R.F. Power Amp EIN Model: A301   | 2/13                    |
| LISN: Compliance Eng. Model 240/20                                     | 2/13                    |
| LISN: Fischer Custom Communications Model: FCC-LISN-50-16-2-08         | 2/13                    |
| Antenna: EMCO Dipole Set 3121C   | 2/13                    |
| Antenna: Compliance Design B-101                                       | 2/13                    |
| Antenna: Solar 9229-1 & 9230-1   | 2/13                    |
| Audio Oscillator: HP 201CD   | 2/13                    |
| Peavey Power Amp Model: IPS 801  | 2/13                    |
| ELGAR Model: 1751  | 2/13                    |
| ELGAR Model: TG 704A-3D  | 2/13                    |
| ESD Test Set 2010i   | 2/13                    |
| Fast Transient Burst Generator Model: EFT/B-101                        | 2/13                    |
| Field Intensity Meter: EFM-018   | 2/13                    |
| KEYTEK Ecat Surge Generator  | 2/13                    |
| Shielded Room 5 M x 3 M x 3.0 M  |                         |



## **Annex C Rogers Qualifications**

**Scot D. Rogers, Engineer**

### **Rogers Labs, Inc.**

Mr. Rogers has approximately 17 years' experience in the field of electronics. Work experience includes six years working in the automated controls industry and remaining years working with the design, development and testing of radio communications and electronic equipment.

#### Positions Held:

Systems Engineer: A/C Controls Mfg. Co., Inc. 6 Years

Electrical Engineer: Rogers Consulting Labs, Inc. 5 Years

Electrical Engineer: Rogers Labs, Inc. Current

#### Educational Background:

- 1) Bachelor of Science Degree in Electrical Engineering from Kansas State University
- 2) Bachelor of Science Degree in Business Administration Kansas State University
- 3) Several Specialized Training courses and seminars pertaining to Microprocessors and Software programming.



NVLAP Lab Code 200087-0

**Annex D FCC Test Site Registration Letter**

**FEDERAL COMMUNICATIONS COMMISSION**

**Laboratory Division  
7435 Oakland Mills Road  
Columbia, MD 21046**

November 01, 2011

Registration Number: 90910

Rogers Labs, Inc.  
4405 West 259th Terrace,  
Louisburg, KS 66053

Attention: Scot Rogers,

Re: Measurement facility located at Louisburg  
3 & 10 meter site  
Date of Renewal: November 01, 2011

Dear Sir or Madam:

Your request for renewal of the registration of the subject measurement facility has been received. The information submitted has been placed in your file and the registration has been renewed. The name of your organization will remain on the list of facilities whose measurement data will be accepted in conjunction with applications for Certification under Parts 15 or 18 of the Commission's Rules. Please note that the file must be updated for any changes made to the facility and the registration must be renewed at least every three years.

Measurement facilities that have indicated that they are available to the public to perform measurement services on a fee basis may be found on the FCC website [www.fcc.gov](http://www.fcc.gov) under E-Filing, OET Equipment Authorization Electronic Filing, Test Firms.

Sincerely,

Phyllis Parrish  
Industry Analyst

Rogers Labs, Inc.  
4405 W. 259th Terrace  
Louisburg, KS 66053  
Phone/Fax: (913) 837-3214  
Revision 1

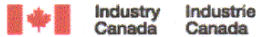
EZURIO LTD. (Laird Technologies)  
Model: TRBLU24-00100 / BISMS02BI  
Test #: 130619  
Test to: FCC 15C (15.249), IC RSS-210  
File:Laird TRBLU24 00100 Class 2 Change 130619

SN: ENG1  
FCC ID#: PI403B  
IC: 1931B-EUSB  
Date: July 9, 2013  
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NVLAP Lab Code 200087-0

## Annex E Industry Canada Test Site Registration Letter



December 28, 2011

OUR FILE: 46405-3041  
Submission No: 152685

Rogers Labs Inc.  
4405 West 259th Terrace  
Louisburg, KS, 66053  
USA

**Attention:** Mr. Scot D. Rogers

Dear Sir/Madame:

The Bureau has received your application for the renewal of 3/10m OATS. Be advised that the information received was satisfactory to Industry Canada. The following number(s) is now associated to the site(s) for which registration / renewal was sought ( **Site# 3041A-1** ). Please reference the appropriate site number in the body of test reports containing measurements performed on the site. In addition, please keep for your records the following information;

- The company address code associated to the site(s) located at the above address is: **3041A**

Furthermore, to obtain or renew a unique site number, the applicant shall demonstrate that the site has been accredited to ANSI C63.4-2003 or later. A scope of accreditation indicating the accreditation by a recognized accreditation body to ANSI C63.4-2003 or later shall be accepted. Please indicate in a letter the previous assigned site number if applicable and the type of site (example: 3 metre OATS or 3 metre chamber). If the test facility is not accredited to ANSI C63.4-2003 or later, the test facility shall submit test data demonstrating full compliance with the ANSI standard. The Bureau will evaluate the filing to determine if recognition shall be granted.

The frequency for re-validation of the test site and the information that is required to be filed or retained by the testing party shall comply with the requirements established by the accrediting organization. However, in all cases, test site re-validation shall occur on an interval not to **exceed three years**. There is no fee or form associated with an OATS filing. OATS submissions are encouraged to be submitted electronically to the Bureau using the following URL;

[http://strategis.ic.gc.ca/epic/internet/inceb-bhst.nsf/en/h\\_tt00052e.html](http://strategis.ic.gc.ca/epic/internet/inceb-bhst.nsf/en/h_tt00052e.html).

If you have any questions, you may contact the Bureau by e-mail at [certification.bureau@ic.gc.ca](mailto:certification.bureau@ic.gc.ca) Please reference our file and submission number above for all correspondence.

Yours sincerely,

Dalwinder Gill  
For: Wireless Laboratory Manager  
**Certification and Engineering Bureau**  
3701 Carling Ave., Building 94  
P.O. Box 11490, Station "H"  
Ottawa, Ontario K2H 8S2  
Email: [dalwinder.gill@ic.gc.ca](mailto:dalwinder.gill@ic.gc.ca)  
Tel. No. (613) 998-8363  
Fax. No. (613) 990-4752

Rogers Labs, Inc.  
4405 W. 259th Terrace  
Louisburg, KS 66053  
Phone/Fax: (913) 837-3214  
Revision 1

EZURIO LTD. (Laird Technologies)  
Model: TRBLU24-00100 / BISMS02BI  
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