



**Flom Test Labs**  
EMI, EMC, RF Testing Experts Since 1963

toll-free: (866) 311-3268  
fax: (480) 926-3598  
<http://www.flomlabs.com>  
[info@flomlabs.com](mailto:info@flomlabs.com)

**Date:** May 2, 2008

**Applicant:** Thermodynamic Process Control LLC  
5935 Kopetsky Dr, Ste C  
Indianapolis, IN 46217

**Attention of:** ATTN: David Johnson, Jr  
PH: (866) 660-3569  
FAX: (317) 228-9771  
email: [davej@flowintel.com](mailto:davej@flowintel.com)

**Equipment:** LFC-01-001  
**FCC Rules:** Part 15, Subpart B. Class A Limits.

Gentlemen:

Enclosed please find your copy of the Declaration of Conformity Test Data Report for the referenced equipment.

Please keep the original on record for submission to the FCC, **but only if and when they request it.**

In the event this submission is ever requested by the FCC, please complete all the documentation requirements, (as per the LIST OF EXHIBITS) before sending.

Should you have any questions, please do not hesitate to call.

Sincerely yours,

John Erhard



**Flom Test Labs**  
EMI, EMC, RF Testing Experts Since 1963

toll-free: (866) 311-3268  
fax: (480) 926-3598  
<http://www.flomlabs.com>  
[info@flomlabs.com](mailto:info@flomlabs.com)

**Declaration of Conformity  
(Unintentional Radiator)**

of

**Model:** LFC-01-001

to

**Federal Communications Commission**

**Rule Part 15, Subpart B - Unintentional Radiators**

**Class A Limits**

**Date of Report:** May 2, 2008

Date of Revised Report: June 26, 2008

**At the Request of:**

Thermodynamic Process Control LLC  
5935 Kopetsky Dr, Ste C  
Indianapolis, IN 46217

**Attention of:**

ATTN: David Johnson, Jr  
PH: (866) 660-3569  
FAX: (317) 228-9771  
email: [davej@flowintel.com](mailto:davej@flowintel.com)

John Erhard

Reviewed By:

Flom Test Labs  
3356 N. San Marcos Place, Suite 107  
Chandler, Arizona 85225-7176  
(866) 311-3268 phone, (480) 926-3598 fax

MFA p0840007, d0850002 Rev 2.0

## Revision History

Revision	Date	Revised By	Reason for revision
1.0	May 2, 2008	J. Erhard	Original Document
2.0	June 27, 2008	J. Erhard	Edit test set up photos

**The applicant has been cautioned as to the following:**

15.21 Information to User.

The users manual or instruction manual for an intentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.27(a) Special Accessories.

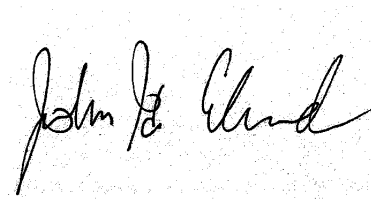
Equipment marketed to a consumer must be capable of complying with the necessary regulations in the configuration in which the equipment is marketed. Where special accessories, such as shielded cables and/or special connectors are required to enable an unintentional or intentional radiator to comply with the emission limits in this part, the equipment must be marketed with, i.e. shipped and sold with, those special accessories. However, in lieu of shipping or packaging the special accessories with the unintentional or intentional radiator, the responsible party may employ other methods of ensuring that the special accessories are provided to the consumer, without additional charge.

Information detailing any alternative method used to supply the special accessories for a grant of equipment authorization or retained in the verification records, as appropriate. The party responsible for the equipment, as detailed in § 2.909 of this chapter, shall ensure that these special accessories are provided with the equipment. The instruction manual for such devices shall include appropriate instructions on the first page of text concerned with the installation of the device that these special accessories must be used with the device. It is the responsibility of the user to use the needed special accessories supplied with the equipment.

## Testimonial And Statement Of Certification

**This is to certify that:**

1. **That** the application was prepared either by, or under the direct supervision of, the undersigned.
2. **That** the technical data supplied with the application was taken under my direction and supervision.
3. **That** the data was obtained on representative units, randomly selected.
4. **That**, to the best of my knowledge and belief, the facts set forth in the application and accompanying technical data are true and correct.



John Erhard

Certifying Engineer:

## Table Of Contents

Rule	Description	Page
	Test Report	1
	Standard Test Conditions and Engineering Practices	2
	Test Results Summary	3
15.109	Radiated Emissions	4
15.107	A/C Powerline Conducted Emissions	5
	Test Setup Photos	6
	Test Equipment Utilized	8

*Required information per ISO 17025-2005, paragraph 5.10.2:*

a) **Test Report**

b) Laboratory: Flom Test Lab, Inc.  
(FCC: 31040/SIT) 3356 N. San Marcos Place, Suite 107  
(Canada: IC 2044A-1) Chandler, AZ 85225

c) Report Number: d0850002

d) Client: Thermodynamic Process Control LLC

e) Identification: LFC-01-001

Description: 2.4 GHz TX with Zigbee

f) EUT Condition: Not required unless specified in individual tests.

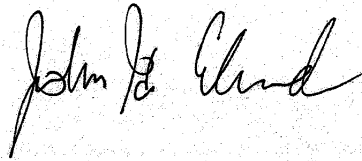
g) Report Date: May 2, 2008  
EUT Received:

h, j, k): As indicated in individual tests.

i) Sampling method: No sampling procedure used.

l) Uncertainty: In accordance with FTL internal quality manual.

m) Supervised by:



John Erhard

n) Results: The results presented in this report relate only to the item tested.

o) Reproduction: This report must not be reproduced, except in full, without written permission from this laboratory.

Sub-part  
2.1033(b):

### Test And Measurement Data

All tests and measurement data shown were performed in accordance with FCC Rules and Regulations, Volume II; Part 2 and the following individual Parts:

15.107, 15.109                      Unintentional Radiators

### Standard Test Conditions and Engineering Practices

Except as noted herein, the following conditions and procedures were observed during the testing:

In accordance with ANSI C63.4-2004, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40°C (50° to 104 °F) unless the particular equipment requirements specify testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Prior to testing, the EUT was tuned up in accordance with the manufacturer's alignment procedures. All external gain controls were maintained at the position of maximum and/or optimum gain throughout the testing.

Measurement results, unless otherwise noted, are worst-case measurements.

### **A2LA**

"A2LA has accredited Flom Test Labs, Inc. Chandler, AZ for technical competence in the field of Electrical testing. The accreditation covers the specific tests and types of tests listed on the agreed scope of accreditation. This laboratory meets the requirements of ISO 17025:2005 'General Requirements for the Competence of Testing and Calibration Laboratories' and any additional program requirements in the identified field of testing."

Please refer to [www.a2la.org](http://www.a2la.org) for current scope of accreditation.

Certificate number: 2152.01



**IC O.A.T.S. Number: 2044A-1**



### Test Results Summary

Specification	Test Name	Pass, Fail, N/A	Comments
15.109	Radiated Emissions	Pass	
15.107	A/C Powerline Conducted Emissions	Pass	

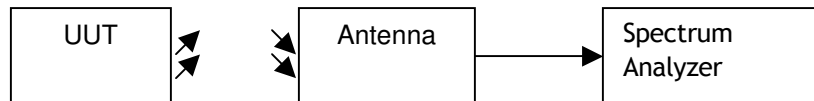
**Name of Test:** Radiated Emissions  
**Specification:** 15.109  
**Spec. Limit:** See Table  
**Test Equipment Utilized** i00049, i00088, i00089

**Test Date:** 4/11/2008

### Test Procedure

The UUT was tested in an Open Area Test Site (OATS) set 3m from the receiving antenna. A spectrum analyzer was used to verify that the UUT met the requirements for Radiated Emissions. The UUT was tested by rotating it 360° with the antennas in both the vertical and horizontal orientation and raised from 1 to 4 meters to ensure the TX signal levels were maximized. All emissions from 30 MHz to 1 GHz were examined.

### Test Setup



#### Settings

RBW = 100 KHz

VBW = 100KHz

Detector – Quasi Peak

Sample Calculations

Corrected Value = Measured Value + Correction factor

Correction factor = ACF + Cable loss

### Radiated Emissions

Emission Freq (MHz)	Measured Value (dBuV/m)	Correction Factor (dB)	Corrected Value (dBuV/m)	Limit (dBuV/m)	Margin dB
37.68	25.5	2.7	28.2	39.1	-10.9
43.70	22.6	2.1	24.7	39.1	-14.4
51.28	22.2	1.3	23.5	39.1	-15.6
503.39	22.6	9.8	32.4	46.4	-14.0
711.80	15.8	12.6	28.4	46.4	-18.0
818.79	15.9	14.1	30.0	46.4	-16.4

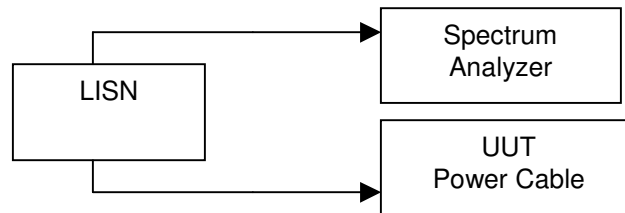
**Name of Test:** A/C Powerline Conducted Emissions  
**Specification:** 15.107  
**Test Equipment Utilized** i00033, i00270

**Test Date:** 4/10/2008

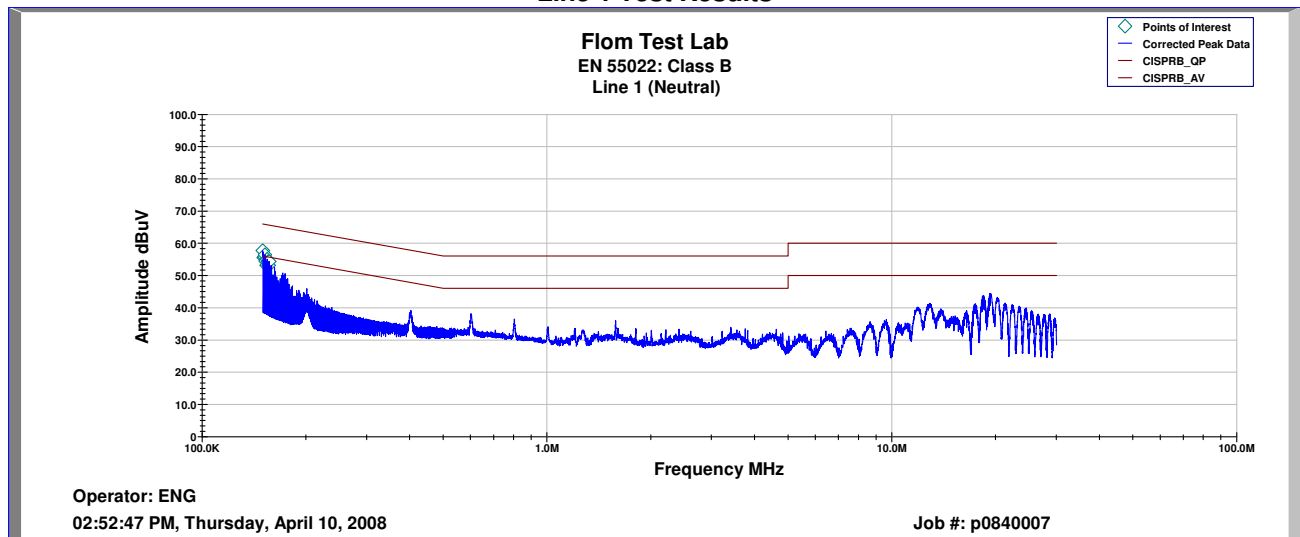
### Test Procedure

The UUT power cable connected to a LISN and the monitored output of the LISN was connected directly to a spectrum analyzer. The conducted emissions from 150 kHz to 30 MHz were monitored and compared to the specification limits. All peak emissions were below the quasi-peak limit.

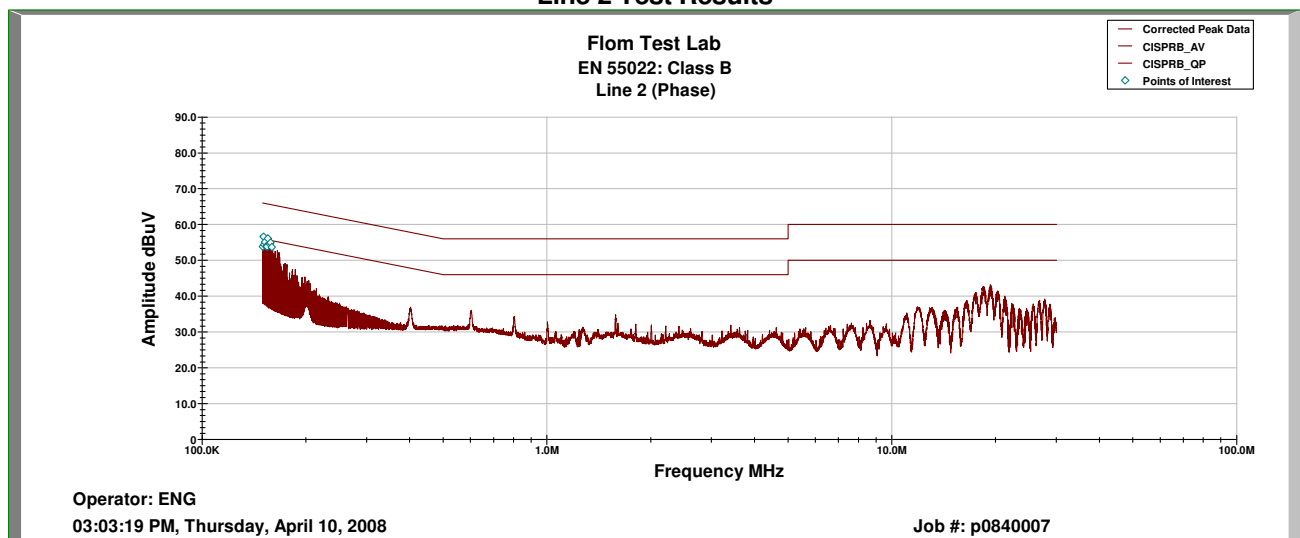
### Test Setup



### Line 1 Test Results



### Line 2 Test Results



## Radiated Emissions Test Setup Photos





### AC Conducted Emissions Test Setup Photos



### Test Equipment Utilized

Description	MFG	Model Number	FTL Asset Number	Last Cal Date	Cal Due Date
Spectrum Analyzer	HP	85462A	i00033	10/1//07	10/1//08
Spectrum Analyzer	HP	8566B	i00049	8/18/07	8/18/08
Bi-conical Antenna	EMCO	3109B	i00088	10/14/07	10/14/09
Log Periodic Antenna	Apriel	2001	i00089	10/19/07	10/19/09
LISN	FCC	FCC-LISN-50-32-2-01	i00270	10/22/07	10/22/09

In addition to the above listed equipment standard RF connectors and cables were utilized in the testing of the described equipment. Prior to testing these components were tested to verify proper operation.

END OF TEST REPORT