



**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 7, 2007

Federal Communications Commission  
Via: Electronic Filing

**Attention:** Authorization & Evaluation Division

**Applicant:** Schneider Electric Sensor Competency Center.  
**Equipment:** XGCS4901201  
**FCC ID:** TW6XGCS4  
**FCC Rules:** FCC 15.225

Gentlemen:

On behalf of the Applicant, enclosed please find Application Form 731, Engineering Test Report and all pertinent documentation, the whole for approval of the referenced equipment as shown.

Filing fees are attached.

We trust the same is in order. Should you need any further information, kindly contact the writer who is authorized to act as agent.

Sincerely yours,

Hoosamuddin S. Bandukwala, Lab Director

enclosure(s)  
cc: Applicant  
HSB/je

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

p0730021, d0750036



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## **Transmitter Certification**

of

Model: XGCS4901201

to

**Federal Communications Commission**

Rule Part(s) FCC 15.225

Date of report: May 7, 2007

Date of revised report: June 29, 2007

**On the Behalf of the Applicant:**

Schneider Electric Sensor Competency Center

**At the Request of:**

Schneider Electric Sensor Competency Center  
1875 Founders Drive,  
Dayton, OH 45420

**Attention of:**

Elizabeth Klinc  
Ph: (937)514-7225  
Fax: (937)258-5830  
Email: [elizabeth.klinc@us.schneider-electric.com](mailto:elizabeth.klinc@us.schneider-electric.com)

Supervised by:

Hoosamuddin S. Bandukwala, Lab Director

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

p0730021, d0750036

## List of Exhibits

(FCC **Certification** (Transmitters) - Revised 9/28/98)

**Applicant:** Schneider Electric Sensor Competency Center

FCC ID: TW6XGCS4

**By Applicant:**

1. Letter of Authorization
2. Confidentiality Request: 0.457 And 0.459
3. Identification Drawings, 2.1033(c)(11)
  - Label
  - Location of Label
  - Compliance Statement
  - Location of Compliance Statement
4. Photographs, 2.1033(c)(12)
5. Documentation: 2.1033(c)
  - (3) User Manual
  - (10) Schematic Diagram
  - (10) Circuit Description
  - Block Diagram
  - Parts List
  - Active Devices

**By M.F.A. Inc.:**

- A. Testimonial & Statement of Certification

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

**15.21 Information to the 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.

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15.225(a)	Radiated Field Strength Within the Band	6
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Required information per ISO 17025-2005 paragraph 5.0:

a)

**Test Report**

b) Laboratory:  
(FCC: 31040/SIT)  
(Canada: IC 2044)

Flom Test Lab  
3356 N. San Marcos Place, Suite 107  
Chandler, AZ 85225

c) Report Number:

d0750036

d) Client:

Schneider Electric Sensor Competency Center  
1875 Founders Drive,  
Dayton, OH 45420

e) Identification:

XGCS4901201

EUT Description:

13.56 MHz Radio frequency identification device

f) EUT Condition:

Not required unless specified in individual tests.

g) Report Date:

May 7, 2007

EUT Received:

h, j, k):

As indicated in individual tests.

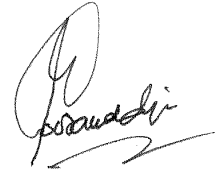
i) Sampling method:

No sampling procedure used.

l) Uncertainty:

In accordance with MFA internal quality manual.

m) Supervised by:



Hoosamuddin S. Bandukwala, Lab Director

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.

Accessories used during testing:

Type	Quantity	Manufacturer	Model	Serial No.	FCC ID
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Sub-part

2.1033(c)(14):

### **Test and Measurement Data**

All tests and measurement data shown were performed in accordance with:

FCC Rules and Regulations Volume II; Part 2, Subpart J, Sections 15.225

## Standard Test Conditions and Engineering Practices

### 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**



## List of General Information Required for Certification

In Accordance with FCC Rules and Regulations,  
Volume II, Part 2 and to

FCC 15.225

Sub-part 2.1033

(c)(1):

**Name and Address of Applicant:** Schneider Electric Sensor Competency Center  
1875 Founders Drive,  
Dayton, OH 45420

**Manufacturer:** Schneider Electric Sensor Competency Center  
1875 Founders Drive,  
Dayton, OH 45420

(c)(2): **FCC ID:** TW6XGCS4

**Model Number:** XGCS4901201

(c)(3): **Instruction Manual(s):**

Please see attached exhibits

(c)(4): **Type of Emission:** N/A

(c)(5): **Frequency Range, MHz:** 13.56

(c)(6): **Power Rating, Watts:** .04  $\mu$ W  
       \_\_\_\_\_ Switchable                      \_\_\_\_\_ Variable                        x   N/A

**FCC Grant Note:**

(c)(7): **Maximum Power Rating, Watts:** 5  $\mu$ W

**DUT Results:** Passes   x   Fails \_\_\_\_\_

(c)(10): **Circuit Diagram/Circuit Description:**

Including description of circuitry & devices provided for determining and stabilizing frequency, for suppression of spurious radiation, for limiting modulation and limiting power.

Please see attached exhibits

(c)(11): **Label Information:**

Please see attached exhibits

(c)(12): **Photographs:**

Please see attached exhibits

(c)(13): **Digital Modulation Description:**

☐ Attached Exhibits

☒ N/A

(c)(14): **Test and Measurement Data:**

Follows

**Name of Test:** Radiated Field Strength Within the Band  
**Specification:** 15.225(a)(b)(c)  
**Test Equipment:** i00048, i00049, i00050, i00051, i00055, i00326

### Test Procedure

The UUT was tested in an Open Area Test Site (OATS) set 1m from the receiving transducer, an active loop antenna. A spectrum analyzer was used to verify that the UUT met the requirements for Radiated Field Strength. An amplifier was utilized to ensure there was sufficient dynamic range for accurate measurement. The signal was maximized by rotating the antenna through all 3 axis and turning the UUT 360°.

Settings  
 RBW = 100 KHz  
 VBW = 100KHz  
 Detector – Peak

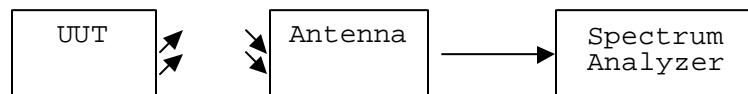
### Sample Calculations

Corrected Level = Recorded Level + Correction factor

Correction factor = ACF + Cable loss + Distance Correction factor

Distance Correction factor =  $10 \log D1/D2$

### Test Setup



### Test Results

Emission Frequency (MHz)	Recorded Level (dB $\mu$ V/m)	Antenna Correction Factor (dB)	Cable Correction Factor (dB)	Distance Correction Factor (dB)	Corrected Level (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Result
13.294	32.7	16.5	2.1	-29.5	21.8	40.0	Pass
13.553	35.6	16.5	2.1	-29.5	24.7	50.0	Pass
13.558	43.6	16.5	2.1	-29.5	32.7	84.0	Pass
13.615	32.9	16.5	2.1	-29.5	22.0	50.0	Pass
13.904	32.5	16.5	2.1	-29.5	21.6	40.0	Pass

**Name of Test:** Radiated Spurious Emissions  
**Specification:** 15.225(d)  
**Test Equipment:** i00048, i00049, i00050, i00051, i00055, i00088, i00089

### Test Procedure

The UUT was tested in an Open Area Test Site (OATS) set 3m from the receiving transducer. A spectrum analyzer was used to verify that the UUT met the requirements for Radiated Spurious Emissions. An amplifier was utilized to ensure there was sufficient dynamic range for accurate measurement. The antennas were tested in both the vertical and horizontal orientation and raised from 1 to 4 meters while rotating the UUT 360° to ensure the TX signal levels were maximized.

#### Settings

RBW = 100 KHz

VBW = 100KHz

Detector – Quasi Peak

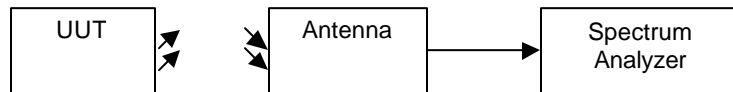
#### Sample Calculations

Corrected Level = Recorded Level + Correction factor

Correction factor = ACF + Cable loss + Distance Correction factor

Distance Correction factor =  $10 \log D1/D2$

### Test Setup



### Test Results

Emission Frequency (MHz)	Recorded Level (d 3μV/m)	Antenna Correction Factor (dB)	Cable Correction Factor (dB)	Distance Correction Factor (dB)	Corrected Level (d 3μV/m)	Limit (d 3μV/m)	Result
50.477	16.9	10.9	3.1	0	30.9	40.0	Pass
134.970	20.0	16.0	3.8	0	39.8	43.5	Pass
203.489	16.5	15.9	4.0	0	36.4	46.0	Pass
229.864	16.9	16.0	4.1	0	37.0	46.0	Pass
349.739	-4.8	15.3	4.5	0	15.0	46.0	Pass
599.780	3.2	20.9	4.9	0	29.0	46.0	Pass

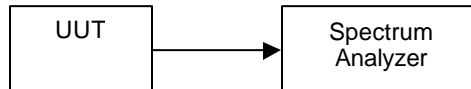
**Name of Test:** Frequency Stability  
**Specification:** 15.225(e)  
**Test Equipment:** i00027, i00048, i00049, i00054

### Frequency Stability (Temperature)

#### Test Procedure

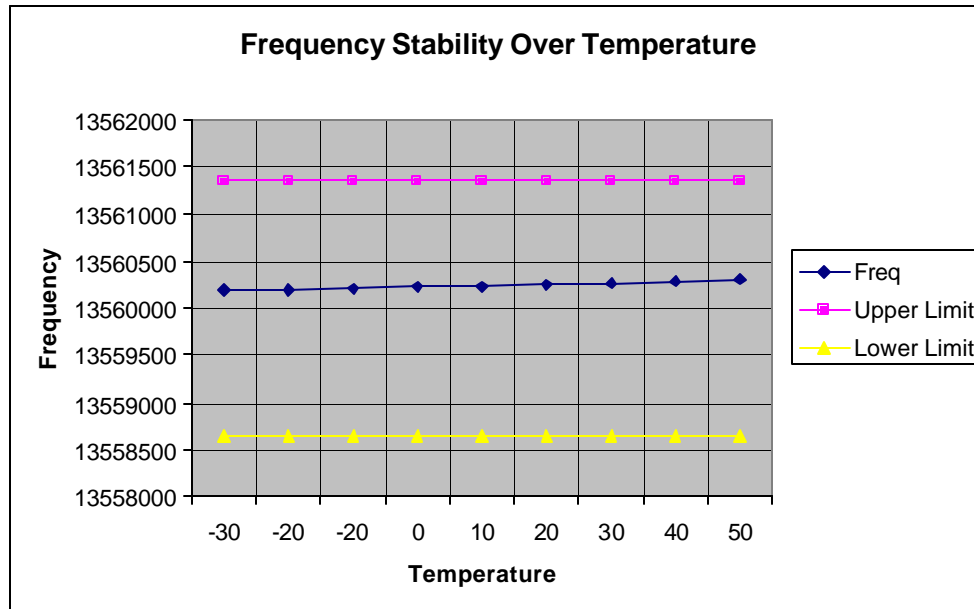
The UUT was tested by placing it in an environmental test chamber and varying the temperature from  $-20^{\circ}$  to  $+50^{\circ}$  degrees centigrade while monitoring the emission output. The temperature was raised in  $10^{\circ}$  C increments allowing sufficient soak time for the UUT internal circuitry to stabilize. The output emission was monitored with a spectrum analyzer set for max hold to capture the frequency drift of the UUT.

#### Test Setup



#### Test Results

Monitored Frequency Minimum (MHz)	Monitored Frequency Maximum (MHz)	Frequency Drift (Hz)	Limit (Hz)	Result
13.560182	13.560309	126	2,712	Pass

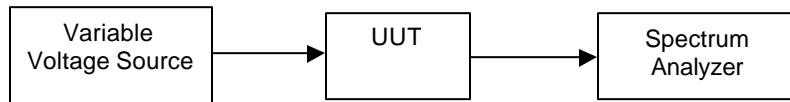


## Frequency Stability (Voltage)

### Test Procedure

The UUT was tested by connecting it to a variable voltage source and varying the control voltage from 85% to 115% of the nominal voltage. The output emission was monitored with a spectrum analyzer set for max hold to capture the frequency drift of the UUT.

### Test Set-Up



### Test Results

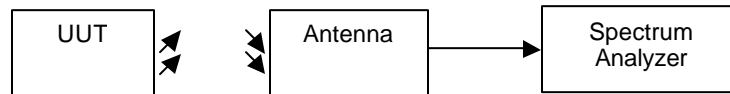
Monitored Frequency Minimum (f Hz)	Monitored Frequency Maximum (f Hz)	Frequency Drift (Hz)	Limit (Hz)	Result
13.560	13.560	0	2,712	Pass

**Name of Test:** 99% Bandwidth  
**Specification:**  
**Test Equipment:** i00029, i00326

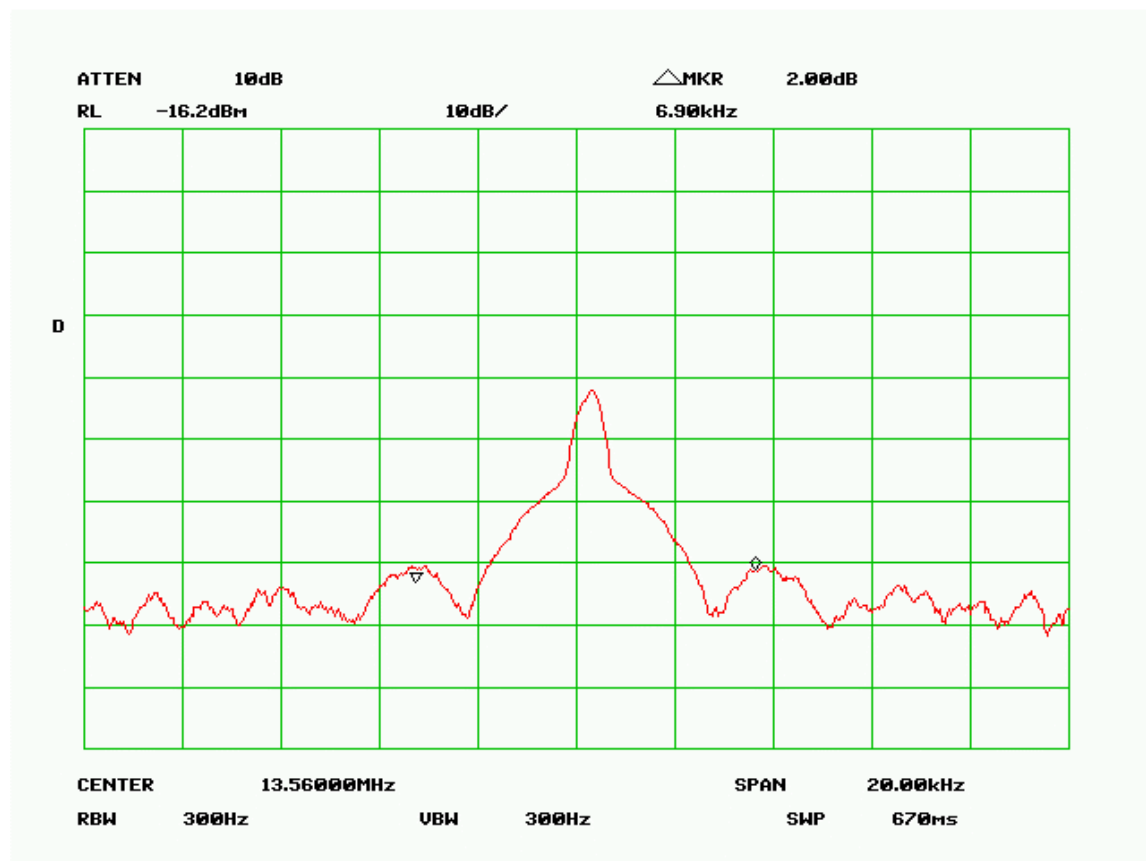
### Test Procedure

The UUT was tested in an Open Area Test Site (OATS) set 1m from the receiving transducer, an active loop antenna. A spectrum analyzer was used to verify that the UUT met the requirements for Radiated Field Strength. An amplifier was utilized to ensure there was sufficient dynamic range for accurate measurement. The signal was maximized by rotating the antenna through all 3 axis and turning the UUT 360°.

### Test Setup



### 99% Bandwidth Plot



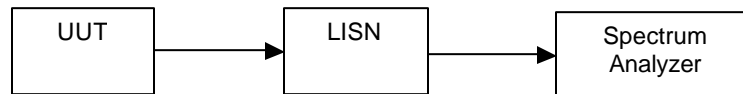
**Name of Test:** AC Conducted Emissions  
**Specification:** 15.207  
**Test Equipment:** i00048, i00049, i00051, i00051, i00270

### AC Conducted Emissions

#### Test Procedure

The UUT was tested by connecting an AC powered DC Supply through a LISN and monitoring the AC Conducted Emissions with a spectrum analyzer. Emissions from 150kHz to 30 MHz were and both average and quasipeak levels were monitored. The 6 highest readings average and quasipeak on both line 1 and line 2 were recorded.

#### Test Setup





## Test Results

### Line 1 Average

Frequency	Recorded Level (dbμV)	Correction Factor (dB)	Corrected Level (dbμV)	Limit (dbμV)	Margin (dB)
14.216 MHz	32.44	0.66	33.1	50	-16.9
13.991 MHz	32.74	0.66	33.4	50	-16.6
13.885 MHz	33.19	0.66	33.85	50	-16.15
13.648 MHz	33.26	0.65	33.92	50	-16.08
13.318 MHz	31.22	0.65	31.86	50	-18.14
13.219 MHz	31.65	0.64	32.29	50	-17.71

### Line 2 Average

Frequency	Recorded Level (dbμV)	Correction Factor (dB)	Corrected Level (dbμV)	Limit (dbμV)	Margin (dB)
14.35 MHz	30.99	0.67	31.65	50	-18.35
13.902 MHz	30.7	0.66	31.35	50	-18.65
13.794 MHz	31.94	0.66	32.59	50	-17.41
13.555 MHz	32.21	0.65	32.86	50	-17.14
13.423 MHz	32.18	0.65	32.83	50	-17.17
13.085 MHz	31.08	0.64	31.73	50	-18.27

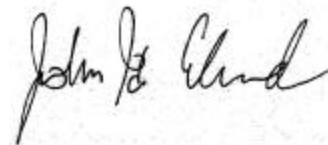
### Line 1 Quasi-peak

Frequency	Recorded Level (dbμV)	Correction Factor (dB)	Corrected Level (dbμV)	Limit (dbμV)	Margin (dB)
14.216 MHz	46.25	0.66	46.91	60	-13.09
13.991 MHz	46.14	0.66	46.8	60	-13.2
13.885 MHz	46.11	0.66	46.77	60	-13.23
13.754 MHz	45.38	0.66	46.04	60	-13.96
13.648 MHz	46.33	0.65	46.98	60	-13.02
13.219 MHz	44.98	0.64	45.62	60	-14.38

### Line 2 Quasi-peak

Frequency	Recorded Level (dbμV)	Correction Factor (dB)	Corrected Level (dbμV)	Limit (dbμV)	Margin (dB)
14.119 MHz	44.66	0.66	45.32	60	-14.68
13.902 MHz	45.2	0.66	45.86	60	-14.14
13.794 MHz	45.61	0.66	46.27	60	-13.73
13.555 MHz	45.76	0.65	46.41	60	-13.59
13.423 MHz	45.54	0.65	46.19	60	-13.81
13.085 MHz	44.66	0.64	45.3	60	-14.70

Asset#	Manufacturer	Model	Serial Number	Calibration Cycle	Calibration Due
i00027	Tenney	Tenney Jr	9083-76J-234	12 mo.	9/12/2007
i00029	HP	8563E	3213A00104	12 mo.	3/9/2008
i00048	HP	85662A	2511AD1467	12 mo.	8/30/2007
i00049	HP	8566B	2511AD1467	12 mo.	8/30/2007
i00050	HP	85685A	2510A00185	12 mo.	7/25/2007
i00051	HP	85650A	2521A00647	12 mo.	7/25/2007
i00054	HP	6286A	1612A02671	N/A	N/A
i00055	HP	8447D	1726A01101	when used	N/A
i00088	EMCO Biconical	3109B	2336	12 mo.	10/14/2007
i00089	Aprel Log Periodic	2001	001500	12 mo.	10/25/2007
i00270	FCC	FCC-LISN-50-50-2-01	2050	24 mo.	10/20/2007
i00326	EMCO Loop	6507	8112-1144	24 mo.	1/19/2009



John Erhard

Performed by:

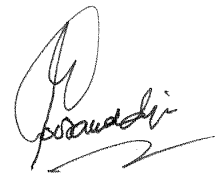
END OF TEST REPORT

**Testimonial  
and  
Statement of Certification**

**This is to Certify:**

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.

Certifying Engineer:



Hoosamuddin S. Bandukwala, Lab Director