FCC Part 15.247
Transmitter Certification

Frequency Hopping Spread Spectrum Transmitter

Test Report

FCC ID: SK9C1A-2

FCC Rule Part: 15.247

ACS Report Number: 04-0396-15C-DSS

Manufacturer: Itron Electricity Metering, Inc.
Trade Name: CENTRON ™ ICARe
Model: C1A-2

Test Begin Date: December 7, 2004
Test End Date: December 9, 2004

Report Issue Date: January 3, 2005

FOR THE SCOPE OF ACCREDITATION UNDER LAB Code 200612

Prepared by: _____
J. Kirby Munroe
Manager Wireless Certifications
ACS, Inc.

Reviewed by: _____
R. Sam Wismer
Engineering Manager
ACS, Inc.

This report contains 22 pages

Table of Contents

Additional Exhibits Included In Filing

Internal Photographs
External Photographs
Test Setup Photographs
Product Labeling
RF Exposure – MPE Calculations
BOM
Installation/Users Guide
Theory of Operation
System Block Diagram
Schematics

1.0 GENERAL

1.1 Purpose
The purpose of this report is to demonstrate compliance with Part 15, Subpart C of the FCC's Code of Federal Regulations.

1.2 Product Description

1.2.1 General
The ICARe will be a transmit-only meter module that collects and transmits metering data over the 902 - 928 MHz Industrial, Scientific and Medical (ISM) RF band. The unit will contain both a Direct Sequence Spread Spectrum (DSSS) transmitter and a Frequency Hopping (FSK) transmitter.

The ICARe functions as a RF transmitter that is capable of supporting remote meter reading using mobile and fixed network protocols. The mobile network functions will be the R300 (ITRON™ protocol) or the R900 (SURF© protocol). The fixed network function will be the CellNet© electricity endpoint protocol (PID2) to maintain legacy functionality.

The endpoint will be installed in the CENTRON meter as the register board. The metrology board will provide power and energy data to the endpoint in the same manner as a normal register board.

The endpoint will provide the following data depending on configuration and firmware option:
- Cumulative energy readings using the ITRON protocol
- Cumulative energy readings using the Schlumberger SURF protocol
- Cumulative and interval readings using the CellNet by Atos Origin protocol

The endpoint will determine electrical energy data by counting pulses from the metrology board and then converting them to energy values for display and transmission. The endpoint will use a constant loaded during configuration to provide the correct energy values for the network being supported.

The endpoint will also use a serial protocol for configuration and testing using the register serial port.

It is also necessary for the endpoint to be able to be installed on previous meter bases with no modifications to the base to maintain the modularity requirement of the CENTRON meter.

Detailed photographs of the EUT are filed separately with this filing.

1.2.2 Intended Use
The CENTRON ™ ICARe is intended to be installed on a residential or commercial structure to record electricity usage and transmit the data to either utility personnel or to a nearby base station depending on which radio is active. Only one radio will ever be active at any given time.

If the meter is configured for remote meter data collection by a utility meter reader, the Frequency Hopping (FSK) transmitter radio will be activated.

If the meter is configured for base station data collection the Direct Sequence Spread Spectrum (DSSS) transmitter radio will be activated.

The radios are configured at the factory and cannot be activated by the end user or utility personnel.

2.0 LOCATION OF TEST FACILTY

All testing was performed by qualified ACS personnel located at the following address:

ACS, Inc.
5015 B.U. Bowman Drive
Buford, GA 30518

2.1 DESCRIPTION OF TEST FACILITY

Both the Open Area Test Site (OATS) and Conducted Emissions site have been fully described, submitted to, and accepted by the FCC, Industry Canada and the Japanese Voluntary Control Council for Interference by information technology equipment.

The following certification numbers have been issued in recognition of these accreditations and certifications:

FCC Registration Number: 89450
Industry Canada Lab Code: IC 4175
VCCI Member Number: 1831

- VCCI OATS Registration Number R-1526
- VCCI Conducted Emissions Site Registration Number: C-1608

2.1.1 Open Area Test Site

The open area test site consists of a 40' x 66' concrete pad covered with a perforated electro-plated galvanized sheet metal. The perforations in the sheet metal are 1/8" holes that are staggered every 3/16". The individual sheets are placed to overlap each other by 1/4" and are riveted together to provide a continuous seam. Rivets are spaced every 3" in a 3 x 20 meter perimeter around the antenna mast and EUT area. Rivets in the remaining area are spaced as necessary to properly secure the ground plane and maintain the electrical continuity.

The entire ground plane extends 12' beyond the turntable edge and 16' beyond the antenna mast when set to a 10 meter measurement distance. The ground plane is grounded via 4 - 8' copper ground rods, each installed at a corner of the ground plane and bound to the ground plane using 3/4" stainless steel braided cable.

The turntable is an all aluminum 10' flush mounted table installed in an all aluminum frame. The table is remotely operated from inside the control room located 40' from the range. The turntable is electrically bonded to the surrounding ground plane via steel fingers installed on the edge of the turn table. The steel fingers make constant contact with the ground plane during operation.

Adjacent to the turntable is a 7' x 7' square and 4' deep concrete pit used for support equipment if necessary. The pit is equipped with 5 - 4" PVC chases from the pit to the control room that allow for cabling to the EUT if necessary. The underside of the turntable can be accessed from the pit so cables can be supplied to the EUT from the pit. The pit is covered with 2 sheets of 1/4" diamond style re-enforced steel sheets. The sheets are painted to match the perforated steel ground plane; however the underside edges have been masked off to maintain the electrical continuity of the ground plane. All reflecting objects are located outside of the ellipse defined in ANSI C63.4.

A diagram of the Open Area Test Site is shown in Figure 3.2-1 below:

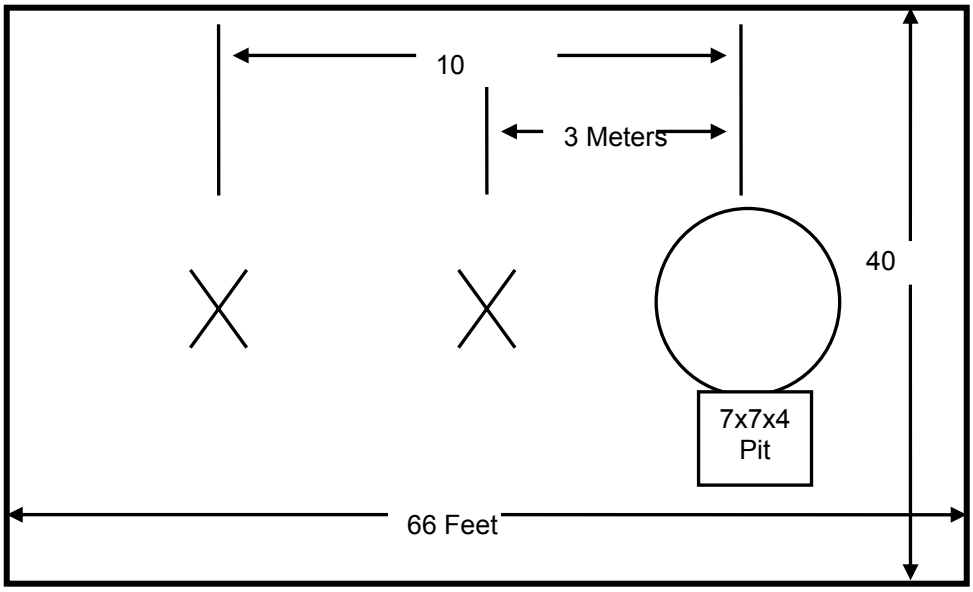

Figure 2.1.1-1: Open Area Test Site

2.1.2 Conducted Emissions Test Site Description

The AC mains conducted EMI site is a shielded room with the following dimensions:

- Height: 3.0 Meters
- Width: 3.6 Meters
- Length: 4.9 Meters

The room is manufactured by Rayproof Corporation and installed by Panashield, Inc. Earth ground is provided to the room via an 8' copper ground rod. Each panel of the room is connected electrically at intervals of 4".

Power to the room is filtered to prevent ambient noise from coupling to the EUT and measurement equipment. Filters are models 1B42-60P manufactured by Rayproof Corporation.

The room is of sufficient size to test table top and floor standing equipment in accordance with section 6.1.4 of ANSI C63.4.

A diagram of the room is shown below in figure 2.1.2-1:

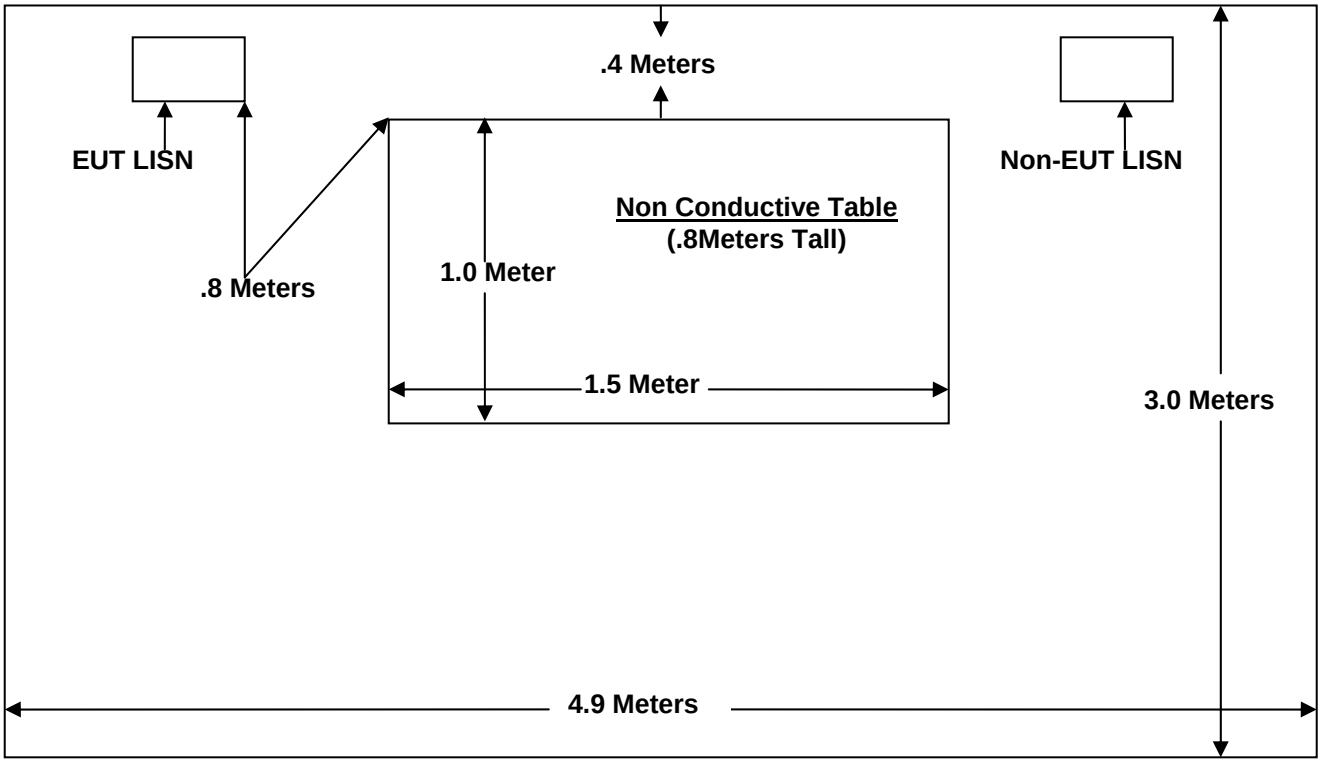

Figure 2.1.2-1: AC Mains Conducted EMI Site

3.0 APPLICABLE STANDARD REFERENCES

The following standards were used:

1 - ANSI C63.4-1992: Method of Measurements of Radio-Noise Emissions from Low-Voltage Electrical And Electronic Equipment in the 9 KHz to 40GHz

2 - US Code of Federal Regulations (CFR): Title 47, Part 15, Subpart C: Radio Frequency Devices, Intentional Radiators (October 2002)

3 - FCC OET Bulletin 65 Appendix C - Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields

4.0 LIST OF TEST EQUIPMENT

All test equipment used for regulatory testing is calibrated yearly or according to manufacturer's specifications.

Table 4.0-1: Test Equipment

Equipment Calibration Information					
ACS#	**Mfg.**	**Eq. type**	**Model**	**S/N**	**Cal. Due**
---	Agilent	Spectrum Analyzer	E7402A	US40240259	02/26/05
26	Chase	Bi-Log Antenna	CBL6111	1044	10/05/05
152	EMCO	LISN	3825/2	9111-1905	01/08/05
193	ACS	OATS Cable Set	RG8	193	01/09/05
167	ACS	Conducted EMI Cable Set	RG8	167	01/09/05
22	Agilent	Pre-Amplifier	8449B	3008A00526	05/12/05
73	Agilent	Pre-Amplifier	8447D	272A05624	04/30/05
30	Spectrum Technologies	Horn Antenna	DRH-0118	970102	05/08/05
105	Microwave Circuits	High Pass Filter	H1G810G1	2123-01 DC0225	06/09/05
209	Microwave Circuits	High Pass Filters	H3G020G2	4382-01 DC0421	06/09/05
1	Rohde & Schwarz	Receiver	804.8932.52	833771/007	02/26/05
2	Rohde & Schwarz	Receiver	1032.5640.53	839587/003	02/26/05
3	Rohde & Schwarz	ESMI Receiver	804.8932.52	839379/011	12/15/05
4	Rohde & Schwarz	ESMI Receiver	1032.5640.53	833827/003	12/15/05
213	Test Equipment Corp.	Pre-Amplifier	PA-102	44927	06/28/05
211	Eagle	Band Reject Filter	C7RFM3NFNM	n/a	06/28/05
168	Hewlett Packard	Pulse Limiter	11947A	3107A02268	04/30/05
93	Chase	EM Clamp	CIC 8101	65	01/12/05
184	ACS	Cable	RG8	184	01/09/05
169	Solar Electronics	LISN	9117-5-TS-50-N	031032	04/12/05
6	Harbour Industries	HF RF Cable	LL-335	00006	03/15/05
7	Harbour Industries	HF RF Cable	LL-335	00007	03/15/05
208	n/a	HF RF Cable	n/a	00208	06/14/05
5	ChaseRF Current Probe	Current Probe	CSP-8441	19	01/23/05

5.0 SUPPORT EQUIPMENT

Table 5-3: Support Equipment

Manufacturer	Equipment Type	Model Number	Serial Number	FCC ID
EUT Was Self Supporting				

6.0 EQUIPMENT UNDER TEST SETUP BLOCK DIAGRAM

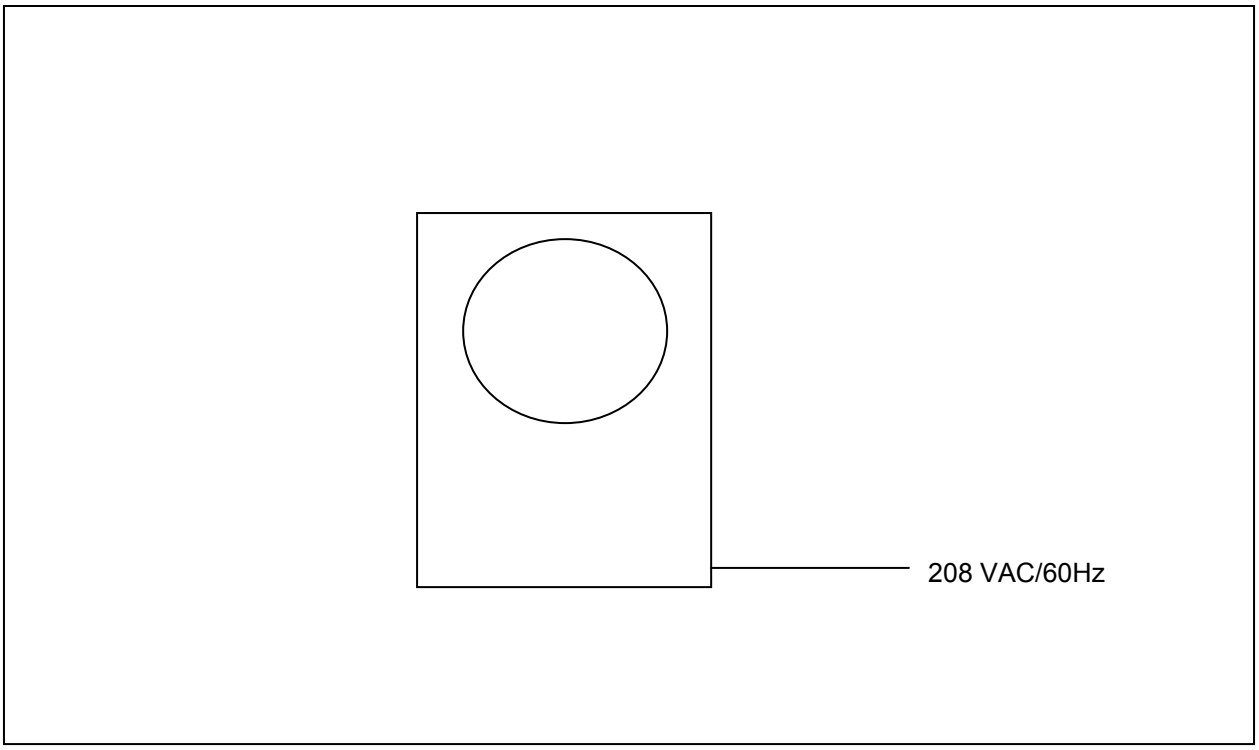

Figure 6-1: EUT Test Setup

7.0 SUMMARY OF TESTS

Along with the tabular data shown below, plots were taken of all signals deemed important enough to document.

7.1 Antenna Requirement - FCC Section 15.203

The EUT employs an integrated antenna that cannot be modified without damaging the device.

7.2 Power Line Conducted Emissions - FCC Section 15.207

Conducted emissions were performed from 150kHz to 30MHz with the spectrum analyzer's resolution bandwidth set to 9kHz and the video bandwidth set to 30kHz. The calculation for the conducted emissions is as follows:

Corrected Reading = Analyzer Reading + LISN Loss + Cable Loss
Margin = Corrected Reading – Applicable Limit

Results of the test are shown below in and Tables 7.2-1 through 7.2-4 and Figure 7.2-1 through 7.2-2

Table 7.2-1: Line 1 Conducted EMI Results (Quasi-Peak)

Frequency MHz	Level dBµV	Transducer dB	Limit dBµV	Margin dB	Line	PE
0.208	32.9	22.1	63.2	30.3	L1	FLO
0.346	28.4	18.5	59.0	30.6	L1	FLO
0.478	22.7	16.7	56.3	33.6	L1	FLO
0.568	21.4	15.6	56.0	34.5	L1	FLO
0.700	20.8	14.5	56.0	35.2	L1	FLO
1.348	13.0	11.9	56.0	42.9	L1	FLO
4.198	36.7	10.4	56.0	19.2	L1	FLO
16.780	24.6	10.6	60.0	35.3	L1	FLO
20.974	27.0	10.7	60.0	32.9	L1	FLO
29.362	31.6	10.8	60.0	28.3	L1	FLO

Table 7.2-2: Line 1 Conducted EMI Results (Average)

Frequency MHz	Level dBµV	Transducer dB	Limit dBµV	Margin dB	Line	PE
0.226	21.8	21.4	52.5	30.7	L1	FLO
0.352	17.7	18.4	48.9	31.1	L1	FLO
0.442	16.0	17.2	47.0	30.9	L1	FLO
0.598	13.7	15.3	46.0	32.2	L1	FLO
0.724	12.3	14.2	46.0	33.6	L1	FLO
1.348	9.2	11.9	46.0	36.7	L1	FLO
4.198	33.6	10.4	46.0	12.3	L1	FLO
16.780	21.6	10.6	50.0	28.3	L1	FLO
20.974	23.5	10.7	50.0	26.4	L1	FLO
29.362	27.0	10.8	50.0	22.9	L1	FLO

Table 7.2-3: Line 2 Conducted EMI Results (Quasi-Peak)

Frequency MHz	Level dBµV	Transducer dB	Limit dBµV	Margin dB	Line	PE
0.184	32.8	22.8	64.3	31.4	L2	FLO
0.400	26.7	17.7	57.8	31.1	L2	FLO
0.448	25.4	17.1	56.9	31.4	L2	FLO
0.754	17.6	13.9	56.0	38.3	L2	FLO
1.300	12.8	11.9	56.0	43.1	L2	FLO
4.198	36.7	10.4	56.0	19.2	L2	FLO
8.392	22.9	10.5	60.0	37.0	L2	FLO
16.780	24.9	10.6	60.0	35.0	L2	FLO
20.974	26.2	10.7	60.0	33.7	L2	FLO
29.362	32.7	10.8	60.0	27.2	L2	FLO

Table 7.2-4: Line 2 Conducted EMI Results (Average)

Frequency MHz	Level dBµV	Transducer dB	Limit dBµV	Margin dB	Line	PE
0.178	23.5	22.9	54.5	31.0	L2	FLO
0.424	15.9	17.3	47.3	31.4	L2	FLO
0.466	15.5	16.8	46.5	31.0	L2	FLO
0.742	11.8	14.0	46.0	34.1	L2	FLO
1.318	8.9	11.9	46.0	37.0	L2	FLO
4.198	33.5	10.4	46.0	12.4	L2	FLO
8.392	19.1	10.5	50.0	30.8	L2	FLO
16.780	21.8	10.6	50.0	28.1	L2	FLO
20.974	22.3	10.7	50.0	27.6	L2	FLO
29.362	28.1	10.8	50.0	21.8	L2	FLO

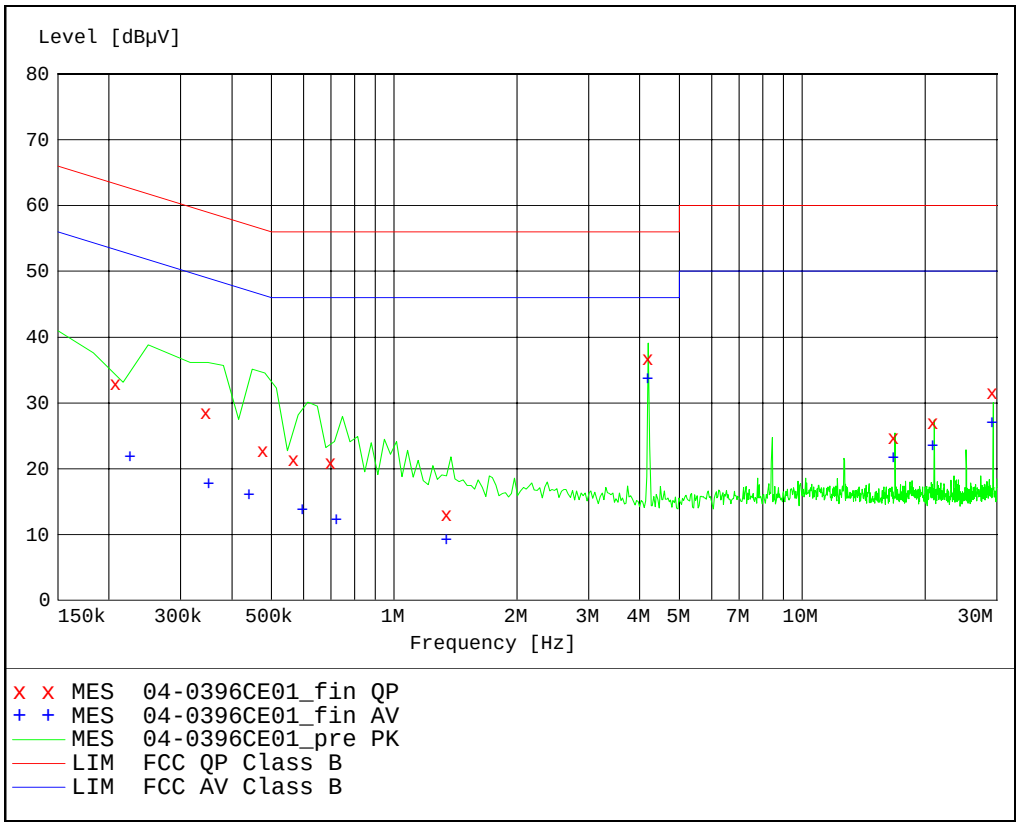

Figure 7.2-1: Conducted Emissions Graph – Line 1

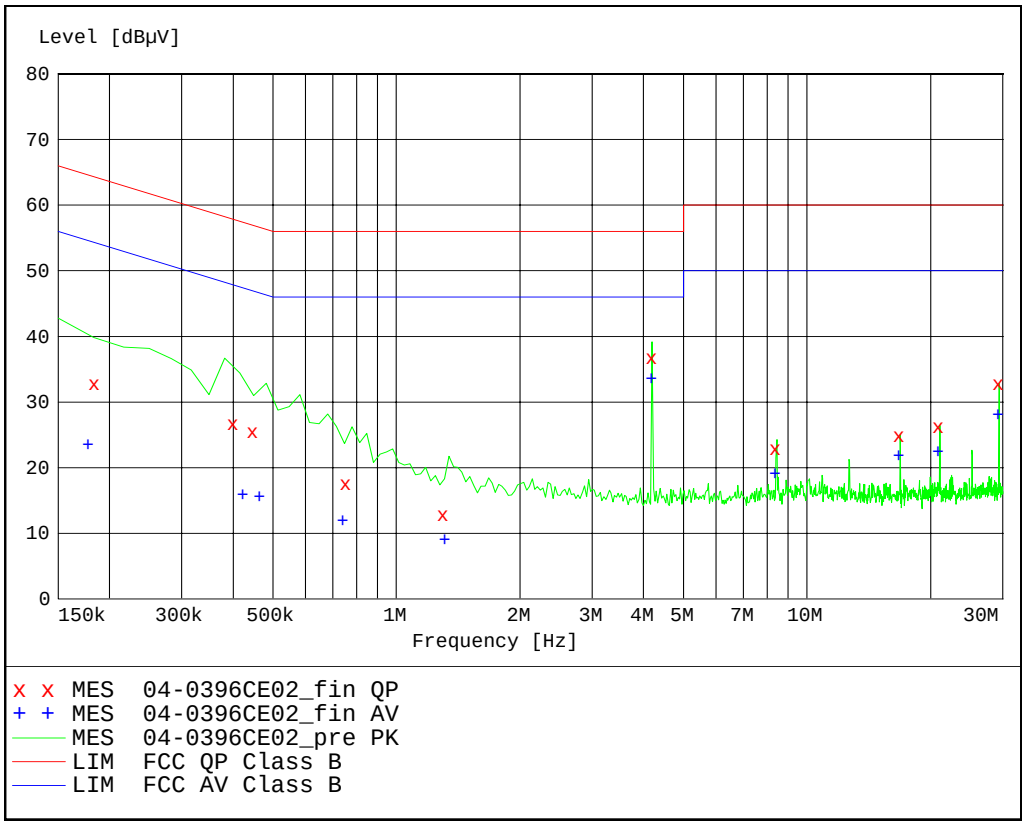

Figure 7.2-2: Conducted Emissions Graph – Line 2

7.3 Radiated Emissions - FCC Section 15.109(Unintentional Radiation)

Radiated emissions tests were performed over the frequency range of 30MHz to 1 GHz. Measurements of the radiated field strength were made at a distance of 3m from the boundary of the equipment under test (EUT) and the receiving antenna. The antenna height was varied from 1m to 4m so that the maximum radiated emissions level would be detected. Radiated measurements were made with the Spectrum Analyzer's resolution bandwidth set to 120 KHz for measurements above 30MHz. Average measurements are taken with the RBW and VBW were set to 1MHz and 10 Hz respectively for measurements above 1000MHz.

Results of the test are given in Table 7.3-1 and Figure 7.3-1below:

Table 7.3-1: Radiated Emissions Tabulated Data

Frequency (MHz)	Antenna Polarity (H/V)	Antenna Height (cm)	Turntable Position (°)	Total Correction Factor (dB)	Corrected Reading (dBµV/m)	Limit (dBµV/m)	Margin (dB)
30.0	V	298	57	-5.6	14.6	40.0	25.4
43.4	H	250	43	-12.6	8.0	40.0	32.0
106.7	V	229	79	-13.3	8.3	43.5	35.2
130.0	H	170	285	-12.6	19.9	43.5	23.6
267.2	H	170	66	-9.4	19.4	46.0	26.6
489.6	H	210	265	-2.8	19.7	46.0	26.3
595.8	V	290	79	-1.3	22.4	46.0	23.6
839.7	H	110	258	2.4	24.5	46.0	21.5

* Note: All emissions above 839.7 MHz were attenuated at least 20 dB below the permissible limit.

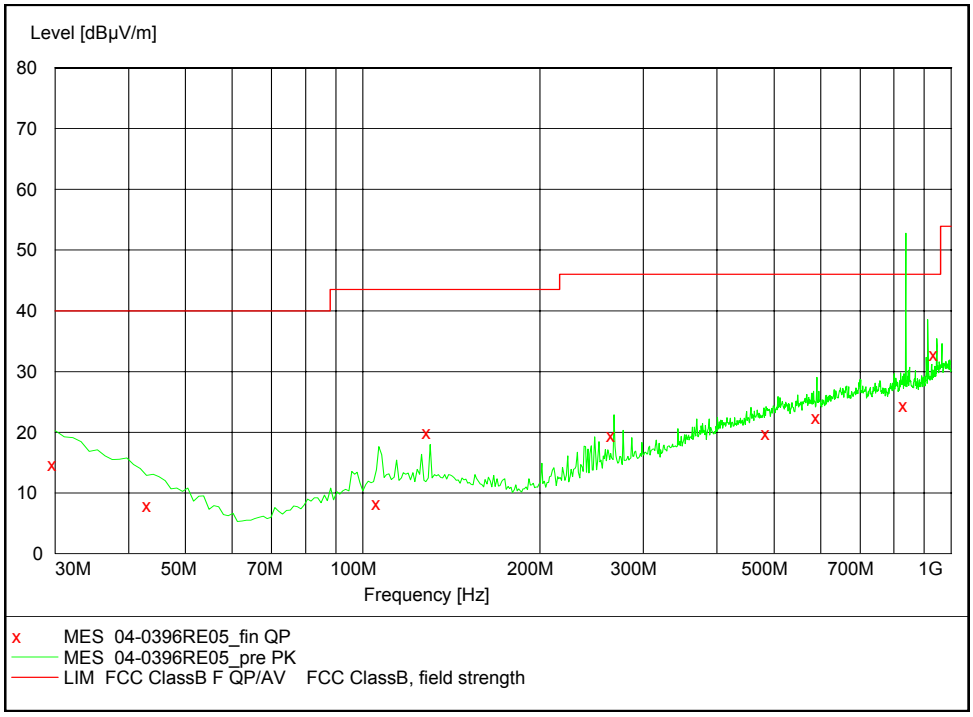

Figure 7.3-1: Radiated Emissions

* Note: The transmitter could not be disabled so the EUT was caused to transmit at the lowest possible duty cycle. The radiated emission at 910 MHz is the fundamental frequency of the transmitter and therefore can be disregarded.

7.4 Peak Output Power Requirement - FCC Section 15.247(b)

Antenna conducted measurements could not be performed on this device, therefore radiated tests were performed to show compliance with the peak output power limit specified in Section 15.247(b) according to FCC DA 00-705.

The procedures set forth in ANSI C63.4 were followed with respect to maximizing the peak emission.

The EUT was caused to generate a continuous carrier signal on the hopping channel. The resolution bandwidth of the spectrum analyzer was set 1 MHz which was significantly greater the 20 dB bandwidth measured in section 7.5.4. The video bandwidth was set to 1 MHz and a peak detector using the Max Hold function was utilized.

The power was calculated using the following equation:

$$P = (E * d)^2 \Big/ 30 * G$$

Where: G = Numeric Gain of the transmitting antenna with reference to an isotropic radiator
d = The distance in meters from which the field strength was measured
E = The measured maximum fundamental field strength in V/m

Results are shown below in Table 7.4-1 to Table 7.4.2 and Figures 7.4-1 to 7.4-2.

Table 7.4-1: Fundamental Field Strength

Frequency (MHz)	Uncorrected Reading (dBµV/m)	Antenna Polarity (H/V)	Antenna Height (cm)	Turntable Azimuth (°)	Total Correction Factor (dB)	Corrected Reading (dBµV/m)
910.04	90.7	V	100	0	6.88	97.58
910.04	100.98	H	186	0	6.88	107.86
919.67	93.38	V	108	327	7.37	100.75
919.67	101.36	H	181	3	7.37	108.73

Table 7.4-2: Peak Output Power

Channel	Frequency (MHz)	Numeric Gain	Distance (m)	Max. Fund. Field Strength (V/m)	Output Power (dBm)
Low	910.04	1	3	0.2472	12.63
High	919.67	1	3	0.2732	13.55

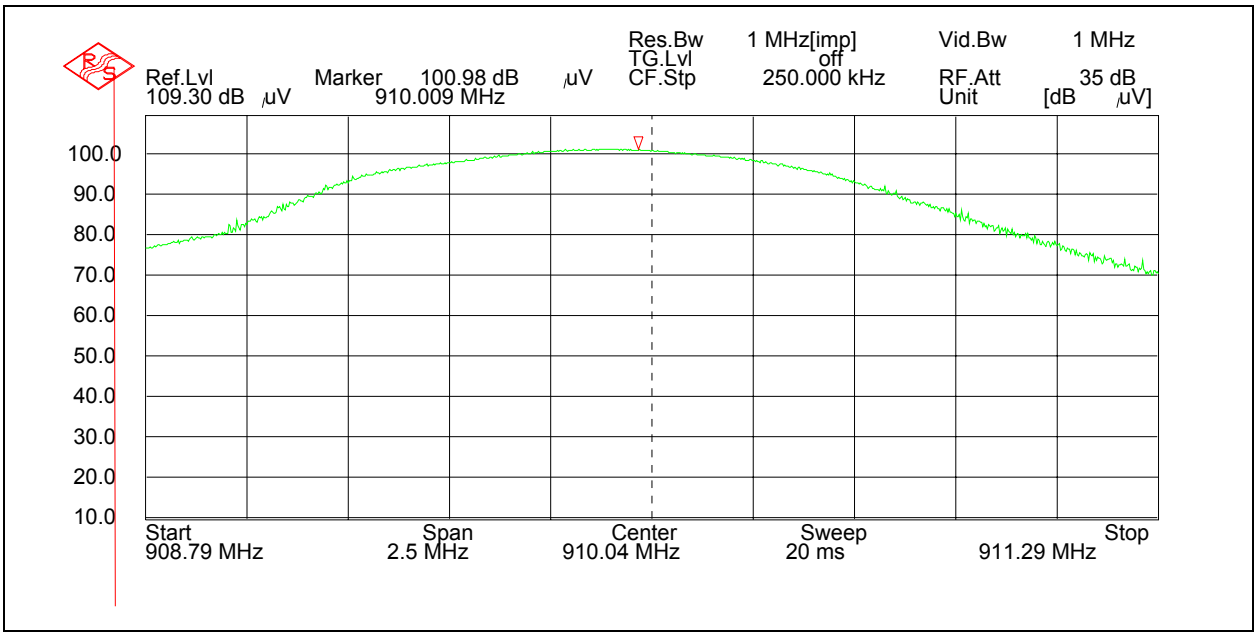

Figure 7.4-1: Output power – Low Channel

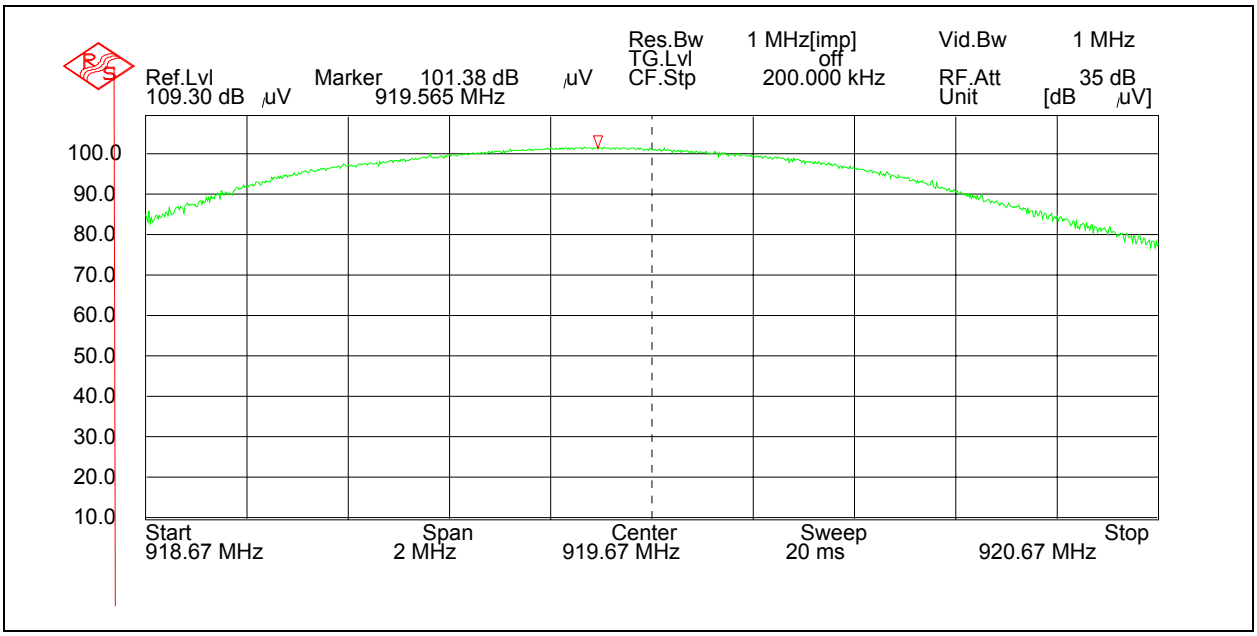

Figure 7.4-2: Output power – High Channel

7.5 Channel Usage Requirements - FCC Section 15.247(a) (1)

15.247(a)(1): Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudorandomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

15.247(a) (1) (i): For frequency hopping systems operating in the 902–928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

7.5.1 Carrier Frequency Separation

The maximum 20dB bandwidth of the hopping channel was measured to be 182.7 kHz (See figure 7.5.4-1 to 7.5.4-3 below). The adjacent channel separation was measured to be 203.8 kHz. Results are shown in figure 7.5.1-1 below:

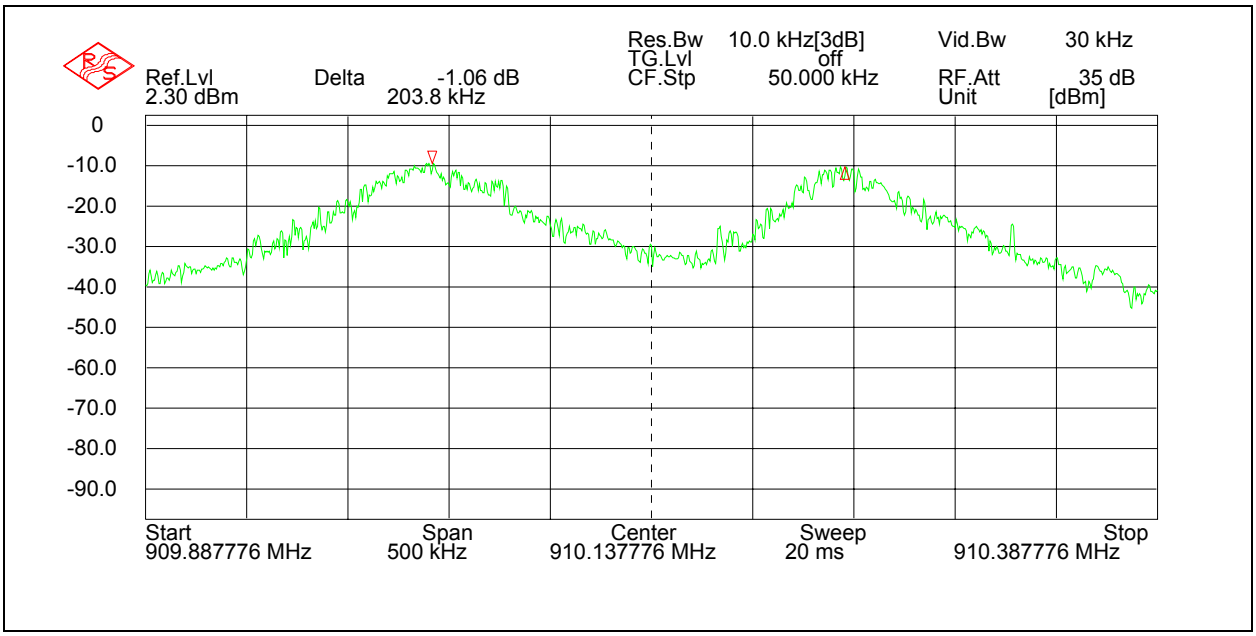

Figure 7.5.1-1: Carrier Frequency Separation

7.5.2 Number of Hopping Channels

The 20dB bandwidth of the device is less than 250 kHz. The device employs 50 hopping channels as required. Results are shown in table 7.5.2-1 below:

Table 7.5.2-1: Frequency Table

Value	Channel Frequency	Channel No.	Value	Channel Frequency	Channel No.	Value	Channel Frequency	Channel No.
1601	910044770	1	1652	913386427	18	1703	916728085	35
1604	910241338	2	1655	913582995	19	1706	916924653	36
1607	910437906	3	1658	913779563	20	1709	917121221	37
1610	910634474	4	1661	913976132	21	1712	917317789	38
1613	910831042	5	1664	914172700	22	1715	917514357	39
1616	911027610	6	1667	914369268	23	1718	917710925	40
1619	911224178	7	1670	914565836	24	1721	917907493	41
1622	911420746	8	1673	914762404	25	1724	918104062	42
1625	911617314	9	1676	914958972	26	1727	918300630	43
1628	911813882	10	1679	915155540	27	1730	918497198	44
1631	912010451	11	1682	915352108	28	1733	918693766	45
1634	912207019	12	1685	915548676	29	1736	918890334	46
1637	912403587	13	1688	915745244	30	1739	919086902	47
1640	912600155	14	1691	915941813	31	1742	919283470	48
1643	912796723	15	1694	916138381	32	1745	919480038	49
1646	912993291	16	1697	916334949	33	1748	919676606	50
1649	913189859	17	1700	916531517	34			

7.5.3 Channel Dwell Time

The CENTRON ICARe meter will operate with a transmission timing of 1 RF transmission every 2 seconds randomized. The transmission time is 7 milliseconds and there are 50 transmitter frequencies used.

Based on the average timing of 2 seconds per transmission per channel the dwell time would be 7 ms per channel within a 20 second period. A single transmission is shown in figure 7.5.3-1 below:

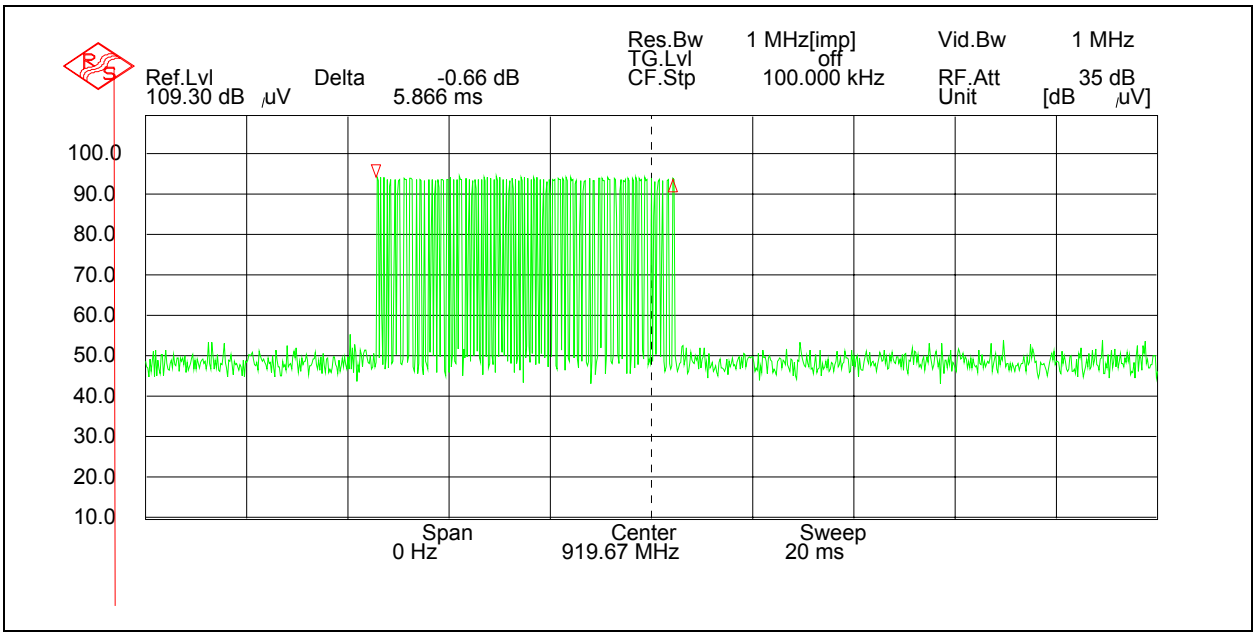

Figure 7.5.3-1: Channel Dwell Time

7.5.4 20dB Bandwidth

The maximum 20dB bandwidth was found to be approximately 182.7 kHz. Results are shown below in Figure 7.5.4-1 through 7.5.4-2.

Channel	Frequency	20dB Bandwidth
Low	910.04	182.7 kHz
High	919.67	170.5 kHz

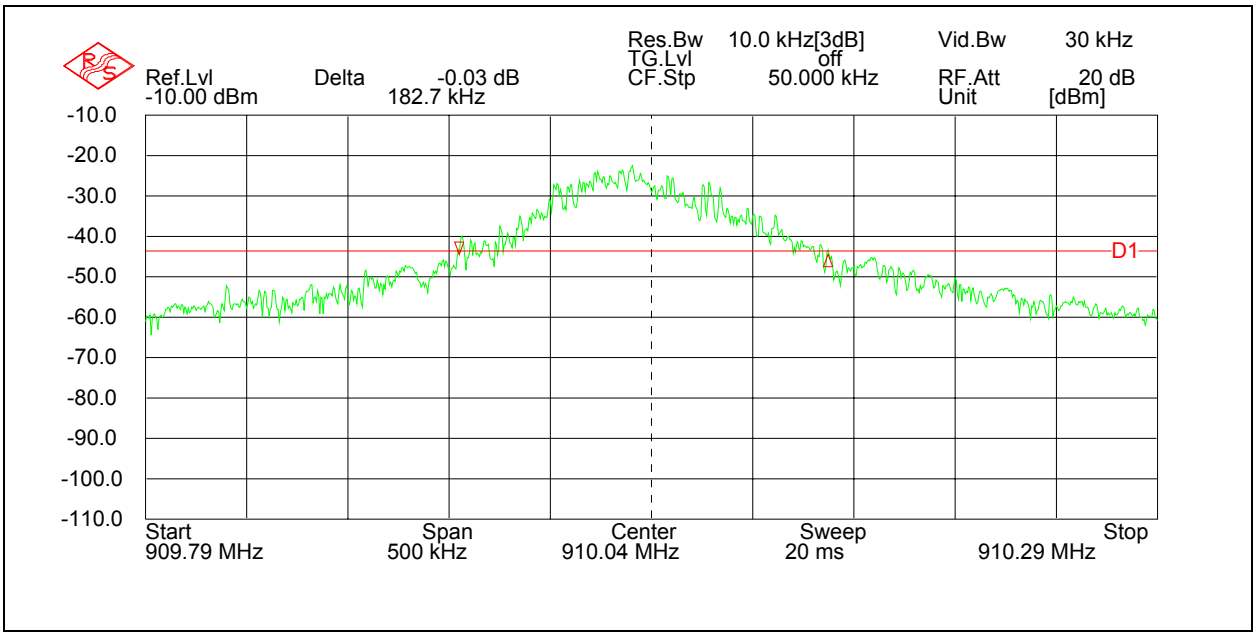

Figure 7.5.4-1: 20dB Bandwidth Low Channel

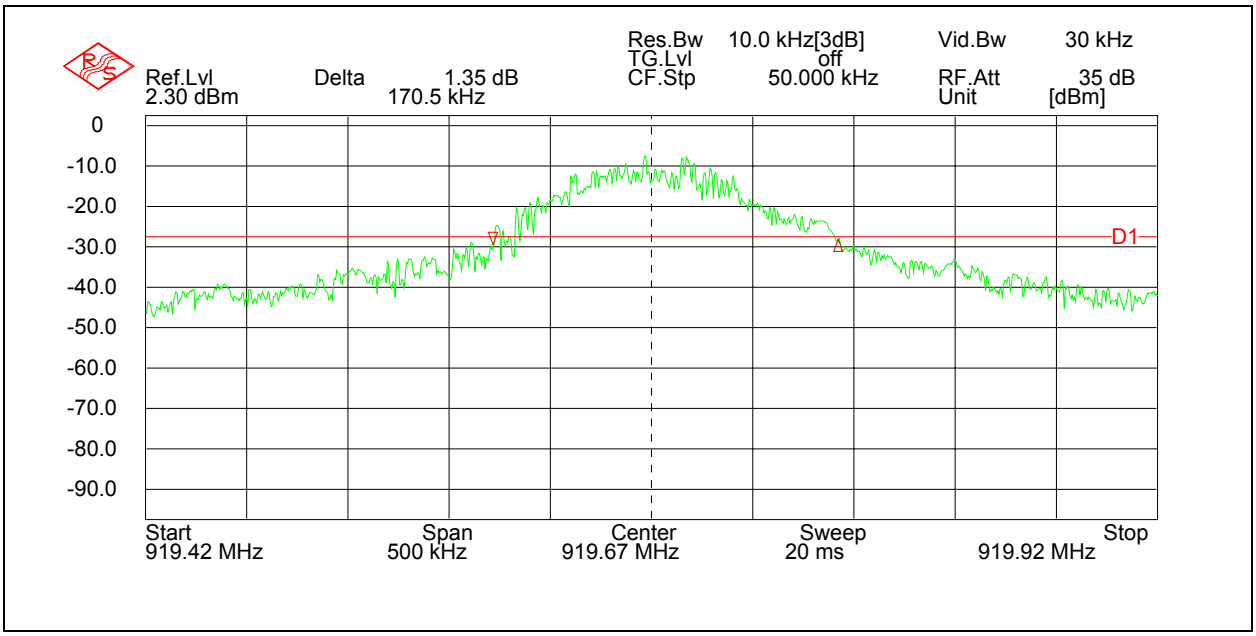

Figure 7.5.4-2: 20dB Bandwidth High Channel

7.6 Band-Edge Compliance and Spurious Emissions - FCC Section 15.247(c)

7.6.1 Band-Edge Compliance of RF Conducted Emissions

The EUT was investigated at the lowest and highest channel available to determine band-edge compliance. For each measurement the spectrum analyzer's RBW was set to 300 kHz, which is ≥ 1% of the span, and the VBW was set to 1 MHz.

7.6.1.1 Test Results

In a 100 kHz bandwidth at the lower and upper band-edge, the radio frequency power that was produced by the EUT is at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of desired power. Band-edge compliance is displayed in Figures 7.6.1-1 and 7.6.2-2

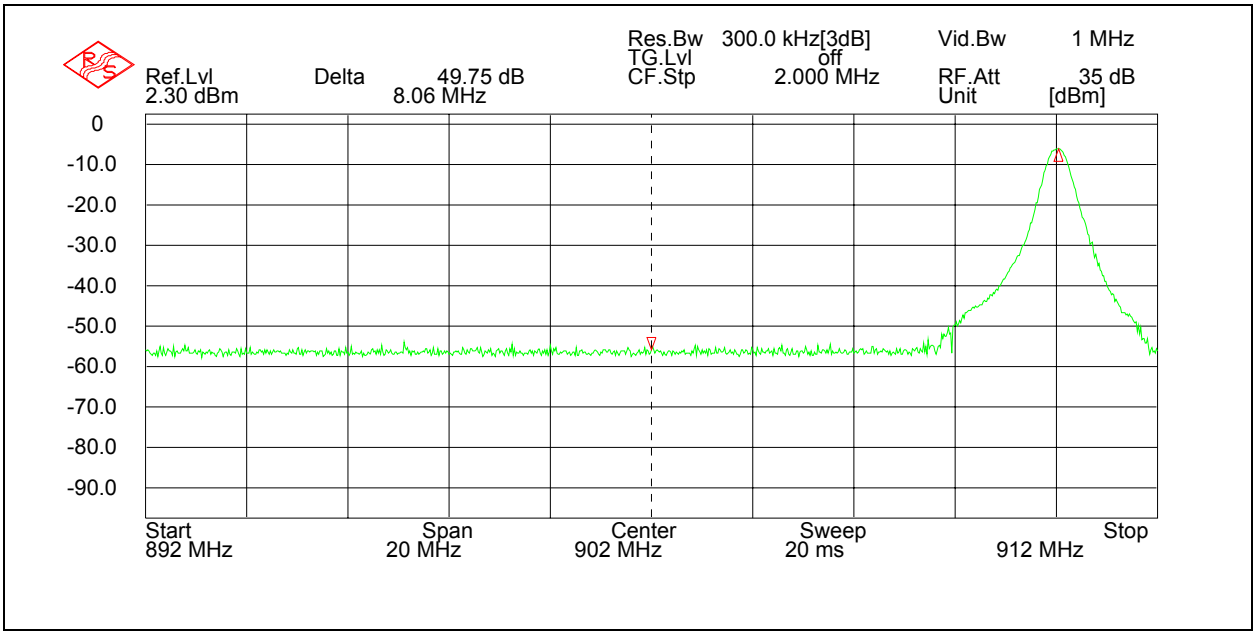

Figure 7.6.1-1: Lower Band-edge

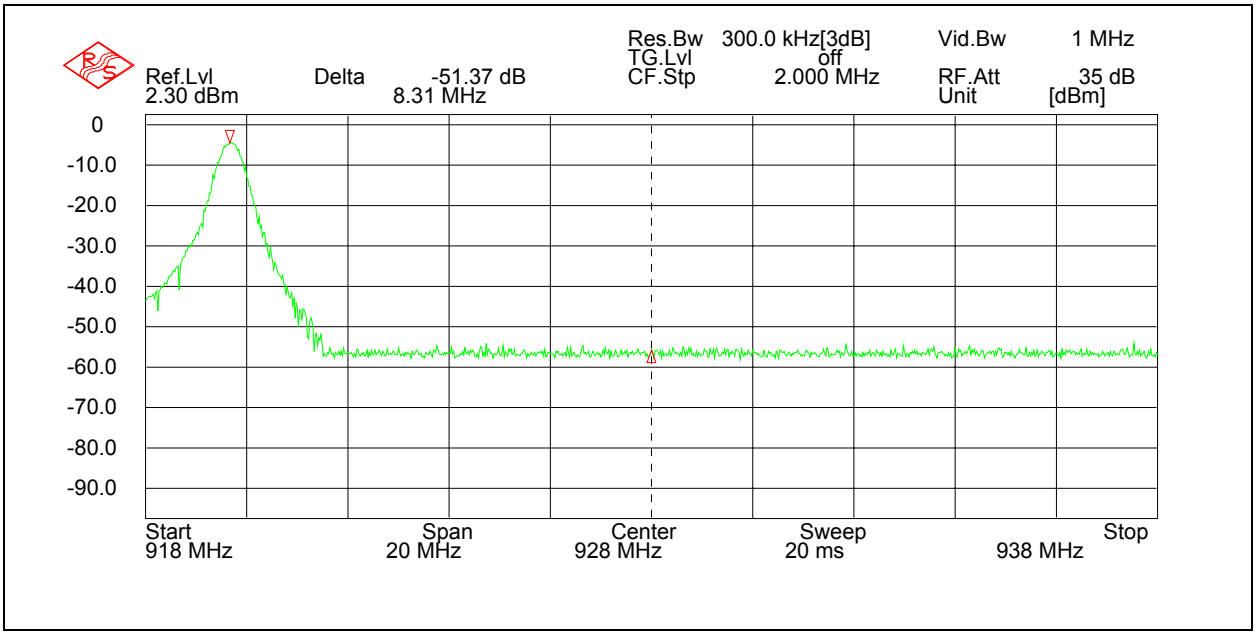

Figure 7.6.1-2: Upper Band-edge

7.6.2 RF Conducted Spurious Emissions

The EUT was investigated for conducted spurious emissions from 30MHz to 10GHz, 10 times the highest fundamental frequency.

Antenna conducted measurements could not be performed on this device, therefore radiated tests were performed to show compliance with the spurious RF conducted limit specified in Section 15.247(c) according to FCC DA 00-705.

For each measurement, the spectrum analyzer's RBW was set to 100 kHz and the VBW was set to 300 kHz. The peak detector and Max Hold function of the analyzer were utilized. The field strength of both the fundamental emission and all spurious emissions were measured with these settings. Procedures in C63.4-1992 with respect to maximizing the emissions were followed. The measured field strength of all spurious emissions must be below the measured field strength of the fundamental emission by the amount specified in Section 15.247(c).

7.6.2.1 Test Results

The magnitude of all emissions are reported in section 7.6.3 with the appropriate limit as referenced to 20 dB below the fundamental frequency field strength. Emissions that fell within the restricted bands were referenced to the radiated emissions limit set forth in Section 15.209 which is more stringent than that called out in 15.247(c).

7.6.3 Radiated Spurious Emissions (Restricted Bands) - FCC Section 15.205

Radiated emissions tests were made over the frequency range of 30MHz to 10GHz, 10 times the highest fundamental frequency.

The EUT was rotated through 360° and the receive antenna height was varied from 1m to 4m so that the maximum radiated emissions level would be detected. For frequencies below 1000MHz, quasi-peak measurements were made using a resolution bandwidth (RBW) of 120 kHz and a video bandwidth (VBW) of 300 kHz. For frequencies above 1000MHz, average measurements were made using an RBW of 1 MHz and a VBW of 10 Hz and peak measurements were made with RBW of 1 MHz and a VBW of 1 MHz. For those frequencies that fell outside the restricted bands as defined in 15.205, the alternative procedure set forth in FCC DA 00-0705 for conducted spurious emissions was followed using a RBW of 100 kHz and VBW of 300 kHz.

7.6.3.1 Test Results

Radiated spurious emissions and conducted spurious emissions, using the alternative test procedures set forth in FCC DA 00-0705, found in the band of 30MHz to 10GHz are reported in Table 7.6.3-1 to 7.6.3-2. Each emission found to be in a restricted band as defined by section 15.205, was compared to the radiated emission limits as defined in section 15.209. Those spurious emissions outside the restricted bands were compared to the limits of 15.247(c), 20 dB below the fundamental frequency field strength.

Table 7.6.3-1: Radiated Spurious Emissions – Low Channel

Frequency (MHz)	Level (dBuV/m)	Detector (P/A)	Antenna Polarity (H/V)	Turntable Position (o)	Correction Factors (dB)	Corrected Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
Fundamental Field Strength								
910.04	100.98	p	H	0	6.88	107.86		
910.04	90.70	p	V	0	6.88	97.58		
Spurious Emissions								
1820	47.60	p	H	356	-2.10	45.50	87.86	42.36
1820	42.68	p	V	321	-2.10	40.58	77.58	37.00
2730	51.60	p	H	303	2.35	53.95	74.00	20.05
2730	27.91	a	H	303	2.35	30.26	54.00	23.74
2730	52.26	p	V	0	2.35	54.61	74.00	19.39
2730	27.50	a	V	0	2.35	29.85	54.00	24.15
3640	57.80	p	H	60	6.08	63.88	74.00	10.12
3640	33.17	a	H	60	6.08	39.25	54.00	14.75
3640	56.30	p	V	29	6.08	62.38	74.00	11.62
3640	31.24	a	V	29	6.08	37.32	54.00	16.68
4550	44.90	p	H	294	8.09	52.99	74.00	21.01
4550	26.72	a	H	294	8.09	34.81	54.00	19.19
4550	43.58	p	V	339	8.09	51.67	74.00	22.33
4550	26.84	a	V	339	8.09	34.93	54.00	19.07

Table 7.6.3-2: Radiated Spurious Emissions – High Channel

Frequency (MHz)	Level (dBuV/m)	Detector (P/A)	Antenna Polarity (H/V)	Turntable Position (o)	Correction Factors (dB)	Corrected Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
Fundamental Field Strength								
919.67	101.36	p	H	3	7.37	108.73		
919.67	93.38	p	V	327	7.37	100.75		
Spurious Emissions								
1839	51.27	p	H	0	-1.98	49.29	88.73	39.44
1839	43.86	p	V	37	-1.98	41.88	80.75	38.87
5518	35.54	p	H	0	13.33	48.87	88.73	39.86
5518	35.31	p	V	7	13.33	48.64	80.75	32.11
2760	53.05	p	H	345	2.51	55.56	74.00	18.44
2760	31.87	a	H	345	2.51	34.38	54.00	19.62
2760	54.47	p	V	3	2.51	56.98	74.00	17.02
2760	28.04	a	V	3	2.51	30.55	54.00	23.45
3680	56.38	p	H	47	6.25	62.63	74.00	11.37
3680	34.84	a	H	47	6.25	41.09	54.00	12.91
3680	52.41	p	V	25	6.25	58.66	74.00	15.34
3680	30.09	a	V	25	6.25	36.34	54.00	17.66
4600	46.80	p	H	19	8.31	55.11	74.00	18.89
4600	28.11	a	H	19	8.31	36.42	54.00	17.58
4600	45.71	p	V	351	8.31	54.02	74.00	19.98
4600	27.83	a	V	351	8.31	36.14	54.00	17.86

7.6.3.2 Sample Calculation:

$R_C = R_U + CF_T$

Where:

CF_T	=	Total Correction Factor (AF+CA+AG)-DC (Average Measurements Only)
R_U	=	Uncorrected Reading
R_C	=	Corrected Level
AF	=	Antenna Factor
CA	=	Cable Attenuation
AG	=	Amplifier Gain
DC	=	Duty Cycle Correction Factor

Corrected Level: 51.60 + 2.35 = 53.95 dBuV
Margin: 74dBuV – 53.95 dBuV = 20.05 dB

8.0 CONCLUSION

In the opinion of ACS, Inc. the CENTRON ™ ICARe C1A-2, manufactured by Itron Electricity Metering, Inc., meets the requirements of FCC Part 15 subpart C.