FCC Part 15.247/15.249
Transmitter Certification

Composite Device

<u>Test Report</u>

FCC ID: SK9AMI-2

FCC Rule Part: 15.247/15.249

ACS Report Number: 06-0240-15C-DSS, 06-0240-15C-DXX

Manufacturer: Itron Electricity Metering Inc.
Trade Name: CENTRON Open Way
Model(s): CVSOR

RF Exposure

General Information:

Applicant: Itron Electricity Metering Inc.
ACS Project: 06-0240
FCC ID: SK9AMI-2
Device Category: Mobile
Environment: General Population/Uncontrolled Exposure
Exposure Conditions: Greater than 20 centimeters

Technical Information:

Radio	900 MHz LAN	2.4GHz Zigbee
Antenna Type	single-band patch	single-band slot
Antenna Gain	3dBi	4dBi
Conducted Power	19.40dBm	-6.7dBm
Maximum EIRP	0.174W	0.0005W
Maximum ERP	0.106W	0.0003W

MPE Calculation:

Calculated Conducted Power (15.249) – 2.4GHz Zigbee Radio

For the purpose of determining Power Density for the 2.4GHz Zigbee radio the conducted RF power must first be calculated. The Zigbee radio with the highest radiated field strength was used for calculation purposes.

The power was calculated using the following equation:

$$P = \frac{(E * d)^2}{30 * G}$$

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

Table 1: Maximum Fundamental Field Strength

Frequency (MHz)	Uncorrected Reading (dBµV/m)	Antenna Polarity (H/V)	Total Correction Factor (dB)	Corrected Reading (dBµV/m)
2480	91.96	V	0.53	92.49

Table 2: Peak Output Power

Frequency (MHz)	Numeric Gain	Distance (m)	Max. Fund. Field Strength (V/m)	Output Power (dBm)
2480	2.51	3	0.04	-6.7

Power Density

The Power Density (mW/cm^2) is calculated as follows:

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = power density (in appropriate units, e.g. mW/cm2)

P = power input to the antenna (in appropriate units, e.g., mW)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

MPE Calculator for Mobile Equipment Limits for General Population/Uncontrolled Exposure*							
Transmit Frequency (MHz)	Radio Power (dBm)	Power Density Limit (mW/Cm2)	Radio Power (mW)	Antenna Gain (dBi)	Antenna Gain (mW eq.)	Distance (cm)	Power Density (mW/cm^2)
902.25	19.4	0.60	87.10	3	1.995	20	0.035

Summation of Power Densities – Simultaneous Transmissions

This device contains multiple transmitters which can operate simultaneously and therefore the maximum RF exposure is determined by the summation of power densities. The maximum power density is calculated by a summation of power densities for all transmitters. However, the contribution of the low power Zigbee radios are insignificant to the overall power density. Therefore a summation of power densities was not provided and it is concluded the total power density for simultaneous operation of all transmitters is consistent with that provided by the 900MHz LAN radio.

Installation Guidelines:

The installation manual contains the following text advising how to install the equipment to maintain compliance with the FCC RF exposure requirements:

"RF Exposure (Intentional Radiators Only)

In accordance with FCC requirements of human exposure to radiofrequency fields, the radiating element shall be installed such that a minimum separation distance of 20cm is maintained from the general population."

Conclusion:

This device complies with the MPE requirements by providing adequate separation between the device, any radiating structure and the general population.