FCC Part 15.247/15.249
Transmitter Certification

Composite Device

Test Report

FCC ID: SK9AMI-1

FCC Rule Part: 15.247/15.249

ACS Report Number: 06-0239-15C-DSS, 06-0239-15C-DXX

Manufacturer: Itron Electricity Metering Inc.
Trade Name: CENTRON Open Way
Model(s): CVSO, CVSOD, CVSOC

RF Exposure

General Information:

Applicant: Itron Electricity Metering Inc.
ACS Project: 06-0239
FCC ID: SK9AMI-1
Device Category: Mobile
Environment: General Population/Uncontrolled Exposure
Exposure Conditions: Greater than 20 centimeters

Technical Information:

Radio	900 MHz LAN	2.4GHz Zigbee	GPRS Modem Module
Antenna Type	single-band patch	single-band slot	dual-band patch
Antenna Gain	3dBi	4dBi	GSM850: 0dBi GSM1900: 3dBi
Conducted Power	19.40dBm	-3.0dBm	GSM850: 32.4dBm GSM1900: 29.8dBm
Maximum EIRP	0.174W	0.001W	GSM850: 1.737W GSM1900: 1.9W

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 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)
2405	96.36	V	-0.12	96.24

Table 2: Peak Output Power

Frequency (MHz)	Numeric Gain	Distance (m)	Max. Fund. Field Strength (V/m)	Output Power (dBm)
2405	2.52	3	0.06	-2.99

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	21.36	0.60	136.77	3.5	2.239	20	0.061
2405	-3	1.00	0.50	4	2.512	20	0.000
824	32.4	0.55	1737.80	0	1.000	20	0.346
1850	30	1.00	1000.00	3	1.995	20	0.397

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 as calculated by a summation of power densities for each transmitter is as follows:

GPRS Modem Operating in the 800MHz Cellular Band:

900MHz LAN: 0.061 (mW/cm^2)
2.4GHz Zigbee: 0.000 (mW/cm^2)
GSM 850 (GPRS): 0.346 (mW/cm^2)
TOTAL: **0.407 (mW/cm^2)**

GPRS Modem Operating in the 1900MHz PCS Band:

900MHz LAN: 0.061 (mW/cm^2)
2.4GHz Zigbee: 0.000 (mW/cm^2)
GSM 1900 (GPRS): 0.397 (mW/cm^2)
TOTAL: **0.458 (mW/cm^2)**

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.