

## **Certification Exhibit**

**FCC ID: SK9PMCR2  
IC: 864G-PMCR2**

**FCC Rule Part: 15.247  
IC Radio Standards Specification: RSS-210**

**ACS Report Number: 09-0245-15C**

**Manufacturer: Itron, Inc.  
Model: PMCR2**

## **RF Exposure**

**General Information:**

Applicant: Itron Electricity Metering Inc.  
 ACS Project: 09-0245  
 FCC ID: SK9PMCR2  
 Device Category: Mobile  
 Environment: General Population/Uncontrolled Exposure  
 Exposure Conditions: Greater than 20 centimeters  
 Simultaneous Tx: Yes

**Technical Information:**

Radio	900 MHz LAN	2.4GHz Zigbee (Register PCB)	2.4GHz Zigbee (Cell Relay PCB) <sup>1</sup>	GPRS Modem Module <i>FCC ID: N7NMC8790</i> <i>IC:2417C-MC8790</i>
Antenna Type	Phantom Omni-directional	Stud Mount Omni-directional	Stud Mount Omni-directional	Mobile Low Profile Omni-directional
Antenna Model	TRA9023	MMSO2300	MMSO2300	MLPVDB800/1900S
Antenna Gain	3dBi	0dBi	0dBi	GSM850: 3dBi GSM1900: 4dBi
Conducted Power	24.59dBm	15.16dBm	Note1	GSM850: 31.8dBm GSM1900: 28.7dBm
Maximum EIRP	0.574W	0.033W	Note1	GSM850: 3.020W GSM1900: 1.862W
Maximum ERP	0.350W	0.020W	Note1	GSM850: 1.840W GSM1900: 1.135W

Note 1: The Cell Relay 2.4GHz low power Zigbee contribution to the overall MPE calculation is negligible and therefore will not be included in the power density calculations below.

**MPE Calculation:****Power Density**

The Power Density (mW/cm<sup>2</sup>) is calculated as follows:

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

Where:

S = power density (in appropriate units, e.g. mW/cm<sup>2</sup>)

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)

**Source Based Time Averaging of GPRS/EDGE Modem**

The GPRS Modem is a Class 12 modem with a 50% source-based time averaged duty cycle.

The measured level was reduced by a factor 3dB to account for the duty cycle of the Modem. The duty cycle correction factor is determined using the formula:  $10\log(0.50) = 3\text{dB}$ .

Corrected Level 850 =  $31.8 - 3.0 = 28.8\text{dBm}$

Corrected Level 1900 =  $28.7 - 3.0 = 25.7\text{dBm}$

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	24.59	0.60	287.74	3	1.995	20	0.114
2405	15.16	1.00	32.81	0	1.000	20	0.007
824	28.8	0.55	758.58	3	1.995	20	0.301
1850	25.7	1.00	371.54	4	2.512	20	0.186

### **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 simultaneous transmission combination as follows:

#### GPRS Modem Operating in the 800MHz Cellular Band:

900MHz LAN: 0.114 (mW/cm<sup>2</sup>)  
 2.4GHz Zigbee: 0.007 (mW/cm<sup>2</sup>)  
 GSM 850 (GPRS): 0.301 (mW/cm<sup>2</sup>)  
**TOTAL:** **0.422 (mW/cm<sup>2</sup>)**

#### GPRS Modem Operating in the 1900MHz PCS Band:

900MHz LAN: 0.114 (mW/cm<sup>2</sup>)  
 2.4GHz Zigbee: 0.007 (mW/cm<sup>2</sup>)  
 GSM 1900 (GPRS): 0.186 (mW/cm<sup>2</sup>)  
**TOTAL:** **0.307 (mW/cm<sup>2</sup>)**

### **Installation Guidelines:**

The installation manual shall contain text similar to the following 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.