DECLARATION OF COMPLIANCE
FCC PART 90 EMC MEASUREMENTS

Test Lab

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Applicant Information

ITRONIX CORPORATION
801 South Stevens Street
Spokane, WA 99210

FCC Rule Part(s):	**47 CFR §90, §2**
IC Rule Part(s):	**RSS-119 Issue 6**
Test Procedure(s):	**FCC 47 CFR §90, §2; ANSI TIA/EIA-603-A-2001**
FCC Device Classification:	**Licensed Non-Broadcast Station Transmitter (TNB)**
IC Device Classification:	**Land Mobile Radio Transmitter**
Device Type:	**Rugged Laptop PC with Wavenet BM3-900M Mobitex Radio Modem (co-located with Cisco MPI-350 Mini-PCI 2.4GHz DSSS WLAN Card) with Dipole Antenna, WLAN Antenna, (3) Mobile Antennas, & Vehicle Cradle**
FCC ID:	**KBCIX260MPIBM3900**
Model(s):	**IX260**
Tx Frequency Range:	**896.0 - 901.0 MHz**
Rx Frequency Range:	**935.0 - 940.0 MHz**
Max. RF Output Power:	**1.58 Watts ERP (Itronix Swivel Dipole Antenna Model: IX260) 0.515 Watts ERP (MaxRad Vehicle-Mount Antenna Model: Z563) 1.14 Watts ERP (MaxRad Vehicle-Mount Antenna Model: Z567) 1.19 Watts ERP (MaxRad Vehicle-Mount Antenna Model: Z573)**
Max. Conducted Power Tested:	**33.0 dBm (Mobitex) / 21.2 dBm (WLAN)**
Modulation:	**GMSK**
Emission Designator(s):	**12K0F1D**
Frequency Tolerance(s):	**± 0.00015 %**
Antenna Types Tested:	**Itronix IX260 External Swivel Dipole (Mobitex) Rangestar 100929 802.11b Dual Internal Surface-Mount (WLAN) MaxRad Z563 Mobile Vehicle-Mount - Unity Gain (Mobitex) MaxRad Z567 Mobile Vehicle-Mount - 5 dBd Gain (Mobitex) MaxRad Z573 Mobile Vehicle-Mount - 5 dBd Gain (Mobitex)**
Power Supply Tested:	**11.1V Lithium-ion Battery, 6.0Ah (Model: A2121-2) 12V Vehicle Battery (Vehicle-Mount Antennas)**

This device has demonstrated compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in FCC 47 CFR §90, §2, Industry Canada RSS-119 Issue 6, and ANSI TIA/EIA-603-A-2001.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

This test report shall not be reproduced partially, or in full, without the prior written approval of Celltech Labs Inc.
The results and statements contained in this report pertain only to the device(s) evaluated.

Russell Pipe
Senior Compliance Technologist
Celltech Labs Inc.

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FCC PART 90 EMC MEASUREMENT REPORT

1.1 SCOPE

Measurement and determination of electromagnetic emissions (EME) from radio frequency devices for compliance with the technical rules and regulations of the Federal Communications Commission and Industry Canada.

2.1 GENERAL INFORMATION - §2.1033(a)

APPLICANT

ITRONIX CORPORATION
801 South Stevens Street
Spokane, WA 99210

FCC ID	KBCIX260MPIBM3900			
Model(s)	IX260			
Serial No.	ZZGEG3135ZZ1410			
DUT Type	Rugged Laptop PC with Wavenet BM3-900M Mobitex Radio Modem (co-located with Cisco MPI-350 Mini-PCI 2.4GHz DSSS WLAN Card) with Dipole Antenna, WLAN Antenna, (3) Vehicle-Mount Antennas, & Cradle			
FCC Rule Part(s)	47 CFR §90, §2			
IC Rule Part(s)	RSS-119 Issue 6			
FCC Classification	Licensed Non-Broadcast Station Transmitter (TNB)			
IC Classification	Land Mobile Radio Transmitter			
Tx Frequency Range	896.0 - 901.0 MHz			
Rx Frequency Range	935.0 - 940.0 MHz			
Antenna Types Tested	Model Number	Type / Description	Max. RF Output Power (Watts)	Length (inches)
	IX260	External Swivel Dipole (Mobitex)	1.58 (ERP)	4.7
	100929	802.11b Dual Surface-Mount (WLAN)	0.372 (EIRP)	1.1
	Z563	Unity Gain Mobile Vehicle-Mount	0.515 (ERP)	3.0
	Z567	5 dBd Gain Mobile Vehicle-Mount	1.14 (ERP)	22.0
	Z573	5 dBd Gain Mobile Vehicle-Mount	1.19 (ERP)	31.5
Max. RF Conducted Output Power Tested	33.0 dBm (Mobitex)		21.2 dBm (WLAN)	
Emission Designator	12K0F1D			
Frequency Tolerance	± 0.00015 %			
Modulation	GMSK			
Power Supply Tested	11.1V Lithium-ion Battery, 6.0Ah (Model: A2121-2)			
	12V Vehicle Battery (Vehicle-Mount Antennas)			

MEASUREMENT PROCEDURES

3.1 RF OUTPUT POWER MEASUREMENT - §2.1046

The peak conducted power levels were measured at the Wavenet BM3-900M Mobitex radio modem RF port with a Gigatronics 8652A Universal Power Meter in burst average power mode. An offset was entered into the power meter to correct for the losses of the attenuator and cable installed before the sensor input. The transmitter terminal was coupled to the power meter and the DUT was placed in test mode using the Wavenet BM3-900M Mobitex test software installed in the Laptop PC with the internal transmitter in modulated carrier mode (30% duty cycle) at a full rated power. All subsequent tests were performed using the same power measurement procedures.

Conducted Power Measurements	
Frequency (MHz)	Peak Power (dBm)
896.0	33.0
901.0	33.0

4.1 FIELD STRENGTH OF SPURIOUS RADIATION - §2.1053

Radiated spurious emissions were measured on a 3-meter open area test site using the Signal Substitution Method in accordance with ANSI TIA/EIA-603-A-2001. The DUT was placed in the vehicle cradle and programmed in test mode using the Wavenet BM3-900M Mobitex test software installed in the Laptop PC with the internal transmitter in modulated carrier mode (30% duty cycle) at a full rated power. For the simultaneous transmit tests with the co-located WLAN card, the WLAN was set to the maximum conducted power level (21.2 dBm) at the low channel (2412 MHz), with a modulated DSSS signal and the right side internal antenna transmitting (the WLAN EIRP results showed the low channel as the maximum EIRP - please refer to the EIRP data in the Part 15.247 test report for the Cisco MPI-350 Mini-PCI DSSS WLAN Card submitted simultaneously with this application). For the dipole antenna evaluation, the DUT was placed on the turntable with the transmitter transmitting into a non-radiating load connected at the antenna feed point. For the vehicle-mount antenna evaluations, the DUT was placed on the turntable with the transmitter transmitting into a non-radiating load via substitute LMR-195 cable (15 feet) connected to the vehicle cradle. The LMR-195 cable length (15 feet) was equal to the vehicle-mount antennas LMR-195 cable length. A receiving antenna located 3 meters from the turntable received any signal radiated from the transmitter and its operating accessories. The receiving antenna was varied in height from 1 to 4 meters and the polarization was varied (horizontal and vertical) to determine the worst-case emission level. A standard gain horn antenna was substituted in place of the DUT. A modulated signal was fed through a directional coupler to the antenna and the power at the coupler port was monitored. A signal generator and power amplifier controlled the antenna, and the input level of the antenna was adjusted to the same field strength level as the DUT. The antenna feed point was then connected to a calibrated power meter and the power was adjusted to read the same power at the coupler port previously recorded, to account for any mismatch in impedance that may occur at the horn antenna. The conducted power at the antenna feed point was then recorded. The forward conducted power for the horn antenna was determined by measuring the power at the horn antenna feed point and reproducing the coupler power previously measured. The EIRP level was determined by adding the horn forward conducted power and the horn antenna gain. All spurious emissions from the lowest radio frequency generated in the equipment to the tenth harmonic of the carrier were investigated. The test data is shown on pages 6-8.

5.1 EFFECTIVE RADIATED POWER OUTPUT - §90.635; §2.1046

ERP measurements were performed using the Signal Substitution Method in accordance with ANSI TIA/EIA-603-A-2001 on a 3-meter open area test site. The DUT was placed in test mode using the Wavenet BM3-900M Mobitex test software installed in the Laptop PC with the internal transmitter in modulated carrier mode (30% duty cycle) at a full rated power. The DUT was placed on a turntable 3-meters from the receive antenna. For the vehicle-mount antenna evaluations, the antenna was fixed on a 50 cm x 50 cm ground plane. The field of maximum intensity was found by rotating the DUT approximately 360 degrees and changing the height of the receive antenna from 1 to 4 meters. The field strength was recorded from a calibrated spectrum analyzer for each channel being tested. A half-wave dipole was substituted in place of the DUT. A modulated signal with the same bandwidth as the DUT was generated, amplified, and fed through a directional coupler. The height and direction of the dipole was adjusted in order to give the field of maximum intensity. The power to the dipole was adjusted in order to give the same field strength reading as previously recorded for the DUT. The power at the coupler port was recorded at this point. The feed point for the dipole was then connected to a calibrated power meter and the power adjusted to read the same as the coupler port previously recorded, this is to account for any mismatch in impedance, which may occur at the dipole antenna. The conducted power at the antenna feed point was recorded. The ERP level was determined by adding the dipole forward conducted power and the dipole gain in dB. For readings above 1GHz the above method is repeated using a standard gain horn antenna. The test data is shown on page 5.

TEST DATA

6.1 EFFECTIVE RADIATED POWER OUTPUT - §90.635; §2.1046

EFFECTIVE RADIATED POWER OUTPUT MEASUREMENTS

Modem(s) Transmitting	Antenna(s) Model / Type	Freq. Tuned	DUT Conducted Power	Maximum Field Strength of DUT	Antenna Polariz.	Dipole Gain	Dipole Forward Conducted Power	ERP of DUT Dipole Gain + Dipole Forward Conducted Power	
		MHz	dBm	dBm	H/V	dBd	dBm	dBm	Watts
Mobitex only	IX260 Dipole	896.0	33.0	-2.593	H	0.01	31.98	31.99	1.58
Mobitex only	IX260 Dipole	901.0	33.0	-3.659	H	0.06	31.37	31.43	1.39
Mobitex only	IX260 Dipole	896.0	33.0	-6.276	V	0.01	30.43	30.44	1.11
Mobitex only	IX260 Dipole	901.0	33.0	-4.891	V	0.06	30.51	30.57	1.14
Mobitex only	Z563 Unity Gain	896.0	33.0	-8.893	V	0.01	27.11	27.12	0.515
Mobitex only	Z563 Unity Gain	901.0	33.0	-9.818	V	0.06	25.55	25.61	0.364
Mobitex only	Z567 5dBd Gain	896.0	33.0	-5.385	V	0.01	30.55	30.56	1.14
Mobitex only	Z567 5dBd Gain	901.0	33.0	-7.393	V	0.06	28.26	28.32	0.679
Mobitex only	Z573 5dBd Gain	896.0	33.0	-5.11	V	0.01	30.74	30.75	1.19
Mobitex only	Z573 5dBd Gain	901.0	33.0	-8.02	V	0.06	27.62	27.68	0.586

TEST DATA (Cont.)

7.1 FIELD STRENGTH OF SPURIOUS RADIATION - §2.1053

Mobitex External Swivel Dipole Antenna

Operating Frequency (MHz): 896.0
Channel: 481
EUT Conducted Pwr. (dBm): 33.0
Measured ERP (dBm): 31.99
Modulation: Modulated Carrier
Distance: 3 Meters
Limit: 50 + 10 log (W) = 44.99 dBc

Frequency	Field Strength of Spurious Radiation	Horn Forward Conducted Power	Standard Gain Horn Antenna Gain	POL	EIRP	ERP	dBc
MHz	dBm	dBm	dBi	H/V	dBm	dBm	
1792.0	-76.81	-43.92	6.6	H	-37.32	-39.46	71.45
2688.0	-77.30	-39.50	7.8	H	-31.70	-33.84	65.83
3584.0	-81.21	-44.63	7.8	H	-36.83	-38.97	70.96
4480.0	-82.17	-44.15	8.6	H	-35.55	-37.69	69.68
5376.0	-78.94	-42.58	8.5	H	-34.08	-36.22	68.21
6272.0	-78.13	-40.25	9.4	H	-30.85	-32.99	64.98
7168.0	-75.62	-37.74	9.2	H	-28.54	-30.68	62.67
8064.0	-78.38	-40.55	9.2	H	-31.35	-33.49	65.48
8960.0	-77.79	-41.58	9.1	H	-32.48	-34.62	66.61

Operating Frequency (MHz): 901.0
Channel: 870 (High)
EUT Conducted Pwr. (dBm): 33.0
Measured ERP (dBm): 31.43
Modulation: Modulated Carrier
Distance: 3 Meters
Limit: 50 + 10 log (W) = 44.43 dBc

Frequency	Field Strength of Spurious Radiation	Horn Forward Conducted Power	Standard Gain Horn Antenna Gain	POL	EIRP	ERP	dBc
MHz	dBm	dBm	dBi	H/V	dBm	dBm	
1802.0	-78.22	-45.33	6.7	H	-38.63	-40.77	72.20
2703.0	-78.42	-40.62	7.8	H	-32.82	-34.96	66.39
3604.0	-79.05	-42.47	7.8	H	-34.67	-36.81	68.24
4505.0	-80.38	-42.36	8.6	H	-33.76	-35.90	67.33
5406.0	-79.55	-43.19	8.5	H	-34.69	-36.83	68.26
6307.0	-76.99	-39.11	9.4	H	-29.71	-31.85	63.28
7208.0	-76.48	-38.60	9.2	H	-29.40	-31.54	62.97
8109.0	-79.50	-41.67	9.2	H	-32.47	-34.61	66.04
9010.0	-79.04	-42.83	9.1	H	-33.73	-35.87	67.30

TEST DATA (Cont.)

FIELD STRENGTH OF SPURIOUS RADIATION - §2.1053 (Cont.)

Co-located Mobitex External Swivel Dipole Antenna & WLAN Internal Antenna (Right Side)

Operating Frequency (MHz): 896.0
Channel: 481
EUT Conducted Pwr. (dBm): 33.0
Measured ERP (dBm): 31.99
Modulation: Modulated Carrier
Distance: 3 Meters
Limit: 50 + 10 log (W) = 44.99 dBc

Frequency	Field Strength of Spurious Radiation	Horn Forward Conducted Power	Standard Gain Horn Antenna Gain	POL	EIRP	ERP	dBc
MHz	dBm	dBm	dBi	H/V	dBm	dBm	
1792.0	-78.50	-45.61	6.6	H	-39.01	-41.15	73.14
2688.0	-80.30	-42.50	7.8	H	-34.70	-36.84	68.83
3584.0	-79.47	-42.89	7.8	H	-35.09	-37.23	69.22
4480.0	-80.51	-42.49	8.6	H	-33.89	-36.03	68.02
5376.0	-81.01	-44.65	8.5	H	-36.15	-38.29	70.28
6272.0	-78.95	-41.07	9.4	H	-31.67	-33.81	65.80
7168.0	-76.90	-39.02	9.2	H	-29.82	-31.96	63.95
8064.0	-78.42	-40.59	9.2	H	-31.39	-33.53	65.52
8960.0	-81.39	-45.18	9.1	H	-36.08	-38.22	70.21

Operating Frequency (MHz): 901.0
Channel: 870 (High)
EUT Conducted Pwr. (dBm): 33.0
Measured ERP (dBm): 31.43
Modulation: Modulated Carrier
Distance: 3 Meters
Limit: 50 + 10 log (W) = 44.43 dBc

Frequency	Field Strength of Spurious Radiation	Horn Forward Conducted Power	Standard Gain Horn Antenna Gain	POL	EIRP	ERP	dBc
MHz	dBm	dBm	dBi	H/V	dBm	dBm	
1802.0	-78.77	-45.88	6.7	H	-39.18	-41.32	72.75
2703.0	-76.89	-39.09	7.8	H	-31.29	-33.43	64.86
3604.0	-79.63	-43.05	7.8	H	-35.25	-37.39	68.82
4505.0	-81.40	-43.38	8.6	H	-34.78	-36.92	68.35
5406.0	-80.62	-44.26	8.5	H	-35.76	-37.90	69.33
6307.0	-79.11	-41.23	9.4	H	-31.83	-33.97	65.40
7208.0	-76.58	-38.70	9.2	H	-29.50	-31.64	63.07
8109.0	-78.08	-40.25	9.2	H	-31.05	-33.19	64.62
9010.0	-78.15	-41.94	9.1	H	-32.84	-34.98	66.41

TEST DATA (Cont.)

FIELD STRENGTH OF SPURIOUS RADIATION - §2.1053 (Cont.)

Vehicle Cradle & Vehicle-Mount Antennas (Mobitex only)

Operating Frequency (MHz): 896.0
Channel: 481
EUT Conducted Pwr. (dBm): 33.0
Measured ERP (dBm): 30.75
Modulation: Modulated Carrier
Distance: 3 Meters
Limit: 50 + 10 log (W) = 43.76 dBc

Frequency	Field Strength of Spurious Radiation	Horn Forward Conducted Power	Standard Gain Horn Antenna Gain	POL	EIRP	ERP	dBc
MHz	dBm	dBm	dBi	H/V	dBm	dBm	
1792.0	-78.37	-45.48	6.6	V	-38.88	-41.02	71.77
2688.0	-77.53	-39.73	7.8	V	-31.93	-34.07	64.82
3584.0	-81.36	-44.78	7.8	V	-36.98	-39.12	69.87
4480.0	-81.78	-43.76	8.6	V	-35.16	-37.30	68.05
5376.0	-80.41	-44.05	8.5	V	-35.55	-37.69	68.44
6272.0	-80.35	-42.47	9.4	V	-33.07	-35.21	65.96
7168.0	-77.85	-39.97	9.2	V	-30.77	-32.91	63.66
8064.0	-78.21	-40.38	9.2	V	-31.18	-33.32	64.07
8960.0	-77.92	-41.71	9.1	V	-32.61	-34.75	65.50

Operating Frequency (MHz): 901.0
Channel: 870
EUT Conducted Pwr. (dBm): 33.0
Measured ERP (dBm): 28.32
Modulation: Modulated Carrier
Distance: 3 Meters
Limit: 50 + 10 log (W) = 41.32 dBc

Frequency	Field Strength of Spurious Radiation	Horn Forward Conducted Power	Standard Gain Horn Antenna Gain	POL	EIRP	ERP	dBc
MHz	dBm	dBm	dBi	H/V	dBm	dBm	
1802.0	-78.77	-45.88	6.6	V	-39.28	-41.42	69.74
2703.0	-79.68	-41.88	7.8	V	-34.08	-36.22	64.54
3604.0	-79.81	-43.23	7.8	V	-35.43	-37.57	65.89
4505.0	-81.53	-43.51	8.6	V	-34.91	-37.05	65.37
5406.0	-80.84	-44.48	8.5	V	-35.98	-38.12	66.44
6307.0	-81.14	-43.26	9.4	V	-33.86	-36.00	64.32
7208.0	-77.32	-39.44	9.2	V	-30.24	-32.38	60.70
8109.0	-78.69	-40.86	9.2	V	-31.66	-33.80	62.12
9010.0	-78.48	-42.27	9.1	V	-33.17	-35.31	63.63

8.1 TEST EQUIPMENT

TEST EQUIPMENT LIST

Equipment Type	Model	Serial No.	Calibration Due Date
HP Signal Generator	8648D (9kHz-4.0GHz)	3847A00611	Feb 2005
Rohde & Schwarz Signal Generator	SMR40 (10MHz-40GHz)	835537/022	Nov 2004
Gigatronics Power Meter	8652A	1835272	Feb 2005
Gigatronics Power Sensor	80701A (0.05-18GHz)	1833535	Feb 2005
Gigatronics Power Sensor	80701A (0.05-18GHz)	1833542	Feb 2005
Amplifier Research Power Amp.	5S1G4 (5W, 800MHz-4.2GHz)	26235	N/A
Microwave System Amplifier	HP 83017A (0.5-26.5GHz)	3123A00587	N/A
Network Analyzer	HP 8753E (30kHz-3GHz)	US38433013	Feb 2005
Frequency Counter	HP 53181A (3GHz)	3736A05175	May 2004
DC Power Supply	HP E3611A	KR83015294	N/A
Multi-Device Controller	EMCO 2090	9912-1484	N/A
Mini Mast	EMCO 2075	0001-2277	N/A
Turntable	EMCO 2080-1.2/1.5	0002-1002	N/A
Double Ridged Horn Antenna	ETS 3115 (1-18GHz)	6267	Oct 2004
Double Ridged Horn Antenna	ETS 3115 (1-18GHz)	6276	Oct 2004
Horn Antenna	Chase BBHA 9120-A (0.7-4.8GHz)	9120A-239	Sept 2004
Horn Antenna	Chase BBHA 9120-A (0.7-4.8GHz)	9120A-240	Sept 2004
Roberts Dipoles	Compliance Design (2 sets) 3121C		June 2004
Spectrum Analyzer	HP 8594E	3543A02721	Feb 2005
Spectrum Analyzer	HP E4408B	US39240170	Nov 2004
Shielded Screen Room	Lindgren R.F. 18W-2/2-0	16297	N/A
Environmental Chamber	ESPEC ECT-2 (Temperature/Humidity)	0510154-B	Feb 2005

9.1 SUMMARY

The data in this measurement report demonstrates that the ITRONIX CORPORATION Model: IX260 Rugged Laptop PC FCC ID: KBCIX260MPIBM3900 with Wavenet BM3-900M Mobitex Radio Modem, external dipole antenna and (3) vehicle-mount antennas, co-located with Cisco MPI-350 Mini-PCI DSSS WLAN Card and internal 802.11b surface-mount dual antenna, complies with the requirements of FCC Rule Parts §90, and §2.