

Test Report S/N:	100504KBC-T566-E90M
Test Date(s):	September 03-20, 2004
Test Type:	FCC Part 90 EMC Measurements

DECLARATION OF COMPLIANCE FCC PART 90 EMC MEASUREMENTS					
Test Lab		Applicant Information			
CELLTECH LABS INC. Testing and Engineering Services 1955 Moss Court Kelowna, B.C. Canada V1Y 9L3 Tel.: 250-448-7047 Fax: 250-448-7046 e-mail: info@celltechlabs.com web site: www.celltechlabs.com		ITRONIX CORPORATION 801 South Stevens Street Spokane, WA 99204 United States			
FCC IDENTIFIER: Model(s):	KBCIX260PNL3BM390 IX260PNL3BM390	0			
FCC Rule Part(s): Test Procedure(s): Device Classification: Device Description: Tx Frequency Range: Rx Frequency Range: Max. ERP Measured: Max. ERP Measured: Max. Conducted Power Tested: Max. Duty Cycle Tested: Source-Based Time-Aver. Power:	47 CFR §90, §2 FCC 47 CFR §90, §2; ANSI TIA/EIA-603-A-2002 Licensed Non-Broadcast Station Transmitter (TNB) Rugged Laptop PC with Wavenet BM3-900M Mobitex Radio Modem & Dipole Antenna (co-located with Senao NL-3054MP 802.11b/g WLAN & Internal Dual Surface-Mount Antenna including (3) Mobile Vehicle-Mount Antennas and Vehicle Cradle 896.0 - 901.0 MHz 935.0 - 940.0 MHz 2.87 Watts (34.58 dBm) - Itronix Swivel Dipole Antenna Model: IX260+ 0.668 Watts (28.25 dBm) - MaxRad Vehicle-Mount Antenna Model: Z563 1.33 Watts (31.25 dBm) - MaxRad Vehicle-Mount Antenna Model: Z567 1.88 Watts (32.74 dBm) - MaxRad Vehicle-Mount Antenna Model: Z573 33.2 dBm (2.09 Watts) 30 % (Source-Based Time-Averaged) : 28.0 dBm (Conducted)				
Modulation Type: Emission Designator(s): Frequency Tolerance(s): Antenna Type(s) Tested: Power Source(s) Tested:	GMSK 12K0F1D ± 0.00015 % Itronix IX260+ External Swivel Dipole (Mobitex) MaxRad Z563 Vehicle-Mount - Unity Gain (Mobitex) MaxRad Z567 Vehicle-Mount - 5 dBd Gain (Mobitex) MaxRad Z573 Vehicle-Mount - 5 dBd Gain (Mobitex) 11.1 V Lithium-ion Battery, 6.0 Ah (Model: A2121-2) 12 V Vehicle Battery (for Vehicle Cradle)				

This mobile 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, and ANSI TIA/EIA-603-A-2002.

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.

Duane M. Friesen EMC Manager Celltech Labs Inc.





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FCC PART 90 EMC MEASUREMENT REPORT

1.1 SCOPE

This report describes the measurements made and results collected during the Electromagnetic emissions testing of the Itronix Corporation IX260+ Rugged Laptop PC incorporating the internal Wavenet BM3-900M Mobitex Radio Modem with external swivel dipole antenna, (3) vehicle-mount antennas, and vehicle cradle. Co-located within the IX260+ Laptop PC is the Senao NL-3054MP 802.11b/g 2.4 GHz DSSS WLAN Mini-PCI Card and RangeStar internal dual surface-mount antenna (co-located transmitters do not transmit simultaneously). The measurement results were applied against the EMC requirements and limits outlined in the technical rules and regulations set forth in the Federal Communication Commission Code of Federal Regulations Title 47 Parts 90, and 2.

2.1 GENERAL INFORMATION / DEVICE DESCRIPTION

APPLICANT	ITRONIX CORPORATION			8	801 South Ste	uth Stevens Street, Spokane, WA 99204						
FCC IDENTIFIER		KBCIX260PNL3BM390										
Model(s)				IX26	0PNL3BM390							
Serial No.(s)	ZZGEG4196ZZ6470 Production Unit IX260+ Laptor					aptop P	С					
Serial No.(S)	BM315099	WT440		Proc	duction Unit		Mobite	ex Ra	idio Moc	lem		
Device Type	Exte	Rugged La rnal Swivel	aptop PC Dipole /	C with Wave Antenna, (3	enet BM3-900N) Vehicle-Moui	/ Mobite: nt Antenr	x Radio Moo nas, & Vehio	lem, le Cra	adle			
Co-located Transmitter(s)	Sena	ao NL-3054	MP 802	.11b/g WLA	N with Interna	l Dual Su	Irface-Moun	t Ante	enna			
Transmit Type	Single Transm	nit Only (Mo	obitex &	WLAN co-l	ocated transn	nitters de	o not transn	nit sin	nultaneo	ously)		
FCC Rule Part(s)				47 (CFR §90, §2							
FCC Classification		Li	censed	Non-Broado	cast Station Tr	ansmitte	r (TNB)					
Tx Frequency Range		896.0 - 901.0 MHz										
Rx Frequency Range		935.0 - 940.0 MHz										
	Model Number	Type / Description				Max. ERP Measured						
	Itronix IX260+	External Swivel Dipole			2.87	W	3	4.58	dBm			
Antenna Type(s) Tested	MaxRad Z563	Unity Gain Mobile Vehicle-Mount			0.668	8 W	2	8.25	dBm			
	MaxRad Z567	5 dBo	d Gain N	Nobile Vehic	le-Mount	1.33	W	3	1.25	dBm		
	MaxRad Z573	5 dBo	d Gain N	/lobile Vehic	le-Mount	1.88	W	3	2.74	dBm		
Max. RF Conducted Output Power Measured	33.2 dBm Peak	Mobitex	Max. S	Source-Base	ed Time-Avera	aged Cor	nducted Pow	er:	28.0 dl	Bm Peak		
Max. Duty Cycle Tested	30 % Source-Based Time-Averaged											
Emission Designator(s)	12K0F1D											
Frequency Tolerance	± 0.00015 %											
Modulation	GMSK											
Power Source(s) Tested	Lithium-ior	Battery		11.	.1 V, 6.0 Ah	Model: A2121-2						
Fower Source(S) Tested	Vehicle E	Battery			12 V		(For Vehicle Cradle)					

Applicant:	Itronix Corporation	Model:	IX260PNL3BM390	FCC ID:	KBCIX260PNL3BM390	
Rugged Laptop PC with internal Wavenet BM3-900M Mobitex Radio Modem & WLAN (802.11b/g)						IIX [.]
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Test Type:	FCC Part 90 EMC Measurements

3.1 TEST EQUIPMENT LIST

Equipment Type	Model	Serial No.	Calibration Due Date
HP Signal Generator	8648D (9kHz-4.0GHz)	3847A00611	April 2005
Rohde & Schwarz Signal Generator	SMR 20 (10MHz-40GHz)	100104	April 2005
Gigatronics Power Meter	8651A	8650137	April 2005
Gigatronics Power Meter	8652A	1835267	April 2005
Gigatronics Power Sensor	80701A (0.05-18GHz)	1833535	April 2005
Gigatronics Power Sensor	80701A (0.05-18GHz)	1833542	April 2005
Gigatronics Power Sensor	80701A (0.05-18GHz)	1834350	April 2005
Amplifier Research Power Amp.	5S1G4 (5W, 800MHz-4.2GHz)	26235	N/A
Amplifier Research Power Amp.	10W1000C (0.5 – 1 GHz)	27887	N/A
Microwave System Amplifier	HP 83017A (0.5-26.5GHz)	3123A00587	N/A
Network Analyzer	HP 8753E (30kHz-3GHz)	US38433013	April 2005
Frequency Counter	HP 53181A (3GHz)	3736A05175	April 2005
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) TX Substitution Antenna (Horn SN6267)	6267	Oct 2004
Double Ridged Horn Antenna	ETS 3115 (1-18GHz)	6276	Oct 2004
Standard Gain Horn Antenna	ETS 3160-09 TX Substitution Antenna (3160-09)	9810-1123	N/A
Standard Gain Horn Antenna	ETS 3160-09	1263	N/A
Bilog Antenna	Schaffner CBL6111A	1607	Jan 2005
Roberts Dipole Antenna	3121C-DB4 TX Substitution Antenna (B_3121C)	0003-1494	Dec 2004
Roberts Dipole Antenna	3121C-DB4	0003-1498	Dec 2004
Spectrum Analyzer	HP 8594E	3543A02721	April 2005
Spectrum Analyzer	HP E4408B	US39240170	Dec 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
Directional Coupler	Amplifier Research DC7154 (0.8-4.2 GHz)	26197	N/A
Directional Coupler	Pasternack PE2214-20	00078	N/A
High Pass Filter	Microwave Circuits HIG318G1	0001DC0020	N/A
High Pass Filter	Microwave Circuits H02G18G1	0001DC0020	N/A
30 dB Attenuator	Pasternack PE7019-30	00065	N/A

Applicant:	Itronix Corporation	Model:	IX260PNL3BM390	FCC ID:	KBCIX260PNL	3BM390
Rugged Lapt	Rugged Laptop PC with internal Wavenet BM3-900M Mobitex Radio Modem & WLAN (802.11b/g)					
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APPENDIX A - RF OUTPUT POWER MEASUREMENT - §2.1046

A.1. MEASUREMENT PROCEDURE

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 IX260+ 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.

A.2. MEASUREMENT DATA

Conducted Power Measurements				
Frequency (MHz)	Peak Power (dBm)			
896.0	33.2			
901.0	33.2			

Applicant:	Itronix Corporation Model: IX260PNL3BM390 FCC ID: KBCIX260PNL3B							
Rugged Lapt	Rugged Laptop PC with internal Wavenet BM3-900M Mobitex Radio Modem & WLAN (802.11b/g)							
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APPENDIX B - EFFECTIVE RADIATED POWER OUTPUT - §90.635; §2.1046

B.1. MEASUREMENT PROCEDURE

ERP measurements were performed using the Signal Substitution Method in accordance with ANSI TIA/EIA-603-A-2002 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 IX260+ 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 swivel dipole evaluation, the DUT was placed on a Styrofoam support at the center of the turntable, 1 meter above the ground plane. For the vehicle-mount antenna evaluations, the antenna was fixed on a 50 cm x 50 cm ground plane on a Styrofoam support placed on a wooden table, at a distance of 3 meters from the biconilog receive antenna, and connected to the vehicle cradle via a 17-foot LMR-195 cable representing a typical vehicle-mount installation. The IX260+ Laptop PC was installed in the vehicle cradle and placed on the wooden table. The maximum field intensity was determined by rotating the DUT approximately 360 degrees and changing the height of the biconilog receive antenna from 1 to 4 meters. Once the maximum emission was found, the spectrum analyzer was set to peak hold and the uncorrected emission value recorded for each of the low, mid and high channels tested. The DUT was then substituted with a dipole antenna. A signal, simulating the DUT emission was generated, amplified, and fed through a directional coupler to the substitution antenna. The height and direction of the receive antenna as well as the direction of the substitution dipole was adjusted for a maximum received signal. The power applied to the dipole was then adjusted to give the same field strength reading as previously recorded for the DUT and the power at the forward coupler port recorded. The substitution antenna was then replaced with a calibrated power sensor, the forward coupler port power level confirmed and the power applied to the dipole antenna recorded. The ERP level was determined by correcting the applied feed point power with the addition of the dipole gain.

(See next pages for measurement data)

B.2. MEASUREMENT SETUP

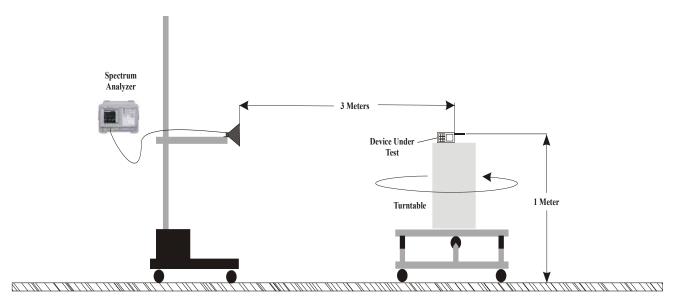


Figure 2. Radiated Power Measurement Test Setup Diagram

Applicant:	Itronix Corporation	Model:	IX260PNL3BM390	FCC ID:	KBCIX260PNL	3BM390		
Rugged Lapt	Rugged Laptop PC with internal Wavenet BM3-900M Mobitex Radio Modem & WLAN (802.11b/g)							
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EFFECTIVE RADIATED POWER OUTPUT - §90.635; §2.1046 (Continued)

B.3. MEASUREMENT DATA

(Cel	ltech	Project N Company Product:		090104KBC-T Itronix IX260+ with W	553-E90M /avenet Mobitex					Standard: Test Start Test End	t Date:	FCC90.6 3-Sep-0- 20-Sep-1	4
				IX260+ with	Wavenet Mob	itex & Attache	ed Swivel D	ipole Anteni	na Carrier F	ower Leve	ls			<u> </u>
Polarity	Distance	Substitution Antenna Type	Carrier	Frequency	Corrected Field Strength	Substituted SA Signal Level (uncorrected)	Power Applied to Antenna	Antenna Gain	Carrier E	RP Level	ERP	Limit	Margin	Pass/Fai
	m			MHz	dBuV/m	dBu∀	dBm	dBi	dBm	Watts	dBm	Watts	dB	
н	3	B_3121C	Lowest	896.00	131.95	106.20	34.25	2.25	34.36	2.73	50.00	100.00	15.64	PASS
н	3	B_3121C	Highest	901.00	132.38	106.48	34.43	2.29	34.58	2.87	50.00	100.00	15.42	PASS
V	3	B_3121C	Lowest	896.00	126.89	101.14	32.36	2.25	32.47	1.77	50.00	100.00	17.53	PASS
V	3	B_3121C	Highest	901.00	127.40	101.50	32.73	2.29	32.88	1.94	50.00	100.00	17.12	PASS
	Note:	e Antenna used f		4:										
	Dipole	e Antenna used f	or substitu	lion										
	Form ERP L	ulae: .evel (dBm) = Po	wer applied	d to Antenna (dł	3m) + Antenna i	Gain (dBi) - 2.14	4							
		in (dB) = Limit (dB												

Test End Date:17 Sep -04Test End Date:17 Sep -04IX260+ with Wavenet Mobilex & Z563 Molecharter and Crafter Power LevelTest End Date:17 Sep -04IX260+ with Wavenet Mobilex & Z563 Molecharter and Crafter Power LevelTest End Date:17 Sep -04IX260+ with Wavenet Mobilex & Z563 Molecharter and Crafter Power LevelTest End Date:IT Sep -04IX260+ with Wavenet Mobilex & Z563 Molecharter and Crafter Power LevelCarrier End Date:IT Sep -04IX260+ with Wavenet Mobilex & Z563 Molecharter and Crafter Power LevelSep -04IT Sep -04IX260+ with Wavenet Mobilex & Z563 Molecharter and Crafter Power LevelSep -04IT Sep -04Milit and StrengthAntennaAntennaCarrier End Watter Internation Colspan="4">Internation Colspan="4">Internation Colspan="4">Internation Colspan="4">Internation Colspan="4">Internation Colspan="4">Internation Colspan="4">Internation Colspan="4">Internation Colspan="4">Internation Colspan="4"Milit addau/inAntennaAntennaCarrier End Watter Internation Colspan="4">Internation Colspan="4"Milit addau/inAntennaAntennaInternation Colspan="4"Milit addau/inAntennaAntennaAntennaInternation Colspan="4"	-1	2	tech	Project Nu Company:		090104KBC-T	553-E90M					Standard: Test Star		FCC90.6 3-Sep-0	
$ \frac{1}{2} 1$	_	height	Esperang Sector La	Product:		IX260+ with W	avenet Mobitex	:				Test End	Date:	· ·	
$ \frac{1}{2} 1$															
Prequency Corrected Field Strength SA Signal Level (uncorrected) Power Antenna Gain Antenna Gain Carrier ER ER Lint Margin Pass/Fa MHz dBuV/m dBuV dBuV dBuV dBm dBm Watts dBm Watts dBm Watts dBm Watts dBm Watts dBm Vatts dBm Vatts dBm Watts dBm Vatts	_				1X260+ with	Wavenet Mob	rtex & 2563 M	obile Anten	na and Crad	lle Carrier I	ower Leve	els			
rest 896.00 117.05 91.30 18.94 2.25 19.06 0.080 50.00 100.00 30.94 PASS rest 901.00 118.00 92.10 19.55 2.29 19.70 0.093 50.00 100.00 30.30 PASS rest 896.00 122.15 96.40 27.96 2.25 28.07 0.642 50.00 100.00 21.93 PASS rest 901.00 122.20 96.30 28.10 2.29 28.25 0.668 50.00 100.00 21.93 PASS rest 901.00 122.20 96.30 28.10 2.29 28.25 0.668 50.00 100.00 21.75 PASS rest 901.00 122.20 96.30 28.10 2.29 28.25 0.668 50.00 100.00 21.75 PASS rest 901.00 122.20 96.30 28.10 2.99 28.25 0.668 50.00 100.00 21.75 PASS rest 901.00 122.20 96.30 28.10 2.99	Polarity	Distance	Substitution Antenna Type	Carrier	Frequency		SA Signal Level	Applied to Antenna		Carrier E	RP Level	ERP	Limit	Margin	Pass/Fa
Instruction Instruction <thinstruction< th=""> <thinstruction< th=""></thinstruction<></thinstruction<>		m			MHz	dBu∀/m	dBuV	dBm	dBi	dBm	Watts	dBm	Watts	dB	
rest 896.00 122.15 96.40 27.96 2.25 28.07 0.642 50.00 100.00 21.93 PASS rest 901.00 122.20 96.30 28.10 2.29 28.25 0.668 50.00 100.00 21.75 PASS abstitution	н	3	B_3121C	Lowest	896.00	117.05	91.30	18.94	2.25	19.06	0.080	50.00	100.00	30.94	PASS
and the state tender tender <thtender< th=""> tender <thtender< th=""> tender<!--</td--><td>н</td><td>3</td><td>B_3121C</td><td>Highest</td><td>901.00</td><td>118.00</td><td>92.10</td><td>19.55</td><td>2.29</td><td>19.70</td><td>0.093</td><td>50.00</td><td>100.00</td><td>30.30</td><td>PASS</td></thtender<></thtender<>	н	3	B_3121C	Highest	901.00	118.00	92.10	19.55	2.29	19.70	0.093	50.00	100.00	30.30	PASS
Antenna (dBm) + Antenna Gain (dBi) - 2.14	V	3	B_3121C	Lowest	896.00	122.15	96.40	27.96	2.25	28.07	0.642	50.00	100.00	21.93	PASS
applied to Antenna (dBm) + Antenna Gain (dBi) - 2.14	V	3	B_3121C	Highest	901.00	122.20	96.30	28.10	2.29	28.25	0.668	50.00	100.00	21.75	PASS
applied to Antenna (dBm) + Antenna Gain (dBi) - 2.14		Note:													
			e Antenna used	for substitu	tion										
		Form	ulee:												
				ower applied	i to Antenna (dB	l 9m) + Antenna (Gain (dBi) - 2.14	1							
			in (dB) = Limit (d												
		marg	in (ab) = 2init (a	2010	(dbill)										

Applicant:	Itronix Corporation	Itronix Corporation Model: IX260PNL3BM390 FCC ID: KBCIX260PNL3B										
Rugged Lapt	PC with internal Wavenet BM3-900M Mobitex Radio Modem & WLAN (802.11b/g)											
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Test Type:	FCC Part 90 EMC Measurements

EFFECTIVE RADIATED POWER OUTPUT - §90.635; §2.1046 (Continued)

B.3. MEASUREMENT DATA (Cont.)

/	2		Project Nu		090104KBC-T	553-E90M					Standard: Test Star		FCC90.6	
L	Le		Company:		Itronix						Test End Date:		3-Sep-0	
	sedan	Lighting service up	Product:		IX260+ with W	/avenet Mobitex					Test End	Date:	17-Sep-	04
				IX260+ with 1	Wavenet Mohi	itex & Z567 Mc	bile Anten	na and Crad	le Carrier P	lower Leve	le			
Polarity	Distance	Substitution Antenna Type	Carrier	Frequency	Corrected Field Strength	Substituted SA Signal	Power Applied to Antenna	Antenna Gain		RP Level		Limit	Margin	Pass/Fa
	m			MHz	dBu∀ <i>l</i> m	dBuV	dBm	dBi	dBm	Watts	dBm	Watts	dB	
н	3	B_3121C	Lowest	896.00	118.45	92.70	20.42	2.25	20.53	0.113	50.00	100.00	29.47	PASS
н	3	B_3121C	Highest	901.00	117.40	91.50	18.95	2.29	19.10	0.081	50.00	100.00	30.90	PASS
V	3	B_3121C	Lowest	896.00	125.25	99.50	31.14	2.25	31.25	1.33	50.00	100.00	18.75	PASS
V	3	B_3121C	Highest	901.00	124.50	98.60	30.42	2.29	30.56	1.14	50.00	100.00	19.44	PASS
_														
	Note: Dipole	e Antenna used	for substitut	ion										
	Form	ulae:												
		.evel (dBm) = Po			m) + Antenna G	ain (dBi) - 2.14								
	Margi	in (dB) = Limit (dl	Bm) - Level ((dBm)										

_			Project N	umber:	090104KBC-T	553-E90M					Standard:		FCC90.6	35d
1	Cel	ltech	Company	<i>r</i> :	ltronix						Test Star	t Date:	3-Sep-0	4
	heirgan	Exploanty Service Lab	Product:		IX260+ with W	/avenet Mobitex					Test End	Date:	20-Sep-	04
_				IX260+ wit	h Wavenet Mo	bitex & Z573	Mobile Ante	nna and Cra	adle Carrier	Power Le	vels			
Polarity	Distance	Substitution Antenna Type	Carrier	Frequency	Corrected Field Strength	Substituted SA Signal Level (uncorrected)	Power Applied to Antenna	Antenna Gain	Carrier E	RP Level	ERP	Limit	Margin	Pass/Fai
	m			MHz	dBu∀/m	dBuV	dBm	dBi	dBm	Watts	dBm	Watts	dB	
Н	3	B_3121C	Lowest	896.00	112.69	86.94	14.59	2.25	14.70	0.029	50.00	100.00	35.30	PASS
н	3	B_3121C	Highest	901.00	112.64	86.74	14.31	2.29	14.46	0.028	50.00	100.00	35.54	PASS
V	3	B_3121C	Lowest	896.00	122.71	96.96	28.49	2.25	28.60	0.725	50.00	100.00	21.40	PASS
V	3	B_3121C	Highest	901.00	126.52	100.62	32.59	2.29	32.74	1.88	50.00	100.00	17.26	PASS
	Note:													
		e Antenna use	ed for subs	titution										
	Form													
					(dBm) + Anten	na Gain (dBi) - :	2.14							
	Marg	n (dB) = Limit	(dBm) - Le	vel (dBm)										
														+

Applicant:	Itronix Corporation	Itronix Corporation Model: IX260PNL3BM390 FCC ID: KBCIX260PNL3B						
Rugged Lapt	op PC with internal Wavenet BM3	PC with internal Wavenet BM3-900M Mobitex Radio Modem & WLAN (802.11b/g)						
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Test Report S/N:	100504KBC-T566-E90M
Test Date(s):	September 03-20, 2004
Test Type:	FCC Part 90 EMC Measurements

APPENDIX C - FIELD STRENGTH OF SPURIOUS RADIATION - §90.210j; §2.1053

C.1. MEASUREMENT PROCEDURE

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-2002. The DUT was placed in the vehicle cradle and programmed in test mode using the Wavenet BM3-900M Mobitex test software installed in the IX260+ Laptop PC with the internal transmitter in modulated carrier mode (30% duty cycle) at a full rated power. For the swivel dipole evaluation, the DUT was placed on a Styrofoam support at the center of the turntable, 1 meter above the ground plane. For the vehicle-mount antenna evaluations, the antenna was fixed on a 50 cm x 50 cm ground plane on a Styrofoam support placed on a wooden table, at a distance of 3 meters from the receive antenna, and connected to the vehicle cradle via a 17-foot LMR-195 cable representing a typical vehicle-mount installation. The IX260+ Laptop PC was installed in the vehicle cradle and placed on the wooden table. A frequency band from just above the highest transmitted frequency to just above the 10th harmonic of the highest transmitted frequency was divided into smaller bands corresponding to measurement equipment setups and capabilities. The measurement equipment including carrier blocking filters, was optimized for maximum sensitivity for each band while ensuring no saturation occurred in any gain stages that may be present. The maximum field intensity in each of these bands were determined by rotating the DUT approximately 360 degrees and changing the height of the receive antenna from 1 to 4 meters while maintaining the spectrum analyzer trace in max hold. The stored trace was then evaluated to determine any significant emissions that should be evaluated by substitution. The frequency and uncorrected field strength level for each significant emission was recorded. To describe the noise floor, the maximum level associated with a number of frequencies within the band were also recorded. The DUT was then substituted with a transmit antenna. A signal simulating the DUT emission was generated for each of the signals recorded; it was amplified and fed through a directional coupler to the substitution antenna. The height and direction of the receive antenna as well as the direction of the substitution horn was adjusted for a maximum received signal. The power applied to the transmit antenna was then adjusted to give the same field strength reading as previously recorded for the DUT and the power at the forward coupler port recorded. The substitution antenna was then replaced with a calibrated power sensor, the forward coupler port power level confirmed and the power applied to the horn antenna recorded. The radiated power level was determined by correcting the applied feed point power with the addition of the antenna gain.

(See next pages for measurement data)

C.2. MEASUREMENT SETUP

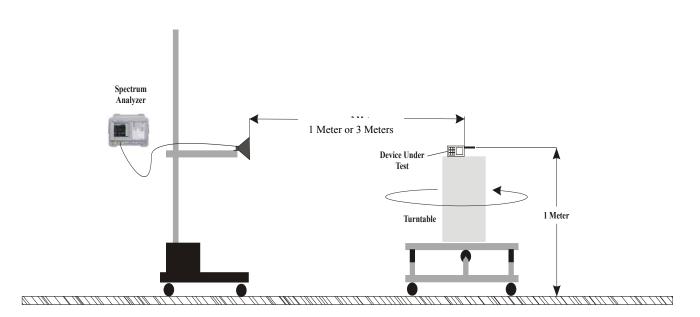


Figure 3. Radiated Spurious Measurement Test Setup Diagram (3 Meters for Frequencies < 10 GHz - 1 Meter for Frequencies > 10 GHz)

Applicant:										
Rugged Lapt	op PC with internal Wavenet BM	3-900M Mobi	tex Radio Modem & WLAN (80	2.11b/g)	ITRON	IX.				
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C.3. MEASUREMENT DATA

	A 11		Project N	umber:	090104KBC-T	553-E90M			Standard:		FCC90.210	- J
1	Cell	tech	Company	y:	Itronix				Test Start	Date:	3-Sep-04	
	Interpreta	greens Service Lat	Product:		IX260+ with Wavenet Mobitex				Test End Date:		20-Sep-04	
												1
			IX260+	• with Wavene	t Mobitex & A	ttached Swive	l Dipole An	tenna Spuri	ous Emissi	ons		
Polarity	Distance	Substitution Antenna Type	Carrier	Frequency	Corrected Field Strength	Substituted SA Signal Level (uncorrected)	Power Applied to Antenna	Antenna Gain	Emission ERP Level	ERP Limit	Margin	Pass/Fai
	m			MHz	dBu∀/m	dBuV	dBm	dBi	dBm	dBm*	dB	
Н	3	Horn SN6267	Lowest	1108.00	73.47	44.40	-33.43	4.24	-31.33	-20.00	11.33	PASS
Н	3	Horn SN6267	Lowest	1793.00	81.30	49.60	-27.97	6.49	-23.62	-20.00	3.62	PASS
Н	3	Horn SN6267	Lowest	5378.00	94.29	52.80	-40.61	8.60	-34.15	-20.00	14.15	PASS
٧	3	Horn SN6267	Lowest	1793.00	80.60	48.90	-27.68	6.49	-23.33	-20.00	3.33	PASS
V	3	Horn SN6267	Lowest	1890.00	66.45	34.30	-40.67	6.59	-36.22	-20.00	16.22	PASS
V	3	Horn SN6267	Lowest	5378.00	61.61	55.60	-38.78	8.60	-32.32	-20.00	12.32	PASS
н	3	Horn SN6267	Highest	1998.00	72.27	39.60	-37.26	6.70	-32.70	-20.00	12.70	PASS
Н	3	Horn SN6267	Highest	5408.00	63.27	57.20	-36.38	8.60	-29.92	-20.00	9.92	PASS
V	3	Horn SN6267	Highest	2000.00	72.38	39.70	-36.62	6.70	-32.06	-20.00	12.06	PASS
۷	3	Horn SN6267	Highest	5408.00	62.47	56.40	-41.19	8.60	-34.73	-20.00	14.73	PASS
	blada.											
	Note: Horn	Antenna used fo	r substituti	on								
		plicable frequent ach range.	cy ranges '	were investigat	ed up to the car	rier tenth harmo	onic and any	significant er	nissions or n	oise floor lev	el reported	
	Form	ulae:										
	Limit	= 50 + 10*log(Fur	ndamental l	Power Level, in	watts) below ti	he Fundamental	peak power	gives -20 dE	Im			
	ERP L	evel (dBm) = Po	wer applied	d to Antenna (dł	3m) + Antenna	Gain (dBi) - 2.14	4	_				
	Margi	n (dB) = Limit (dB	9m) - Level	(dBm)								

Applicant:	Itronix Corporation	Model:	IX260PNL3BM390	FCC ID:	p/g)	
Rugged Lapt	op PC with internal Wavenet BM	3-900M Mobi	tex Radio Modem & WLAN (80	2.11b/g)	ITRON	NX.
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Test Report S/N:	100504KBC-T566-E90M
Test Date(s):	September 03-20, 2004
Test Type:	FCC Part 90 EMC Measurements

C.3. MEASUREMENT DATA (Cont.)

	2	toch	Project Nu	mber:	090104KBC-T	553-E90M			Standard: Test Start	Data:	FCC90.210	Jj
U	VCI	lieur	Company:		Itronix						3-Sep-04	
	letigant	Egherig Series Lit	Product:		IX260+ with Wavenet Mobitex				Test End Date:		17-Sep-04	
				IX260+ with	n Wavenet Mo	bitex & Z563 A	intenna Spu	irious Emis	sions			<u> </u>
Polarity	Distance	Substitution Antenna Type	Carrier	Frequency	Corrected Field Strength	Substituted SA Signal Level (uncorrected)	Power Applied to Antenna	Antenna Gain	Emission ERP Level	ERP Limit	Margin	Pass/Fail
	m			MHz	dBuV/m	dBuV	dBm	dBi	dBm	dBm*	dB	
н	3	Horn SN6267	Lowest	1889.00	71.75	39.60	-37.22	6.59	-32.77	-20.00	12.77	PASS
Н	3	Horn SN6267	Lowest	1897.00	76.18	44.00	-32.23	6.60	-27.77	-20.00	7.77	PASS
Н	3	Horn SN6267	Lowest	2452.00	60.30	63.20	-32.93	7.69	-27.38	-20.00	7.38	PASS
Н	3	Horn SN6267	Lowest	5378.00	60.11	54.10	-38.92	8.60	-32.46	-20.00	12.46	PASS
٧	3	Horn SN6267	Lowest	1797.00	75.41	43.70	-33.37	6.50	-29.01	-20.00	9.01	PASS
٧	3	Horn SN6267	Lowest	1889.00	71.35	39.20	-37.30	6.59	-32.85	-20.00	12.85	PASS
V	3	Horn SN6267	Lowest	5378.00	64.91	58.90	-34.90	8.60	-28.44	-20.00	8.44	PASS
н	3	Horn SN6267	Highest	1994.00	66.75	34.10	-39.81	6.69	-35.26	-20.00	15.26	PASS
Н	3	Horn SN6267	Highest	5408.00	57.67	51.60	-43.55	8.60	-37.09	-20.00	17.09	PASS
۷	3	Horn SN6267	Highest	1803.00	78.14	46.40	-31.31	6.50	-26.95	-20.00	6.95	PASS
۷	3	Horn SN6267	Highest	1953.00	66.54	34.10	-40.27	6.65	-35.76	-20.00	15.76	PASS
۷	3	Horn SN6267	Highest	5408.00	63.37	57.30	-40.32	8.60	-33.86	-20.00	13.86	PASS
	All ap	Antenna used s pplicable freque ach range.			ed up to the car	rier tenth harmo	nic and any :	significant en	hissions or no	bise floor lev	el reported	
	Form	ulae: = 50 + 10*log(F)	undementel D	lower Level in	watte) helow ti	e Eurodementel	neek nower	aiues 20 dB	r.			
		= 50 + ronog(ri Level (dBm) = P			,			gires -zo ub				
		in (dB) = Limit (d										

Applicant: Itronix Corporation Model: IX260PNL3BM390 FCC ID: KBCIX260PNL3										
Rugged Lapt	op PC with internal Wavenet BM3	8-900M Mobi	tex Radio Modem & WLAN (80	2.11b/g)	ITRON	NIX.				
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Test Report S/N:	100504KBC-T566-E90M
Test Date(s):	September 03-20, 2004
Test Type:	FCC Part 90 EMC Measurements

C.3. MEASUREMENT DATA (Cont.)

	1		Project Nu	mber:	090104KBC-T	553-E90M			Standard:		FCC90.210	Ĵj
1	Cell	tech	Company: Itro						Test Start	Date:	3-Sep-04	
1	Istigant I	Ingreening Services Late	Product:		IX260+ with Wavenet Mobitex				Test End Date:		17-Sep-04	ļ
_			IX260+	with Wavenet	t Mobitex & Z	567 Mobile Ant	enna and C	radle Spuri	ous Emissio	ons		
Polarity	Distance	Substitution Antenna Type	Carrier	Frequency	Corrected Field Strength	Substituted SA Signal Level (uncorrected)	Power Applied to Antenna	Antenna Gain	Emission ERP Level	ERP Limit	Margin	Pass/Fail
	m			MHz	dBu∀/m	dBuV	dBm	dBi	dBm	dBm*	dB	
Н	3	Horn SN6267	Lowest	1998.00	73.27	40.50	-36.14	6.70	-31.58	-20.00	11.58	PASS
Н	3	Horn SN6267	Lowest	5378.00	58.11	52.00	-41.40	8.60	-34.94	-20.00	14.94	PASS
Н	3	Horn SN6267	Lowest	7986.00	55.82	45.70	-55.66	9.29	-48.51	-20.00	28.51	PASS
V	3	Horn SN6267	Lowest	1793.00	78.49	46.90	-29.65	6.49	-25.30	-20.00	5.30	PASS
V	3	Horn SN6267	Lowest	1998.00	72.77	40.00	-36.23	6.70	-31.67	-20.00	11.67	PASS
V	3	Horn SN6267	Lowest	5378.00	64.51	58.40	-35.49	8.60	-29.03	-20.00	9.03	PASS
Н	3	Horn SN6267	Highest	1994.00	72.05	39.30	-37.87	6.69	-33.32	-20.00	13.32	PASS
Н	3	Horn SN6267	Highest	5408.00	58.67	52.50	-41.93	8.60	-35.47	-20.00	15.47	PASS
V	3	Horn SN6267	Highest	1668.00	58.38	27.50	-39.62	6.37	-35.39	-20.00	15.39	PASS
V	3	Horn SN6267	Highest	1801.00	81.63	50.00	-27.62	6.50	-23.26	-20.00	3.26	PASS
V	3	Horn SN6267	Highest	5408.00	64.67	58.50	-38.63	8.60	-32.17	-20.00	12.17	PASS
	Note:			_								
		Antenna used fo oplicable frequer			d un to the cerr	ier tenth hermor	ic and any s	ionificant em	issions or poi	se floor leve	l reported	
	· ·	ach range.	icy runges v	rere investigate	a ap to the can		ne ana any a	igninount on		30 11001 1070	reported	
	Form	ulae:										
		= 50 + 10*log(Fu						gives -20 dBr	n			
		Level (dBm) = Po			im) + Antenna (∋ain (dBi) - 2.14						
	Marg	in (dB) = Limit (d	Bm) - Level ((dBm)								

Applicant:	Itronix Corporation	Model:	IX260PNL3BM390	FCC ID:	KBCIX260PNL	3BM390
Rugged Lapt	op PC with internal Wavenet BM	3-900M Mobi	itex Radio Modem & WLAN (80	2.11b/g)	ITRON	NIX.
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Test Date(s):	September 03-20, 2004
Test Type:	FCC Part 90 EMC Measurements

C.3. MEASUREMENT DATA (Cont.)

	A 11	u di	Project N	umber:	090104KBC-T	553-E90M			Standard:		FCC90.210)j
(Lell	iech	Company	<i>r</i> :	t tronix				Test Start	Date:	3-Sep-04	
	Testing and B	gierig Seike Lit	Product:		IX260+ with W	/avenet Mobitex		Test End D	ate:	20-Sep-04		
			1X260)+ with Waven	et Mobitex & .	Z573 Mobile A	ntenna and	Cradle Spu	irious Emis:	sions		
Polarity	Distance	Substitution Antenna Type	Carrier	Frequency	Corrected Field Strength	Substituted SA Signal Level (uncorrected)	Power Applied to Antenna	Antenna Gain	Emission ERP Level	ERP Limit	Margin	Pass/Fai
	m			MHz	dBu∀/m	dBuV	dBm	dBi	dBm	dBm*	dB	
Н	З	Horn SN6267	Lowest	1793.00	61.20	29.50	-40.77	6.49	-36.42	-20.00	16.42	PASS
Н	З	Horn SN6267	Lowest	1998.00	71.57	38.90	-37.86	6.70	-33.30	-20.00	13.30	PASS
Н	3	Horn SN6267	Lowest	5378.00	61.61	55.60	-37.26	8.60	-30.80	-20.00	10.80	PASS
٧	3	Horn SN6267	Lowest	1793.00	80.60	48.90	-27.67	6.49	-23.32	-20.00	3.32	PASS
٧	3	Horn SN6267	Lowest	1998.00	72.67	40.00	-36.37	6.70	-31.81	-20.00	11.81	PASS
V	3	Horn SN6267	Lowest	5378.00	65.31	59.30	-34.37	8.60	-27.91	-20.00	7.91	PASS
Н	3	Horn SN6267	Highest	2000.00	72.28	39.60	-37.25	6.70	-32.69	-20.00	12.69	PASS
Н	3	Horn SN6267	Highest	5408.00	57.37	51.30	-43.54	8.60	-37.08	-20.00	17.08	PASS
۷	З	Horn SN6267	Highest	1998.00	71.97	39.30	-37.23	6.70	-32.67	-20.00	12.67	PASS
V	3	Horn SN6267	Highest	5408.00	63.27	57.20	-40.21	8.60	-33.75	-20.00	13.75	PASS
	Note:											
	Horn	Antenna used	l for subst	itution								
		plicable frequ ted for each r		es were investi	gated up to the	carrier tenth ha	rmonic and a	any significar	it emissions o	r noise floor	level	
	Form	ulae:										
	Limit	= 43 + 10*log(i	Fundamen	tal Power Level	, in watts) belo [,]	w the Fundame	ntal peak pov	ver gives -13	3 dBm			
	ERP L	.evel (dBm) =	Power app	olied to Antenna	(dBm) + Anten	na Gain (dBi) - :	2.14					
	Margi	n (dB) = Limit	(dBm) - Le	vel (dBm)								

Applicant:	Itronix Corporation	Model:	IX260PNL3BM390	FCC ID:	KBCIX260PNL	3BM390
Rugged Laptop PC with internal Wavenet BM3-900M Mobitex Radio Modem & WLAN (802.11b/g)						NIX.
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