ACME TESTING

Worldwide EMC & Product Safety Services

17 March, 2003

Merv Flahr
Identec Solutions, Inc.
Suite 102 - 1860 Dayton Street
Kelowna British Columbia
Canada V1Y 7W6

Dear Mr. Flahr,

Enclosed is a Test Report for the NEMA Enclosure-Mounted Fixed UHF Intelligent Long Range Interrogator System with AC - DC Power Supply, Model i-Port III and the CD ROM containing the report in PDF Format. Please check it thoroughly for discrepancies and please contact us immediately if you have any questions or if you identify any problems.

This is an official copy of your report, complete with the original Acme Testing Co. staff signatures. You should retain this report as the official record of testing, as proof of compliance in the future. Please note that FCC Regulation requires that you, as the "responsible party" keep this data for a period of three (3) years after the equipment is last placed on the market. Please be aware that our internal controls require us to retain a historical copy of your report on file for a three-year period, after which our copy of your report will be destroyed.

Thank you for your business and we look forward to being of service should you require testing services in the future.

Yours sincerely,

Harry H. Hodes
Principal EMC Engineer
President & CEO

:dh
Enclosure

Acme Testing Co.
P. O. Box 3, 2002 Valley Highway, Acme, Washington 98220-0003
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Email acmetest@acmetesting.com www.acmetesting.com

ACCREDITED
CERTIFICATE # 0820-01 ACME, WA
CERTIFICATE # 0820-02 PLEASANTON, CA
AN ISO 9000 REGISTERED CORPORATION
A VALIDATED CONFORMITY ASSESSMENT BODY

2002 Valley Highway PO Box 3 Acme WA 98220-0003
phone:888 226-3837 fax: 360 595-2722

§ 15.105 Information to the user

(a) For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- **Reorient or relocate the receiving antenna.**
- **Increase the separation between the equipment and receiver.**
- **Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.**
- **Consult the dealer or an experienced radio/TV technician for help.**

The following are samples of what the FCC expects to see displayed prominently in your users manual and/or on your FCC ID label (more information can be found in the CFR 47):

§ 15.19 Labelling requirements.

The following is a sample of the statement that must appear on the FCC ID Label that will be placed on your product:

COMPANY NAME This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For devices that are so small that a label can not be affixed upon the product the FCC states: "When the device is so small or for such use that it is not practicable to place the statement specified in this section on it, the information required by these paragraphs shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. **However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device.**

§ 15.21 Information to user.

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

2002 Valley Highway PO Box 3 Acme WA 98220-0003
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REPORT OF MEASUREMENTS

SYSTEM: NEMA ENCLOSURE-MOUNTED FIXED UHF INTELLIGENT LONG RANGE INTERROGATOR SYSTEM WITH AC - DC POWER SUPPLY

MODEL: I-PORT III

MANUFACTURER: IDENTEC SOLUTIONS, INC.

ADDRESS: SUITE 102 - 1860 DAYTON STREET, KELOWNA, BRITISH COLUMBIA V1Y 7W6 CANADA

WORK ORDER: 02-EMC-1219-0423

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1. General

1.1 Document History

REVISION	DATE	COMMENTS
-	26 January 2003	Initial Release, Harry H. Hodes

Note: Acme Testing Co. hereby makes the following statements so as to conform with Chapter 10 (Test Reports) Requirement of ANSI C63.4:1992 "Methods and Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz":

- The units described in this report were received at Acme Testing Co.'s facilities on 23 December 2002. Testing was performed on the units described in this report on 23 & 24 December 2002.
- The Test Results reported herein apply only to the Units actually tested, and to substantially identical Units.
- This test report must not be used to claim product endorsement by A2LA or any agency of the U.S. Government, or any other foreign government.

This document is the property of Acme Testing, Co., and shall not be reproduced, except in full, without prior written approval of Acme Testing Co. However, all ownership rights are hereby returned unconditionally to Identec Solutions, Inc., and approval is hereby granted to Identec Solutions, Inc. and its employees and agents to reproduce all or part of this report for any legitimate business purpose without further reference to Acme Testing Co.

1.2 Purpose

The purpose of this report is to document the compliance of the "NEMA Enclosure-Mounted Fixed UHF Intelligent Long Range Interrogator System with AC - DC Power Supply", Model i-Port III to the FCC regulations for narrowband unlicensed devices operating under 47 CFR Part 15 Subpart C, Section 15.249. This report references the applicable electromagnetic emissions requirements.

THE DATA CONTAINED IN THIS REPORT WAS COLLECTED AND COMPILED BY:

DANIEL B. STATON
LABORATORY OPERATIONS MANAGER

1.3 Manufacturer

Company Name:	Identec Solutions, Inc.
Contact:	Merv Flahr
Street Address:	Suite 102 - 1860 Dayton Street
City/Province:	Kelowna British Columbia
Country/Postal Code:	Canada V1Y 7W6
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1.4 Test location

Laboratory:	Test Site #2
Street Address:	2002 Valley Highway
Mailing Address:	PO Box 3
City/State/Zip:	Acme WA 98220-0003
Telephone:	360 595-2785
Fax:	360 595-2722
E-mail:	acmetest@acmetesting.com
Web:	www.acmetesting.com

1.5 Accreditations and Listings

Acme Testing Co.'s test facilities are accredited by A2LA for a specific scope of accreditation which includes the tests detailed herein, under Certificate Numbers: 0829-01 (Acme, WA), and 0829-02 (Plummer, ID). Acme Testing Co.'s test facilities that are used to perform radiated and conducted emissions are currently registered with the Federal Communications Commission under registration numbers: 90420 (Acme, WA), and 96502 (Plummer, ID). In addition, Acme Testing Co.'s test facilities are also registered with the Industry Canada under registration numbers: IC3251 (Acme, WA), and IC3618 (Plummer, ID).

2. Test Results Summary

Summary of Test Results
NEMA Enclosure-Mounted Fixed UHF Intelligent Long Range Interrogator System with AC - DC Power Supply, Model i-Port III

Summary of Test Results - Emissions

Test Specification	Test Description	Compliance Criteria	Result
FCC Rules: 47CFR Part 15, Subpart C, Section 15.207	**AC Line Conducted Emissions (TX Mode)** 0.15 MHz - 30 MHz	**Section 15.207**	**Pass**
FCC Rules: 47CFR Part 15, Subpart C, Section 15.249(a)	**Field Strength of Fundamental and Spurious Emissions**	**Section 15.249 (a)**	**Pass**
FCC Rules: 47CFR Part 15, Subpart C, Section 15.205(a) & (b)	**Radiated Emissions (TX Mode Spurious Emissions in Restricted Bands)** 14 MHz – 10,000 MHz	**Section 15.205 (a) & (b)**	**Pass**
FCC Rules: 47 CFR Part 15, Subpart C, Section 15.215 and 15.249(d)	**Occupied Bandwidth and Band Edge Compliance**	**Sections 15.215 and 15.249(d)**	**Pass**

The signed original of this report, supplied to the client, represents the only "official" copy. Retention of any additional copies (electronic or non-electronic media) is at Acme Testing Co.'s discretion to meet internal requirements only. The client has made the determination that EUT Condition, Characterization, and Mode of Operation are representative of production units, and meet the requirements of the specifications referenced herein.

Consistent with Industry practice, measurement and test equipment not directly involved in obtaining measurement results but having an impact on measurements (such as cable loss, antenna factors, etc.) is factored into the "Correction Factor" documented in certain test results. Instrumentation employed for testing meets tolerances consistent with known Industry Standards and Regulations.

The measurements contained in this report were made in accordance with the referenced standards. Acme Testing Co. assumes responsibility only for the accuracy and completeness of this data as it pertains to the sample tested.

REVIEWED AND APPROVED BY:

Harry H. Hodes
President/CEO
Principal EMC Engineer

17 MARCH 2003
Date of Issuance

3. Description of Equipment and Peripherals

3.1 Equipment Under Test (EUT)

Device: NEMA Enclosure-Mounted Fixed UHF Intelligent Long Range Interrogator System with AC - DC Power Supply
Model Number: i-Port III
Note: The EUT consists of: the i-Port III Fixed UHF Interrogator Unit, an AC-DC "Brick" Power Supply, (both installed in a modified NEMA Enclosure) and, Quantity = 5 Rectangular Patch Antennas.

i-Port Fixed UHF Interrogator Unit

Serial Number: 02394P0128
FCC ID: 02E-ILR-916IP3 (being applied for)
Power: 120 V/60 Hz
Grounding: None*
Size: 19 cm x 21 cm x 5.5 cm
* Note: The i-Port III is floating relative to the NEMA Enclosure and relative to the output side of the AC-DC Power Supply.

AC-DC Power Supply

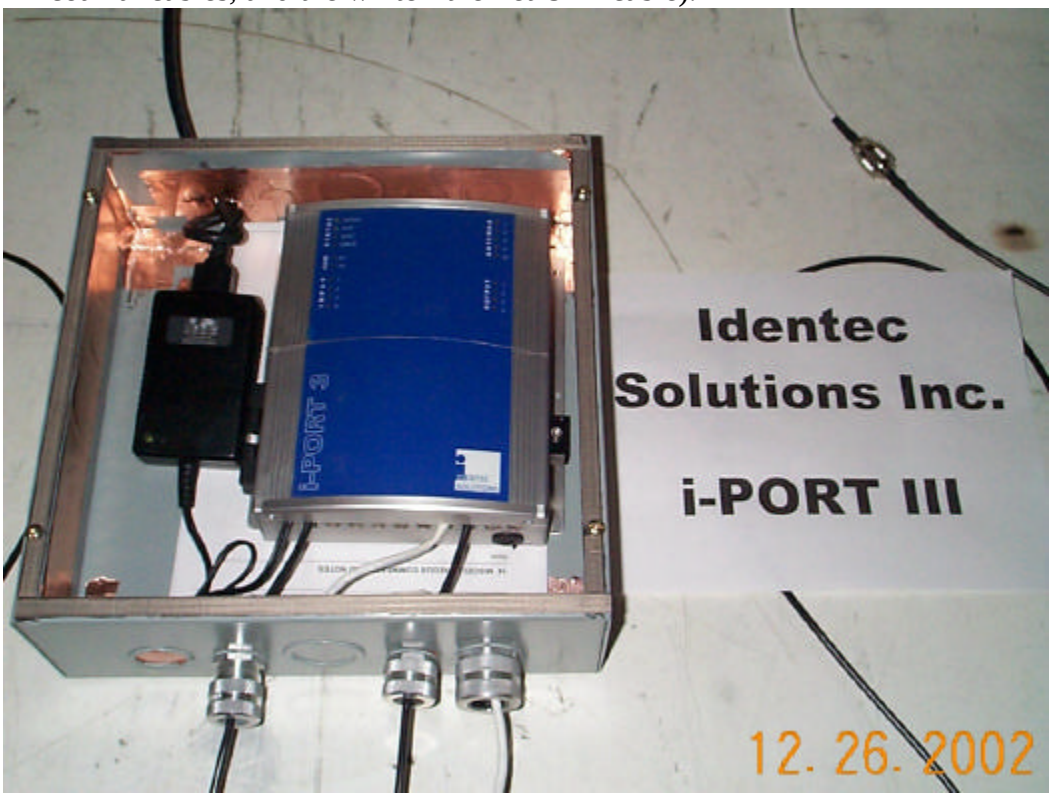
Model Number: HUP24-12B2
Serial Number: 01024636
FCC ID: None
Power: 120 V/60Hz
Grounding: Via the Protective Earth (Ground) prong of the 3-Wire AC Plug
Size: 10.5 cm x 6.5 cm x 3 cm

Antennas:

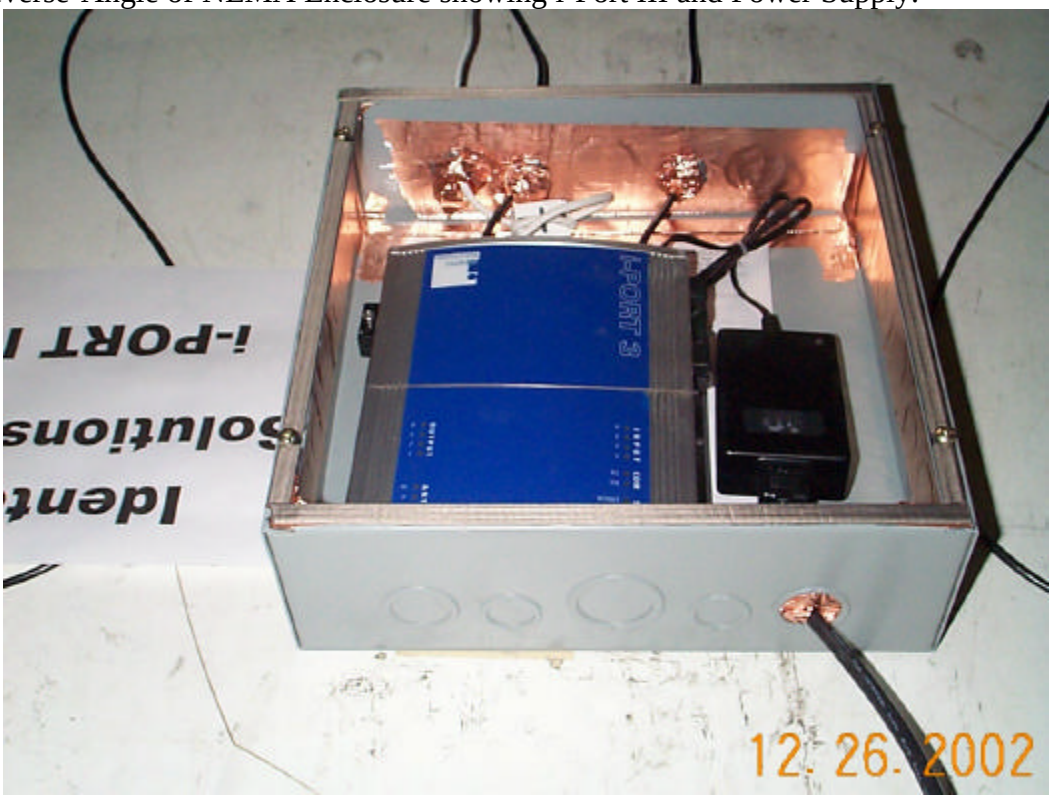
Type: Regular Patch
Quantity: 5 (all identical)
Model Number: S9028PC (Manufactured by Cushcraft)
Note: One antenna is designated the "wake-up" antenna, it is a transmit – only antenna. The other four are identical Transmit/Receive antennas. They are multiplexed to one RF Source.

Exterior View of the i-Port III and Power Supply installed in NEMA Enclosure:

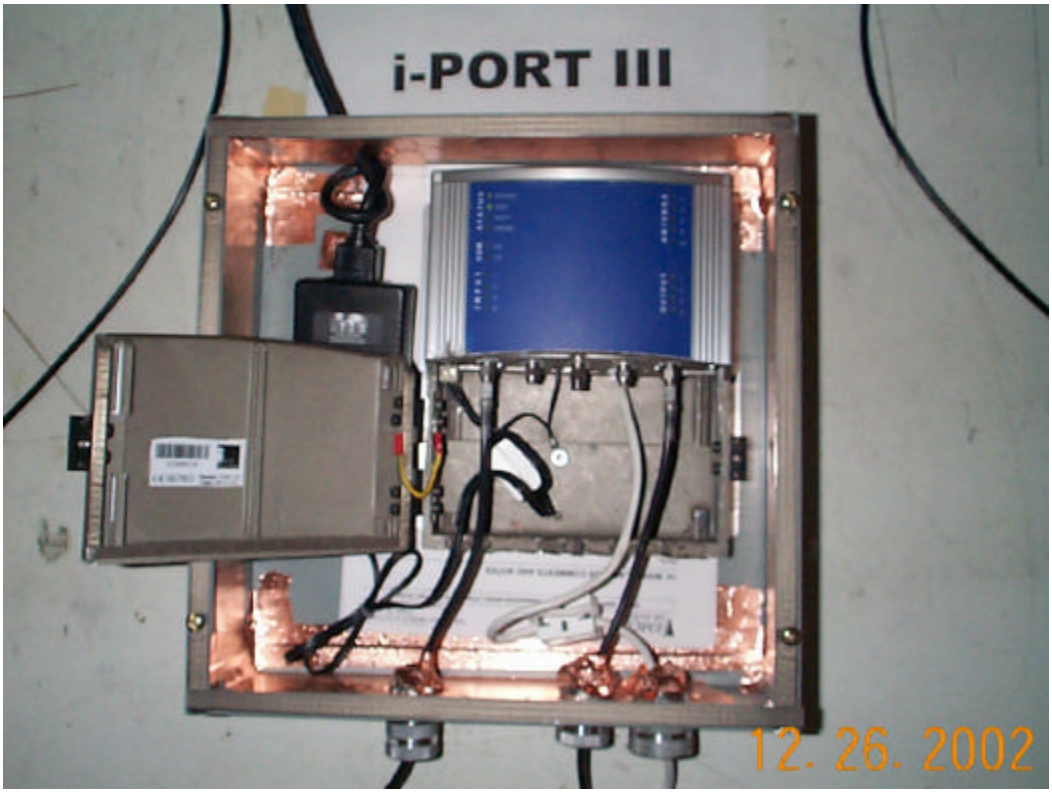
Interior view of NEMA Enclosure showing i-Port III, Power Supply and paper insulating stand off (to float the i-Port III relative to the NEMA Enclosure). Also, note the DC Input Cable (on left side), the two Black RF coaxial cables, and the white Ethernet UTP cable).



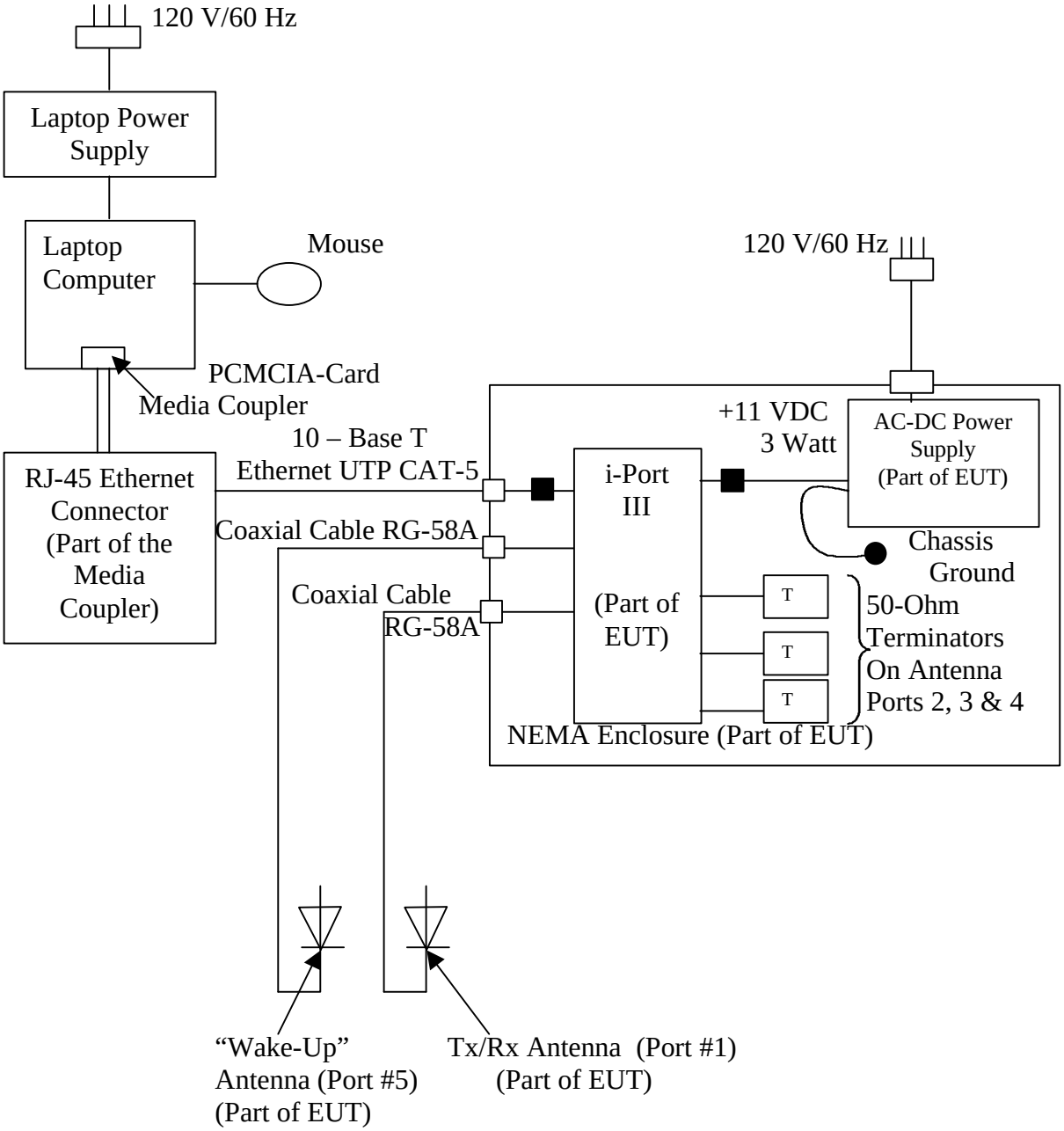
Interior Reverse-Angle of NEMA Enclosure showing i-Port III and Power Supply.



Interior view of NEMA Enclosure, showing the access door of the i-Port III in an "Open" state. Note the bond straps connecting both the door and the RF Bulk Lead of the i-Port III to the i-Port III Chassis. Also, note the RF gasketing on the door edges and on the chassis edges.



3.2 Test Setup Block Diagram



3.3 Support Equipment Used During Testing

Device	Manufacturer	Model Number	FCC ID	Serial Number
Laptop Computer	Panasonic	CF-47	D.O.C.	CF-47LYAGAEM
Laptop Power Supply	Panasonic	CF-AA1639A	None	010106575A
Media Coupler	Network Everywhere	NP10TC	None	None
Mouse	IBM	MU293	D.O.C.	23-011171

3.4 Description of Interface Cables Used During Testing

i-Port III/AC-DC Power Supply

Shielded	Unshielded	Flat	Round	Length	Ferrite
No	Yes	Yes	No	0.7 m	Yes*

AC-DC Power Supply/AC Mains Input Power (120 V/60 Hz)

Shielded	Unshielded	Flat	Round	Length	Ferrite
No	Yes	Yes	No	1.8 m	No

i-Port III TX-RX Antenna Port (Antenna Port #1)/Antenna #1 (RG-58A Coaxial Cable)

Shielded	Unshielded	Flat	Round	Length	Ferrite
Yes	No	No	Yes	3.3 m	No

i-Port III Wake-up Antenna Port (Antenna Port #5)/Antenna #5 (RG-58A Coaxial Cable)

Shielded	Unshielded	Flat	Round	Length	Ferrite
Yes	No	No	Yes	3.3 m	No

i-Port III/Media Coupler (CAT 5 UTP Ethernet Cable)

Shielded	Unshielded	Flat	Round	Length	Ferrite
No	Yes	No	Yes	14 m	Yes*

Media Coupler RJ-45 Ethernet Connector/Laptop Computer

Shielded	Unshielded	Flat	Round	Length	Ferrite
Yes	No	No	Yes	0.13 m	No

Laptop Computer/Laptop Power Supply

Shielded	Unshielded	Flat	Round	Length	Ferrite
No	Yes	Yes	No	1.8 m	Yes

Laptop Power Supply/AC Mains Input Power (120 V/60 Hz)

Shielded	Unshielded	Flat	Round	Length	Ferrite
No	Yes	Yes	No	1.8 m	No

Laptop Computer/Mouse

Shielded	Unshielded	Flat	Round	Length	Ferrite
Yes	No	No	Yes	1.8 m	No

* Steward Part # 28A2029-0A0

ARRANGEMENT OF INTERFACE CABLES: All interface cables were positioned for worst-case maximum emissions within the manner assumed to be a typical operation condition (please reference photographs).

3.5 Mode of Operation During Testing

The EUT had three modes. Specifically, these were: Transmit [Tag ID Only Mode], Transmit [Tag ID Plus Data Mode], and Receive Mode. For the purposes of Intentional Radiator testing of the i-Port III (in the Transmit Tag ID-Only Mode and, the Transmit Tag ID Plus Data Mode), the applicable transmit Mode was selected by downloading commands through the RS-232 serial port to the CPU in the i-Port III.

It should be noted that the i-Port III was designed to operate with quantity = 5 antennas. Each antenna was identical; they were all Rectangular Patch antennas. The internal configuration of the i-Port III was such that one antenna operated from a "Transmit Only" path. This antenna was designated the "Wake-up" antenna. The other four antennas were attached to an internal 4-port multi-coupler. Each of these four ports were identical; consequently only one of these four ports was populated with an rectangular patch antenna and tested. The remaining three ports were terminated with 50-Ohm resistive termination loads.

3.6 Modifications Required for Compliance

i-Port III

The i-Port III required no modifications in order to comply with the FCC Rules for Intentional Radiators under 47CFR Part 15 Subpart C, Section 15.249.

Note: The i-Port III required substantial modifications in order to comply with the FCC Rules for Unintentional Radiators (i.e. 47CFR Part 15 Subpart B, Section 15.109). See Section 14.6 of the Test Report for details.

4. Antenna Requirement

4.1 Regulation (47 CFR Part 15 Subpart C, Section 15.203):

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of Part 15C. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiator that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in the Part are not exceeded.

4.2 Result

Each of the five antennas that are used in this system are required to be professionally installed.

It should be noted that the i-Port III is a part of a complex inventory-tracking system that is installed only by Identec personnel; each installation includes software that is customized to each specific installation. Consequently, the i-Port III system complies with the “Professional Installation” exemption to the Unique-Connector Rule given in 47 CFR Part 15 Subpart C, Section 15.203.

5. Conducted Emissions Tests

Test Requirement: FCC Rules: 47CFR Part 15, Subpart C, 15.207

Test Procedure: ANSI C63.4 - 1992

Date of Test: 24 December 2002

Laboratory: Test Site #2 (Acme, WA)

5.1 Test Equipment

⇒ Spectrum Analyzer (blue): Hewlett-Packard 8566B, Serial Number 2410A00168, Calibrated: 17 April 2002, Calibration Due Date: 17 April 2003
⇒ RF Preselector (blue): Hewlett-Packard 85685A, Serial Number 2648A00519, Calibrated: 17 April 2002, Calibration Due Date: 17 April 2003
⇒ Quasi Peak Adapter (blue): Hewlett-Packard 85650A, Serial Number 2043A00327, Calibrated: 17 April 2002, Calibration Due Date: 17 April 2003
⇒ Line Impedance Stabilization Networks: Solar Type 9408-50-R-24-BNC, Serial Number941702, Calibrated: 08 November 2002, Calibration Due Date: 08 November 2003
⇒ Transient Limiter: Hewlett-Packard 11947A, Serial Number 3107A01879, Calibrated: 25 April 2002, Calibration Due Date: 25 April 2003
⇒ Line Conduction Test Site: Acme Testing Co., Test Site Number 2, Calibrated: 22 June 2002, Calibration Due Date: 22 June 2003

5.2 Purpose

The purpose of this test was to evaluate the level of conducted noise the EUT imposed on the AC Mains.

5.3 Test Procedures

The EUT was placed on a 1 meter long by 1.5 meters wide and 0.8 meter high nonconductive table that was placed directly on a flush-mounted turntable. The EUT was connected to its associated support equipment, with any excess I/O cabling bundled to approximately 1 meter. The EUT was connected to a dedicated LISN and all support equipment were connected to a second separate LISN circuit. The LISNs were bonded to the groundplane.

Prescan tests were performed to determine the “worst-case” mode of operation. With the EUT operating in “worst-case” mode, final conducted measurements were taken. Conducted measurements were made on each current carrying conductor with respect to ground.

Conducted Emissions Test Characteristics	
Frequency range	0.15 MHz - 30.0 MHz
Test instrumentation resolution bandwidth	9 kHz
Lines Tested	Line 1/Line 2

5.4 Test Results

A summary of the 9 (nine) highest amplitude conducted emissions is listed below.

FCC RULES: 47CFR PART 15, SUBPART C, SECTION 15.207,
CONDUCTED EMISSIONS
(0.15 MHz TO 30 MHz) 60 Hz/120 VAC

TX, Tag ID Only Mode

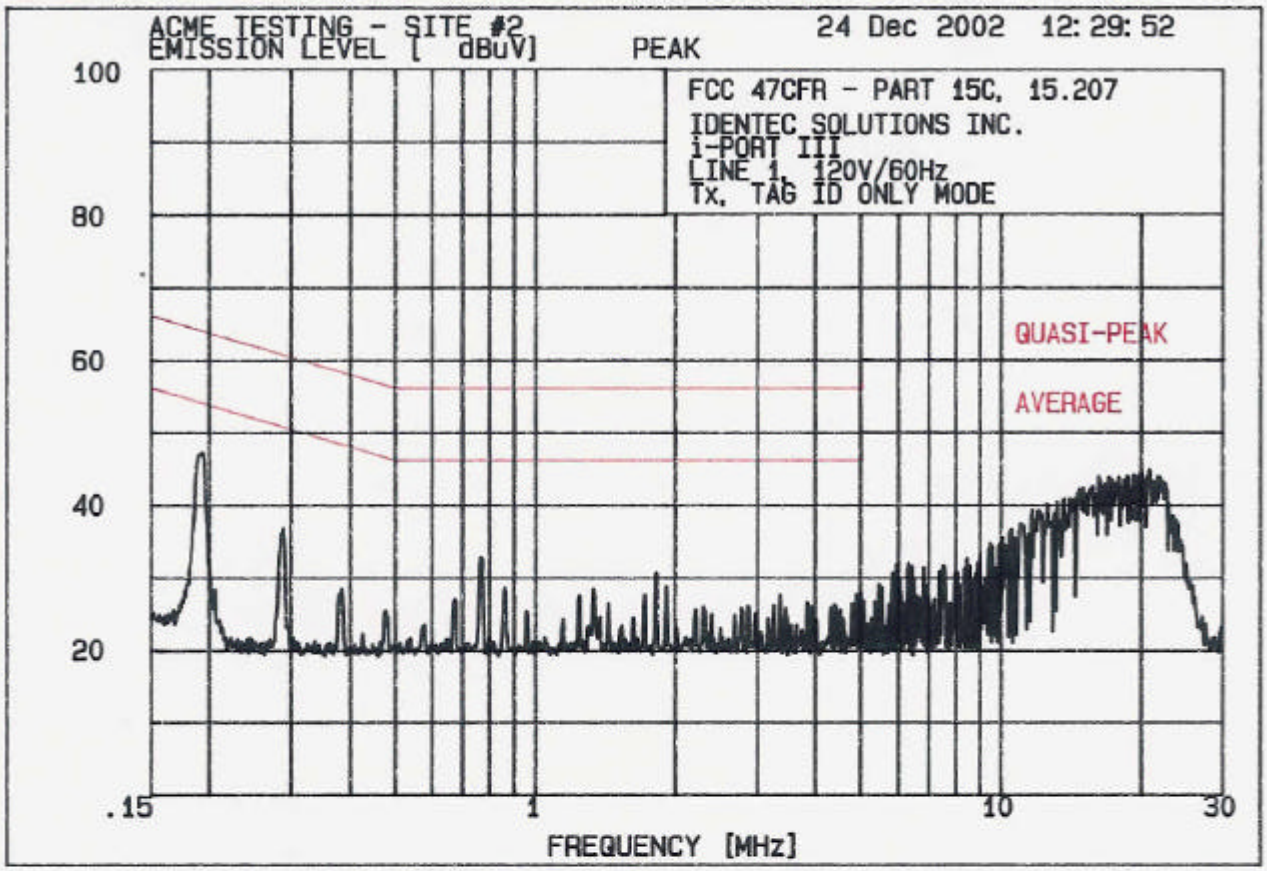
LINE 1 "HOT"

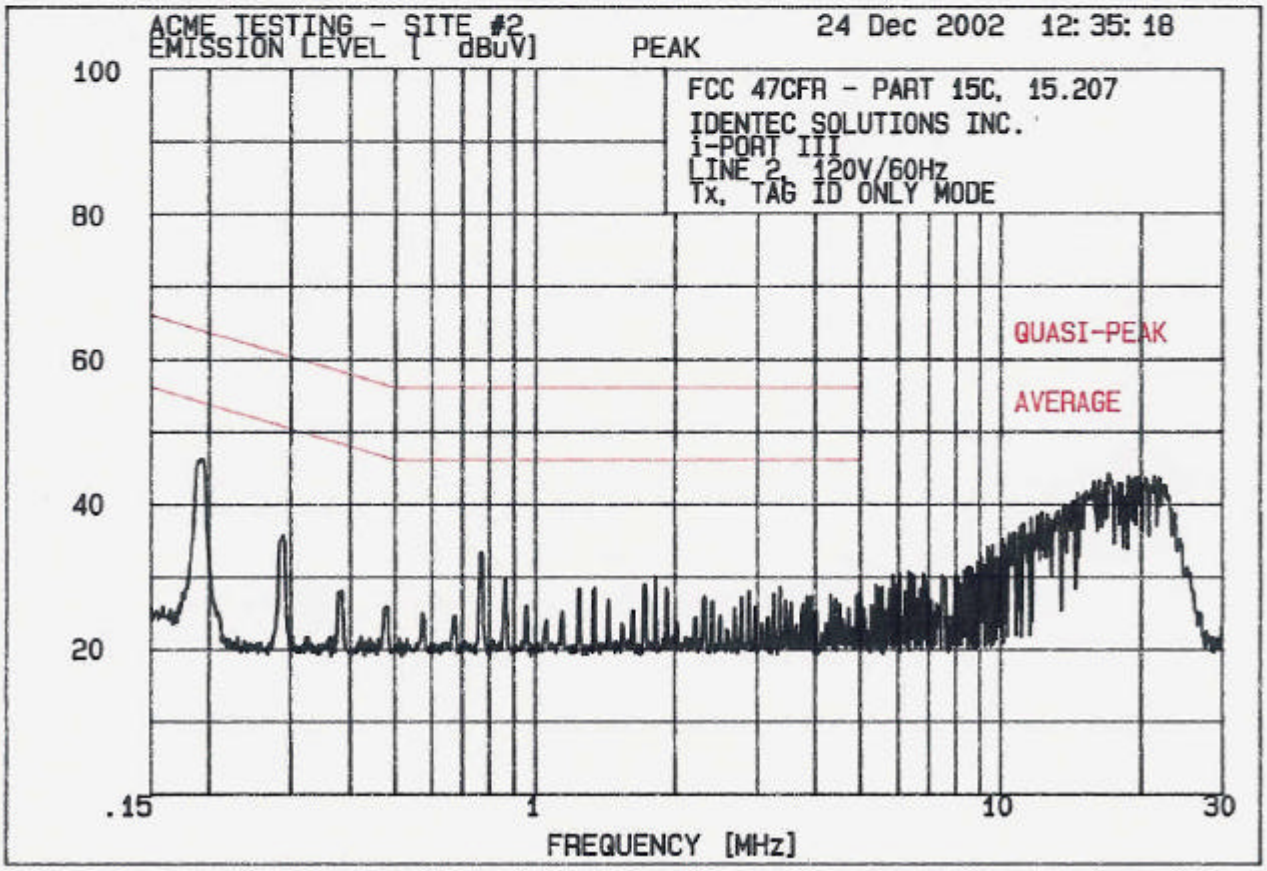
PEAK #	FREQ. (MHz)	AMPL (dBµV)
1	0.1934	47.2
2	16.24	43.9
3	17.12	43.8
4	17.95	43.8
5	18.73	43.9
6	19.33	44.1
7	19.85	44.2
8	20.06	44.6
9	20.82	44.9

LINE 2 "NEUTRAL"

PEAK #	FREQ. (MHz)	AMPL (dBµV)
1	15.9	43.1
2	16.32	43.3
3	17.12	44.2
4	18.83	43.8
5	19.44	43.6
6	19.75	43.7
7	20.49	43.6
8	21.38	43.8
9	21.95	43.6

The EUT complied with the Conducted Emissions Limits specified in 47CFR Part 15 Subpart C Section 15.207.


ACME TESTING - SITE #2
EMISSION LEVEL [dBuV]
PEAK
24 Dec 2002 12:29:52
FCC 47CFR - PART 15C, 15.207
IDENTEC SOLUTIONS INC.
i-PORT III
LINE 1, 120V/60Hz
Tx, TAG ID ONLY MODE
QUASI-PEAK
AVERAGE
100
80
60
40
20
.15
1
10
30
FREQUENCY [MHz]


ACME TESTING - SITE #2
EMISSION LEVEL [dBuV]
PEAK
24 Dec 2002 12:35:18
FCC 47CFR - PART 15C, 15.207
IDENTEC SOLUTIONS INC.
i-PORT III
LINE 2, 120V/60Hz
Tx, TAG ID ONLY MODE
QUASI-PEAK
AVERAGE
100
80
60
40
20
.15
1
10
30
FREQUENCY [MHz]

A summary of the 8 (eight) highest amplitude conducted emissions is listed below.

FCC RULES: 47CFR PART 15, SUBPART C, SECTION 15.207,
CONDUCTED EMISSIONS
(0.15 MHz TO 30 MHz) 60 Hz/120 VAC

TX, Tag ID with Data Mode

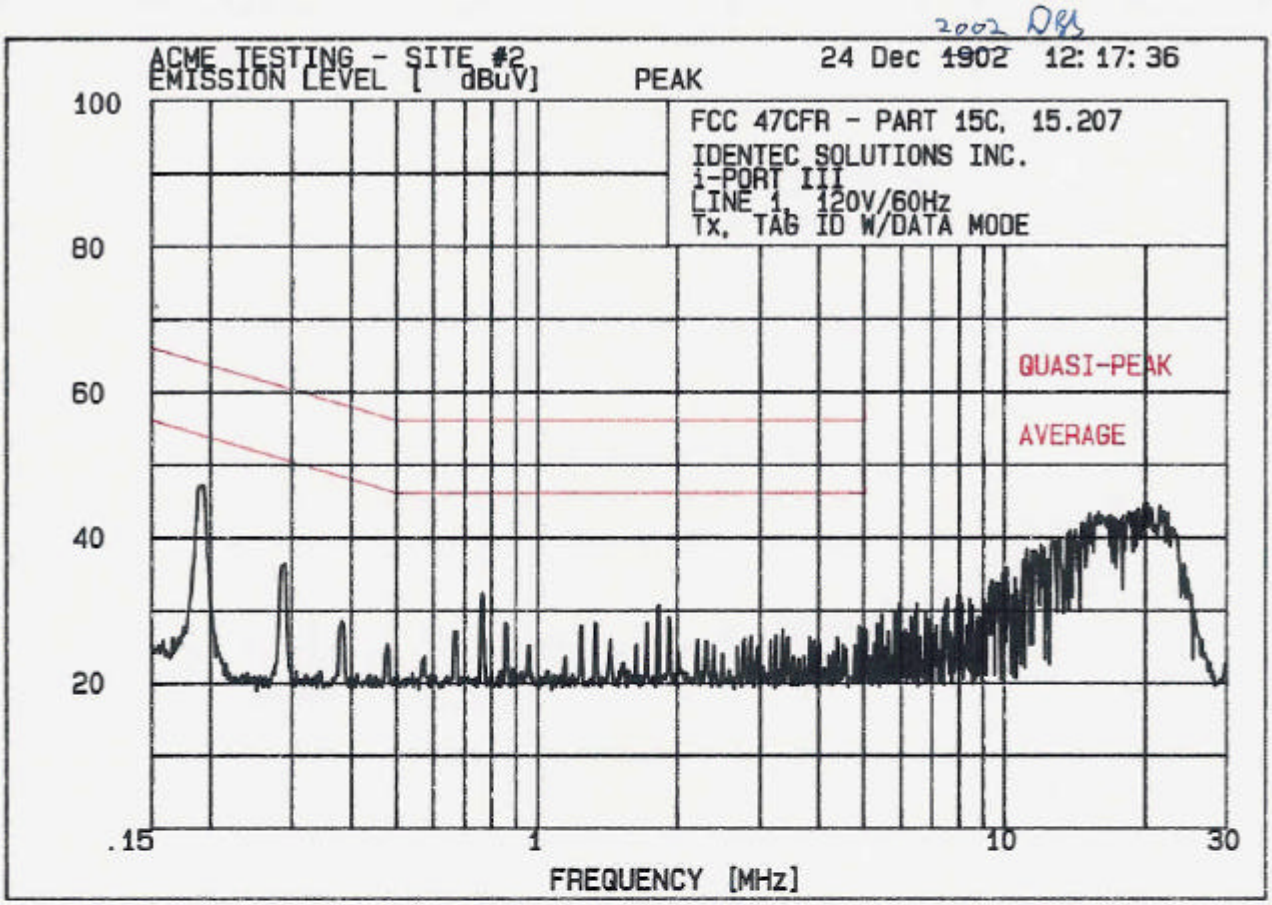
LINE 1 "HOT"

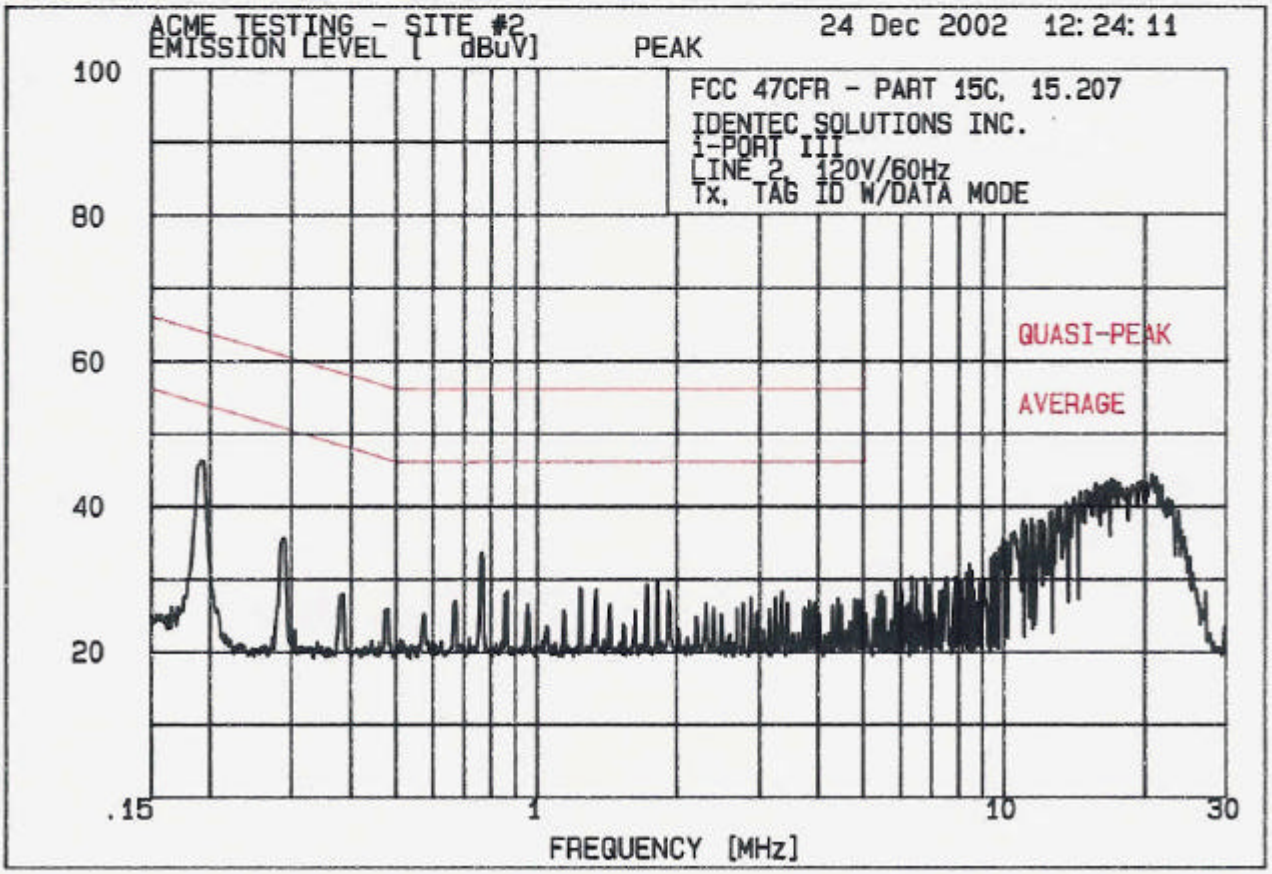
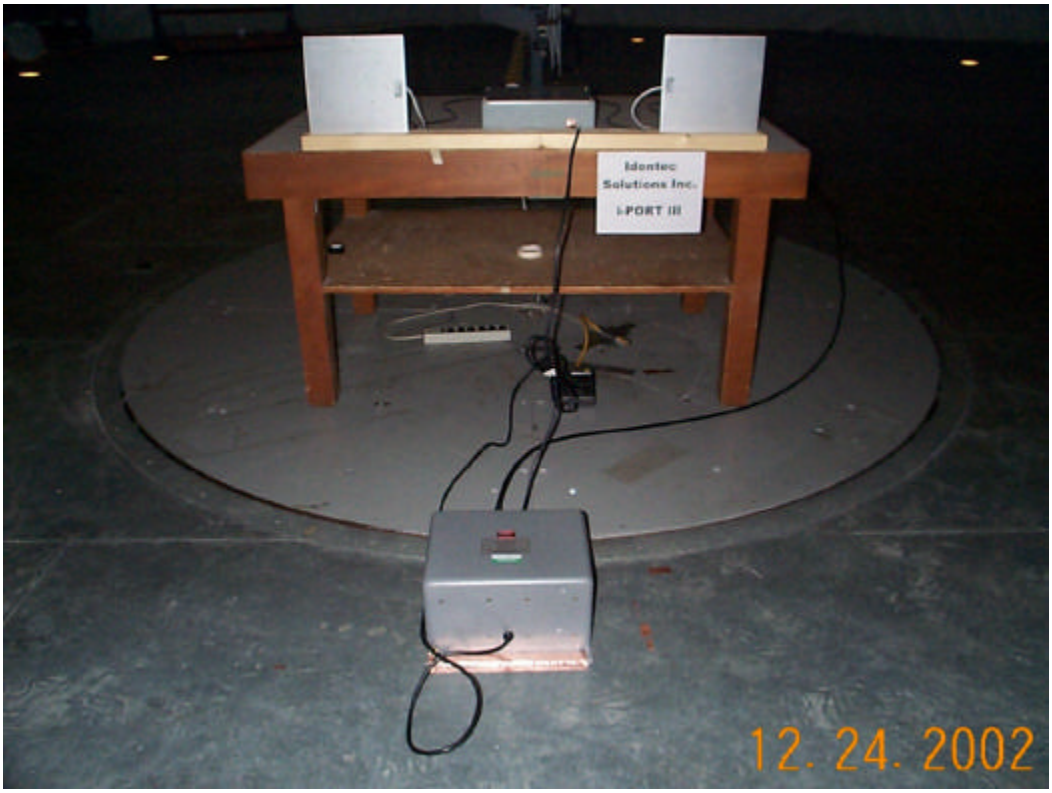
PEAK #	FREQ. (MHz)	AMPL (dBµV)
1	0.1934	47.2
2	15.24	43.2
3	15.98	43.4
4	18.53	43.4
5	19.03	43.4
6	19.44	43.9
7	20.28	44.7
8	21.61	44.3

LINE 2 "NEUTRAL"

PEAK #	FREQ. (MHz)	AMPL (dBµV)
1	0.1924	46.3
2	13.63	40.6
3	14.15	41.2
4	14.6	42.0
5	15.81	43.1
6	16.67	43.3
7	17.03	43.8
8	20.82	44.4

The EUT complied with the Conducted Emissions Limits specified in 47CFR Part 15 Subpart C Section 15.207.


2002 DB
ACME TESTING - SITE #2
EMISSION LEVEL [dBuV]
PEAK
24 Dec 1902 12:17:36
FCC 47CFR - PART 15C, 15.207
IDENTEC SOLUTIONS INC.
i-PORT III
LINE 1, 120V/60Hz
Tx, TAG ID W/DATA MODE
QUASI-PEAK
AVERAGE
100
80
60
40
20
.15
1
10
30
FREQUENCY [MHz]


ACME TESTING - SITE #2
EMISSION LEVEL [dBuV]
PEAK
24 Dec 2002 12:24:11
FCC 47CFR - PART 15C, 15.207
IDENTEC SOLUTIONS INC.
i-PORT III
LINE 2, 120V/60Hz
Tx, TAG ID W/DATA MODE
QUASI-PEAK
AVERAGE
100
80
60
40
20
.15
1
10
30
FREQUENCY [MHz]

5.5 Test Setup Photographs