Test Site Services. Inc.

NVLAP Lab Code 100419-0

EMI Test Report

For Amperion

Model Amperion PLC System

Radiated & Conducted Emissions

FCC Part 15 B, C

Test # B03093

Test Site Services, Inc.
P.O. Box 766
Marlboro, MA 01752
U.S.A.
Phone/Fax: (508) 481-1684

Table of Contents

ELA No. 174

EMC001677-NE
EMC000142-NE

Reg. No. R-1145
Reg. No. C-1205

BSMI Lab No. SL2-IN-E-1018

Cert. No. 00-016

Reg. No. 91007
Reg. No. 91008

Test Site Services
Test Report
for
Amperion

Test Number : B03093

Product Name : Amperion PLC System

Regulation : FCC, Part 15 Subpart B, C(U.S.)

Date : 17-Mar 03 thru 02-Apr-03

Report Reviewed
& Accepted by: _____

Amperion
250 Apollo Drive
Chelmsford, MA 01824
Phone:1-978-250-1110
Fax :1-978-256-0180

Report Issued By: _____

Richard L. Wiedeman, Laboratory Director

Test Engineers:

Robert Howland and Kenneth Klimasewski

This test report is not valid without the signatures of Test Site Services, Inc. personnel.

Administrative Data

Regulation	: FCC, Part 15 Subpart B, C (U.S.)	
	: Section 15.31(f)(1), 15.107, 15.109, 15.209	
Level	: Class B	
Test Method	: ANSI C63.4 (1992)	
Test Type	: Field Verification of Complete System	
Manufacturer	: Amperion	
EUT Type/Model #	: PLC System / Lynx, Falcon	
Date(s) of Test		
Customer Personnel	: Gerrett Durling	Principal Reg. Engineer
TSS Personnel	: R. Wiedeman	EMC Engineer
	: Robert Howland	Test Engineer
	: Kenneth Klimasewski	Test Engineer

Test Location

In-Situ Testing in
Dublin, OH. (American Electric Power)
Raleigh, NC.(Progress Energy)
Allentown, PA.(Pennsylvania Power and Light)

NOTICE	: FCC Rule 2.955 requires that a Verification Report for a Class A Computing Device must be signed by "an Official of the Company responsible for the device". A signature block has been provided on the first page for this purpose.

EUT Description

The EUT (Model Amperion PLC System) Power Line Carrier System. See individual reports.

A complete description of the EUT may be found on Block Identifier1 page.

The tests were run in a typical configuration including the following:

1) Overhead Components:
2) Falcon Injector
3) Falcon Extractor
4) Falcon Repeater
5) Underground Components:
6) Lynx Injector
7) Lynx Extractor
8) Lynx Repeater
9) Lynx Power Supply
10) Lynx Installation Kit

REASON FOR TEST:

Field Verification of Complete System

CHANGES MADE DURING TEST:

None

DEVIATIONS FROM STANDARD TEST METHOD:

1) Voltage probes and Current clamps were used for Conducted Emissions.

Test Summary

The (Amperion PLC System) was tested to FCC Part 15 Subpart B,C. limits for FCC Class B equipment in the system configuration defined herein.

See attached individual reports for Data / Summaries for the following locations:

Dublin, OH. (American Electric Power)
Raleigh, NC.(Progress Energy)
Allentown, PA.(Pennsylvania Power and Light)

The following table indicates the margins (i.e. difference between measurement point and limit) of the six (6) worst case data points:

Block Diagram for Amperion PLC System

See attached individual reports for equipment configurations at each site.

EUT Technical Data

Description : Power line Carrier System

Manufacturer : Amperion

Power Rated : 100/240/277 VAC, 47, 63 Hz
: Inductively coupled from MV power lines for overhead units.
: Direct connect from transformer secondary for underground units.

System Components :

1)	Overhead Components:	Part Number	Revision Number
2)	Falcon Injector	890-0024-01	B
3)	Falcon Extractor	890-0024-02	A
4)	Falcon Repeater	890-0024-00	A
5)	Underground Components:		
6)	Lynx Injector	890-0007-01	D
7)	Lynx Extractor	890-0007-02	02
8)	Lynx Repeater	890-0007-00	D
9)	Lynx Power Supply	990-0014-00	01
10)	Lynx Installation Kit:		
11)	Lynx Injector	896-0007-01	-
12)	Lynx Extractor	896-0007-02	-
13)	Lynx Repeater	896-0007-00	-

Frequencies Generated (PLC):
PLC operates between 3.8-30. MHz
See attached individual reports for specific frequencies at each location.

Frequencies Generated (Unintentional):
20 MHz 80 MHz 133 MHz 266 MHz

Comments:

Operational Mode(s) During Test

Operational Modes Available: Provides two way internet access to residential and commercial subscribers.

Mode(s) Tested: Provides two way internet access to residential and commercial subscribers; only mode available.

Function: Passing actual customer data.

Data rates based on customer use at time of test.

See Manufacturers specification for maxim data rates / protocols.

Rational: Normal operation of hardware / network.

Test Equipment List

#	Equipment Type	Manufacturer	Model #	Serial #	Cal Date	Cal Due	Dublin	Raleigh	Alletown
1	Current Clamp	Emco	94606-1B	113	1/15/03	1/15/04			
2	Coax. Cable	?????	9222				X		X
3	Loop Antenna	Electro-Metrics	ALR-30	121	1/15/03	1/15/04	X		X
4	Biconical Ant.	Electro-Metrics	BIA-25C	2762	1/21/03	1/21/04	X		X
5	Log Peri. Ant	Electro-Metrics	LPA-25	1428	1/15/03	1/15/04	X		X
6	Receiver	Electro-Metrics	EMC-30	44117	12/16/02	12/16/03	X		X
7	Current Clamp	Electro-Metrics	PLC-25	031452	1/15/03	1/15/04			
8	Monopole Ant?	Electro-Metrics	RVR-30	120	1/15/03	1/15/04	X		
	Current Clamp	Emco	94606-1	1005	1/15/03	1/15/04			
10	Biconical Ant.	Electro-Metrics	BDA-25	343	3/5/03	3/5/04			
11	Current Clamp	Electro-Metrics	CT-4	9-473	1/15/03	1/15/04	X		X
12	Spectrum Anal.	H-P	8591E	3308A01215	11/27/02	11/27/03		X	
13	Current Clamp	FischerCC	F-33-1	367	8/12/02	8/12/03	X	X	
14	Current Clamp	FischerCC	F-35-1	41	2/02/03	2/02/04	X		
15	Preamplifier	MITEQ	AFS4-00101000-30-10P	241036	06/24/02	06/24/03	X	X	X
16	Cable	Pasternack	RG 214/U	NA	11/18/02	11/18/03		X	
17	Cable	Andrews	FSJ1P-50A-4B	NA	6/17/02	6/17/03	X	X	X
18	Horn Antenna	Emco	3115	9604-4783	7/31/02	7/31/03		X	
19	Loop Antenna	Emco	6502	9307-2841	1/21/03	1/21/04		X	
20	Biconical Ant.	Schwarzbeck	BBA 9106	102	6/4/02	6/4/03		X	
21	Log Peri. Ant.	Schwarzbeck	UHALP9107	0103	6/17/02	6/17/03		X	
22	Coax. Cable	Pasternak	RG 214/U	CO2100	11/18/02	11/18/03			
23	Coax. Cable	Andrews	FSJ4-50B	NA	4/7/2003	4/7/2004		X	
24	Spectrum Anal.	Advantest	R3261B	91720339	8/20/02	8/20/03	X	X	X

Yellow is AEP equipment

Appendix A Dublin, OH Test Report

Appendix B Raleigh, NC Test Report

Appendix C Allentown, PA Test Report

Appendix D Laboratory Conducted Emissions Data

Appendix E Measurement Facilities Information

MEASUREMENT FACILITIES INFORMATION

DESCRIPTION of MEASUREMENT FACILITIES -OATS

The Open Area Test Site (OATS) is composed of a building and associated ground screen with a control room underneath.

The building is a TUFF-SPAN enclosure constructed of fiberglass reinforced plastic materials which provide above-ground weather protection. These materials are non conductive, non magnetic and RF transparent. They do not impact the surrounding electromagnetic environment and are corrosion resistant. The enclosure size permits Ten Meter Radiated Measurements within its confines and utilizes a remote controlled Macton Turntable Assembly. The conductive turntable is 16 feet in diameter and capable of moving a 10,000 pound load a full 360 degrees of rotation. It is flush-mounted to the ground screen and edge bonded circumferentially to the ground screen with beryllium copper "fingers". The ground screen is constructed of welded wire mesh lying directly on top of a concrete-over-steel foundation. The screen is extended beyond the building itself to provide 30 meter measurement capability when needed. There are no reflecting objects within the required obstruction free oval area.

The control room is located beneath the ground screen level with stairwell access to the ground plane area. An elevator is located beyond the ground screen and provides access to the control room, shipping dock and ground screen areas for large sized EUT's. Primary power cabling to the EUT is fed through a hole in the center of the table along with necessary EUT/Support Equipment interface cabling. A remote controlled EMCO Antenna Mast Assembly is located on the ground screen. It provides the operator with adjustable antenna height over the 1 meter through 4 meter range as well as allowing both horizontal and vertical polarizations at any height.

A conducted emissions measurement area is located in a shielded room and consists of a conductive (galvanized sheet metal) wall 20' wide x 8' high with a metal floor bonded to the wall. AC Power is supplied through receptacles located on the vertical wall. Each receptacle is adequately filtered using Shielded Room EMI Power Line Filters (Rayproof 1B42 Units) which provide 100 db attenuation over the 14KHz to 10GHz frequency range. The shielded room itself is bonded directly to earth ground.

Additionally, both the control room/shielded rooms and ground plane area have heating, air conditioning and relative humidity controlled environments.

Capability

Test Site Service's open area Test Sites have been evaluated in accordance with ANSI C63.4 procedures and found to be in compliance with ANSI C63.4-(1992) Site Attenuation and LISN requirements.

In addition, Test Site Services is Assessed and Approved annually by a European Competent Body to assure competence in testing products for CE Mark Compliance (Emissions and Immunity).

All of Test Site Service's measurement facilities meet the technical requirements for qualification testing of products to FCC, CISPR, IEC, VCCI, BSMI and other International Standards.

Accreditations / Approvals

- FCC Registered (Registration # 91007 & #91008)
- Industry Canada RSS-212 (File # IC4276)
- VCCI Registered (Registration # R-1145, C-1205)
- BSMI Accreditation (Reference # SL2-IN-E-1018)
- NVLAP Accredited (Radiated and Conducted Emissions Tests Only) (Lab Code # 100419-0)
- Australia (ACA), MRA / NVLAP
- New Zealand (Ministry of Commerce), MRA / NVLAP
- U.S. Conformity Assessment Body (CAB), EMC Directive 89/336/EEC
- Competent Body Assessment / Approval (Technology International, UK)(File# TSS-031899)
- Competent Body Assessment / Approval (Nemko AS, Norway) (Aut. # ELA174)
- Competent Body Assessment / Approval (TUV Rhineland)
- NCC-OCD / Anatel (Brazil / Latin America)
- NARTE certified EMC Technicians & Engineers (ATL-0122T, ATL-0025T, EMC-001677NE, EMC-000142NE)

Note**: Certificate(s) Available Upon Request**

TEST SITE SERVICES, INC.

PO BOX 766

MARLBORO, MA 01752

(508)634-3444

EMC Facility Client Satisfaction Questionnaire

Thank you for choosing to use the Test Site Services EMC test facilities to test your product. Client satisfaction is very important to Test Site Services. To help serve you fully and continue to make improvements in our service, we need your feedback and comments on the service we performed for you today. We would appreciate your taking a few moments to complete this questionnaire.

1. Did scheduling meet your needs _____

2. Test operator support _____

3. Personnel attitude _____

4. Efficiency of test process _____

5. Work completed in a timely manner _____

6. Report received in a timely manner _____

7. Report content and clarity _____

8. Overall rating _____

9. Additional Comments:_____

_____

_____

Test Date: / / Completed By: _____

_ _

Please return to: *Lab Manager (At Test Site)* or *Richard L. Wiedeman*
President
Test Site Services, Inc.
PO Box 766
Marlboro, MA 01752