TEST REPORT

Report Number: 100016744ATL-002

February 28, 2010

Product Designation: VersaRouter 800 & 900

Standard: CFR, Title 47, Chapter I, Part 15 Subpart B (USA)
ICES-003, Issue 4, 2004 (Canada)

Tested by:
Intertek Testing Services NA Inc.
1950 Evergreen Blvd., Suite 100
Duluth, GA 30096

Client:
Nivis LLC
1000 Circle 75 Parkway
3rd Floor
Atlanta, GA 30339
Contact: Dean Carpenter
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Tests performed by:

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EMC Project Engineer

Report reviewed by:

Jeremy O. Pickens
EMC Department Engineer

1.0 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 3.0. The remaining test sections are the verbatum text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product tested complies with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested.

2.0 Test Summary

Section	Test Full Name	Test Date	Result
4.0	System setup including cable interconnection details, support equipment and simplified block diagram. (System Setup)		
5.0	Radiated emissions (E-field) (Radiated Emissions)	02/04/2010	PASS
NA	Conducted emissions on AC power lines (Conducted Emissions) was waived due to the EUT is a POE only device.		

3.0 Description of Equipment Under Test

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
Router	Nivis LLC	VersaRouter 800 & 900	NA

EUT receive date:	02/03/2010
EUT receive condition:	Good

Description of EUT provided by Client:
The VR800 and VR900 are all-in-one routers (VR900 includes the enclosure) that include the system/network manager, security manager, integration interface, modbus TCP support and the Nivis Monitor Control System (MCS). The MCS provides real time network and status information about the sensors, gateway, etc. Both routers enable industrial routing of sensor data, enabling customers to easily obtain and manage important data about their operating environment.

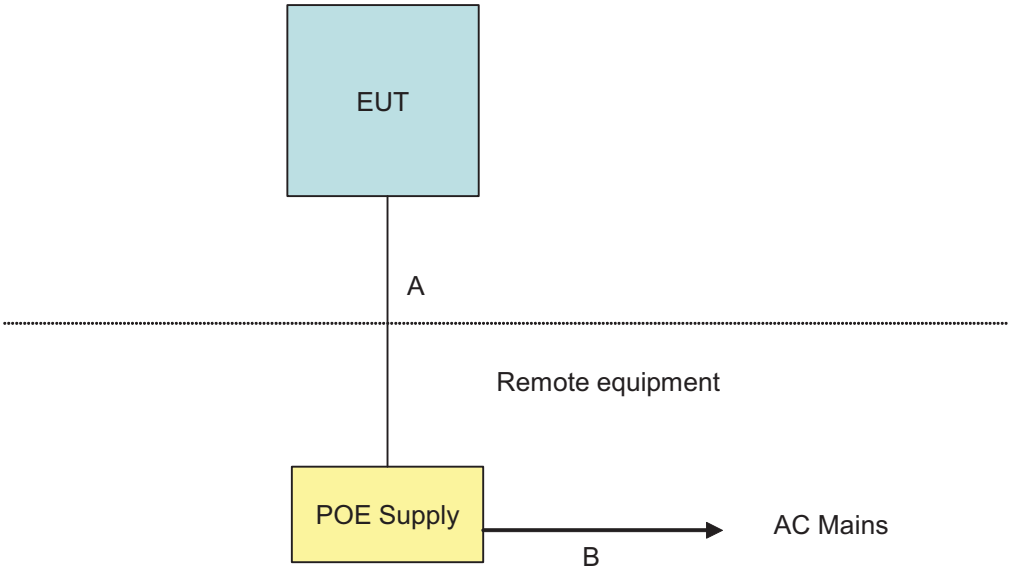
Description of EUT exercising:
The device was communicating data packets while the Transmitter was in standby mode.

4.0 System setup including cable interconnection details, support equipment and simplified block diagram. (System Setup)

Method:

Record the details of EUTcabling, document the support equipment, and show the interconnections in a block diagram.

Drawing:



Simplified Block Diagram

4.0 System setup including cable interconnection details, support equipment and simplified block diagram. (System Setup)

Data:

EUT Cabling						
					Connection	
ID	Description	Length	Shielding	Ferrites	From	To
A	RJ45	10m	No	No	EUT	POE Supply
B	Power cord	1.5m	No	No	POE Supply	AC Mains

Support Equipment			
Description	Manufacturer	Model Number	Serial Number
POE Power Supply			

5.0 Radiated emissions (E-field) (Radiated Emissions)

Method:

Measurements in the frequency range of 30 MHz to 1000 MHz shall be performed with a quasi-peak detector instrument that meets the requirements of Section One of CISPR 16. Above 1000 MHz, a peak detector shall be used. Peak values converted to average by appying the duty cycle correction factor, when applicable. When an average detector is used, it shall meet the requirements of Section One of CISPR 16. The measuring antenna shall correlate to a balanced dipole.

Bandwidths:
30 MHz to 1000 MHz: 120 kHz RBW and 1 MHz VBW
Above 1000 MHz: 1 MHz RBW and 3 MHz VBW

Measurements of the radiated field are made with the antenna located at a distance of 3 or 10 meters from the EUT. The limit applied to the measurement shall be appropriate for the test distance. The test distance shall be indicated in the results section.

The EUT shall be arranged and connected with cables terminated in accordance with the product specification.

Exploratory tests should be carried out while varying the cable positions to determine the maximum or near-maximum emission level. During manipulation, cables shall not be placed under or on top of the system test components unless such placement is required by the inherent equipment design.

The antenna shall be adjusted between 1m and 4m in height above the ground plane for maximum meter reading at each test frequency.

The antenna-to-EUT azimuth shall be varied during the measurement to find the maximum field-strength readings.

The antenna-to-EUT polarization (horizontal and vertical) shall be varied during the measurements to find the maximum field-strength readings.

If the EUT is intended for tabletop use, it shall be placed on a table whose top is 0.8m above the ground plane. The table shall be constructed of non-conductive materials. Its dimensions are at least 1m by 1.5m, but may be extended for larger EUT.

If EUT is floor standing, the EUT was placed on a horizontal metal ground plane and isolated from the ground plane by up to 12 mm of insulating material.

Equipment setup for radiated disturbance tests shall follow the guidelines of ANSI C63.4:2003.

TEST SITE
The test site for radiated emissions is located at 1950 Evergreen Blvd, Suite 100, Duluth, Georgia 30096. It is a 10 meter semi-anechoic chamber manufactured by Panashield. Embedded in the floor is a 3 meter diameter turntable.

A2LA: 1455.01
IC: 2077-1
VCCI Registration Number: R-2570

MEASUREMENT UNCERTAINTY
Compliance of the product is based on the measured value. However, the measurement uncertainty is included for informational purposes. The values given are the measurement uncertainty values with an expanded uncertainty of k=2.
30 MHz to 1000 MHz at 3 meters: +/- 3.9 dB
30 MHz to 1000 MHz at 10 meters: +/- 3.6 dB
1 GHz to 18 GHz at 3 meters: +/- 4.2 dB

Test Equipment Used:

Description:	Manufacturer:	Model:	Asset Number:	Cal Date:	Cal Due:
Antenna, BiLog, 20-2000MHz	Chase	CBL6112B	211386	10/02/2009	10/02/2010
Antenna, Horn, <18 GHz	EMCO	3115	213061	04/30/2009	04/30/2010
Cable E01, <18GHz	Pasternack	RG214/U	E01	05/04/2009	05/04/2010
Cable MP3, 18 GHz, N, 10m	Megaphase	G919-NKNK-394	MP3	05/04/2009	05/04/2010
Cable, 7 meters, 1-18GHz	Storm Products Co.	PR90-241-7MTR	ST-2	08/18/2009	08/18/2010
Cable, N-N 3 meters, 18GHz	Megaphase	TM18 NKNK 118	E203	05/12/2009	05/12/2010
Cable, N-N, 3 meters, 18GHz	Megaphase	TM18-NKNK-118	E205	05/12/2009	05/12/2010
EMI Receiver	Hewlett Packard	8546A	213109	10/06/2009	10/06/2010
EMI Receiver, Preselector section	Hewlett Packard	85460A	213108	10/06/2009	10/06/2010
Excel spreadsheet for radiated emissions	Software	Excel - RE Worksh	SW004	12/09/2009	12/09/2010
Preamplifier, 10 MHz to 2000 MHz, 27 dB gain	Mini-Circuits	ZKL-2	200074	09/17/2009	09/17/2010
Preamplifier, 20 MHz to 18 GHz, 40 dB	A.H. Systems	PAM-0118	200108	04/07/2009	04/07/2010
Spectrum Analyzer, 20Hz-40GHz	Rohde & Schwarz	FSEK30	200062	10/19/2009	10/19/2010

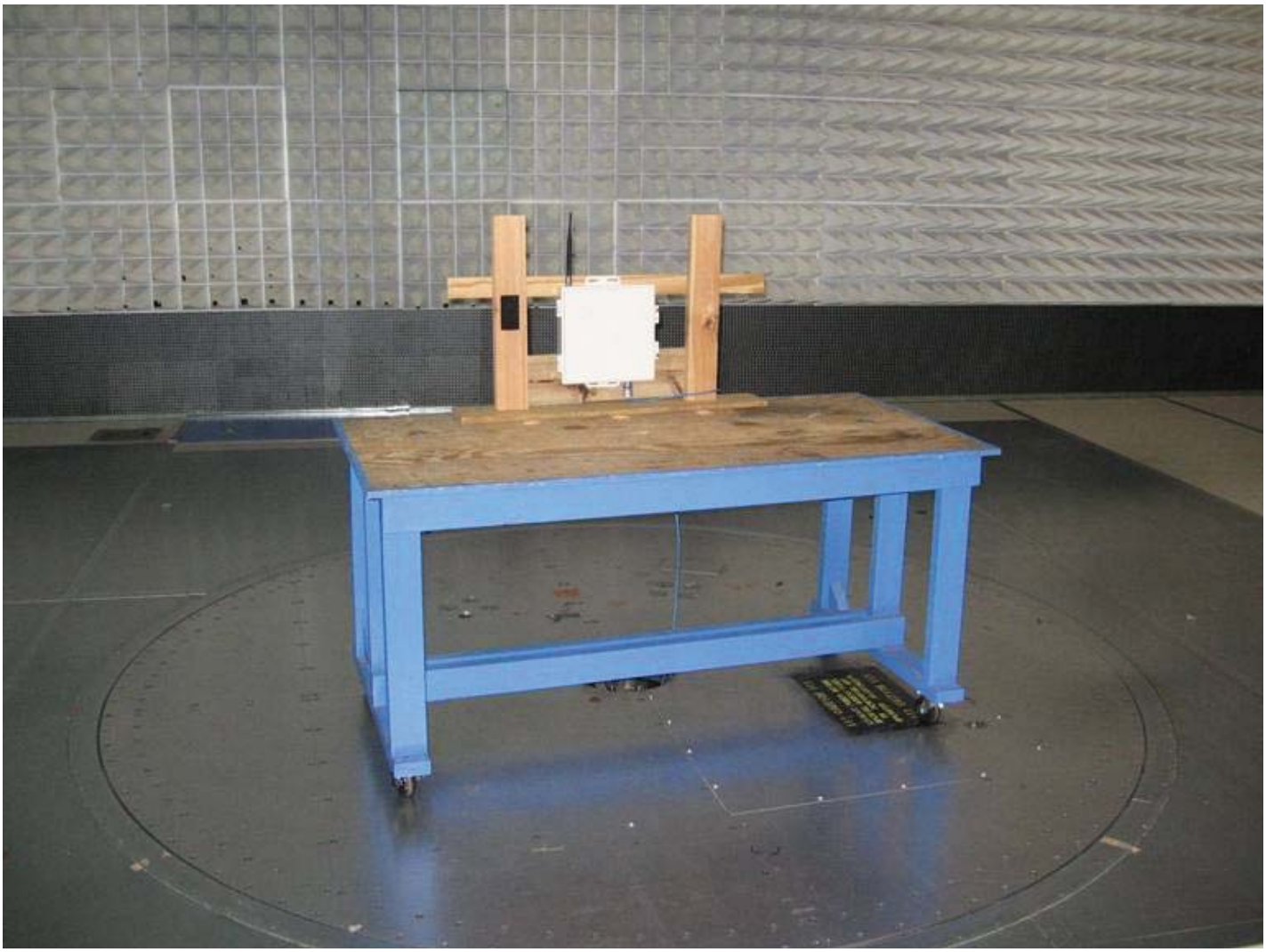
5.0 Radiated emissions (E-field) (Radiated Emissions)

Test Equipment Used:

Description:	Manufacturer:	Model:	Asset Number:	Cal Date:	Cal Due:
Tile - software profile for radiated and conducted emissions testing.	Software	Tile - Emissions	SW006	12/09/2009	12/09/2010

Results: The sample tested was found to Comply.

Photo:



Test Setup - Front View

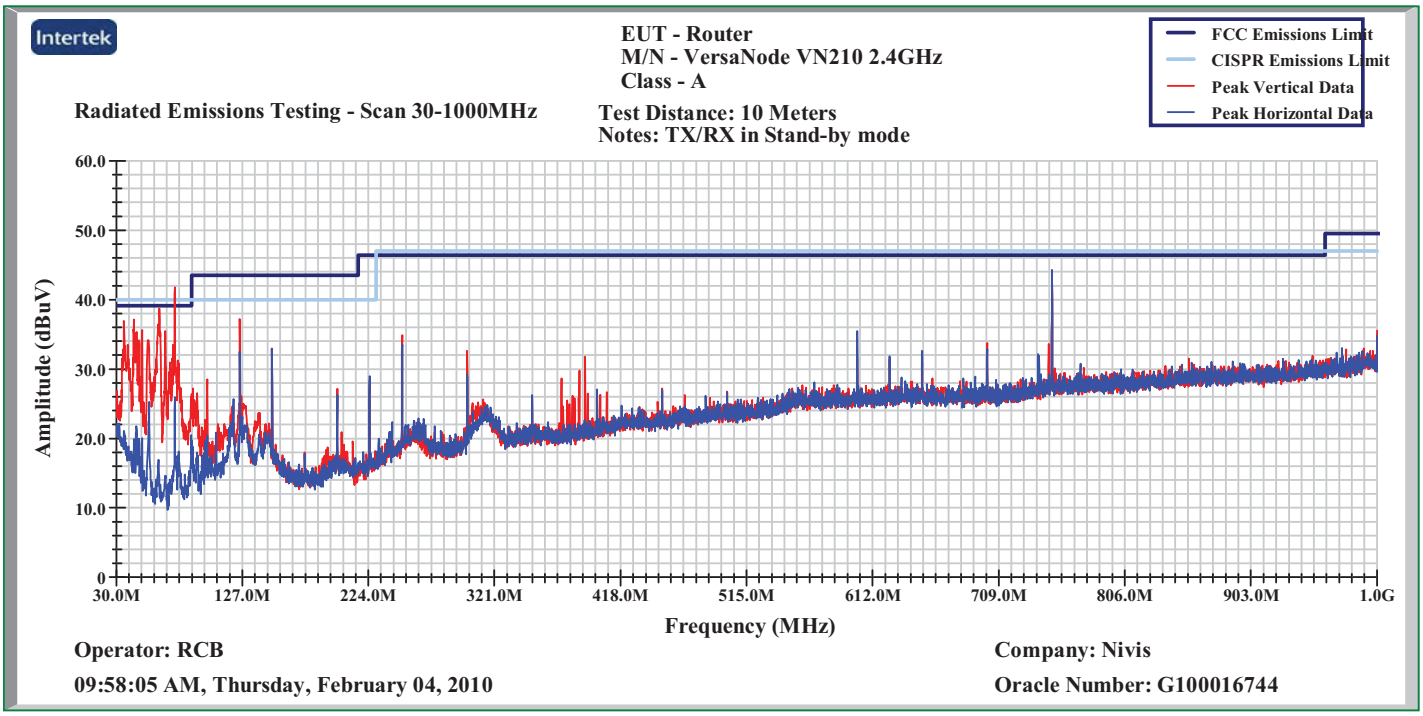
5.0 Radiated emissions (E-field) (Radiated Emissions)

Photo:

Test Setup - Rear View

5.0 Radiated emissions (E-field) (Radiated Emissions)

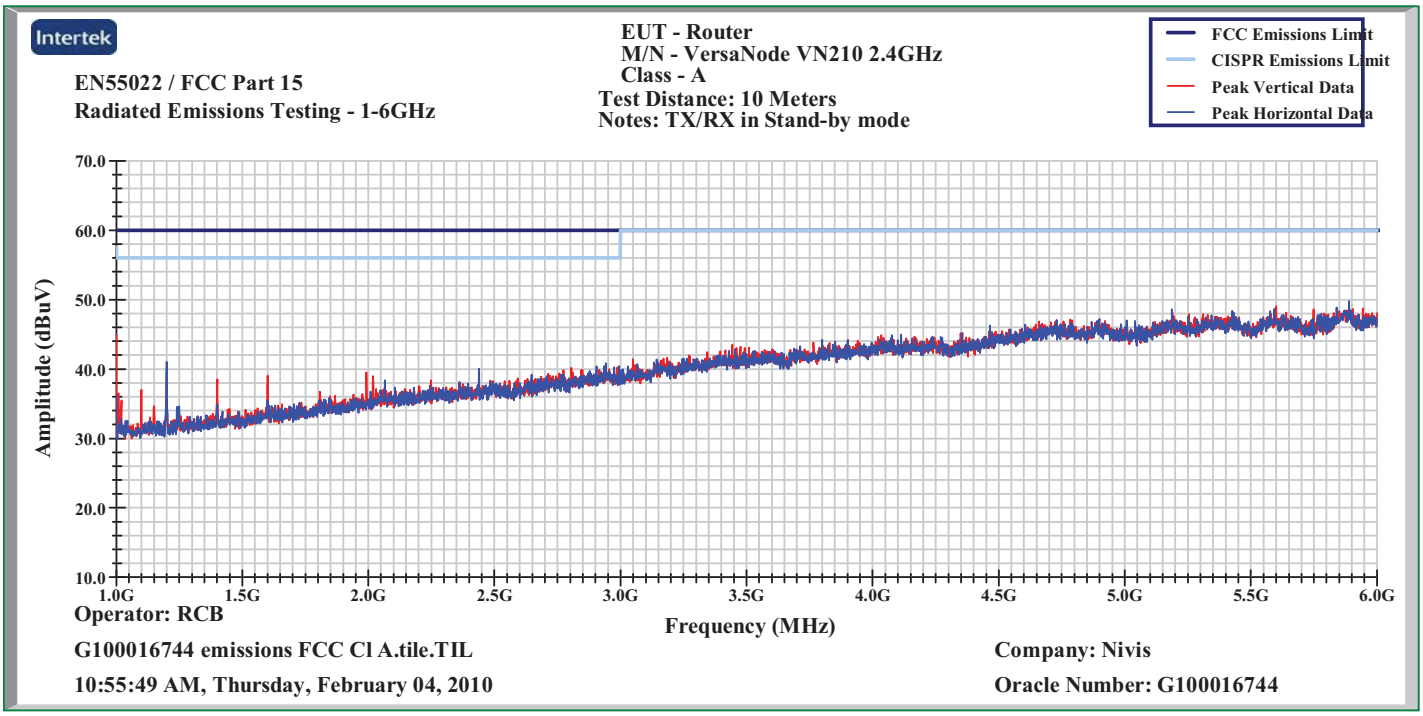
Plot:



30-1000MHz

5.0 Radiated emissions (E-field) (Radiated Emissions)

Plot:



1000-6000MHz

5.0 Radiated emissions (E-field) (Radiated Emissions)

Data:

Frequency Range (MHz): 30-1000 **Test Distance (m):** 10

Input power: POE **Limit:** FCC15-Class A-10m

Modifications for compliance (y/n): n

A	B	C	D	E	F	G	H	I	J
Ant. Pol. (V/H)	**Frequency MHz**	**Reading dB(uV)**	**Antenna Factor dB(1/m)**	**Cable Loss dB**	**Pre-amp Factor dB**	**Net dB(uV/m)**	**10m Limit dB(uV/m)**	**Margin dB**	**Detectors / Bandwidths Det/RBW/VBW**
V	50.004	52.8	8.8	1.2	27.6	35.2	39.1	-3.9	QP/120k/300k
V	75.000	55.3	6.9	1.5	27.5	36.2	39.1	-2.9	QP/120k/300k
V	100.004	49.6	10.9	1.7	27.7	34.6	43.5	-8.9	QP/120k/300k
V	150.000	47.9	11.0	2.1	27.8	33.3	43.5	-10.2	QP/120k/300k
V	250.000	47.7	12.8	2.9	27.7	35.6	46.4	-10.8	QP/120k/300k
H	749.999	45.6	20.0	5.2	27.3	43.5	46.4	-2.9	QP/120k/300k
Calculations		G=C+D+E-F		I=G-H					

30-1000MHz

5.0 Radiated emissions (E-field) (Radiated Emissions)

Data:

Frequency Range (MHz): 1000-6000 **Test Distance (m):** 3

Input power: POE **Limit:** FCC15 Class A-3m

Modifications for compliance (y/n): n

A	B	C	D	E	F	G	H	I	J
Ant. Pol. (V/H)	**Frequency MHz**	**Reading dB(uV)**	**Antenna Factor dB(1/m)**	**Cable Loss dB**	**Pre-amp Factor dB**	**Net dB(uV/m)**	**3m Limit dB(uV/m)**	**Margin dB**	**Detectors / Bandwidths Det/RBW/VBW**
V	1000.025	44.9	24.0	4.1	40.3	32.7	60.0	-27.3	Av/1M/3M
H	1200.000	48.0	24.4	4.5	40.4	36.5	60.0	-23.5	Av/1M/3M
Calculations		G=C+D+E-F		I=G-H					

1000-6000MHz