ORDOS Technologies Inc.

CERTIFICAT

#2MNT310FX

According to testing performed at E.M.I TEST LAB. , the below mentioned equipment is in compliance with the electromagnetic compatibility requirements defined in the USA regulations which identify the Emission requirements for an ITE equipment by the following standard:

Emission:	FCC Part 15 Class B
Equipment Under Test :	"NtPLUS"
Manufacturer's Name And Address :	Main.net Communication Ltd. 14 Hataas St. P.O.Box 2324 Kfar Saba, 44641, Israel
Tested Date:	May 2002

Results and conditions of EMC tests are specified in "ORDOS" report No. 2MNT310F.

I, the undersigned, hereby declare that the equipment tested at "E.M.I TEST LAB" as specified above conforms to all the requirements of above Standard.

Ben - David Yossi, M.Sc.
ORDOS & EMI Test Ltd. Manager

42 Weizman St. , Kfar-Saba P.O.Box 5097, Israel, 44150 Tel: (972) 9-7462555, (972) 54-746255
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ORDOS Technologies Inc.

EMI TEST

EMI TEST Ltd. EMC & SAFETY Test Labs

ELECTROMAGNETIC COMPATIBILITY

TEST REPORT No. 2MNT310IC

FOR:

Company Name: **Main.net Communication Ltd.**

Equipment Under Test: **NtPLUS**

FCC Part 15 Class B Compliance Test Report

Total number of pages (including this page): 31

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1. General Information.

Applicant:	Main.net Communication Ltd.
Applicant Address:	14 Hataas St. P.O.Box 2324 Kfar Saba, 44641, Israel
Telephone:	972-9-7667333
Fax:	972-9-7667303
The testing was observed by the following applicant personnel:	Mr. Barkan Yossi
Dates of testing:	May 2002
Test Laboratory Location:	EMI TEST Ltd., Moshav Hanniel, D.N.Lev Hasharon, Israel, 42865
Web:	www.ordos.co.il
Equipment Under Test (EUT):	NtPLUS
S/N:	P003
Mode of Operation:	Transmitting and Receiving internet data Radiated in transmitting mode Conducted in receiving mode
Applicable EMC Specification:	FCC Part 15 Class B : 2001

2. Applicable Documents.

EMI TEST Laboratory performs all testing of conducted and radiated emissions in accordance with FCC, VDE, CISPR and EN requirements.

2.1 Federal Communication Commission (FCC), Code of Federal Regulations 47, FCC Docket 89-103, Part 15: Radio Frequency Devices, Section 15.107 & 15.109, October 2001.

2.2 FCC/OET, "FCC Procedure for Measuring Electromagnetic Emissions from Digital Devices", TP-5, March 1989.

2.3 International Special Committee On Radio Interference (CISPR) Publication 16, First Edition 1977, "CISPR Specification for Radio Interference Measuring, Apparatus and Measurement Methods".

2.4 American National Standard, "Method of Measurement Electromagnetic Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 10KHz to 1 GHz", ANSI C63.4, 1992.

3. Detailed Applicable EMC Requirements and Limits.

Requirements of Federal Communications Commission (FCC)
FCC Part 15, Sections 15.107 and 15.109, Class B are applicable for the tested equipment.

The conducted and radiated limits when measured in accordance with FCC Measurement Procedure "Measurement of Radio Noise Emissions from Computing Devices" are:

3.1 Conducted Limits.

Frequency in (MHz)	Emission Current in μV	Emission Current In dBμV
0.45 - 30	250	48

Conducted Standard Limits.

Note:

Measurements are made across a 50ohm/μHenry Line Impedance Stabilization Network (LISN).

3.2 Radiated Interference Limits.

Frequency (MHz)	Field Strength at 3 m	
	in μV/m	in dBμV/m
30 - 88	100	40.0
88 – 216	150	43.5
216 - 960	200	46.0
960 – 1000	500	54.0
1000 - 5000	500	54.0

* Note (3)

FCC Class B Radiated Emission standard Limits.

Notes:

(1) The tighter limit shall apply at the edge between two frequency bands.

(2) Distance refers to the distance in meters from measuring instrument antenna to the closest point of any part of the EUT.

(3) Above 1000 MHz: for clocks between 108 and 500 MHz measurements are required up to 2000 MHz; for higher clocks or oscillators, measurements required up to 5-th harmonic or 40 GHz, whichever is lower.

4. Procedures for Measuring RF Emissions from the EUT.

4.1 Radiated Emissions Measurements.

The radiated emissions test measured the strength of the electromagnetic field generated by equipment under test (EUT), and its cables.

Measurements of radiated emission were made using a Spectrum Analyzer and calibrated broadband antennas. Tests were performed in the frequency range of 1 to 30MHz and 30 to 1000 MHz. The EUT was set and operated in a manner representative of actual use.

At the first stage preliminary testing was done in order to determine the characteristics of the EUT. The test antenna was placed at a distance of 3 meters and 30 meter from the EUT and radiated emission was measured. All I/O cables were bundled in non-inductive way so that their overall length was approximately one meter. During preliminary test, all I/O cables and power cable were moved to maximize emissions, and configuration yielding the highest signal relative to FCC Class B limit was selected. This configuration was fixed for a final test. All significant emissions were registered.

The test antenna was installed on the antenna mast in vertical polarization.
Small frequency ranges (5 or 10 MHz, typically) were spanned in order to increase resolution and easier identification of emissions emanating from the EUT. The Spectrum Analyzer was set to Peak mode with bandwidth equal 120 KHz. At each emission the EUT was rotated on the turntable, and direction of maximum emission was determined. Further maximization of this emission was done by raising the test antenna from 1 to 4 meters.
In each case of emission exceeding the limit or approaching (within 10 dB) the standard limit, measurements were repeated in the quasi-peak detector mode. All results were recorded and emissions levels were compared with the standard level.

Similar measurements were conducted with antenna in horizontal polarization.

All significant emissions were reported in Appendix A and C of this report.

4.2 Carrier Current system – Radiated test

As per FCC Part 15.209 the E.U.T should be tested in 3 deferent site in U.S.A (on-site).
This test is radiated emission in frequency range of 1.705MHz – 30MHz.
The antenna should be located at 30m distance. The electric field strength should be compared to the limits defined in table 15.209.
The test is for informative only and its results are detailed in Appendix C.

4.3 AC Power line Conducted Emissions Measurements.

Measurements were made to determine the line-to-ground radio noise voltages. Measurements were conducted on EUT input power terminals that are directly connected to the public utility AC power lines.

The EUT was connected to the public utility power lines through a nominal, standard Line Impedance Stabilization Network (LISN). To avoid inductance, excessive length of the power cord from EUT was looped in a figure-eight pattern around the phonemic pegs of LISN. Both "Phase" and "Neutral" power leads were tested.

During the tests EUT was placed on a non-conducting table. An excess length of interconnection cables was bundled at the approximate center of the cable with the bundle 30 to 40 cm in length. The EUT and cables were positioned in a way maximizing emissions.

5. Labeling Requirements.

5.1 Labeling.

In accordance with FCC rules, Part 15, Section 15.19 (3) a Class B digital device shall have the following statement in a conspicuous location on the device:

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".

5.2 Information for the User.

In accordance with FCC rules, Part 15, Section 15.105 for a Class B digital devices, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

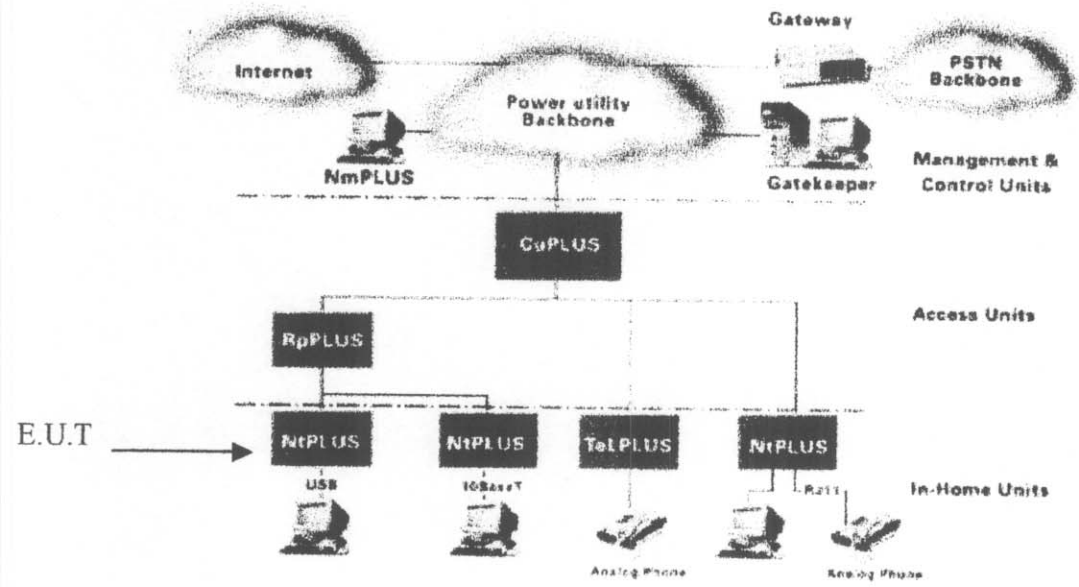
"Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment 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.
Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense."

6. System test description

6.1 Product Description.

Power Line Ultimate System (PLUS) has a unique concept that provides a highly cost-effective telecommunication solution for high-speed transmissions over low and medium voltage power lines.
It is a multi-service platform that enables power utilities and telecom operators to utilize their communication backbone and electric grid infrastructure to offer their end users a wide range of high-speed telecommunication services through any electrical outlet.

PLUS Architecture



The PLUS system can easily be integrated into any communications infrastructure (e.g. SDH/ATM/IP). It consists of three types of sub-categories:

1. Access units (PLUS backbone) - installed by the power utility along the street's power lines.
2. In-home units - installed by the end users at their home or office ('Plug & Play').
3. Network Management and Control - installed at the utility's regional control center.

Access Units

The PLUS backbone consists of several units that connect the communication backbone to the home:

CuPLUS - The CuPLUS (Concentrating Unit) located in the vicinity of the low-voltage transformer in the street, transforms the information from the backbone to the electricity grids (and vice versa).
It communicates on one end with:

- Network Management
- Internet for data application
- Voice gatekeeper and PSTN gateway for VoIP application

and with the home and other access units on the other end.

RpPLUS - The RpPLUS (Repeater Unit) enables the PLUS system to cover vast distances even under noisy environments, using smart repetition.

CtPLUS - The CtPLUS (Communications Transformer) enables power utilities to communicate over the medium voltage lines in the US and in other markets that have 110V grids topology. This unit uses couplers that isolate the unit from the medium voltage but coupled the signals to the electric grid

MvPLUS - The MvPLUS (Medium Voltage) enables power utilities to communicate over the medium voltage lines in markets that have 220V grids topology.

In-home units

There are several types of In-home units for various markets:

NtPLUS (E.U.T) - the NtPLUS (Network Termination) provides Internet connection betweenthe electrical outlet and the PC (or any other peripheral). The units come with a standard connector to the PC (USB and Ethernet) and optional telephony abilities.
Units with VoIP module enables parallel use of telephony (utilizing standard analog phone) and Internet. Several units can be plugged in to create a home network.

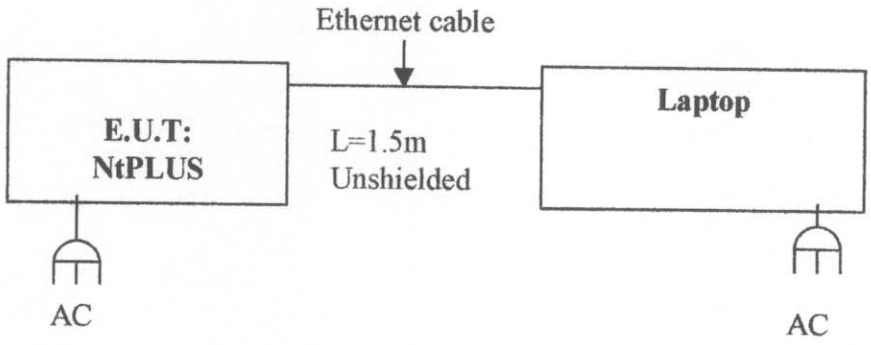
NtRPLUS equipment is similar to the tested NtPLUS as declared in Appendix D.

TelPLUS - The TelPLUS is similar unit that support only telephony applications, using RJ11 connectors for connecting standard analog phones.

Network Management and Control Units

NmPLUS is Main.net's unique Network Management solution for network monitoring, management and diagnostic of PLC networks. It provides the ability to manage and monitor all PLUS units from a single location without having to send the power utilities' operators to the location, whenever a customer places a call. This also allows the power utility to remotely enable, block and/or terminate end users' services.

6.2 Tested Configuration



3.3 Equipment Modifications

To achieve compliance to EMC standards requirements the following improvements were made:

a) Changing the fuse of the mains input to a "SCHURTER" 630mA
slow blew
model 0034.6613

b) Shielding and grounding improvements

These improvements must be implemented in all production models of this equipment.

7. Description of the Test Site.

Location:	Moshav Hanniel , Israel.
Phone:	(972)-9-8987382 (972)-54-746255
Fax:	(972)-9-7425813
E-Mail:	emit@netvision.net.il
Open Site Ranges:	3, 10 and 30 meter
Turntable:	2.1 x 1.6 meter with maximum loading 1500kg, distant actuation. The turntable and the tested equipment are environmentally protected.
Antenna Mast:	1 to 4 meter
Supply Voltages:	220VAC, 3 Phases, 16A from each phase; 110VAC, 3 Phases, 32A from each phase; up to 50VDC, 30A max
Shielded room:	4 X 3.5 X 2.5m high unechoich shielded room.

8. List of Used Test Equipment.

No.	Description	Manufacturer and Model Number	C E	R E	Series No.
1	Spectrum Analyzer 9KHz to 2.2GHz	Anritsu MS2601B/K	X	X	MT81431
2	Antenna, Biconical, 20MHz to 200MHz	EMCO Model 3110B		x	1813
3	Antenna, Log-Periodic, 200MHz to 1GHz	EMCO Model 3146		x	3807
4	Amplifier 10MHz to 500MHz	MITEQ Model AU-1114		x	323214
5	Amplifier, 500MHz to 2GHz	MITEQ Model AM-3A-0520		x	329110
6	Plotter	HP,Model 7440A-002	x	x	2929A17765
7	LISN, 10KHz to 100MHz	EMCO Model 3825/2	x		2205
8	LISN 10KHz to 100MHz	EMCO Model 3625/2	X		1003

Measurement:
CE - Conducted Emission, Power Line, 10KHz to 30MHz
RE - Radiated Emission, Electric Field, 30MHz to 1000MHz
RE- Radiated Emission, Electric Field, 1MHz to 30MHz
EMI Test Laboratory test equipment is calibrated on regular basis according to equipment manufacturer requirements.

9. EMI Test Results.

9.1 Radiated Emission Data.

The final level, expressed in dBμV/m is arrived at by taking the reading voltage from the spectrum analyzer (dBμV level) and adding to it the antenna correction factor and the cable loss factor.
From this results the FCC limit and amplifier gain is subtracted to provide the safety margin as shown in Appendix A.

The field strength was calculated using the following formula:

E(dBμV/m) = Vrec(dBμV) + AF(dB/m) + CL(dB)

Where :

Vrec is the detected voltage by the spectrum analyzer.
AF(dB) is the antenna factor at the special frequency.
CL(dB) is the insertion loss on the RF cable which connected between the antenna and the S.A.

Conclusion:

The E.U.T met the FCC Part 15 Class B radiated emission requirements.
The minimum margin was 0.97dB at 448MHz.
See Appendix A for more detailed data.

9.2 Conducted Emission Data.

The final level of the conducted emission in dBμV, is calculated by taking the reading from the spectrum analyzer and taking into account the LISN Correction Factor and the Cable Loss.
More detailed Information is given in tabular form in the Appendix B.

Conclusion:

The EUT **met** the FCC Part 15 Class B conducted emission requirements.
The minimum passing margin was 3.7dB at 1.2MHz .