# LVD REPORT

**Applicant: TRENDware International Inc.** 

Model No: TEW-421PC

Report No: C51LV133

### Lily Technology Co., Ltd.



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Applicant TRENDware International Inc.

3135 Kashiwa Street Torrance, CA 90505, U.S.A.

Test item Low Voltage Directive

Items tested 802.11g WLAN PCI Adapter

Model No. TEW-421PC

Sample No. # C51215

Rating SELV

Sample received date 05/14/2004

Specifications EN60950, 2000 / IEC 60950, 3<sup>rd</sup> Ed, 1999

Results As detailed within this report

Prepared by Flora Shila project engineer

Authorized by
Issue date

Tony Chen
Laboratory Manager
(month / day / year)

**Modifications** None

Tested by Lily Technology Co., Ltd.

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#### SAFETY TEST RESULTS

The results appear in the following order:

EN60950, 2000 / IEC 60950, 3<sup>rd</sup> Ed, 1999

Safety of information technology equipment -

The results contained herein apply only to the particular samples tested and to the specific tests carried out, as detailed in this Test Report. The issuing of this Test Report does not indicate any measure of Approval, Certification, Supervision, Control or Surveillance by Lily Technology Co., Ltd. of any product. No extract, abridgement or abstraction from a Test Report may be published or used to advertise a product without the written consent of the Director, Lily Technology Co., Ltd. who reserves the absolute right to agree or reject all or any of the details of any items of publicity for which consent may be sought.

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Test Report EN 60950, 2000 / IEC 60950, 3<sup>rd</sup> Ed, 1999

Equipment mobility. .....: Movable

Operating condition.....: Continuous

Tested for IT power systems...... No

IT testing, phase-phase voltage (V). ..... N/A

Class of equipment. .....: Class III

Mass of equipment (kg).....< <18kg

Protection against ingress of water. ..........: N/A

#### Possible test case verdicts:

- test object does meet the requirement......P
- test object does not meet the requirements......F

#### General remarks

" (see appended table) " refers to a table appended the report.

Throughout this report a point is used as the decimal separator.

- 1. Safety Strategy
  - The equipment is powered from SELV by PCMCIA slot.
  - This report is based on original report C51LV215 for alternate housing.
- 2. Testing Environment:

All testing was conducted at:

- An ambient temperature in the range 25 °C to 35 °C.
- A relative humidity in the range 25% to 75%
- An air pressure in the range 86KPa to 106Kpa

#### RESULTS

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1.2.2	OPERATING CONDITIONS		
1.2.2.1	Normal load as described in Annex	The unit is running to communicate	
	L or as close as possible to the	and transmit data.	
	most severe normal use.		
1.2.2.2	Rated operating time as assigned by	The manufacturer has not declared a rated	
	the Manufacturer.	operating time.	

Clause	Requirement - Test	Result - Remark	Verdict
1.2.2.3	-1.2.2.5 Continuous operation /	The equipment is regarded to be for	
	Shot-time operation / Inter mitten	continuous operation.	
	operation.		
1.5.	COMPONENTS		P
1.5.1	General	Ref. List of Critical Components.	
1.5.2	Evaluation and testing of	Certified components are used in	P
	components	accordance with their ratings,	
		certifications and they comply with	
		applicable parts of this standard.	
		Components not certified are used in	
		accordance with their rating and they	
		comply with applicable parts of IEC	
		60950 and the relevant component	
		standard.	
		Components, for which no relevant	
		IEC-standard exists have been tested	
		under the conditions occurring in the	
		equipment, using applicable parts of	
		IEC 60950.	
	Dimensions of mains plug for	The equipment is not plug-in type.	N
	direct plug-in equipment		
	Additional torque (Nm)		
	Pull (N)		
1.5.3	Thermal controls	No thermal controls.	N
1.5.4	Transformers		N
1.5.5	Interconnecting cables	No interconnection cables.	N
1.5.6	Capacitors in primary circuits	No primary circuits.	N
1.5.7.1	-1.5.7.3 Double or reinforced	No such components bridging double or	N
	insulation bridged by components.	reinforced insulation.	

Clause	Requirement - Test	Result - Remark	Verdict
1.5.8	Components in equipment for IT	Class III equipment. No components	N
1.5.0	system	connected between line and earth.	
	-7		
1.6.	POWER INTERFACE	Class III equipment	N
1.6.1	AC power distribution systems		N
1.6.2	Input current		N
	Test voltage (at each rated voltage		
	or at each end of a rated voltage		
	rang)		
	Measured current		
	Deviation		
1.6.3	Voltage limit of hand – held		
	equipment (max. 250V)		
1.6.4	Neutral conductor		
1.7.	MARKING AND		
	INSTRUCTIONS		
1.7.1	Power rating	The equipment marking is located on	P
		outside surface of the equipment.	
	Rated voltage (s) or voltage rang	5 VDC	
	Symbol of nature of supply for d.c		
	Rated frequency or frequency range		
	Rated current		
	Manufacturer name, trade mark or		
	1		1

TEW-421PC

There is no additional marking.

Class III

CE mark

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identification mark

Type/model ......

Other symbols

Symbol of Class II ......

Certification marks ......

Clause	Requirement - Test	Result - Remark	Verdict
1.7.2	Safety instructions	No precautions are necessary.	N
	Operating instructions	Installation instructions are available to	P
		the user in User's Manual.	
1.7.3	Short duty cycles		N
1.7.4	Supply voltage adjustment	Class III equipment.	N
1.7.5	Power outlets on the equipment	Class III equipment.	N
1.7.6	Fuse identification	No primary fuse.	N
1.7.7	Wiring terminals		N
1.7.7.1	Protective earthing and bonding terminals	Class III equipment	N
1.7.7.2	Terminal for ac. mains supply conductors	Class III equipment	N
1.7.8	Controls and indicators		N
1.7.8.1	Identification, location and marking		N
1.7.8.2	Colours	For functional indication LED lights when	N
		the equipment is operating.	
1.7.8.3	Symbols.		N
1.7.8.4	Markings using figures	No indicators for different positions.	N
1.7.9	Isolation of multiple power sources		N
1.7.10	IT power system		N
1.7.11	Thermostats and other regulating	No thermostats or other regulating device.	N
	devices		
1.7.12	Language	Instructions and markings shall be in a	P
		language acceptable for the county where	
		the equipment is to be used.	
1.7.13	Durability	The marking withstands regulating	P
		devices.	
1.7.14	Removable parts		N
1.7.15	Replaceable batteries	No lithium batteries	N
	Language		

Clause	Requirement – Test	Result – Remark	Verdict
			•
2.2.4	Connection of SELV circuits to other	SELV circuits are only connected to	N
	circuits	other SELV circuits.	
2.3	TNV CIRCUITS		
2.3.1	Limits	Refer below:	
	Type of TNV circuits	No TNV circuits.	N
2.3.2	Separation from other circuits and	Supplementary insulation.	N
	from accessible parts		
2.3.3	Separation form hazardous voltage	No hazardous voltage.	N
2.3.4	Connection of TNV circuits to other	Supplementary insulation.	N
	circuits		
2.3.5	Test for operating voltage generated	No applicable.	N
	externally		
2.4.	LIMITED CURRENT CIRCUIT	2.4.1-2.4.3; no safety interlocks.	N
		, ,	
2.5	LIMITED POWER SOURCE	No limited power source.	N
		1	
2.6.	PROVISIONS FOR EARTHING	2.6.1-2.6.5.8; Class III equipment.	N
2.0.	AND BONDING	Zioir Zioicio, Ciass III equipment	
	IND BONDING		
2.7.	OVERCURRENT AND EARTH	Class III equipment	N
	FAULT PROTECTION IN	The F	
	PRIMARY CIRCUITS		
2.8.	SAFETY INTERLOCKS	2.8.1-2.8.8; No safety interlocks.	N
		_	
2.9	ELECTRICAL INSULATION		
2.9.1	Properties of insulating materials	Neither natural rubber, materials	N
		containing asbestos nor hygroscopic	
		materials are used as insulation. No	
		driving belts or coupling used.	

Clause	Requirement – Test	Result – Remark	Verdict
		•	<b>.</b>
2.9.2	Humidity conditioning	Humidity treatment performed at 120h at	N
		40 ,91-95% and 48h at 25 , 91-95%	
2.9.3	Requirements for insulation	The insulation complies with sub-clauses	N
		4.5.1 and 2.10	
2.9.4	Insulation parameters	Application of insulation and working	N
	_	voltage are considered.	
2.9.5	Categories of insulation	Insulation is considered to be	N
İ		supplementary insulation.	
		1 55	
2.10	CLEARANCES, CREEPAGE	Class III equipment.	N
	DISTANCES AND DISTANCE		
	THOUGH INSULATION		
	Normal voltage		
	Pollution degree		
	CTI rating		
2.10.1	General	Considered. see the following clauses:	
2.10.2	Determination of working voltages	Considered.	N
2.10.3	Clearances	See table 2.10	N
2.10.3.1	General	Refer below:	
	10 mm air gap between hazardous	Not applicable.	N
	voltage and accessible conductive		
	parts of enclosure		
	2 mm air gap between hazardous	Not applicable.	N
	voltage and earthed accessible		
	conductive parts of enclosure.		
2.10.3.2	Clearances in primary circuits	Not applicable.	N
2.10.3.3	Clearances in secondary circuits	See table 2.10	P
2.10.3.4	Measurements of transient levels	Measurement not relevant.	N
2.10.4	Creepage distances	See table 2.10	P

Clause	Requirement – Test	Result – Remark	Verdict
2.10.5	Solid insulation	Refer below:	N
2.10.5.1	Minimum distances through	See below	N
	insulation		
2.10.5.2	Thin sheet material	No transformers.	N
2.10.5.3	Printed boards	PCB does not serve as insulation barrier.	N
2.10.5.4	Wound components	No wound components used.	N
	Two wire in contact inside	No wound components used.	N
• 10 1	component		
2.10.6	Coated printed boards.	No special coating in order to reduce	N
		distances.	
2.10.6.1	General	Refer below:	
2.10.6.2	Sample preparation and preliminary		
	inspection.		
2.10.6.3	Thermal cycling		
2.10.6.4	Thermal ageing		
2.10.6.5	Electric strength test		
2.10.6.6	Abrasion resistance test		
2.10.7	Enclosure and sealed parts	No enclosed or hermetically sealed	N
		components	
2.10.8	Spacing filled by insulating	No components treated/filled with	N
	compound	insulation compound.	
2.10.9	Component external terminations	See appended table 2.10.1 up to and	N
		including 2.10.4	
2.10.10	Insulation with varying dimensions.	No such transformer used.	N

3	WIRING, CONNECTIONS AND SUPPLY	
3.1.	GENERAL	

circuits.

Clause	Requirement – Test	Result – Remark	Verdict
			_
4	PHYSICAL REOUIAEMENTS		
		1	1
4.1.	Stability	Refer below:	
	Angle of 10°		N
	Test: force (20% of the weight of the	The unit is not floor-standing.	N
	unit, max. 250N)		
	Test: force (800N)		N
4.2.	MECHANICAL STRENGTH		P
4.2.1	General	Considered.	P
4.2.2	Steady force test, 10 N	No hazard, ref. Comment in table 2.10	P
4.2.3	Internal enclosures 30N 3; 5	No inter enclosure.	N
4.2.4	External enclosures 250N 10 ; 5	No outer enclosure.	N
4.2.5	Impact test	Refer below:	N
	Fall test		N
	Swing test		N
4.2.6	Drop test	Drop test not applicable.	N
4.2.7	Stress relief		N
4.2.8	Cathode ray tubes	CRT is not used in the equipment.	N
4.2.9	High pressure lamps	No high pressure lamps in the equipment.	N
4.2.10	Well or ceiling mounted equipment		N
4.3.	DESIGN AND CONSTRUCTION		
4 3 1	Edges and corners	All edges and corners are rounded and/or	N
		smoothed.	
4.3.2	Handles and manual controls	No knobs, grips, handles, lever etc.	N
4.3.3	Adjustable controls	No hazardous adjustable controls.	N
4.3.4	Securing of parts	No loosening of parts impairing creepage	N
		distances or clearance is likely to occur.	
4.3.5	Connection of plugs and sockets	SELV and TNV connectors do not comply	N
		with IEC 60320 or IEC 60083.	

Clause	Requirement – Test	Result – Remark	Verdict
	1		
4.3.6	Direct plug-in equipment	Not interned to plug directly into a wall	N
		socket-outlet.	
	Torque (Nm)	Nm	
4.3.7	Heating elements in earthed	No heating elements provided.	N
	equipment.		
4.3.8	Batteries	No lithium batteries.	N
4.3.9	Oil and grease.	Insulation is not exposed to oil, grease etc.	N
4.3.10	Dust, powders, liquids and gases	The equipment does not generate ionising	N
		radiation or use a leaser, and does not	
		contain flammable liquids or gases.	
4.3.11	Containers for liquids or gases	No containers for liquids or gases in the	N
		equipment.	
4.3.12	Flammable liquids.	The equipment does not contain	N
		flammable liquid.	
	Quantity of liquid.	L	
	Flash point		
4.3.13	Radiation	Diffusion LED only.	N
		•	

4.4	PROTECTION AGAINST		
	HAZARDOUS MOVING PARTS		
4.4.1	General	Adequate protection against risk of	P
		personal injury.	
4.4.2	Protection in operator access areas	No moving parts.	N
4.4.3	Protection in restricted access areas	Not intended for installation in RAL.	N
4.4.4	Protection in service access areas	Unintentional contact is not likely in	N
		service access areas.	

4.5	THERMAL REQUIREMENTS		N
4.5.1	Temper rises	(see appended table)	N
4.5.2	Resistance to abnormal heat		N

Clause	Requirement – Test	Result – Remark	Verdict	
4.6	OPENING IN ENCLOSURE			
4.6.1	Top and side openings	Refer below		
	Top openings	Openings are measured to be (mm):		
	Dimensions (mm)			
	Front, side and rear openings	No front side or rear opening.	N	
	Dimensions (mm)			
4. 6.2	Bottom of fire enclosures	No fire enclosure requirements.	N	
		No bottom opening.		
4.6.3	Doors and covers in fire enclosure	No door or cover in enclosure.	N	
4.6.4	Opening in transportable equipment	The unit is not regarded as transportable	N	
		equipment.		
4.6.5	Adhesives for constructional	No barrier secured by adhesive inside	N	
	purposes	enclosure.		
	Conditioning temperature/time	/week (s)		

4.7.	RESISTANCE TO FIRE	Metallic Enclosure	
4.7.1	Reducing the risk of ignition and Method 1 is used.		N
	spread of flame		
4.7.2	Condition for a fire enclosure	Refer below:	N
4.7.2.1	Parts requiring a fire enclosure	The modem is only connected to SELV	N
		circuit of low power, no fire enclosure is	
		required.	
4.7.2.2	Parts not requiring a fire enclosure		N
4.7.3	Materials	No enclosure.	N
4.7.3.1	General	Considered.	N
4.7.3.2	Materials of fire enclosure		N
4.7.3.3	Material for components and other		N
	outside fire enclosure		
4.7.3.4	Materials for components and other	Since it contains only SELV circuit (low	N
	inside fire enclosure	power source) No fire enclosure is	
		required. Enclosure is of min. 94 HB.	

Clause	Requirement – Test	Result – Remark	Verdict
4725	No. 1 C 1 C1. 11	N	<b>N</b> T
4.7.3.5	Materials for air filter assemblies	No air filter in the equipment.	N
4.7.3.6	Materials used in high-voltage	No parts exceeding 4 KV.	N
5.	ELECTRICAL	Class III equipment.	N
	REQUIREMENTS AND		
	SIMULATED ABNORMAL		
	CONDITIONS		
5.2.	ELECTRIC STRENGTH		<u> </u>
5.2.1		C1	N.T
5.2.1	-5.2.2 General. Test procedure	Considered.	N
5.3.	ABNORMAL OPERATING AND		
	FAULT CONDITIONS		
5.3.1	Protection against overload and		N
	abnormal operation		
5.3.2	Motors	No motors.	N
5.3.3	Transformers	No transformer.	N
5.3.4	Functional insulation		N
5.3.5	Electromechanical components	No electromechanical components.	N
5.3.6	Simulation of faults	See the enclosure fault condition tests.	N
5.3.7	Unattended equipment	No thermostats, temperature limiters or	N
		thermal cut-outs.	
5.3.8	Compliance criteria for abnormal	Refer below:	
	operating and fault conditions		
5.3.8.1	During the tests	No fire or molten metal occurred and no	N
		deformation of enclosure during the test.	
5.3.8.2	After the tests	No reduction of clearance and creepage	N
		distances. Electric strength test is mode	
		on basic and supplementary insulation.	

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Clause	Requirement – Test	Result – Remark	Verdict
			· '
6.2.2.2	Steady-state test		N
6.2.2.3	Compliance criteria	No breakdown of insulation during above	N
		tests.	
			<u>'</u>
6.3.	PROTECTION OF	Equipment not intended to provide power	N
	TELECOMMUNICATION	over the telecommunication wring system.	
	WIRING SYSTEM FROM		
	OVERHEATING		
	Maximum output current	A	
	Current limiting method		

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Clause	Requirement - Test	Result – Remark	Verdict
Annex A	TESTS FOR RESISTANCE TO	All materials have suitable flame class,	N
	HEAT AND FIRE	no testing require.	
A.1	Flammability test for fire enclosures of r	moveable equipment having a total mass	N
	exceeding 18kg, and of stationary equip	oment.	
A.2	Flammability test for fire enclosures of r	moveable equipment having a total mass	N
	not exceeding 18kg, and for materials lo	ocated within fire enclosure.	
A	Tested material		N
	Mounting of samples during test;		
	Wall thickness		
	Sample 1 burning time		N
	Sample 2 burning time		N
	Sample 3 burning time		N
	Material: compliance with the		N
	requirements		
	Manufacturer of tested material		
	Type of tested material		
	Additional information		

Clause	Requirement - Test	Result – Remark	Verdict
			1
Annex B	MOTOR TESTS UNDER	No motors in the equipment.	N
	ABNORMAL CONDITIONS		
	Position		
	Manufacturer		
	Type		
	Rated voltage (V) or current (A)		
B.2	Temperatures	(see appended table 5.4)	N
B.4	Running overload test		N
B.5	Locked-rotor overload test		N
	Test duration (days)		
	Electric strength test:		
	test voltage (V)		
B.6	Running overload test for DC motor		N
	in secondary circuits.		
B.7	Locked-rotor overload test for DC		N
	motor in secondary circuits		
B.7.2	Test time (h)		N
B.7.3	Test lime (h)		N
B.8	Test for motors with capacitor		N
B.9	Test for three-phase motor		N
B.10	Test for series motors		N
	Test voltage (V)		

Clause	Requirement - Test	est Result – Remark		
Annex C	TRANSFORMERS	No transformer.	N	
	Position			
	Manufacturer			
	Type			
	Rated values			
	Temperatures		N	
C.1	Overload test	See fault condition test	N	
	Linear transformer			
	Ferro-resonant transformer			
	Transformer for switch mode power supply.			
	Type of thermal cut-out	None provided.	N	
C.2	Insulation	The insulation fulfill the requirements in 2.10 and relevant test of 5.2.2	N	
	Precautions taken	See the attached specification for the transformer.	N	
	Retaining of end turns of all windings	Secured to the soldering pins with purposes.	N	
	Earth screen for protective purposes	No earthed screen for protective purposes.	N	

#### **APPENDED TABLES**

1.5	List of critical components			P	
Object/part No		Manufacturer/ Trademark	Type / model	Technical Data	Mark(s) of Conformity
Metal enclosure		Applicant's Spec.		min. 025mm	
Plastic of Material		Applicant's Spec.		94V-HB or better	UL, R/C
Main P	СВ	Recognized		94V-0	UL R/C

4.7 Re		sistance to Fire	P	
Item		UL Recognized Declar		d Rating
PCB				V-0

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#### **APPENDIX –TEST INSTRUMENTS**

Inst. ID	Instrument No.	Range Used	Instruments Type
LTC01	THS-ML1	Temperature : 70 °C R. Humidity :. 60%	Temperature Humidity Chambers
LTC02	GPI-615	Cutoff Current:10mA: Voltage:1500VAC	Withstand Voltage Tester
LTC03	GDM-8039	VAC	Digital Multimeter
LTC04	HP OSCILLO SCOPE	DC/AC 0-500 V	54600A
LTC05	CHITAI 2402A	Auto	Digital Power Meter (DC/AC)
LTC06	CHENHWA DC Electronic Load	60V/60A	2600
LTC07	IMADA FB-50	50 KG Resolution: 0.5N	Portable Force Indicator
LTC08	N/A	Ball Impact Test H.: 1.30 m	Steel Sphere
LTC09	OVEN	50-300	Thermal Oven
LTC10	YOKOGAWA HR1300	CH1-CH20	HYBRID Recorder
LTC11	ED&D LT-952HC	20 Ma, 2 mA	Leakage Current Tester
LTC12	GW GFG-813	100 Hz – 10 KHz	13 MHz Function Generator
LTC13	APC AFC-3KB	90V-260V 47-63Hz, 3KVA	AC Power Source
LTC14	GDM 8055	200 Ma (DC A)	Digital Multimeter
LTC15	GDM 8055	20 VAC	Digital Multimeter
LTC16	B&K 4155	12.5 mV/Pa	Microphone
LTC17	B&K ZC0020	Gain: 0dB	Pre-Amplifier
LTC18	B&K TYPE 2230	70-140 dBspl	Precision Sound Level Meter
LTC19	1036-AF	ANSI S3.7-1973	Acoustic Coupling
LTC20	TRC 1102	Press T1 V1	Surge Testor
LTC21	OTS	All	Overvoltage Test Simulator
LTC22	GDM-8039	VAC	Digital Multimeter
LTC23	Lufkin 5m/16'	1 Meter 1.3 Meter	Roll Ruler
LTC24	GW GCT-630	Ohm.& A.	Ground Continuty Tester

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