



# EMC

## TEST REPORT

REPORT NO. : F89083101

MODEL NO. : TC4000 Series

DATE OF TEST : Aug. 31 ~ Sept. 2, 2000

PREPARED FOR: VXL INSTRUMENTS LIMITED

ADDRESS : "HOUSE OF EXCELLENCE", #17, ELECTRONICS CITY,  
HOSUR ROAD, BANGALORE 561229, INDIA

PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION



Accredited Laboratory

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## 1. CERTIFICATION

Issue Date: Sept. 6, 2000

Product : THINCLIENT  
Trade Name : VXL  
Model No. : TC4000 Series  
Applicant : VXL INSTRUMENTS LIMITED  
Standard : FCC Part 15, Subpart B, Class B  
              CISPR 22: 1997, Class B  
              ANSI C63.4-1992

We hereby certify that one sample of the designation has been tested in our facility from Aug. 31 ~ Sept. 2, 2000. The test record, data evaluation and Equipment Under Test (EUT) configurations represent herein are true and accurate representation of the measurements of the sample's EMC characteristics under the conditions herein specified.

The test results show that the EUT as described in this report is in compliance with the Class B limits of conducted and radiated emission of applicable standards.

TESTED BY : Ken Liu , DATE: 9/6/2009  
(Ken Liu)

CHECKED BY : Sharon Hsiung , DATE: 9/6/2000  
( Sharon Hsiung )

APPROVED BY: Mike Su, DATE: 9/16/2000  
(Mike Su)

ADVANCE DATA TECHNOLOGY CORPORATION



### Accredited Laboratory



## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Product	:	THINCLIENT
Model No.	:	TC4000 Series
Power Supply Type	:	DC 5V (from power adapter)
Power Cord	:	Nonshielded (1.8m)
Data Cable	:	NA

Note: The EUT is a terminal device that connects to multi-user application servers operating under the Citrix MetaFrame, Citrix WinFrame and Windows NT operating system. It is an aesthetically and ergonomically designed ultra-thin "Bookend" desktop. It provides simultaneously full screen connectivity to Windows NT and UNIX application servers – a powerful business alternative to Users migrating to Win32 applications while continuing access to legacy UNIX applications.

It is equipped with a 10/100 Base-T Ethernet port that gives an instant connection to a multi-user Windows NT application server. It also has serial, parallel and video display ports along with PS/2 compatible keyboard and mouse ports, allowing quick setup and use.

It has a 200 MHz National Geode GXLV processor, 32MB SO-DIMM memory (expandable to 128MB). It also has an integrated smart card reader.

The EUT was tested with DVE power adapter, model: DSA-0301-05. Its rating:  
Input: 100-240 Vac 0.7A 47-63 Hz  
Output: DC +5V, 4.0A

This power adapter will be sold together with the EUT.

For more detailed features description, please refer to ATTACHMENT 1 - TECHNICAL DESCRIPTION OF EUT and User's Manual.



## 2.2 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories are used to form representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
1	21" COLOR MONITOR	HP	D2846	JP74912250	FCC DoC APPROVED
2	PRINTER	HP	2225C	2923S47245	DSI6XU2225
3	MODEM	ACEEX	1414	980020508	IFAXDM1414
4	MODEM	ACEEX	1414	980020503	IFAXDM1414
5	PS/2 KEYBOARD	FORWARD	FDA-104GA	FDKB8110111	F4ZDA-104G
6	USB KEYBOARD	BTC	7932	178190030	E5XKBUCP1041 0
7	USB MOUSE	DEXIN	A2U800A	71001829	NIYA2U800A
8	MOUSE	LOGITECH	M-S43	LZE00703123	DZL211106
9	SPEAKER	JAZZ	J-008	J786800	NA
10	MICROPHONE	L	UDM-535	S/N	NA
11	PERSONAL COMPUTER	IBM	6560-T7T	9983708	AN06260F
12	21" COLOR MONITOR	HP	D2846	JP74912250	FCC DoC APPROVED
13	MOUSE	LOGITECH	M-S43	LZE00703078	DZL211106
14	LAN CARD	INTEL	S82557	00A0C9A6CB5 252713	EJMNPDSPD035

No.	Signal cable description
1	1.8 m braid shielded wire, terminated with VGA connector via metallic frame, w/o core.
2	1.2m braid shielded wire, terminated with DB25 and Centronic connector via metallic frame, w/o core.
3	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
4	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
5	1.5 m foil shielded wire, terminated with PS/2 connector via metallic frame, w/o core.



6	1.8 m foil shielded wire, terminated with USB connector via drain wire, with core.
7	1.5 m foil shielded wire, terminated with USB connector via drain wire, w/o core.
8	1.5 m foil shielded wire, terminated with PS2 connector via drain wire, w/o core.
9	1.5 m wrapped shielded wire, terminated via drain wire, with 3.5 mm phone plug , w/o core.
10	1.8 m wrapped shielded wire, terminated via drain wire, with 3.5 mm phone plug, w/o core.
11	NA
12	1.8 m braid shielded wire, terminated with VGA connector via metallic frame, w/o core.
13	1.5 m foil shielded wire, terminated with PS2 connector via drain wire, w/o core.
14	NA

Note: 1. All power cords of the above support units are non shielded (1.8m).

2. The EUT acted as a SERVER PC system and communicated with support units 11-14 which acted as WORKSTATION and partners of communication system via a STP cable (10m).

## 2.3 TEST METHODOLOGY AND CONFIGURATION

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4:1992. Radiated testing was performed at an antenna to EUT distance of 3/10 m on an open area test site. Please refer to the photos of test configuration in Item 5.



### 3. TEST INSTRUMENTS

#### 3.1 TEST INSTRUMENTS (EMISSION)

##### CONDUCTED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ Test Receiver	ESHS30	828109/007	July 6, 2001
ROHDE & SCHWARZ Artificial Mains Network	ESH3-Z5	839135/006	July 9, 2001
ROHDE & SCHWARZ 4-wire ISN	ENY41	835154/007	Apr. 26, 2001
EMCO-L.I.S.N.	3825/2	9204-1964	July 9, 2001
Shielded Room	Site 2	ADT-C02	NA

Note: 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per NAMAS document NIS81.  
 2. The calibration interval of the above test instruments is 12 months.  
 And the calibrations are traceable to NML/ROC and NIST/USA.

##### RADIATED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
HP Spectrum Analyzer	8590L	3544A01176	April 18, 2001
HP Preamplifier	8447D	2944A08485	Oct. 23, 2000
HP Preamplifier	8449B	3008A01201	Dec. 14, 2000
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Aug. 3, 2001
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 23, 2000
CHASE BILOG Antenna	CBL6112A	2221	Aug. 4, 2001
EMCO Turn Table	1060	1115	NA
SHOSHIN Tower	AP-4701	A6Y005	NA
Open Field Test Site	Site 5	ADT-R05	July 28, 2001

Note: 1. The measurement uncertainty is less than +/- 3.0dB, which is calculated as per NAMAS document NIS81.  
 2. The calibration interval of the above test instruments is 12 months.  
 And the calibrations are traceable to NML/ROC and NIST/USA.



### 3.2 LIMITS OF CONDUCTED AND RADIATED EMISSION

#### LIMIT OF RADIATED EMISSION OF CISPR 22

FREQUENCY (MHz)	Class A (at 10m) *	Class B (at 10m) *
	dBuV/m	dBuV/m
30 - 230	40	30
230 - 1000	47	37

\* Detector Function: Quasi-Peak

#### LIMIT OF RADIATED EMISSION OF FCC PART 15, SUBPART B FOR FREQUENCY ABOVE 1000 MHz

FREQUENCY (MHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	Peak	Average	Peak	Average
Above 1000	80.0	60.0	74.0	54.0

Note: (1) The lower limit shall apply at the transition frequencies.

(2) Emission level (dBuV/m) = 20 log Emission level (uV/m).

(3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

#### LIMIT OF CONDUCTED EMISSION OF CISPR 22

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

Note: (1) The lower limit shall apply at the transition frequencies.

(2) The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz

(3) All emanation from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.



## 4. TEST RESULTS (EMISSION)

### 4.1 RADIO DISTURBANCE

Frequency Range : 0.15 - 30 MHz (Conducted Emission)  
 : 30 - 2000 MHz (Radiated Emission)  
 Input Voltage : 120 Vac, 60 Hz  
 Temperature : 28 Degree C  
 Humidity : 85 %  
 Atmospheric Pressure : 1004 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -25.36 dB at 0.264 MHz Minimum passing margin of radiated emission: -4.7 dB at 384.21 MHz

### 4.2 EUT OPERATING CONDITION

1. Turn on the power of all equipment.
2. EUT runs a test program to enable all functions.
3. EUT reads and writes messages from FDD and HDD.
4. EUT sends and receives messages from WORKSTATION via a STP cable.
5. EUT sends "H" messages to monitor and monitor displays them on screen.
6. EUT sends "H" messages to printer, and then printer prints them on paper.
7. EUT sends "H" messages to each modem.
8. EUT sends audio messages to speaker.
9. Repeat steps 2-9.



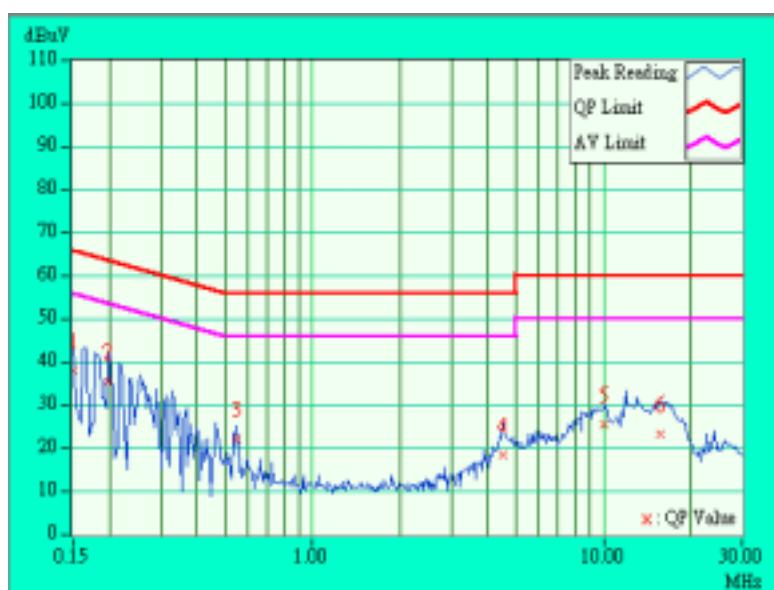
### 4.3 TEST DATA OF CONDUCTED EMISSION

EUT: THINCLIENTMODEL: TC4000 SeriesPHASE: LINE (L)6 dB Bandwidth: 10 kHz

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]	[dB (uV)]	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.1500	0.15	38.06	-	38.21	-	66.00	56.00	-27.79	-
2	0.1994	0.20	35.44	-	35.64	-	63.64	53.64	-28.00	-
3	0.5487	0.20	22.28	-	22.48	-	56.00	46.00	-33.52	-
4	4.52223	0.43	18.60	-	19.03	-	56.00	46.00	-36.97	-
5	10.10785	0.71	25.57	-	26.28	-	60.00	50.00	-33.72	-
6	15.63724	1.01	23.48	-	24.49	-	60.00	50.00	-35.51	-

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Correction Factor + Reading Value.





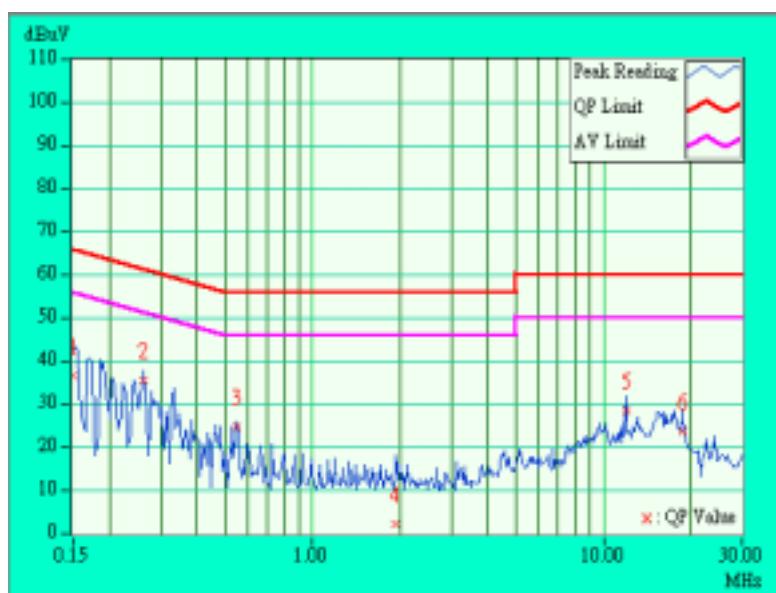
## TEST DATA OF CONDUCTED EMISSION

EUT: THINCLIENTMODEL: TC4000 SeriesPHASE: NEUTRAL (N)6 dB Bandwidth: 10 kHz

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]	[dB (uV)]	[dB (uV)]	[dB (uV)]	(dB)	(dB)		
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.15	36.81	-	36.96	-	66.00	56.00	-29.04	-
2	0.264	0.20	35.74	-	35.94	-	61.30	51.30	-25.36	-
3	0.549	0.20	24.86	-	25.06	-	56.00	46.00	-30.94	-
4	1.938	0.20	2.26	-	2.46	-	56.00	46.00	-53.54	-
5	12.014	0.72	28.65	-	29.37	-	60.00	50.00	-30.63	-
6	18.749	0.97	23.87	-	24.84	-	60.00	50.00	-35.16	-

## Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Correction Factor + Reading Value.





## 4.4 TEST DATA OF RADIATED EMISSION

EUT: THINCLIENTMODEL: TC4000 SeriesANT. POLARITY: HorizontalDETECTOR FUNCTION AND BANDWIDTH: Quasi peak, 120 kHz (30-1000 MHz)  
Peak, 1 MHz (1000 MHz-2000 MHz)FREQUENCY RANGE: 30-1000 MHzMEASURED DISTANCE: 10 MFREQUENCY RANGE: 1000-2000 MHzMEASURED DISTANCE: 3 M

Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
83.72	9.1	8.9	18.0	30.0	-12.0	400	232
119.80	13.7	5.5	19.2	30.0	-10.8	400	19
144.04	13.0	5.7	18.7	30.0	-11.3	400	355
170.40	11.5	10.4	21.9	30.0	-8.1	400	145
180.56	11.3	6.3	17.6	30.0	-12.4	400	216
183.75	11.3	12.2	23.5	30.0	-6.5	400	306
193.26	11.2	9.4	20.6	30.0	-9.4	400	70
199.58	11.2	14.0	25.2	30.0	-4.8	400	3
293.18	15.5	13.2	28.7	37.0	-8.3	296	36
322.95	16.3	8.2	24.5	37.0	-12.5	322	32
384.21	18.3	14.0	32.3	37.0	-4.7	270	246
467.75	19.8	11.4	31.2	37.0	-5.8	162	240
1087.20	28.8	15.8	44.6	74.0	-29.4	104	18
1296.30	30.7	13.1	43.8	74.0	-30.2	100	5

REMARKS:

1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level - Limit value



## TEST DATA OF RADIATED EMISSION

EUT: THINCLIENTMODEL: TC4000 SeriesANT. POLARITY: VerticalDETECTOR FUNCTION AND BANDWIDTH: Quasi peak, 120 kHz (30-1000 MHz)  
Peak, 1 MHz (1000 MHz-2000 MHz)FREQUENCY RANGE: 30-1000 MHzMEASURED DISTANCE: 10 MFREQUENCY RANGE: 1000-2000 MHzMEASURED DISTANCE: 3 M

Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
66.83	6.6	17.4	24.0	30.0	-6.0	173	0
83.74	9.1	14.0	23.1	30.0	-6.9	120	112
114.46	13.5	7.2	20.7	30.0	-9.3	100	245
120.06	13.7	8.6	22.3	30.0	-7.7	100	85
144.06	13.0	10.6	23.6	30.0	-6.4	100	66
180.56	11.3	11.6	22.9	30.0	-7.1	100	0
183.77	11.3	10.4	21.7	30.0	-8.3	100	360
217.19	12.3	8.5	20.8	30.0	-9.2	100	178
283.15	15.3	14.7	30.0	37.0	-7.0	100	162
300.70	15.7	14.4	30.1	37.0	-6.9	100	0
467.76	19.8	12.4	32.2	37.0	-4.8	188	360
1087.10	28.8	14.6	43.4	74.0	-30.6	103	3
1296.40	30.7	12.9	43.6	74.0	-30.4	103	195

REMARKS:

1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level - Limit value



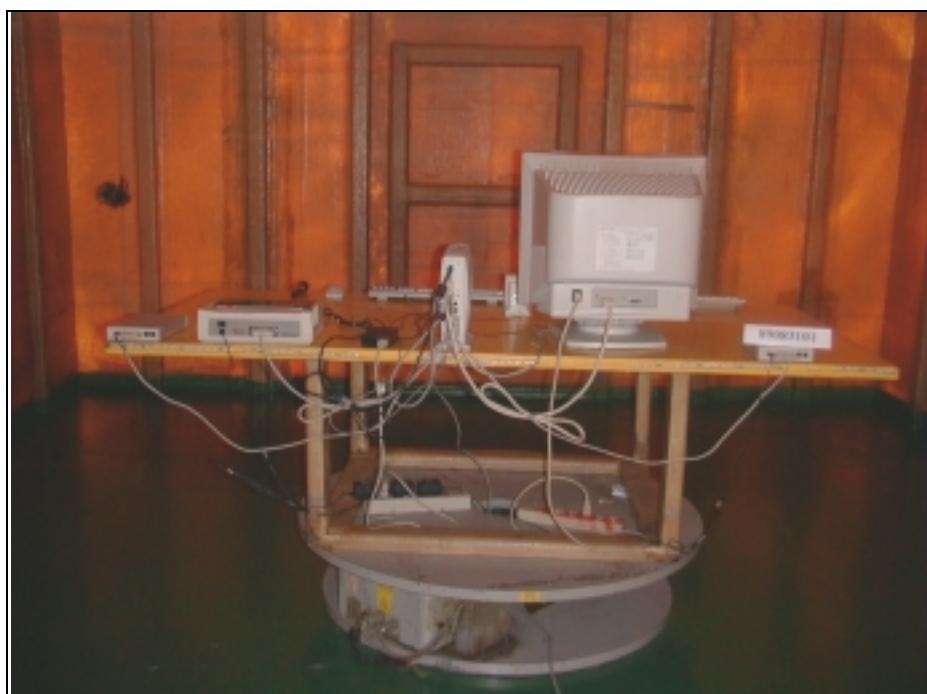
## 5. PHOTOGRAPHS OF THE TEST CONFIGURATION WITH MINIMUM MARGIN

### CONDUCTED EMISSION TEST





### RADIATED EMISSION TEST





## 6. APPENDIX - INFORMATION OF THE TESTING LABORATORY

### Information of the testing laboratory

We, ADT Corp., are founded in 1988, to provide our best service in EMC and Safety consultation. Our laboratory is accredited by the following approval agencies according to ISO/IEC Guide 25 or EN 45001:

● USA	FCC, UL, NVLAP
● Germany	TUV Rheinland
	TUV Product Service
● Japan	VCCI
● New Zealand	RFS
● Norway	NEMKO, DNV
● U.K.	INCHCAPE
● R.O.C.	BSMI

Enclosed please find some certificates of our laboratory obtained from approval agencies. If you have any comments, please feel free to contact us with the following:

**Lin Kou EMC Lab.:**

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**Hsin Chu EMC Lab.:**

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