TRLEMC

TEST REPORT NO: RL1021/285

COPY NO: 2

ISSUE NO: 1

REPORT ON THE
CERTIFICATION TESTING OF A
RENISHAW METROLOGY LTD
MI16-224, PSU3, OM16 & RMM
MACHINE INTERFACE RECEIVER
S/No's P34424, Q04565, P41078, P56933 & P82252
WITH RESPECT TO
THE FCC 47CFR Pt's 15.107, 15.109 & 15.111
CLASS B UNINTENTIONAL RADIATOR
SPECIFICATION

TEST DATE: 25 JANUARY - 8 MARCH 1999

TESTED BY: ..... R P I PARRY

APPROVED BY: ..... S P HAYES

ISSUE DATE: 23rd April 1999

Distribution Copy No's:-

1 RENISHAW METROLOGY LTD

2 FCC EVALUATION LABORATORIES

3 TRL EMC Ltd

TRL EMC LTD
LONG GREEN FORTHAMPTON GLOUCESTER GL19 4QH UNITED KINGDOM

CONTENTS

Notes:-

1. Component failure during test — YES [ ] / NO [X]

2. If Yes, details of failure:-

3. All measurement uncertainty calculations detailed in this report are carried out in accordance with UKAS Publication NIS 81, Edition 1, May 1994, for a 95% confidence level.

4. The contents of the attached applicant's declarations and other supplied information are not covered by the scope of this laboratory's UKAS or FCC accreditations and is provided in good faith.

APPLICANT'S SUMMARY

EQUIPMENT UNDER TEST (EUT):	MI16-224, PSU3, OM16 & RMM
EQUIPMENT TYPE:	MACHINE INTERFACE RECEIVER
SERIAL NUMBER OF EUT:	S/No's P34424, Q04565, P41078, P56933 & P82252
PURPOSE OF TEST:	FCC CERTIFICATION
TEST SPECIFICATION:	FCC 47CFR Pt's 15.107, 15.109 (Class B) & 15.111
RESULT OF TEST:	COMPLIANT YES [X] NO [ ]
CATEGORY OF APPLICANT:	(a) MANUFACTURER [X] (b) IMPORTER [ ] (c) DISTRIBUTOR [X] (d) AGENT [ ]
APPLICANT'S ORDER NO:	RM095794 & RM099234
APPLICANT'S CONTACT PERSON:	MARTIN WOOLLETT
APPLICANT:	RENISHAW METROLOGY LTD
ADDRESS:	NEW MILLS WOTTON-UNDER-EDGE GLOUCESTERSHIRE GL12 8JR UNITED KINGDOM TEL: +44 1453 524524 FAX: +44 1453 524901
MANUFACTURER:	RENISHAW METROLOGY LTD
ADDRESS:	NEW MILLS WOTTON-UNDER-EDGE GLOUCESTERSHIRE GL12 8JR UNITED KINGDOM TEL: +44 1453 524524 FAX: +44 1453 524901
EUT(s) COUNTRY OF ORIGIN:	UNITED KINGDOM
TEST LABORATORY:	TRL EMC LTD
UKAS ACCREDITATION NO:	0728
DATE OF TEST:	25 JANUARY - 8 MARCH 1999
TEST REPORT No:	RL1021/285

TRLEMC

CERTIFICATE OF CONFORMITY & COMPLIANCE

FCC IDENTITY:	KQG MI16-224					
PURPOSE OF TEST:	FCC Certification					
TEST SPECIFICATION:	FCC 47CFR, Parts 15.107, 15.109 (Class B) & 15.111					
TEST RESULT:	Compliant to Specification					
EQUIPMENT UNDER TEST:	MI16-224, PSU3, OM16 & RMM					
EQUIPMENT SERIAL No:	S/No's P34424, Q04565, P41078, P56933 & P82252					
ITU EMISSION CODE:	7K00F2DAN					
EQUIPMENT TYPE:	Machine Interface Receiver					
UTILISATION:	Machine Tool Telemetry					
ANTENNA TYPE:	Fixed, or Integral [ ] ;		Coaxial Output [X]			
BAND OF OPERATION:	224.5MHz to 225.475MHz					
CHANNEL SPACING:	25kHz					
No. of CHANNELS:	40					
FREQUENCY CONVERSION:	Superhet	[X] ;	Direct	[ ]		
FREQUENCY GENERATION:	SAW Resonator	[ ] ;	Crystal	[ ] ;	Synthesizer	[X]
INTERMEDIATE FREQUENCY:	1st , 21.4MHz	[X] ;	2nd , 455kHz	[X] ;	3rd	[ ]
LOCAL OSCILLATOR:	Higher	[ ] ;	Lower	[X] ;	not applicable	[ ]
MODULATION METHOD:	Amplitude	[ ] ;	Digital	[ ] ;	Angle	[X]
POWER SOURCE(s):	+24Vdc, via 110Vac PSU					
TEST DATE:	25 JANUARY - 8 MARCH 1999					
ORDER No(s):	RM095794 & RM099234					
APPLICANT:	RENISHAW METROLOGY LTD NEW MILLS WOTTON-UNDER-EDGE GLOUCESTERSHIRE GL12 8JR UNITED KINGDOM					

TESTED BY: ..... R P I PARRY

APPROVED BY: ..... S P HAYES
EMC MANAGER

EQUIPMENT TEST CONDITIONS

1.

EQUIPMENT SERIAL / MODEL IDENTITY	CHANNEL NUMBER	Rx NOMINAL FREQUENCY MHz	TESTS REQUIRED	REMARKS
MI16-224, PSU3, OM16 & RMM	1	224.500	ac powerline	Pt 15.107
	1	224.500	radiated	Pt 15.109
	1	224.500	conducted	Pt 15.111

2. Equipment category:

Single channel	[ ]
Two channel	[ ]
Multi-channel	[X]

3. Supply voltages: Vnom = +24Vdc, via 110Vac PSU

Note:- Vnom voltages are as stated above unless otherwise shown on the test report page.

4. Temperatures: Tnom = [see test]

5. Maximum bit or pulse rate: bps = 1000

6. Channel spacing:

kHz	=	25
Narrowband		[X]
Wideband		[ ]

7. Frequency deviation or shift: kHz = 5

TESTS REQUIRED

RECEIVER TESTS

Receiver Spurious Emissions - Powerline - Part 15.107 **[X]**

Receiver Spurious Emissions - Radiated - Part 15.109 **[X]**

Receiver Spurious Emissions - Conducted - Part 15.111 **[X]**

Receiver Spurious Emissions - Radiated - Part 15.209.c - <30MHz **[n/a]**

Notes:-

1. Equipment tested for (mains ac) 110V powerline emissions. **[X]**
2. Equipment tested for (fixed) integral antenna configuration. **[X]**
3. Equipment tested for (coaxial) conducted antenna configuration. **[X]**
4. Equipment tested for radiated emissions as per Part 15.109.e {15.209.c}. **[n/a]**
5. All tests were carried out with new batteries, as per Part 15.31.e. **[n/a]**

SAMPLE CALCULATIONS

Part 15.107 - Powerline.

Frequency (MHz)	Rx (dBμV)	LISN Correction (dB)	Cable loss (dB)	Powerline (dBμV)
1.485	+32.6	+0.1	+0.1	+32.8

Parts 15.109 & 15.209 - Radiated.

Frequency (MHz)	Rx (dBμV)	3m Correction (dB)	Ae AF & Cable loss (dB/m & dB)	Field Strength @ 3m (dBμV/m)
80.000	+25.8	n/a	+7.8	+33.6
n/a				
n/a				

Part 15.111 - Conducted.

Frequency (MHz)	Rx (dBW)	Attenuator (dB)	Cable loss (dB)	Conducted (dBW)
1015.500	-122.8	n/a	+1.0	-121.8

RECEIVER TESTS

RECEIVER SPURIOUS EMISSIONS - POWERLINE - PART 15.107

Ambient temperature	=	+17°C	Class A digital device	[ ]
Relative humidity	=	62%	Class B digital device	[X]
Conditions	=	Indoors		
Supply voltage	=	Vnom		
Channel number	=	1		

Frequency & Level 450kHz to 1705kHz		0.488MHz 0.573MHz 0.695MHz 0.792MHz 0.965MHz 1.055MHz 1.485MHz	+28.2dBμV +31.7dBμV +31.0dBμV +32.0dBμV +29.3dBμV +31.2dBμV +32.8dBμV
Frequency & Level 1705kHz to 30MHz		6.123MHz	+28.6dBμV
Limits	450kHz to 1705kHz	+60.0 dBμV [ ];	+48.0 dBμV [X]
	1705kHz to 30MHz	+69.5 dBμV [ ];	+48.0 dBμV [X]
Measurement Uncertainty		±4.0dB	

Notes:-
1. Receiver detector = CISPR, Quasi-Peak, 10kHz bandwidth.
2. Sample calculation, see page 6.

Test Method:-
1. As per Radio - Noise Emissions, ANSI C63.4: 1992.
2. EUT located 0.4m from wall of shielded room, 0.8m from LISN. & above the ground plane.
3. EUT emissions evaluated for live and neutral lines at power terminals of the ac mains supply.
4. EUT emissions evaluated with an ac mains supply frequency of 50Hz.
5. EUT emissions evaluated with an ac mains supply voltage of 110V.
6. Worst case results recorded and reported.

Test Equipment Used:-
1. Full description at Annex B.
2. TRL190, TRL191, TRL238, TRL12, TRL89, TRL237.

RECEIVER TESTS

RECEIVER SPURIOUS EMISSIONS - RADIATED - PART 15.109

Ambient temperature	=	+10°C (<1GHz), +20°C (>1GHz)	Class A digital device	[ ]
Relative humidity	=	78% (<1GHz), 68% (>1GHz)	Class B digital device	[X]
Conditions	=	Open Area Test Site (OATS)	10m measurements <1GHz	[ ]
Supply voltage	=	Vnom	3m measurements <1GHz	[X]
Channel number	=	1	1m measurements >1GHz	[X]

Frequency & Level 30MHz to 88MHz		68.775MHz 75.250MHz 76.500MHz 80.000MHz	+29.5dBμV/m @ 3m +32.9dBμV/m @ 3m +33.0dBμV/m @ 3m +33.6dBμV/m @ 3m
Frequency & Level 88MHz to 216MHz		112.650MHz	+31.2dBμV/m @ 3m
Frequency & Level 216MHz to 960MHz		nil emissions	>20dB below limit
Frequency & Level 960MHz to (x) MHz		nil emissions	>20dB below limit
Limits	30MHz to 88MHz	+39.0dBμV/m @ 10m [ ];	+40.0dBμV/m @ 3m [X]
	88MHz to 216MHz	+43.5dBμV/m @ 10m [ ];	+43.5dBμV/m @ 3m [X]
	216MHz to 960MHz	+46.4dBμV/m @ 10m [ ];	+46.0dBμV/m @ 3m [X]
	960MHz to (x) MHz	+49.5dBμV/m @ 10m [ ];	+54.0dBμV/m @ 3m [X]
Measurement Uncertainty		±4.1dB	

Notes:-

1. Results quoted are extrapolated as indicated.
2. Emissions were searched to:- (x) 2100MHz inclusive, as per Part 15.33b.
3. Extrapolation factor @ 20dB/decade from 10m to 1m, as per Part 15.31f.
4. Extrapolation factor @ 10.5dB from 10m to 3m.
5. Extrapolation factor @ 9.5dB from 3m to 1m.
6. Measurements <1GHz @ 10m (Class A), or @ 3m (Class B), as per Part 15.109.
7. Measurements >1GHz @ 1m, as per Part 15.31f (1).
8. Receiver Detector <1GHz = CISPR, Quasi-Peak, 120kHz Bandwidth.
9. Receiver Detector >1GHz = Peak Hold, 1MHz Resolution Bandwidth.
10. Sample calculation, see page 6.

Test Method:-

1. As per Radio - Noise Emissions, ANSI C63.4: 1992.
2. Measuring distances as Notes 1, 2 & 3 above.
3. EUT 0.8 metre above ground plane.
4. Emissions maximised by rotation of EUT, on an automatic turntable, raising and lowering the receiver antenna between 1m & 4m in horizontal and vertical polarisations, with worst case results recorded.

Test Equipment Used:-

1. Full description at Annex B.
2. TRL190, TRL191, TRL182, TRL415, TRL164, TRL193, TRL203, TRL138, TRL279.

RECEIVER TESTS

RECEIVER SPURIOUS EMISSIONS - CONDUCTED - PART 15.111

Ambient temperature	=	+21°C
Relative humidity	=	66%
Conditions	=	Indoors
Supply voltage	=	Vnom
Channel number	=	1 (RMM21 port)

Frequency & Level 9kHz to (**x**) MHz	203.1MHz 406.2MHz 609.3MHz 812.4MHz 1015.5MHz 1421.7MHz 1624.8MHz 2031.0MHz	-135.3dBW -126.8dBW -135.8dBW -127.7dBW -128.6dBW -132.3dBW -111.5dBW -124.9dBW
Limit	-87dBW (2nW)	
Measurement Uncertainty	±1.5dB	

Notes:-

1. Emissions were searched to:- (**x**) 2100MHz inclusive, as per Part 15.33b.

Test Method:-

1. As per Radio - Noise Emissions, ANSI C63.4: 1992.
2. RF Spectrum Analyser set to:-
   - Res BW = 10kHz @ <30MHz.
   - Res BW = 100kHz @ <1GHz.
   - Res BW = 1MHz @ >1GHz.
   - Video BW = as per Res BW.
   - Detector = Peak Hold.
   - Freq. Span = as appropriate.
   - Scan Rate = Auto.
3. Measurement Receiver set to:-
   - Rx BW = 10kHz @ <30MHz.
   - Rx BW = 120kHz @ <1GHz.
   - Detector = CISPR, Quasi-Peak.

Test Equipment Used:-

1. Full description at Annex B.
2. TRL190, TRL191, TRL164, TRL55.

RECEIVER TESTS

RECEIVER SPURIOUS EMISSIONS - CONDUCTED - PART 15.111

Ambient temperature = +21°C
Relative humidity = 66%
Conditions = Indoors
Supply voltage = Vnom
Channel number = 1 (RMM22 port)

Frequency & Level 9kHz to (**x**) MHz	203.1MHz 406.2MHz 609.3MHz 812.4MHz 1015.5MHz 1218.6MHz 1421.7MHz 1624.8MHz 1827.9MHz 2031.0MHz	-130.9dBW -130.0dBW -128.6dBW -124.9dBW -121.8dBW -130.9dBW -131.9dBW -106.7dBW -131.5dBW -122.1dBW
Limit	-87dBW (2nW)	
Measurement Uncertainty	±1.5dB	

Notes:-
1. Emissions were searched to:- (**x**) 2100MHz inclusive, as per Part 15.33b.

Test Method:-
1. As per Radio - Noise Emissions, ANSI C63.4: 1992.
2. RF Spectrum Analyser set to:-
   Res BW = 10kHz @ <30MHz.
   Res BW = 100kHz @ <1GHz.
   Res BW = 1MHz @ >1GHz.
   Video BW = as per Res BW.
   Detector = Peak Hold.
   Freq. Span = as appropriate.
   Scan Rate = Auto.
3. Measurement Receiver set to:-
   Rx BW = 10kHz @ <30MHz.
   Rx BW = 120kHz @ <1GHz.
   Detector = CISPR, Quasi-Peak.

Test Equipment Used:-
1. Full description at Annex B.
2. TRL190, TRL191, TRL164, TRL55.

ANNEX B

TEST EQUIPMENT LIST

INSTRUMENT	SUPPLIER	TYPE No	SERIAL No	TRL EMC No
LF / HF RECEIVER, 9kHz - 30MHz	ROHDE&SCHWARZ	ESH2	879014 / 028	TRL 06
RF PULSE LIMITER	ROHDE&SCHWARZ	ESH3Z2	M494	TRL 06A
AE, LOOP, Z2, 9kHz - 30MHz	ROHDE&SCHWARZ	HFH2	881058 - 53	TRL 07
RANGE 1 (3 - 30m)	TRL	N/A	N/A	TRL 08
VARIAC, 230V, 10A	ZENITH	100R	V265537	TRL 12
dc PSU, VARIABLE, 30v, 10A, 300W	TOPWARD ELECTRONIC	23010	899672	TRL 15
RF SIGNAL GEN, 10kHz - 1000MHz	MARCONI	2022	119022 / 205	TRL 17
LISN, ac MAINS	CHASE	MN2050	1431	TRL 25
HF RECEIVER, 150kHz - 30MHz	CHASE	HFR2000	2158	TRL 26
LF RECEIVER, 9kHz - 150kHz	CHASE	LFR1000	1020	TRL 27
HF RECEIVER, 150kHz - 30MHz	CHASE	HFR2000	2187	TRL 28
AE, DIPOLE, 20MHz - 300MHz	CHASE	VHA9103	7106	TRL 35
AE, DIPOLE, 20MHz - 300MHz	CHASE	VHA9103	7011	TRL 36
AE, DIPOLE, 300MHz - 1GHz	CHASE	VHA9105	7107	TRL 37
AE, DIPOLE, 300MHz - 1GHz	CHASE	VHA9105	N/A	TRL 38
ATU, RECEIVER, 9kHz - 30MHz	SCHWARZBECK	FMZL1514	1514338	TRL 42
COAX LOAD, 2W, N, 50Ω, dc - 4GHz	BIRD	8360NM	N/A	TRL 113
COAX LOAD, 2W, N, 50Ω, dc - 4GHz	BIRD	8360NM	N/A	TRL 114
COAX LOAD, 2W, BNC, 50Ω, dc - 4GHz	BIRD	8360B	N/A	TRL 115
COAX LOAD, 2W, BNC, 50Ω, dc - 4GHz	BIRD	8360B	N/A	TRL 116
COAX LOAD, 1W, BNC, 50Ω, dc - 1GHz (min)	SUHNER	65BNC - 50 - 0 - 1	N/A	TRL 117
AE, DRG HORN, 1GHz - 18GHz	EMCO	3115	9010 - 3580	TRL 138

ANNEX B

TEST EQUIPMENT LIST

INSTRUMENT	SUPPLIER	TYPE No	SERIAL No	TRL EMC No
AE, DRG HORN, 1GHz - 18GHz	EMCO	3115	9010 - 3581	TRL 139
RF ANALYSER, 10kHz - 60GHz	TEKTRONIX	2756P	B010109	TRL 164
MULTIMETER (mc) 20kΩ / V (sens)	AVO	MODEL 8, MK.V.	0545248	TRL 169
RF SIGNAL GEN, LOW NOISE -90dBc, 10kHz - 5.4GHz	MARCONI	2042	119388 / 080	TRL 176
RANGE 2 (3 - 10m)	TRL	N/A	N/A	TRL 182
VARIAC, 230V, 10A	VARATRAN	Z710R	N/A	TRL 186
ANTENNA MAST	CHASE	HM9104	N/A	TRL 189
MULTIMETER (dig)	ISOTECH	IDM91	00606606	TRL 190
THERMOMETER & HYGROMETER	RS	212 - 146	N/A	TRL 191
AE, BICONE, 20MHz - 300MHz	CHASE	BBA 9106	N/A	TRL 193
SCOPE, 20MHz, 2CH, DIG STORAGE	BECKMAN	9302	2090044	TRL 197
AE, LOG PERIODIC, 300MHz - 1GHz	CHASE	UPA6108	1061	TRL 203
ac PSU, VARIABLE, 300V, 5A, 1kVA, 45Hz - 440Hz	MAGNUS	MP500	1108	TRL 204
TRANSFORMER, ISOLATION, 240Vac	RS	209 - 099	N/A	TRL 205
TRANSFORMER, ISOLATION, 110Vac	RS	208 - 636	N/A	TRL 206
LISN, 3ph MAINS ac	SCHWARZBECK	NSKL8128	8128151	TRL 207
COAX LOAD, 5W, BNC, 50Ω, dc - 4GHz	BIRD	80BNCM	5866	TRL 223
dc PSU, VARIABLE, 15/30V, 2/1A, 30W	WIER	731	88829	TRL 224
VARIAC, 230V, 2A	REGULAC	RB3 - MT	N/A	TRL 225
VARIAC, 230V, 2A	REGULAC	RB3 - MT	N/A	TRL 226
THERMOMETER & HYGROMETER	RS	212 - 124	227	TRL 227
THERMOMETER & HYGROMETER	RS	212 - 124	228	TRL 228
THERMOMETER & HYGROMETER	RS	212 - 124	229	TRL 229

ANNEX B

TEST EQUIPMENT LIST

INSTRUMENT	SUPPLIER	TYPE No	SERIAL No	TRL EMC No
THERMOMETER & HYGROMETER	RS	212 - 124	230	TRL 230
THERMOMETER & HYGROMETER	RS	212 - 124	231	TRL 231
AE, LOG PERIODIC, 300MHz - 1GHz	EMCO	3146	N/A	TRL 233
dc PSU, VARIABLE, (2x) 32V, 3A, 100W	THURLBY THANDAR	PL330	046542	TRL 235
LF / HF RECEIVER, 9kHz - 30MHz	ROHDE&SCHWARZ	ESHS20	837960 / 003	TRL 237
LISN, ac MAINS	ROHDE&SCHWARZ	ESHS3 - Z5	839135 / 013	TRL 238
MULTIMETER, (dig)	ISOTECH	IDM97	32202147	TRL 239
THERMOMETER & BAROMETER	RS	216435	N/A	TRL 240
COAX CABLE, 50Ω, 18GHz, TNC, 1.25m	W L GORE	3390 / 265 / 1	8420202	TRL 249
COAX CABLE, 50Ω, 18GHz, TNC, 1.25m	W L GORE	3390 / 265 / 1	8420223	TRL 250
AE, BICONE, 20MHz - 300MHz	CHASE	VBA6106A	1193	TRL 251
AE, EASY 1, 30MHz - 1GHz	FARNELL	S30280	017	TRL 253
RF SIGNAL GEN, LOW NOISE -90dBc, 10kHz - 5.4GHz	MARCONI	2042	119562 / 021	TRL 254
SCOPE, 400MHz, 4CH, DIG STORAGE	TEKTRONIX	TDS460A	B020781	TRL 258
RF SIGNAL GEN, 10kHz - 1GHz	MARCONI	2022D	119224 - 023	TRL 264
MULTIMETER, (dig)	ISOTECH	IDM97 RMS	32202307	TRL 273
AE, BILOG, 20MHz - 2GHz	CHASE	CBL6112	2098	TRL 274
COAX ADAPTOR, 18GHz, TNC / N	ROSENBERGER	05S106 - K0053	N/A	TRL 275
COAX ADAPTOR, 18GHz, TNC / N	ROSENBERGER	05S106 - K0053	N/A	TRL 276
COAX ADAPTOR, 18GHz, TNC / N	ROSENBERGER	05S106 - K0053	N/A	TRL 277
COAX ADAPTOR, 18GHz, TNC / N	ROSENBERGER	05S106 - K0053	N/A	TRL 278
COAX CABLE, 18GHz, N, 0.5M	ROSENBERGER	RTK161 - GP - Nm90 - 50cms	N/A	TRL 279
COAX CABLE, 18GHz, N, 3.0M	ROSENBERGER	RTK161 - GP - Nm90 - 300cms	N/A	TRL 280

ANNEX B

TEST EQUIPMENT LIST

INSTRUMENT	SUPPLIER	TYPE No	SERIAL No	TRL EMC No
COAX CABLE, 50Ω, 4GHz, N, 12m	TRL	WESTFLEX 103	N/A	TRL 286
COAX CABLE, 50Ω, 4GHz, N, 12m	TRL	WESTFLEX 103	N/A	TRL 287
LISN, ac MAINS	ROHDE&SCHWARZ	ESH3 - Z5	837469 / 010	TRL 289
AE, BILOG, 20MHz - 1GHz	CHASE	CBL6111B	1945	TRL 290
MULTIMETER (dig)	ISOTECH	IDM97 RMS	32202547	TRL 291
MULTIMETER (dig)	ISOTECH	IDM97 RMS	32202565	TRL 292
THERMOMETER & BAROMETER	RS	216435	N/A	TRL 293
COAX CABLE, 50Ω, 26.5GHz, SMA, 2m, c/w 3 ADAPTORS	GORE	145	MFR65474	TRL 308
V / UHF RECEIVER, 20MHz - 1GHz	ROHDE&SCHWARZ	ESVS10	837948 / 003	TRL 317
RF PULSE LIMITER	ROHDE&SCHWARZ	ESH3Z2	A400	TRL 318
RF SIGNAL GEN, 9kHz - 1.2GHz	MARCONI	2023	112224 / 036	TRL 320
AE, LOG PERIODIC, 300MHz - 1GHz	CHASE	UPA6108	1016	TRL 344
V / UHF RECEIVER, 20MHz - 1GHz	ROHDE&SCHWARZ	ESVS10	844594 / 0003	TRL 352
LF / HF RECEIVER, 9kHz - 30MHz	ROHDE&SCHWARZ	ESHS10	844077 / 019	TRL 353
COAX CABLE, 50Ω, 4GHz, N, 0.5m	TRL	NA	NA	TRL 358
COAX CABLE, 50Ω, 4GHz, N, 16m	TRL	NA	NA	TRL 359
COAX CABLE, 50Ω, 4GHz, N, 1m	TRL	NA	NA	TRL 360
THERMOMETER & HYGROMETER	RS	204 - 072	NA	TRL 363
THERMOMETER & HYGROMETER	RS	204 - 072	NA	TRL 364
THERMOMETER & HYGROMETER	RS	204 - 072	NA	TRL 365
THERMOMETER & HYGROMETER	RS	204 - 072	NA	TRL 366
V / UHF RECEIVER, 20MHz - 1GHz	ROHDE&SCHWARZ	ESVS20	838804 / 005	TRL 415
RF ANALYSER, 9kHz - 1GHz	WAYNE KERR	SSA1000A	9800001488	TRL 416

ANNEX B

TEST EQUIPMENT LIST

INSTRUMENT	SUPPLIER	TYPE No	SERIAL No	TRL EMC No
LF / HF RECEIVER, 9kHz - 30MHz	ROHDE&SCHWARZ	ESHS10	830051 / 001	TRLUH 03
AE, LOOP, Z2, 9kHz - 30MHz	ROHDE&SCHWARZ	HFH - Z2	892246 / 023	TRLUH 23
RF ANALYSER, dc - 26.5GHz	MARCONI	2380	152089 / 009	TRLUH 120
		2386	152076 / 044	

ANNEX C

APPLICANT'S SUBMISSION OF DOCUMENTATION LIST

a.	FEDERAL COMMUNICATIONS COMMISSION	- APPLICATION	[X]
		- FEE	[X]
b.	AGENT'S LETTER OF AUTHORISATION		[X]
c.	QUESTIONNAIRE		[X]
d.	TRADE NAME DECLARATION(s)		[ ]
e.	LABELLING	- PHOTOGRAPHS	[ ]
		- DECLARATION	[X]
		- DRAWINGS	[X]
f.	TECHNICAL DESCRIPTION		[X]
g.	BLOCK DIAGRAMS	- Rx	[X]
		- PSU	[X]
		- AUX	[X]
h.	CIRCUIT DIAGRAMS	- Rx	[X]
		- PSU	[X]
		- AUX	[X]
i.	COMPONENT LOCATION	- Rx	[X]
		- PSU	[X]
		- AUX	[X]
j.	PCB TRACK LAYOUT	- Rx	[X]
		- PSU	[X]
		- AUX	[X]
k.	BILL OF MATERIALS	- Rx	[X]
		- PSU	[X]
		- AUX	[X]
l.	USER INSTALLATION / OPERATING INSTRUCTIONS		[X]