





## Test Report

Product	Antenna system for satellite terminals	
Name and address of the applicant	Thrane & Thrane AS Lundtoftegaardsvej 93D.DK 2800 Kgs. Lyngby, Denmark	
Name and address of the manufacturer	Thrane & Thrane AS Lundtoftegaardsvej 93D.DK 2800 Kgs. Lyngby, Denmark	
Model	TT-3721A (System) Consist of : Antenna : TT-3058A / Terminal: TT-3733A	
Rating	DC 24 V	
Brand name	Thrane & Thrane	
Serial number		
Additional information		
Tested according to	EN 301 489-01 (V1.8.1) EN 301 489-20 (V1.2.1) EN 301 444 (v.1.1.1) section 4.2.1.2.1	
Order number	145878	
Tested in period	2010-05-10 – 2010-05-12	
Issue date	2010-06-09	
Name and address of the testing laboratory	 P.O. Box 73 Blindern, N-0314 Oslo, Norway	Telephone (+47) 22 96 03 30 Fax (+47) 22 96 05 50
		 ACCREDITED REPORT REF: NA-TEST 033 <b>An accredited technical test executed under the Norwegian accreditation scheme</b>
	 Prepared by [Jan Gunnar Eriksen]	 Approved by []
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## REVISIONS

Revision #	Date	Order #	Description
00	2010-05-20	145878	DRAFT
01	2010-06-09	145878	Final version

## GENERAL REMARKS

This report applies only to the sample(s) tested. It is the manufacturer's responsibility to assure the additional production units of this product are manufactured with identical electrical and mechanical components. The manufacturer is responsible to the Competent Authorities in Europe for any modifications made to the product, which result in non-compliance to the relevant regulations.

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Opinions expressed within this report regarding general assessments and qualifications for PASS or FAIL to the standards limits and requirements, are not part of the current accreditation. Neither is opinions expressed regarding model variants covered by the testing of this report.

## CALIBRATION

All instruments used in the tests given in this test report are calibrated and traceable to national or international standards. Between calibrations all test set-ups are controlled and verified on a regular basis by periodic checks to ensure, with 95% confidence that the instruments remain within the calibrated levels.

## MEASUREMENT UNCERTAINTY

Measurement uncertainties are calculated or considered for all instruments and instrument set-ups used during these tests. Uncertainty figures are found in an appendix to this report.

Further information about measurement uncertainties is provided on request.

## EVALUATION OF RESULTS

If not explicitly stated otherwise in the standard, the test is passed if the measurement value is equal to or below the limit line, regardless of the uncertainty of the measurement. If the measurement value is above the limit line, the test is not passed - ref. IECEE/CTL (Sec) 056/94 (CTL = Committee of Testing Laboratories).

The instrumentation accuracy is within limits agreed by the IECEE/CTL (ref. Nemko proc. P227).

## DESCRIPTION OF TESTED DEVICE (EUT)

### SYSTEM DESCRIPTION

The EuT is a satellite antenna system to be used with a satellite terminal unit. The EuT is to be used in a vehicular environment on land.

During radiated emission and immunity tests the EuT was tested together with the terminal unit.

Hardware identity and/or version: <>

Software identity and/or version: <>

### MODEL VARIATIONS

The following model variations are considered covered by this report

VA no.	Variant	Comment	Investigated
1			
2			
3			

Note: Items that are shaded have been subject to testing documented in this report. Opinions expressed regarding application of test results to variant models are not part of our current accreditation.

### PRINCIPLE DIAGRAM



### SYSTEM COMPONENTS

SC no.	Description	Manufacturer	Type	Serial no.
1	Antenna unit	Thrane & Thrane	TT-3058A	
2	Terminal Unit	Thrane & Thrane	TT-3733A	
3				

### PORTS AVAILABLE

This equipment is fitted with the following electrical ports.

PO no.	Port Name	Type	Count	Comment
1	Signal and mains port	Coaxial cable	1	Coaxial cable for DC power and signal to/from the satellite terminal unit
2				
3				

### CONFIGURATION OF CABLES (INCLUDING INTERCONNECTING ONES)

This equipment has been tested with the following cable types and cable configurations. Any changes to these parameters when installed may influence on the EMC properties of this equipment.

CA no.	Connection	Manufacturer	Type	Shielded	Leads	Length (m)
1						
2						
3						

### CLOCK FREQUENCIES AND DISTRIBUTIONS

This equipment utilizes the following crystal oscillators and clocking schemes as described below:

XF no.	Frequency	Type	Purpose
1			
2			
3			

### AVAILABLE OPERATING MODES

The following functional operating modes are available and are considered applicable under intended use.

FU no.	Operating mode	Comment	Investigated
1			
2			
3			

### ACCESSORIES APPLIED DURING TEST

AE no.	Description	Manufacturer	Type	Serial no.
1				
2				
3				

### EQUIPMENT MODIFICATIONS

The following equipment modifications were required to achieve compliance with the applied standards.

MO no.	Modification	Purpose
1		
2		
3		

### ADDITIONAL INFORMATION RELATED TO TESTING

No further information.

## GENERAL TEST CONDITIONS

### TEST LABORATORY

The following Nemko test sites have been utilized for the tests documented in this report:

Site	
<input type="checkbox"/> GAUSTAD	(Gautstadalleen 30, N-0314 Oslo, Norway)
<input checked="" type="checkbox"/> KJELLER	(Instituttveien 6, N-2027 Kjeller, Norway)
<input type="checkbox"/> SKAR	(Maridalsveien 621, N-0890 Oslo, Norway)

#### Laboratory accreditation:

NORSK AKKREDITERING – TEST 033

P06 – EMC – Electromagnetic Compatibility

P17 – Environmental Tests

### POWER SUPPLIED TO EUT

Filtered electrical power was available for operation of EuT in all the test sites.

**Voltage type:** 24V DC

**Grounding:** Grounded through its power/signal connection

### AMBIENT CONDITIONS

All EMC tests and measurements were performed in a shielded enclosure or in a controlled environment suitable for the tests conducted.

Normal ambient test conditions:

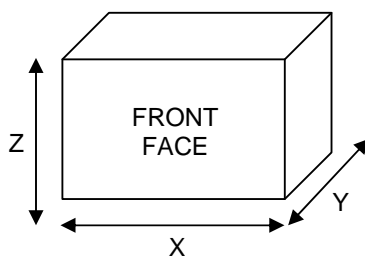
**Ambient temperature:** 20 – 23°C

**Relative humidity:** 20 – 50%RH

**Atmospheric pressure:** 98 – 102kPa

Note: The climatic conditions in the test areas are automatically controlled and recorded continuously.

### DEFINITION OF AXIS CONVENTIONS



## EVALUATION OF PERFORMANCE

### FUNCTIONS MONITORED DURING IMMUNITY TESTS

In order to verify acceptable performance by the EuT during the applied tests, the following functions were monitored:

#	Function	Monitoring method
1	RF spectrum being transmitted from EuT	Visual on PC
2	Data packets being transmitted to/from EuT	Visual on PC
3	Antenna system being able to move during immunity tests	Visual

### FUNCTIONAL CHECKS

A verification of correct function was performed before, during and after each test, by the following tests:

#	Functional tests
1	Ability to turn TX ON/OFF
2	Ability to start/stop transmitting of data
3	Ability to start/stop moving of antenna system

### PERFORMANCE CRITERIA

In order to pass each test, the EuT shall meet the following criteria:

Criteria	General description	Criteria modified by manufacturer
A	The device shall continue to operate as intended both during and after the test. No degradation of performance or loss of function is allowed below the expected performance level of the device	
B	The device shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below the expected performance level of the device	
C	Temporary loss of function during test is allowed, provided the function is self-recoverable or can be restored by the operation of the controls	

## SUMMARY OF TESTING

### APPLIED STANDARDS

- » **EN 301 489-01 (V1.8.1)** *Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements*
- » **EN 301 489-20 (V1.2.1)** *Electromagnetic compatibility and Radio spectrum Matters (ERM); Electromagnetic compatibility (EMC) standard for radio equipment and services; Part 20: Specific conditions for Mobile Earth Stations (MES) used in the Mobile Satellite Services (MSS)*
- » **EN 301 444 (v.1.1.1) section 4.2.1.2.1** *Satellite Earth Stations and Systems (SES); Harmonized EN for Land Mobile Earth Stations (LMES) operating in the 1,5GHz and 1,6GHz bands providing voice and/or data communications*

### APPLIED TESTS

Test items	Test methods	Result
Mains Port Disturbance Voltage	EN 301 489-01 (V1.8.1) EN 301 489-20 (V1.2.1)	PASS
Radiated Disturbance (RF)	EN 301 489-01 (V1.8.1) EN 301 489-20 (V1.2.1)	PASS
Electrostatic Discharges	EN 301 489-01 (V1.8.1) EN 301 489-20 (V1.2.1) EN 61000-4-2 (2009), Ed.2.0	NA
Radiated RF Field	EN 301 489-01 (V1.8.1) EN 301 489-20 (V1.2.1) EN 61000-4-3 (2008), Ed.3.1 EN 301 444 (v.1.1.1) section 4.2.1.2.1	PASS
Electric Fast Transients	EN 301 489-01 (V1.8.1) EN 301 489-20 (V1.2.1) EN 61000-4-4 (2004), Ed.2.0	NA
Surge	EN 301 489-01 (V1.8.1) EN 301 489-20 (V1.2.1) EN 61000-4-5 (2006), Ed.2.0	NA
Conducted RF Disturbance	EN 301 489-01 (V1.8.1) EN 301 489-20 (V1.2.1) EN 61000-4-6 (2009), Ed.3.0	PASS
Dips/Interruptions	EN 301 489-01 (V1.8.1) EN 301 489-20 (V1.2.1) EN 61000-4-11 (2004), Ed.2.0	NA

- PASS : Tested and complied with the requirements  
 FAIL : Tested and failed the requirements  
 NA : Test not relevant to this specimen (evaluated by the test laboratory)  
 – : Test not performed (instructed by the applicant)  
 \* : An asterisk (\*) placed after the verdict in the Result column indicates test items that are not within Nemko's scope of accreditation  
 # : A grid (#) placed after the verdict in the Result column indicates test items that are only partly covered by Nemko's scope of accreditation. Further information is detailed in the test section

### DEVIATIONS AND EVALUATIONS

Product standards with dated references to basic standards may be modified by Nemko AS to test according to the newest edition of the basic standard. This may impact the compliance criteria or technical performance of the test, still this is considered to be adequate as long as the test is expected to confirm compliance to the intention of the product standard. The table above lists the edition of the basic standards used during testing.

# Test Results



## EMISSION – MAINS PORT DISTURBANCE VOLTAGE

### TEST DESCRIPTION

#### Method

The reference method for this test is listed in the table under clause APPLIED TESTS.

#### Set-up

The measurements were performed in a shielded enclosure. EuT was connected to an Artificial Mains Network (AMN) and placed on a wooden table 10cm (floor-standing) or 80cm (tabletop) above the grounded floor and 40cm from the reference ground plane (wall). EuT was connected to the AMN by its power cable, which was adjusted to 100cm length by folding.

#### Procedure

A screening test was first performed to decide the most disturbing operating mode of the EuT, maximizing the cable layout and deciding the proper dwell time for the measurements.

Then measurements were run between each of the current carrying wires of the power cord, and ground.

The frequency was swept in the range specified under Severity.

A comparison of the results obtained from the different wires was then performed to find the highest level at each frequency. This worst-case sweep with peak detector is presented below.

At the frequencies where the peak level of the emission was exceeding the applicable [limit - offset], the emission was also measured with the quasi-peak detector and, if required, with the average detector.

#### Instruments used during measurement

Instrument list:            Test Receiver R&S ESAI (LR 1089/90) (4-2010 )  
                                      AMN R&S ESH2-Z5 (N-4097) (06-2010)

#### Comments

No recorded comments.

#### Severity

Port:	Mains DC 24 V
Frequency range:	0,150 – 30 MHz
Frequency step:	100 Hz / 5 kHz
Dwell time:	50 mSec
Bandwidth:	10 kHz

#### Conformity

Verdict:	PASS
Test engineer:	Jan G Eriksen

**QUASI PEAK DETECTOR DATA**

Frequency [MHz]	Level Plus [dBuV]	Level Minus [dBuV]	Limit [dBuV]	Margin Plus [dB]	Margin Minus [dB]	Verdict [Pass/Fail]
13,419	48,1	48,4	60,0	11,9	11,6	Pass

**AVERAGE DETECTOR DATA**

Frequency [MHz]	Level Plus [dBuV]	Level Minus [dBuV]	Limit [dBuV]	Margin Plus [dB]	Margin Minus [dB]	Verdict [Pass/Fail]
13,419	44,4	44,6	50,0	5,6	5,4	Pass

# EMISSION – RADIATED DISTURBANCE

## TEST DESCRIPTION

### Method

The reference method for this test is listed in the table under clause APPLIED TESTS.

### Set-up

All measurements are performed in a 10m semi-anechoic chamber. EuT is connected to filtered mains supply and placed on a wooden table 10 cm (floor-standing) / 80 cm (tabletop) above the ground plane, in the centre of the turntable. The measuring antenna is located 10 meters from EuT.

### Procedure

A screening test was first performed to decide the most disturbing operating mode of the EuT, maximizing the cable layout and deciding the proper dwell time for the measurements.

A set of preliminary measurements are then run with a peak detector across the frequency range, for horizontal and vertical polarizations of the antenna, and for 0°, 90°, 180° and 270° turntable azimuths. The frequency is swept in the range specified under Severity.

A comparison of the levels measured at each measurement positions is then performed, and the highest level at each frequency is stored. This "Worst Case" sweep with peak detector is presented in the report.

At the frequencies where the peak values of the emission are exceeding the applicable [limit - offset], the emission is also measured with the quasi-peak detector: Cables connected to EuT are fixed to cause maximum emission, and a maximum emitting point is searched by tuning the turntable azimuth 0 - 360° and then tuning the antenna height 100 - 400cm above the ground plane.

The quasi-peak detector measurement is performed at the maximum emitting point and compared to the limit. The emission level is calculated in the following matter:  $E_{level} = E_{reading} + E_{antenna} + E_{cable}$ .

### Instruments used during measurement

Instrument list: Test Receiver R&S ESN (LR 1237) (10-2011),  
 Test Receiver R&S ESCI (N 4259) (08-2010),  
 Spectrum Analyzer R&S FSEK 30 (LR-1337) (11-2010),  
 Antenna R&S HK-116 (LR-1260) (04-2010),  
 Antenna R&S HL-223 (LR-1261) (04-2010),  
 Antenna EMCO 3115 (LR-1330) (04-2010),  
 Preamp HP 10855A (LR-1322) (01-2010),  
 Preamp HP 8449B (LR-1445) (08-2011)

### Comments

No recorded comments.

### Severity

Port:	Enclosure Port
Frequency range:	30 MHz – 6000 MHz
Frequency step:	80 kHz
Dwell time:	20 mSec
Bandwidth:	120 kHz / 1 MHz above 1000 MHz
Meas. distance:	

### Conformity

Verdict:	PASS
Test engineer:	Jan G Eriksen

**QUASI PEAK DETECTOR DATA**

Frequency [MHz]	Level [dBuV]	Limit [dBuV]	Margin [dB]	Height [cm]	Azimuth [deg]	Polarisation [Ver / Hor]	Verdict [Pass/Fail]
54,43	28,0	30,0	2,0	120	0	Ver	Pass
83,00	25,5	30,0	4,5	130	0	Ver	Pass
250,00	24,5	37,0	12,5	300	330	Hor	Pass
266,00	23,0	37,0	14,0	400	270	Hor	Pass
799,98	28,0	37,0	9,0	220	330	Ver	Pass
799,98	27,0	37,0	10,0	300	270	Hor	Pass

**PEAK AND AVERAGE DETECTOR DATA**

Frequency [MHz]	Level [dBuV]	Limit [dBuV]	Margin [dB]	Height [cm]	Azimuth [deg]	Polarisation [Ver / Hor]	Verdict [Pass/Fail]
1) 4930,5	<67,0	74,0	>7,0	120	0-360	Ver&Hor	Pass
2) 4930,5	<45,0	54,0	>9,0	120	0-360	Ver&Hor	Pass

Note: 1) Peak measurement  
2) Average measurement

**EN 301 444 V.1.1.1 SECTION 4.2.1.2.1**

Ref. Same test as for EN 55022

Results: See table above  
See Radiated emission plots under Annexes

Comments: Pass

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# IMMUNITY – RADIATED RF DISTURBANCE

## TEST DESCRIPTION

### Method

The reference method for this test is listed in the table under clause APPLIED TESTS.

### Set-up

The tests are performed at 3 meter antenna distance in an anechoic chamber. EuT is placed on a wooden table 10 cm (floor standing) / 80 cm (tabletop) above the floor.

The EuT is placed within the calibrated volume, and the cables connected to EuT is arranged so that 100 cm of each cable is exposed to the electromagnetic field.

Interconnecting cables specified  $\leq 300$  cm whose length exceeded 100 cm are bundled to achieve 100 cm length.

Interconnecting cables specified  $> 300$  cm and other cables connected to the EuT are exposed for 100 cm, and the remaining cable length is decoupled with the use of ferrites.

### Procedure

The EuT is exposed to a RF electromagnetic field generated by one or more antennas. The field is applied with the antennas facing each of the four faces of the EuT (0°, 90°, 180°, 270°). The polarization of the field requires testing each side of the EuT twice, once with the antenna horizontally and again with the antenna vertically. The antenna height during test is 150 cm.

A field level and type as specified below is applied in the defined frequency range. The frequency is swept through the range with a step width and a dwell time per frequency as specified below.

### Optional conditions if the testing has been performed in a GTEM cell or in a Stripline (see Severity):

For physically small, uncomplicated equipment, this test may have been done in a GTEM cell. In a GTEM cell the EuT is placed on a wooden table in the centre between the floor ground reference plane and the septum transmitter plane. The EuT is tested in all three orthogonal axis (X, Y and Z). The septum height in the test volume is 140 cm.

### Instruments used during measurement

Instrument list: RF Generator R&S SMT03 (LR-1230) (01-2011),  
 Power Meter R&S NRVD (LR-1347) (02-2010),  
 Power Probe NRV-Z5 R&S (LR-1372) (02-2010),  
 Coupler Narda 3020B (LR-287) (05-2011),  
 Coupler Amplifier Research DC6180 (LR-1404) (05-2010),  
 Antenna R&S HL023-A1 (LR-282) (NA),  
 Antennas EMCO 3161-1 & 2 (LR 1178 & 79) (NA),  
 Field Probe AR FP4080 (LR-1424) (06-2011)

### Comments

No recorded comments.

### Severity

Port: Enclosure Port  
 Frequency range: 80 – 2700 MHz  
 Step size: 1 %  
 Dwell time: 1 s  
 Modulation: 80 % AM, 1000 Hz  
 Field generation: Testing has been performed in an anechoic chamber using antennas to apply the field

### Conformity

Verdict: PASS  
 Test engineer: Jan G Eriksen

## DETAILED TEST LOG

Note: The choice of test levels could differ from the procedure, based on the nature of EuT.

Note: An asterisk (\*) indicates tests not within the scope of accreditation.

Note: Possible test case performances: <space> = Not tested, or letters indicating level of performance.

Frequency range [MHz]	Field strength [V/m]	Azimuth [deg]	Polarization	Required Criteria	Complied Criteria	Result
80 - 1000	10	0°	HOR	A	A	PASS
80 - 1000	10	0°	VER	A	A	PASS
1000 - 2700	3	0°	HOR	A	A	PASS
1000 - 2700	3	0°	VER	A	A	PASS

## CONCLUSION

No operation errors were detected during or after the applied test(s)

# IMMUNITY – CONDUCTED RF DISTURBANCE

## TEST DESCRIPTION

### Method

The reference method for this test is listed in the table under clause APPLIED TESTS.

### Set-up

The test is performed on a large ground reference plane. EuT is placed on a wooden table 10 cm above the reference plane. Cables for AC mains and cables going to and from support equipment plus interconnecting cables are isolated from the ground plane by a 5 cm isolating support.

### Procedure

Disturbance is applied via a coupling/decoupling network (CDN) or a capacitive coupling clamp (EM Clamp) to each port separately.

All ports on EuT not subject to testing are furnished with decoupling networks to achieve RF isolation of the EuT during test. As decoupling networks Nemko use the CDNs normally used to apply the disturbance. One of the CDNs have a 50Ω termination attached to its RF input port, this CDN behaves as true 150Ω loop. Which CDN to select is decided according to the priority given in §7.2 of the reference standard.

For AC ports, DC ports, coax lines and 2- or 4-lines balanced communication lines a CDN is used to apply the disturbance. On other multiple signal cables an EM Clamp is used to apply the disturbance. A signal level/type as specified below is applied in the defined frequency range. The frequency is swept through the range with a step width and a dwell time per frequency as specified below.

### Instruments used during measurement

Instrument list: RF Generator HP 8656B (LR-1026) (10-2011),  
 Voltmeter R&S URV5 (LR-192) (10-2011),  
 Coupler Werlatone 2630 (LR-1321) (05-2011)  
 CDN Fischer 801-M2-16 (LR 1312) (06-2012)  
 Injection Clamp Fischer (LR 1482) (06-2012)  
 CDN Nemko (LR 1474) (NA)

### Comments

No recorded comments.

### Severity

Port:	Mains DC 24 V Signal from BDU
Frequency range:	0,150 – 80
Step size:	1 %
Dwell time:	1 second
Modulation:	80 % AM, 1000 Hz

### Conformity

Verdict:	PASS PASS
Test engineer:	Jan G Eriksen

**DETAILED TEST LOG**

Note: The choice of test levels could differ from the procedure, based on the nature of EuT.

Note: An asterisk (\*) indicates tests not within the scope of accreditation.

Note: Possible test case performances: <space> = Not tested, or letters indicating level of performance.

Port	Frequency range [MHz]	Applied Level [Vrms]	Injection Method	Required Criteria	Complied Criteria	Result
DC 24 V Power Port	0.15 – 80	10	CDN-M3	A	A	PASS
Signal from BDU	0.15 – 80	10	EM Clamp	A	A	PASS

**CONCLUSION**

No operation errors were detected during or after the applied test(s)



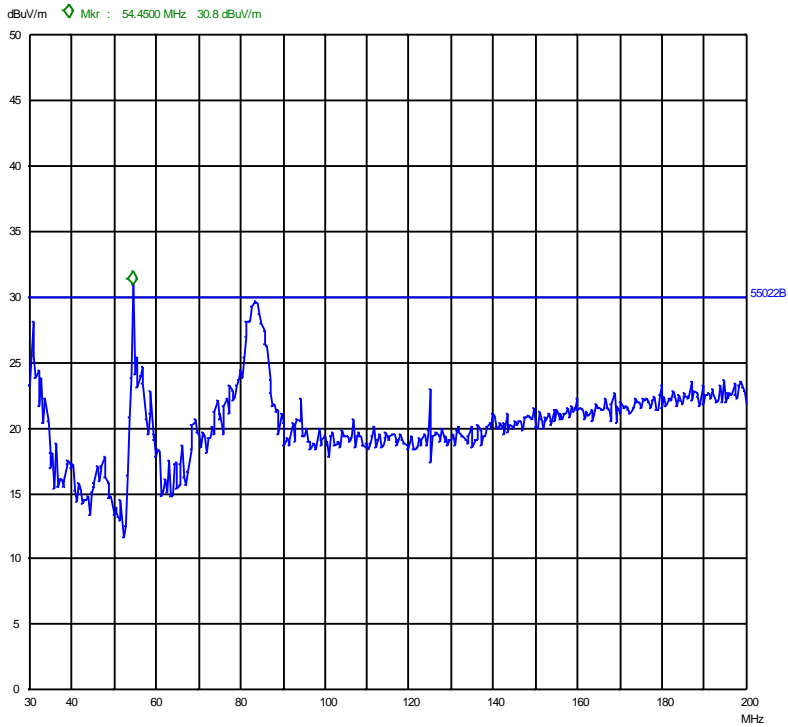
# Annexes

## UNCERTAINTY FIGURES

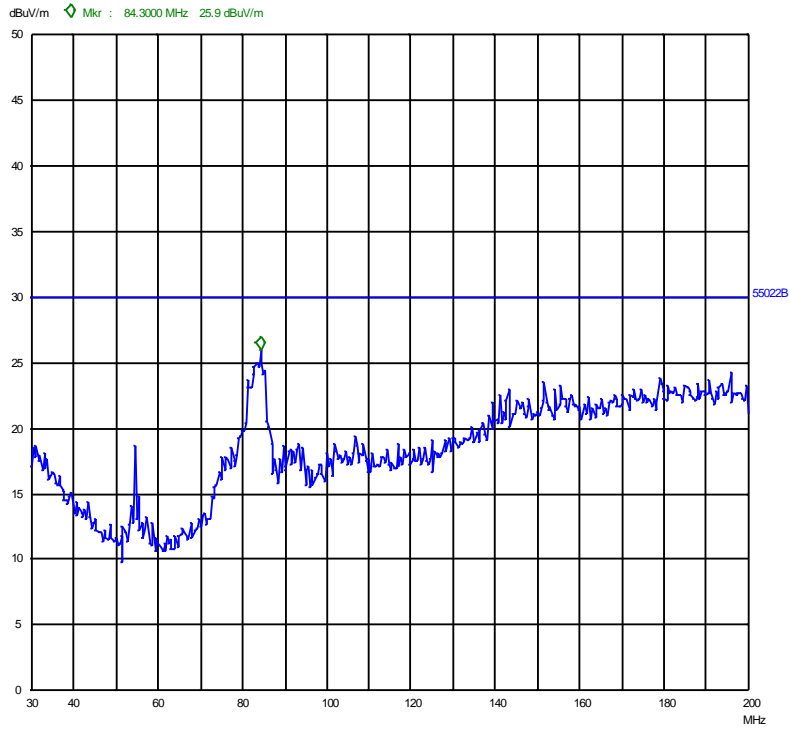
	Gaustad	Kjeller
Mains Port Disturbance Voltage	± 3.8 dB (9 kHz – 150 kHz) ± 3.5 dB (150 kHz – 30 MHz)	+ 2.9 dB / - 4.1 dB
Load Port Disturbance Voltage	± 2.7 dB (150 kHz – 30 MHz)	
Signal Port Disturbance Voltage	± 2.7 dB (150 kHz – 30 MHz)	
Discontinuous Disturbance Voltage	± 4.3 dB (150 kHz – 30 MHz)	
Insertion Loss	± 2.5 dB (150 kHz – 1.605 MHz)	
Disturbance Power	± 3.4 dB (30 MHz – 300 MHz)	
Radiated Electromagnetic Field	± 2.7 dB (9 kHz – 30 MHz)	
Radiated Disturbance (3 meter)		± 4.8 dB (150 kHz – 30 MHz) ± 4.7 dB (30 MHz – 200 MHz) ± 4.8 dB (200 MHz – 1000 MHz)
Radiated Disturbance (10 meter)		± 4.7 dB (30 MHz – 200 MHz) ± 4.8 dB (200 MHz – 1000 MHz)
Harmonic Current Emissions	± 2.1mA	
Flicker	± 0.64 V (Dc and Dmax) ± 5 % (Pst and Plt)	
Electrostatic Discharges	± 10 % (peak voltage) ± 30 % (pulse shape)	
Radiated RF Field		± 2.4 dB
Electric Fast Transients	± 10 % (peak voltage) ± 30 % (pulse shape)	
Surge	± 10 % (peak voltage) ± 30 % (rise time) ± 20 % (duration)	
Conducted RF Disturbance	± 2 dB	± 2.8 dB (150 kHz – 26 MHz) ± 3.7 dB (26 MHz – 80 MHz)
Power Frequency Magnetic Field	± 2 %	
Dips/Interruptions	± 5 % (voltage) ± 10% (zero crossing control) ± 10° (phase relationship)	
Compass Safe Distance	± 9 % (on measured level) ± 5 cm (on distance)	
Acoustic Noise	± 1 dB	
Vibration	± 5.6 % (acceleration) ± 0.01% (frequency)	
Temperature	± 2°C	
Humidity	± 5 %Rh	
Voltage	± 1.5 %	
Frequency	± 0.2 %	
<p>The instruments specified are subject to periodic calibration. Monthly controls ensure, with 95% confidence level, that the instruments remain within the calibrated levels</p>		

# MEASUREMENT PLOTS

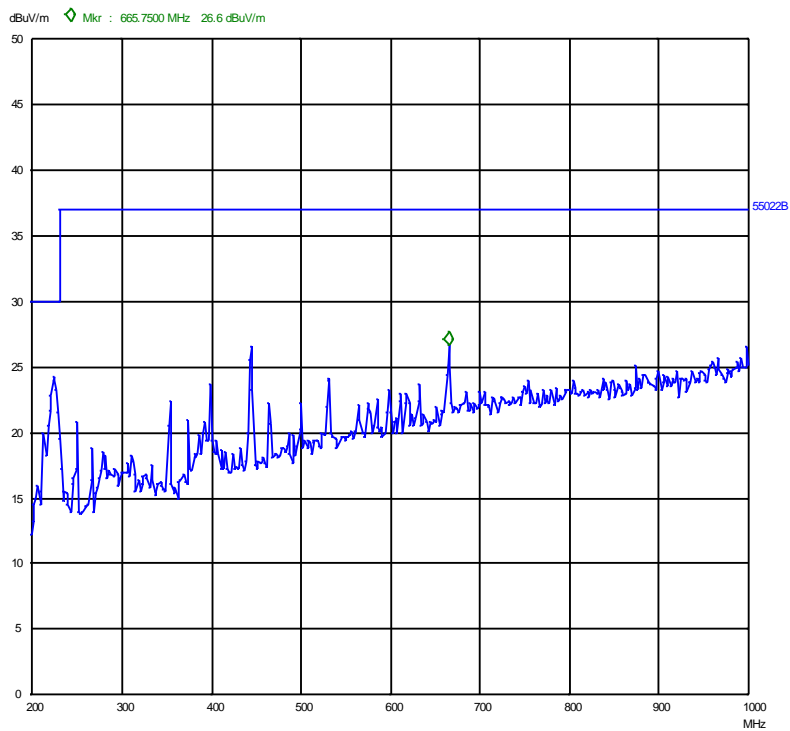
## RADIATED EMISSION



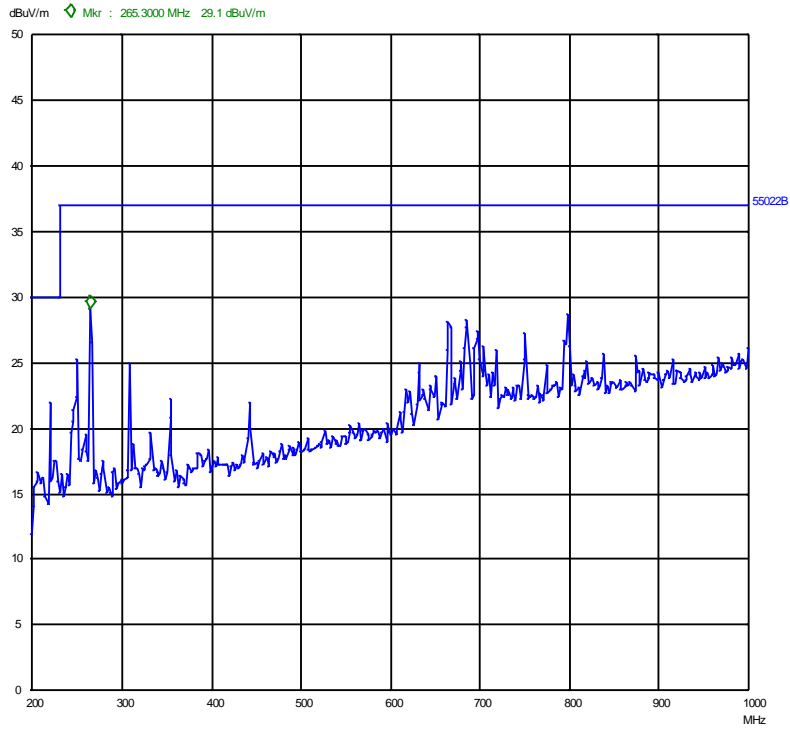
TX ON: Vertical polarisation



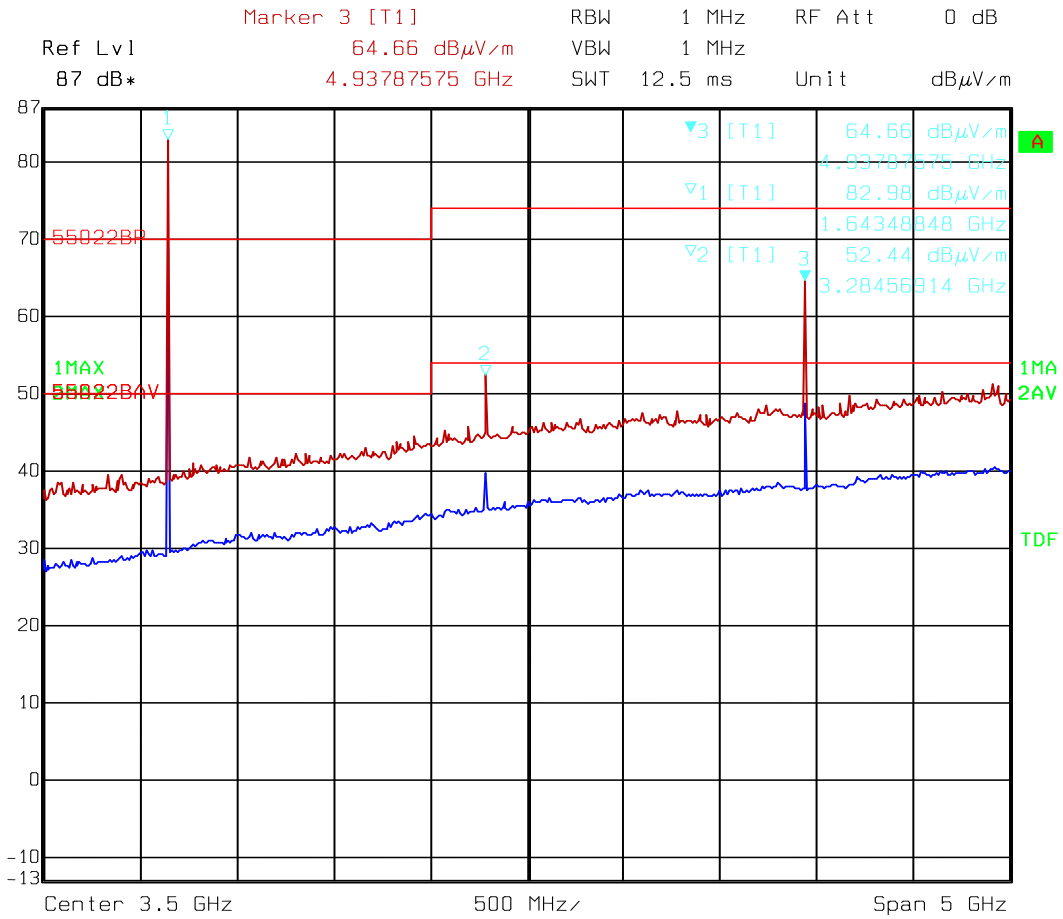
TX ON: Horizontal polarisation



TX ON: Vertical polarisation

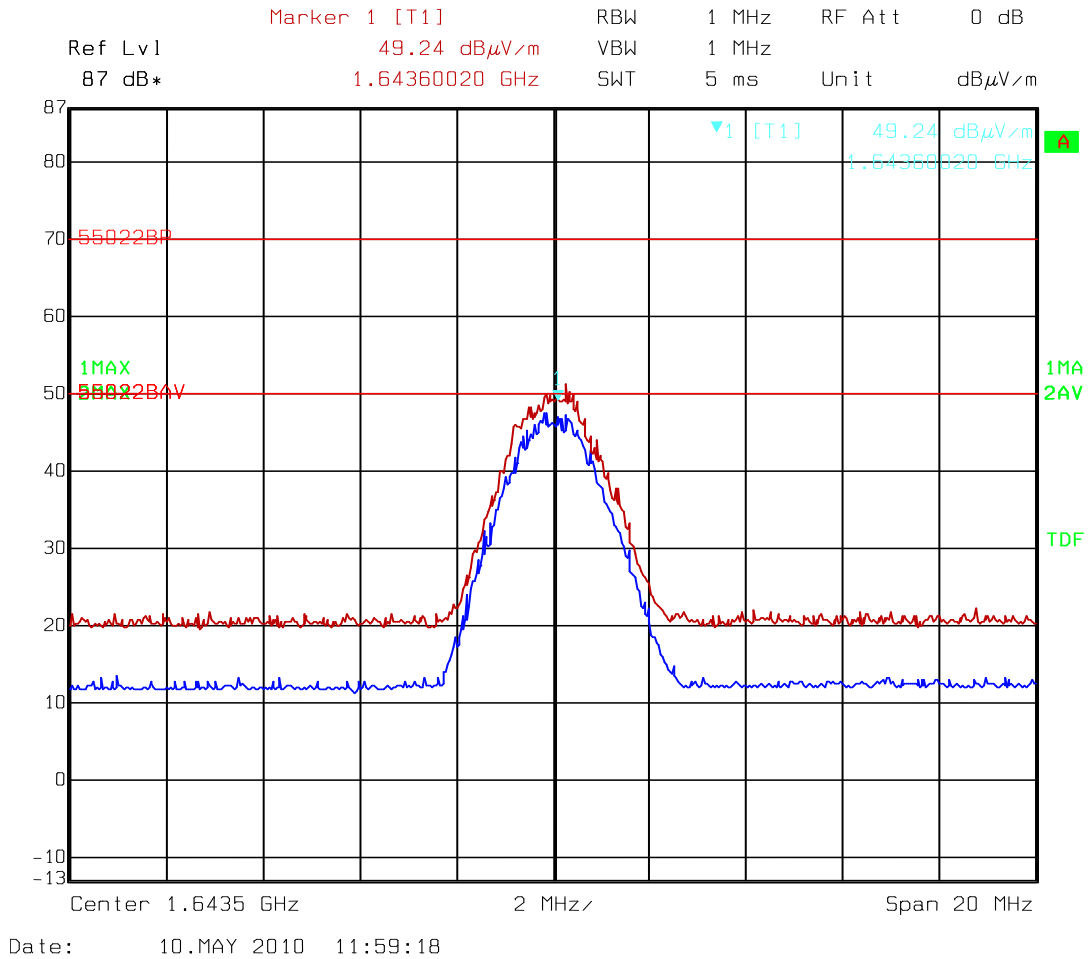


TX ON: Horizontal polarisation

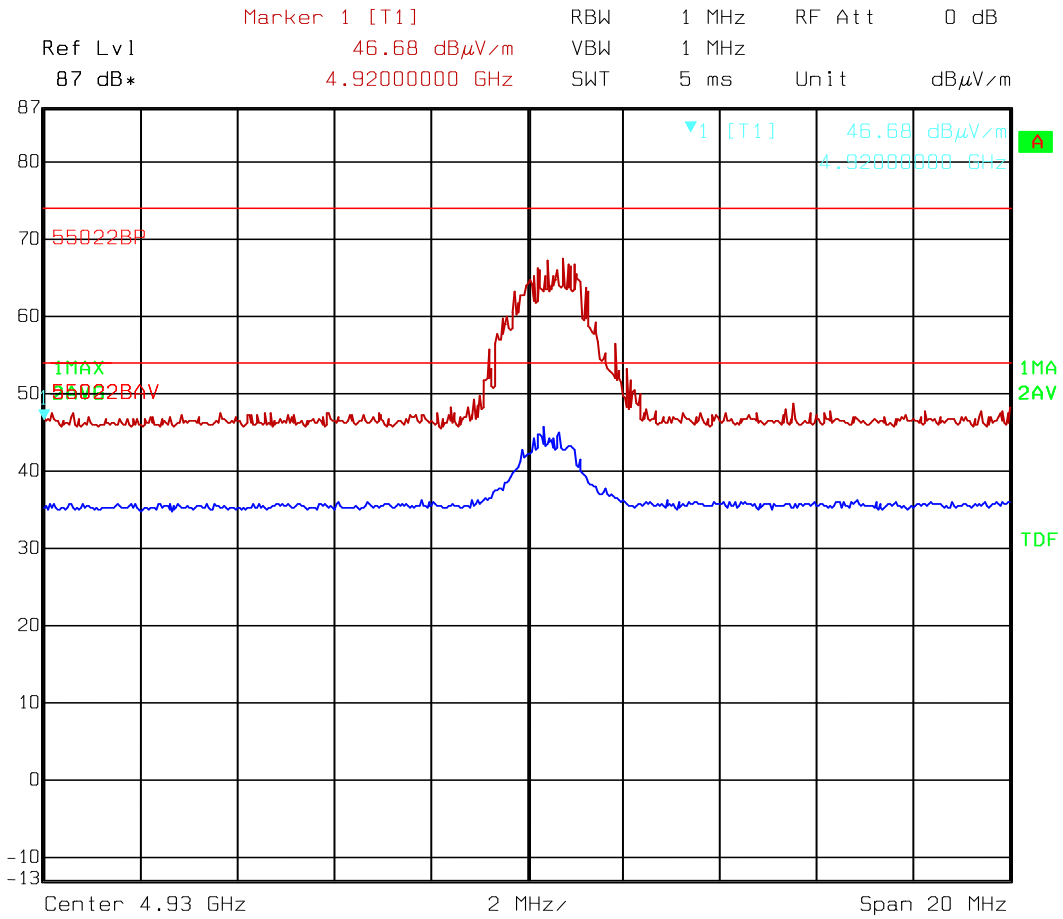


Date: 10.MAY 2010 11:37:40

TX ON: Vertical &amp; Horizontal polarization, 0 – 360 degrees



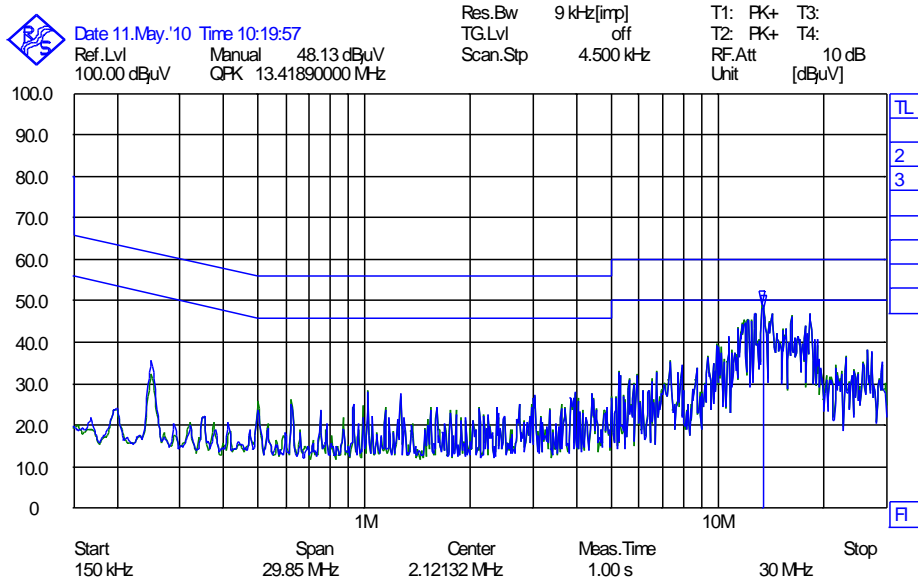
TX ON: Main carrier, Vertical and Horizontal polarisation, 0 – 360 deg



Date: 10.MAY 2010 12:11:08

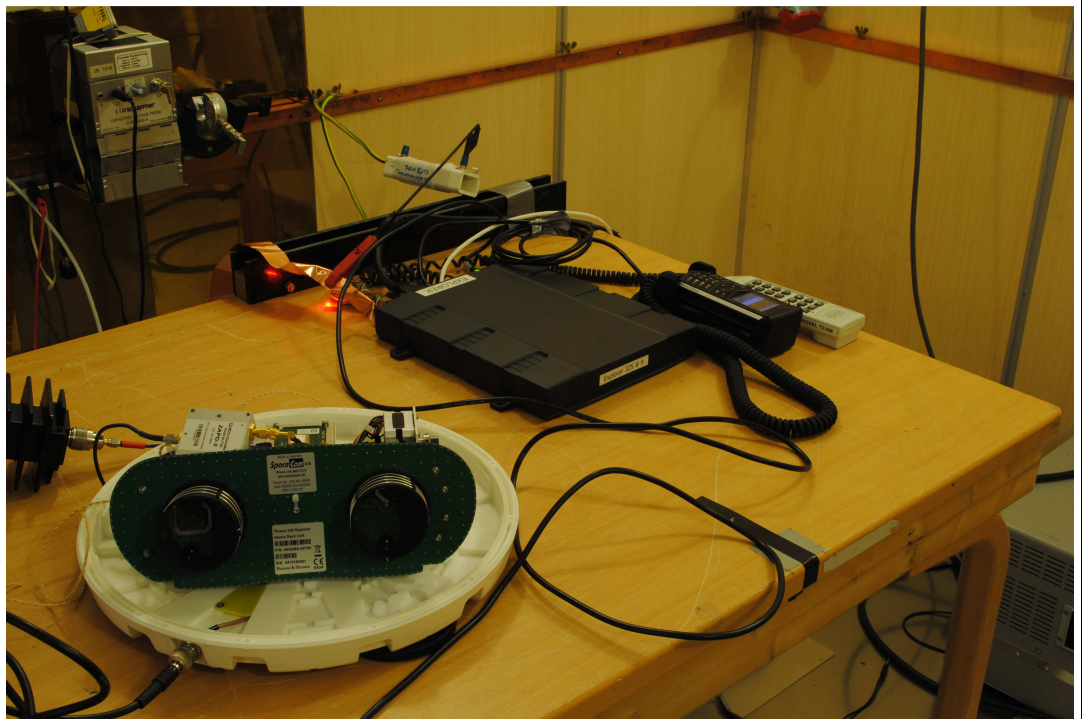
 TX ON: 3<sup>rd</sup> Harmonics, Vertical & Harmonics polarisation, 0 – 360 degrees



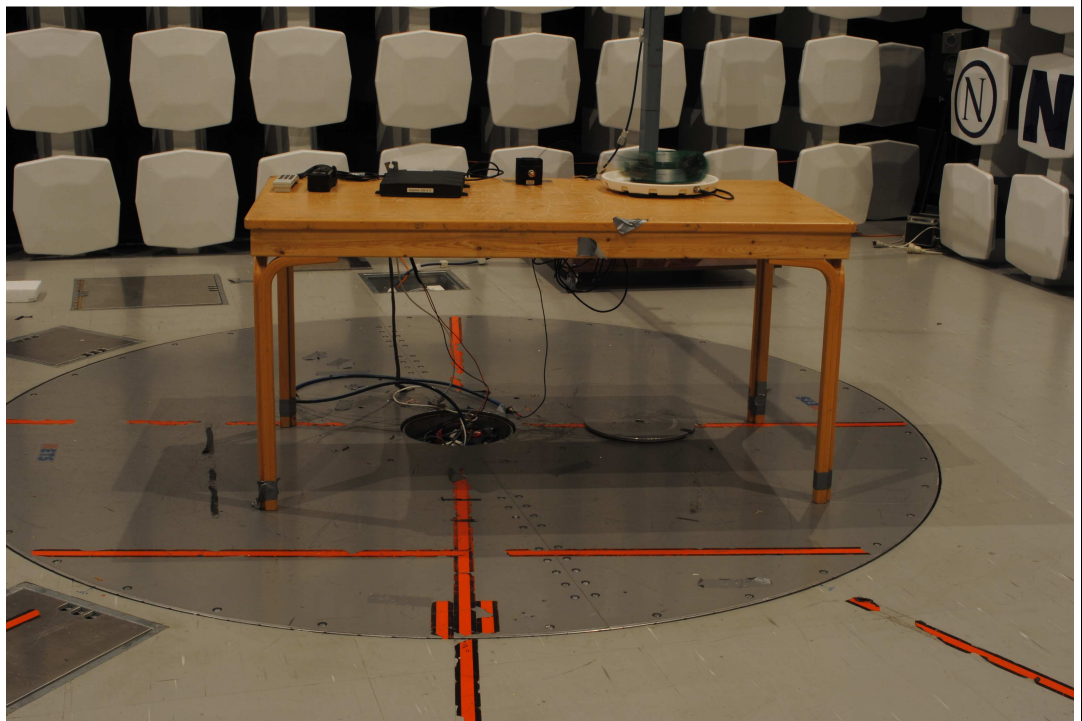
**CONDUCTED SPURIOUS**


Mains 24 V: Plus and Minus

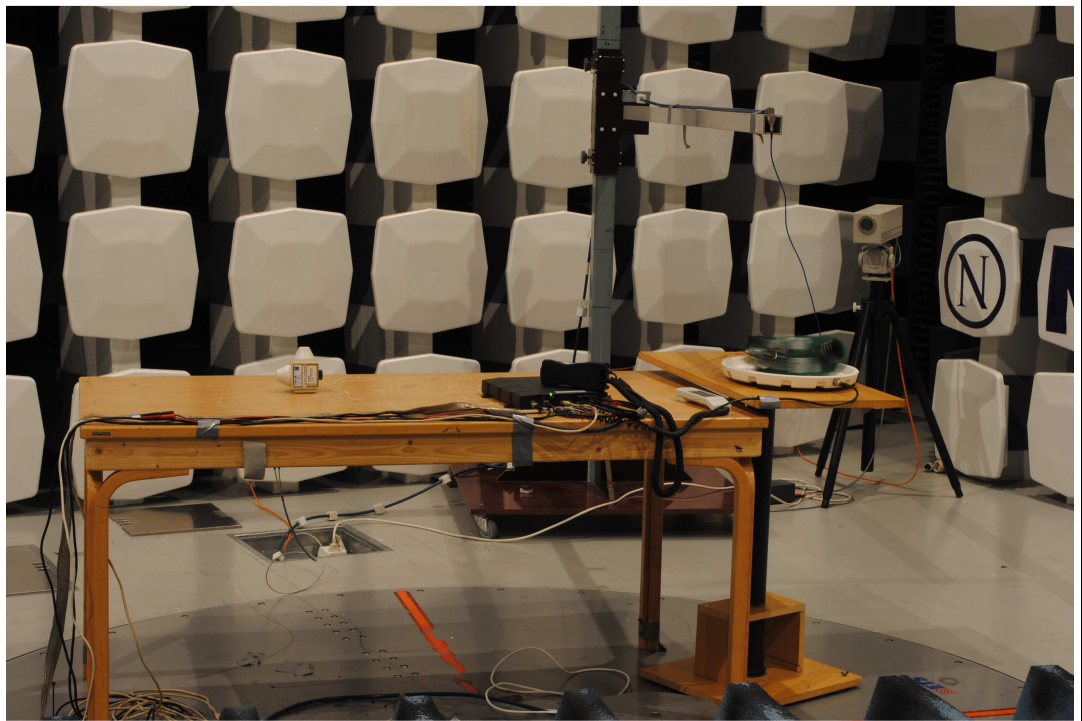
**PHOTOS**



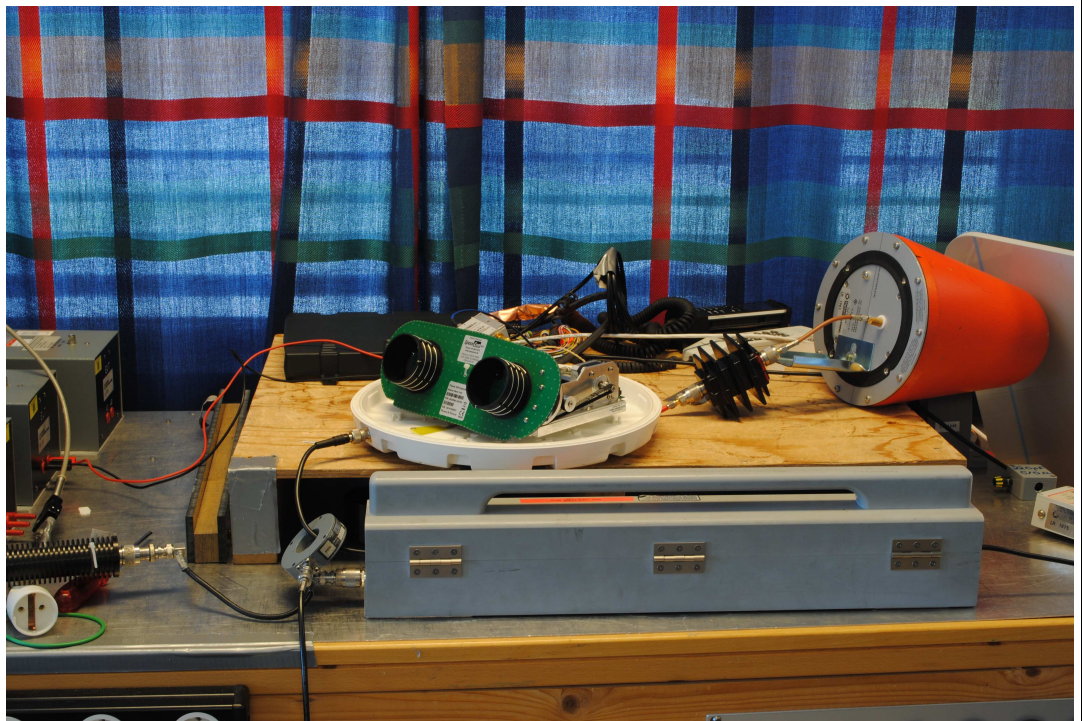
Notes: Test set-up for Mains Port Disturbance Voltage



Notes: Test set-up for Radiated Disturbance



Notes: Test set-up for Radiated RF Field immunity



Notes: Test set-up for Conducted RF Immunity