TEST REPORT CONCERNING THE COMPLIANCE OF A RADAR LEVEL TANK GAUGE, BRAND HONEYWELL ENRAF, MODELS SMARTRADAR FLEXLINE HIGH PERFORMANCE, SMARTRADAR FLEXLINE ADVANCED PERFORMANCE, SMARTRADAR FLEXLINE XTREME PERFORMANCE WITH 47 CFR PART 15B (10-1-12) AND THE REQUIREMENTS OF INDUSTRY CANADA: ICES-003 (ISSUE 5, AUGUST 2012).

13071103.fccic02
October 29, 2013

FCC listed	90828
Industry Canada	2932G-2
R&TTE, LVD, EMC Notified Body	1856

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MEASUREMENT/TECHNICAL REPORT

HONEYWELL-ENRAF
Models :
SmartRadar Flexline High performance,
SmartRadar Flexline Advanced performance,
SmartRadar Flexline Xtreme performance
FCC ID: LOM990SRFL-2
IC: 8554A-990SRFL

This report concerns:	~~Original Certification~~ ~~Class 2 change~~ Verification	
Equipment type:	Radar Level Tank Gauge	
Report prepared by:	Name	: Richard van der Meer
	Company name	: TÜV Rheinland EPS
	Address	: Eiberkamp 10
	Postal code/city	: 9351VT Leek
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The data taken for this test and report herein was done in accordance with 47 CFR Part 15B (10-1-12 edition), ICES-003 (ISSUE 5 AUGUST 2012) and the measurement procedures of ANSI C63.4-2009. TÜV Rheinland EPS at Leek, The Netherlands, certifies that the data is accurate and contains a true representation of the emission profile of the Equipment Under Test (EUT) on the date of the test as noted in the test report. I have reviewed the test report and find it to be an accurate description of the test(s) performed and the EUT so tested.

Date: October 29, 2013

Signature: 

O. Hoekstra
Senior Engineer Telecom TÜV Rheinland EPS

Summary

The device under test does:

- ● fulfill the general approval requirements as identified in this test report
- ○ not fulfill the general approval requirements as identified in this test report

Description of test item

Test item	:	Radar Level Tank Gauge
Manufacturer	:	Enraf B.V.
Brand	:	Honeywell Enraf
Models	:	SmartRadar FlexLine High performance, SmartRadar FlexLine Advanced performance, SmartRadar FlexLine Xtreme performance
Serial number(s)	:	990-proto
FCC ID	:	LOM990SRFL-2
IC		8554A-990SRFL
Contains FCC ID / IC	:	S57500025034 IC:5731-50025034

Applicant information

Applicant's representative	:	Mr. W. Vellekoop / Mr. J. Bok
Company	:	Honeywell Enraf
Address	:	Delftechpark 39
Postal code	:	2628 XJ
City	:	Delft
Country	:	The Netherlands
Telephone number	:	+31 15 2701187
Telefax number	:	+31 15 2701138

Test(s) performed

Location	:	Leek
Test(s) started	:	September 23, 2013
Test(s) completed	:	, 2013
Purpose of test(s)	:	FCC: Class 2 permissive Change and IC: Original certification.
Test specification(s)	:	47 CFR Part 15B (10-1-12 Edition) and ICES-003 (ISSUE 5, AUGUST 2012)
Test engineer(s)	:	R. van der Meer
Report written by	:	R. van der Meer
Report date	:	October 29, 2013

Table of contents

1 General information.

1.1 Product description.

1.1.1 Introduction.

The EUT is designed to measure the level of liquid in storage tanks.

The SmartRadar Flexline consist of 3 models, knowing: SmartRadar Flexline Xtreme performance, SmartRadar Flexline Advanced performance and SmartRadar Flexline High performance.
The difference in these version is purely software, which provide different measurement accuracies.

The content of this report and measurement results have not been changed other than the way of presenting the data.

1.2 Related submittal(s) and/or Grant(s).

1.2.1 General.

This test report summarizes testdata of compliances testing intended to support equipment verification.

1.3 Tested system details.

Details and an overview of the system and all of its components, as it has been tested, may be found below.

EUT	:	Radar Level Tank Gauge
Manufacturer	:	Enraf B.V.
Brand	:	Honeywell Enraf
Models	:	SmartRadar FlexLine High performance, SmartRadar FlexLine Advanced performance, SmartRadar FlexLine Xtreme performance
Serial number	:	990-proto
Operating frequency	:	9.5 – 10.6 GHz
Voltage input rating	:	24-65 V DC and 65 – 240 V AC
Remarks	:	During the tests the following internal modules were functional: CAN-PSX/TII-PSX (power supply), CAN BPM/HCI-BPM (field communication bus), TII-XR+Art2b, HMI-TSI/FII-SMV, HCI-1WL(WiFi-board) and SV(smartview).

AUX 1	:	CIU858
Manufacturer	:	Honeywell-Enraf
Brand	:	Honeywell-Enraf
Model	:	CIU858
Serial number	:	---
Voltage input rating	:	---
Remarks	:	communication interface unit

AUX 2	:	PC
Manufacturer	:	Dell
Brand	:	Dell
Model	:	Latitude
Serial number	:	---
Voltage input rating	:	---
Remarks	:	---

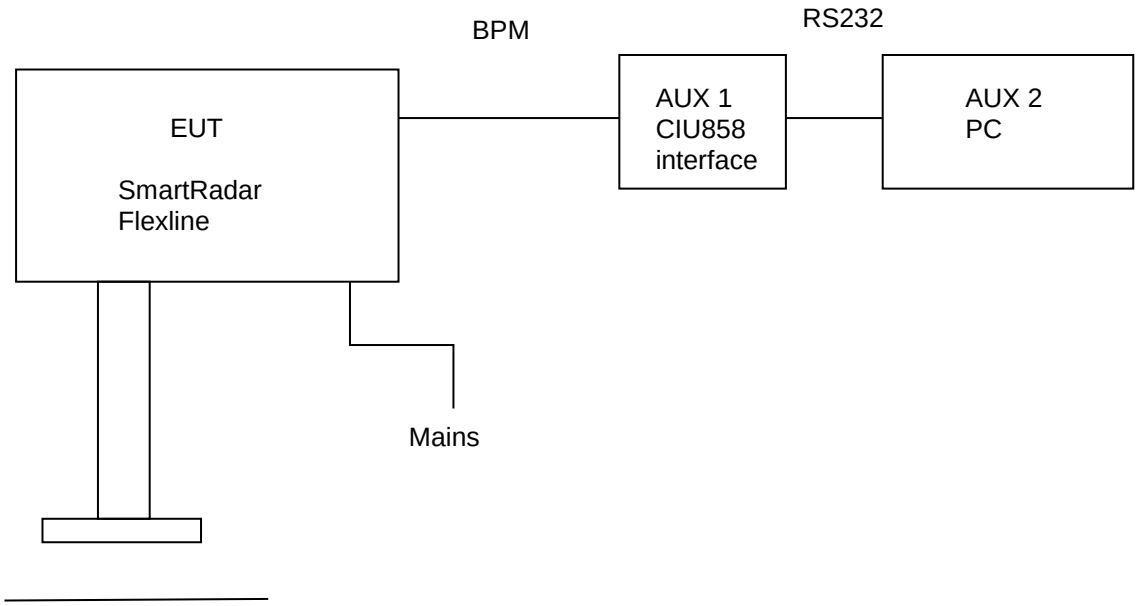


Figure 1. Basic set-up total system during testing

1.4 Test Summary

The EUT was tested in accordance with the specifications given in the table below.

Test Standard		Description		Pass / Fail
FCC 47 CFR Part 15 (10-1-10 Edition)	IC		Page	
15.107(a) Class B	ICES-003 issue 5 Class B	Conducted emissions	11-12	Pass
15.109 Class B	ICES-003 issue 5 Class B	Radiated emissions	10	Pass

Table : testspecifications

Testmethods: ANSI C63.4-:2009 and RSS-Gen Issue 3, December 2012

1.5 Test methodology.

The test methodology used is based on the requirements of 47 CFR Part 15B (10-1-12 Edition), sections 15.31, 15.107 and 15.109, ICES-003 (ISSUE 5, AUGUST 2012).

The test methods, which have been used, are based on ANSI C63.4: 2009.

Radiated emission tests above 30 MHz were performed at a measurement distance of 3 meters.

1.6 Test facility.

The Federal Communications Commission and Industry Canada has reviewed the technical characteristics of the test facilities at TÜV Rheinland EPS , located in Leek, 9351VT Eiberkamp 10, The Netherlands, and has found these test facilities to be in compliance with the requirements of 47 CFR Part 15, section 2.948.

The description of the test facilities has been filed at the Office of the Federal Communications Commission under registration number 90828. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

The description of the test facilities has been filed to Industry Canada under registration number 2932G-2. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

1.7 Test conditions.

Normal test conditions:

Temperature (*)	: +15°C to +35°C
Relative humidity(*)	: 20 % to 75 %
Supply voltage	: 120VAC/60Hz
Air pressure	: 950 – 1050 hPa

When it was impracticable to carry out the tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests are stated separately.

2 System test configuration.

2.1 Justification.

The system was configured for testing in a typical situation as a customer would normally use it.

The justification and manipulation of cables and equipment in order to simulate a worst-case behavior of the test setup has been carried out as prescribed in ANSI C63.4: 2009.

2.2 EUT mode of operation.

The tests have been performed with a complete functioning EUT and interconnections.

The EUT is swept frequency equipment working in the frequency band 9.5 GHz to 10.6 GHz. Conducted emission tests and Radiated emission tests were performed in normal operational mode with the frequency sweep turned on. Worst case results were noted down. The EUT is tested built on a test tank (dummy).

2.3 Special accessories.

No special accessories are used and/or needed to achieve compliance.

2.4 Equipment modifications.

No modifications have been made to the equipment in order to achieve compliance.

2.5 Product Labelling

The product labeling information is available in the technical documentation package.

2.6 Block diagram of the EUT.

The block diagram is available in the technical documentation package.

2.7 Schematics of the EUT.

The schematics are available in the technical documentation package.

2.8 Part list of the EUT.

The part list is available in the technical documentation package.

3 Radiated emission data.

3.1 Radiated field strength measurements (30 MHz – 1 GHz, E-field) EUT as Digital Device.

Frequency (MHz)	Detector	Antenna orientation	Test Results (dBµV/m)	Limits @3m (dBµV/m)	Pass/ Fail
41.640	Qp	Vertical	34.4	40.0	Pass
70.740	Qp	Vertical	22.6	43.5	Pass
95.960	Qp	Horizontal	30.6	46.0	Pass
262.800	Qp	Horizontal	23.5	46.0	Pass
288.020	Qp	Horizontal	32.3	46.0	Pass
383.080	Qp	Vertical	22.1	46.0	Pass

Notes:

1. Field strength values of radiated emissions at frequencies not listed in the Table 1b are more than 20 dB below the applicable limit.
2. Measurement uncertainty is ±5.0dB
3. The reported field strength values are the worst case values at the indicated frequency. The EUT was varied in three positions. the antenna was varied in horizontal and vertical orientations and also in height (between 1m and 4m).
4. A Quasi-peak detector was used with a resolution bandwidth of 120 kHz below 1 GHz. Tested with Wifi-board in receive mode. Low. mid and high Wifi RX channels tested. worst case noted.
5. Tested with the communication connection (AUX 1 and AUX 2).
6. Tested as Digital device, Not transmitting.
7. Testspecification FCC part 15.109:2012 Class B and IC ICES-003 Issue 5 (August 2012) Class B.

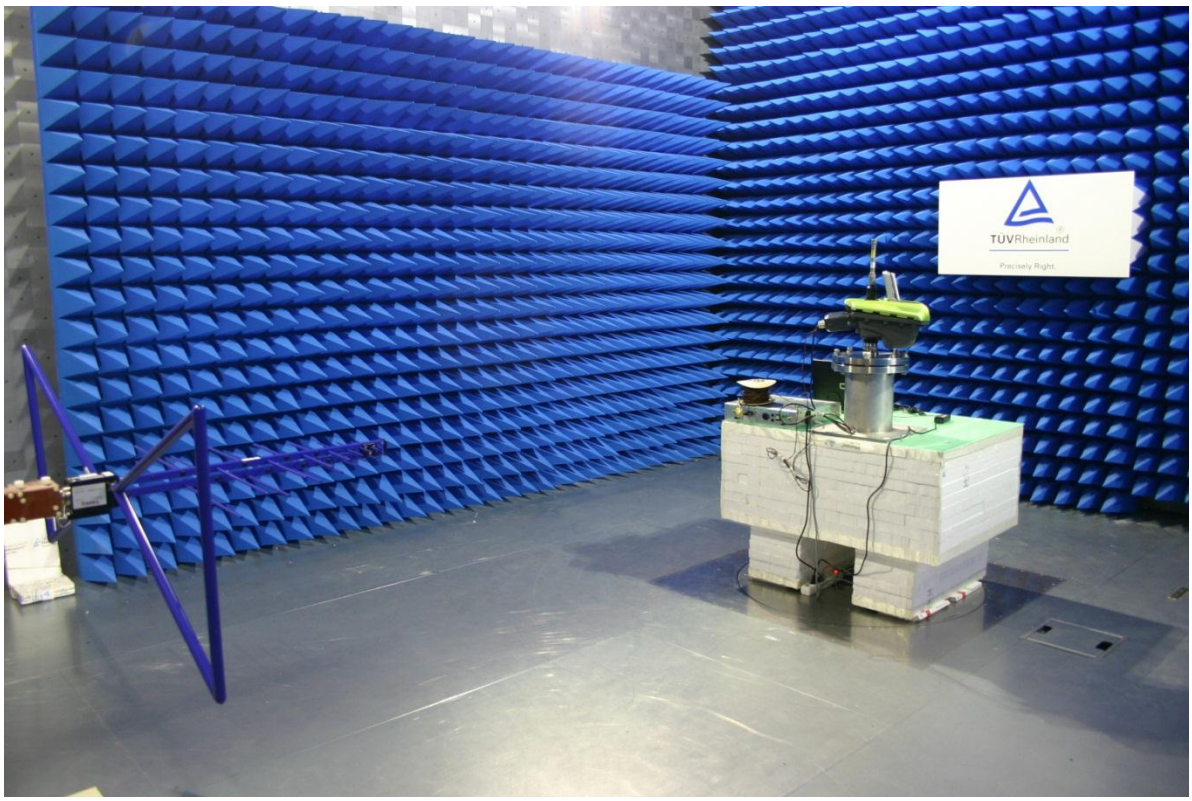
Used test equipment and ancillaries:

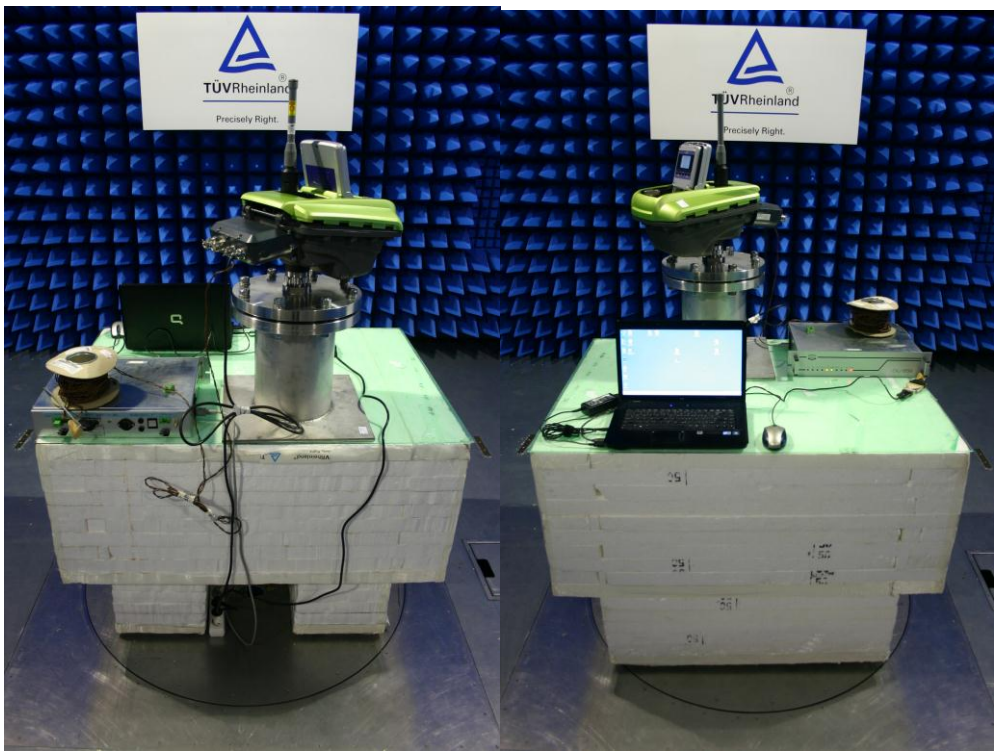
99855	99538	99877	99741	99580/99847	99861			

Test engineer

Signature : 

Name : Richard van der Meer
Date : October 09, 2013





Photographs of the Radiated emissions setup

4 Conducted emission data.

4.1 Conducted emission data of the EUT

Frequency (MHz)	Measurement results dB(µV) Line 1		Measurement results dB(µV) Neutral		Limits dB(µV)		Result
	QP	AV	QP	AV	QP	AV	
0.266	55.8	48.6	51.5	46.3	61.4	51.4	PASS
0.394	48.2	40.7	46.9	40.5	58.1	48.1	PASS
0.530	48.7	37.9	47.5	36.9	56.0	46.0	PASS
1.050	44.0	27.6	42.5	25.7	56.0	46.0	PASS
1.190	42.3	25.0	41.2	23.7	56.0	46.0	PASS
19.882	39.6	24.7	35.3	21.0	56.0	46.0	PASS

Table 2 Conducted emission measurements

The results of the conducted emission tests carried out in accordance with 47 CFR Part 15 section 15.107 and ICES-003 at the 120 Volts AC mains connection terminals of the EUT are depicted in Table 2. The system is tested as in whole, so with all equipment as shown in Figure.1 in place and functioning. Being the worst case situation.

Notes:

1. Measurement uncertainty is ±3.5dB
2. The resolution bandwidth used was 9 kHz.
3. See plots on pages 12 and 13.

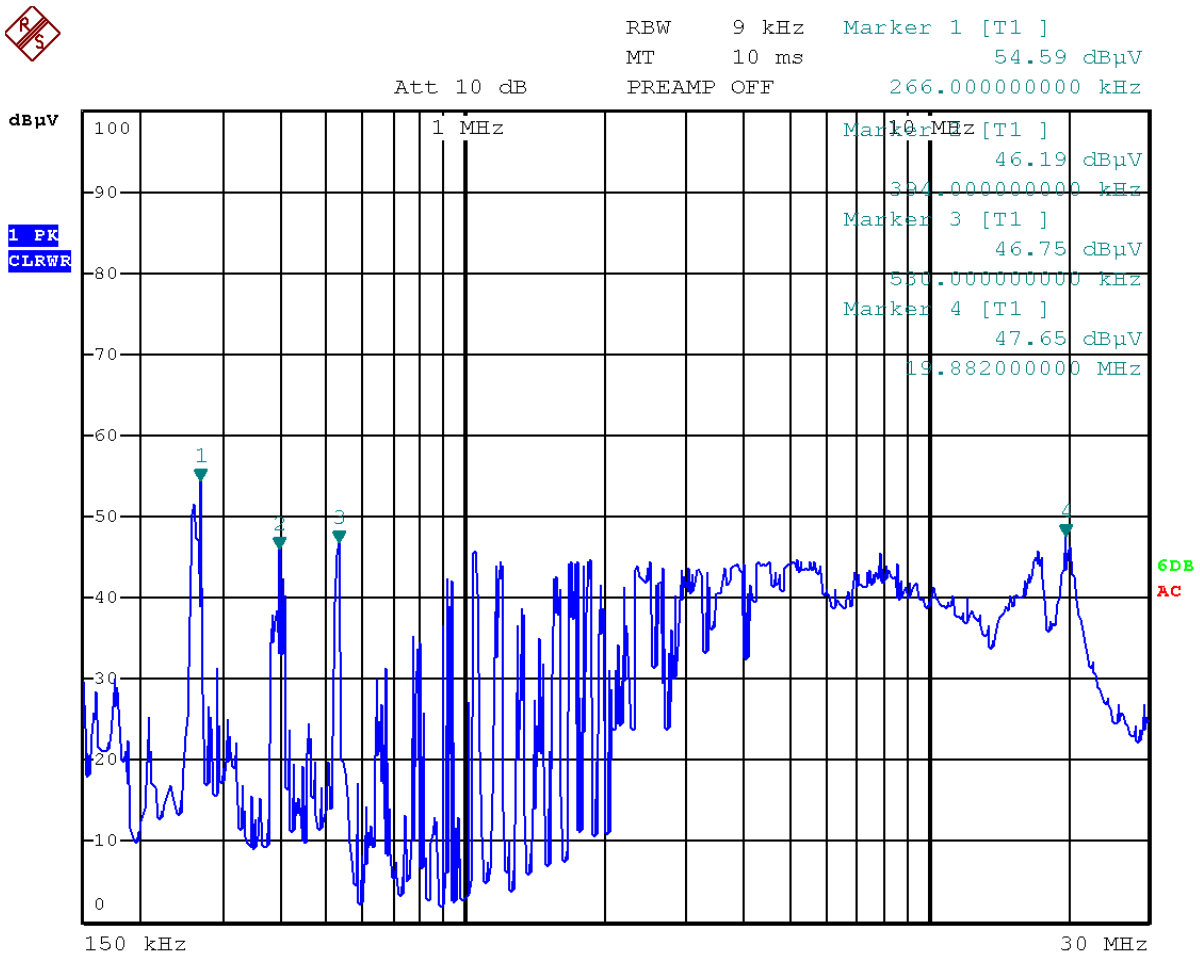
Used test equipment and ancillaries:

99852	99161	12512	99699	13313		

Test engineer

Signature : 

Name : R. van der Meer
Date : September 24, 2013



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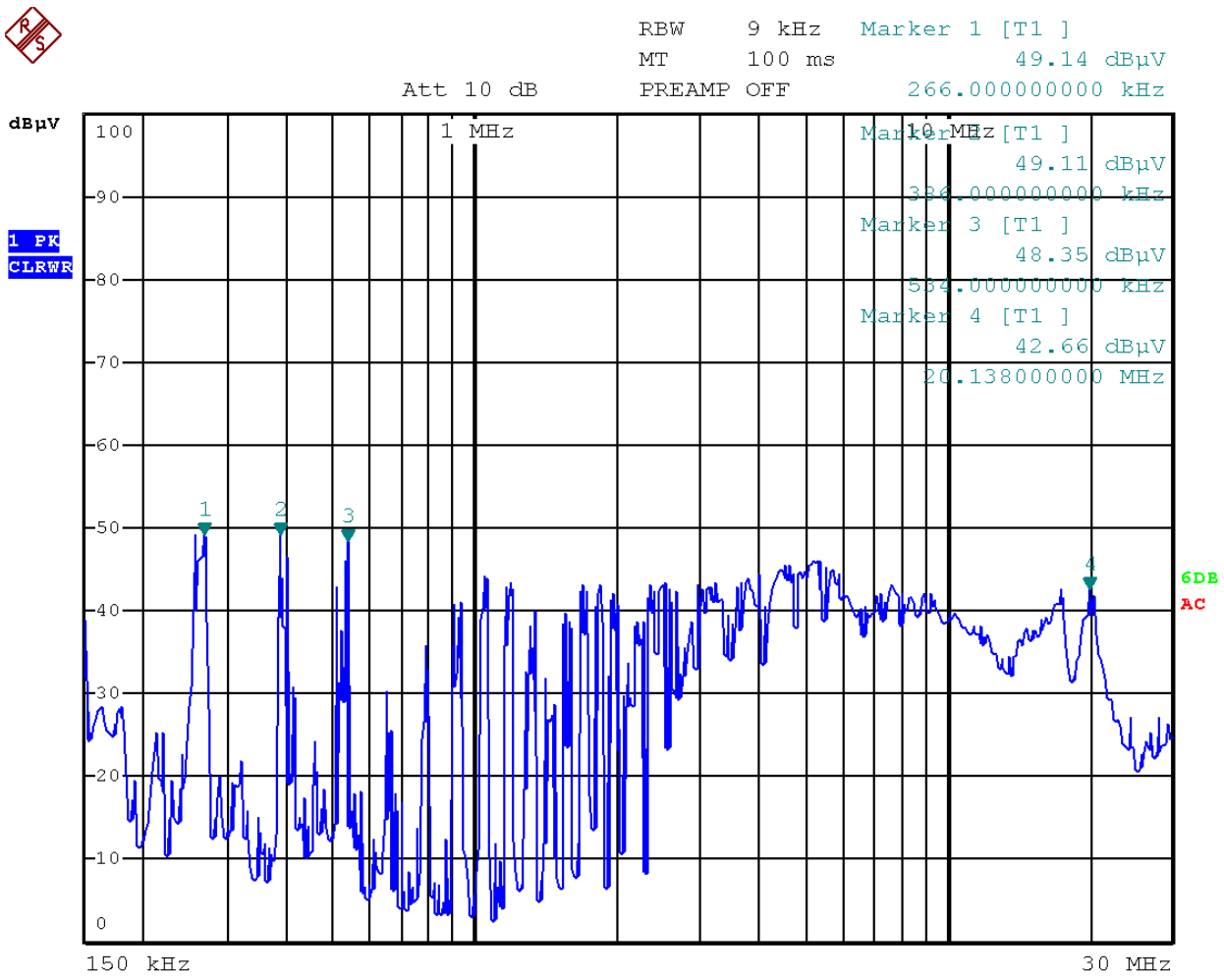
Plot 1: Conducted emissions on L1 (Pk)



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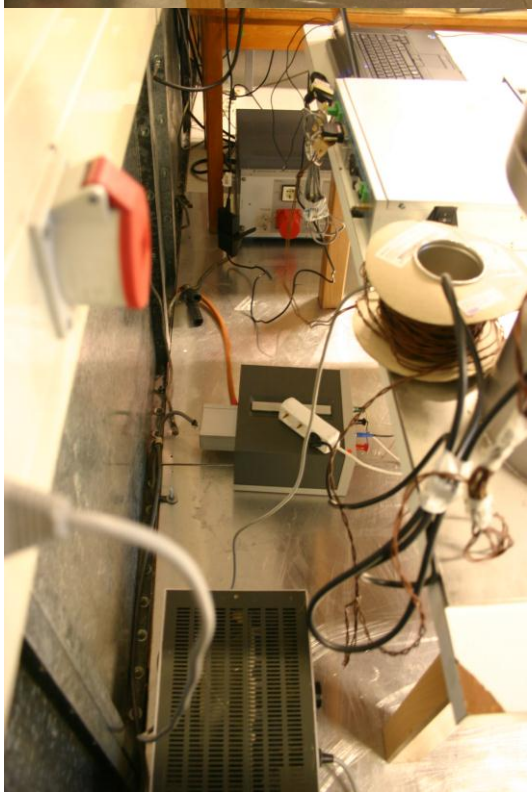
Plot 2: Conducted emissions on L2 (Pk)



Photographs of the Conducted emissions setup

5 List of utilized test equipment.

Inventory number	Description	Brand	Model	Last cal.	Next cal.
12512	LISN	EMCO	3625/2	01/2012	01/2014
99877	Biconilog Testantenna	Teseq	CBL 6111B	06/2013	06/2014
99710	Power supply Pre-test setup	EMCS EMCS	--	NA	NA
99161	Variac 250V 6A	RFT	LTS006	NA	NA
99852/ 99855	Temperature-Humiditymeter	Extech	SD500	02/2013	02/2014
99580/ 99847	Testsite registration	Comtest	FCC listed: 90828 IC: 2932G-2	08/2011	08/2014
99609	Antenna mast	EMCS	AP-4702C	NA	NA
99741	RF cable	Huber + Suhner	Sucoflex102	04/2013	04/2014
99538	Spectrum analyzer	R&S	FSP	12/2012	12/2013
99699	Measuring receiver	R&S	ESCI	03/2013	03/2014
99861	Controller	Maturo	SCU/088/8090811	NA	NA

NA= Not Applicable