EMC Test Report

for the

SRT Marine Technology Ltd

CS100 Coast Station

Project Engineer: R. P. St John James

Approval Signatory

Approved signatories: S. M. Connolly ☑ J. A. Jones ☐

The above named are authorised Hursley EMC Services engineers.

Hursley EMC Services Ltd.
Trafalgar House
Trafalgar Close
Chandlers Ford, Eastleigh
Hampshire. UK. SO53 4BW

Tel. +44 (0) 23 8027 1111
Fax. +44 (0) 23 8027 1144
e mail. sales@hursley-emc.co.uk
www.hursley-emc.co.uk

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1.0 OVERVIEW

1.1 Introduction

The Equipment Under Test (EUT), as described within this document, was submitted for EMC testing as agreed with the customer.

1.2 Objective

The purpose of the test was to measure and report the EUT against limits and methods of the emissions and immunity standards, as requested for and listed in section **2.0 Test Summary**.

1.3 Product Modifications

None to sample submitted.

1.4 Conclusion

The EUT met the emission limits and immunity requirements of the tests defined in section **2.0 Test Summary**.

This report relates to the sample tested and may not represent the entire population. It is valid only for the product identified, either in part or in full, to the relevant electromagnetic requirements necessary for compliance with the EMC Directive 2004/108/EC.

2.0 TEST SUMMARY

2.1 Summary

The EUT was tested to the EN 60945 (Parts 9 and 10) test standard for maritime navigation and radio communication equipment.

The EUT met the **emission** test requirements of the following standards:

Description	General Standard	Referenced Standard
Radiated disturbance	EN 60945:2002 & ETSI EN 301 489-1:V1.9.2†	CISPR 16-1:1999 & EN 55022:2010
Radiated disturbance, H-Field		
Conducted disturbance, AC port		

The EUT met the **immunity** test requirements of the following standards:

Description	General Standard	Referenced Standard
Electrostatic discharge	EN 60945:2002, ETSI EN 301 489-1:V1.9.2† & ETSI EN 301 489-17:V2.2.1†	IEC 61000-4-2:1995
Radiated RF interference		IEC 61000-4-3:1995
Fast transient bursts		IEC 61000-4-4:1995
Surge		IEC 61000-4-5:2005
Conducted RF Interference		IEC 61000-4-6:1996
Power interrupts		IEC 61000-4-11:1994

The uncertainty of measurement for each test has been included to support a level of confidence of approximately 95%.

†These test standards are not currently included in the UKAS Accreditation Schedule for Hursley EMC Services.

2.2 Test Deviations

None.

2.3 EMC Test Lab Reference

Hursley EMC Services file: 14R443.

3.0 EQUIPMENT & TEST DETAILS

3.1 General

EUT:	CS100 Coast Station Make: SRT Marine Technology Ltd Model: CS100 Serial number: 4230001033940007
EUT powered by:	AC/DC Adapter CUI Model EMSA240167 Serial number: 001
EUT manufacturer:	SRT Marine Technology Ltd
EUT build level:	Production sample
Customer:	SRT Marine Technology Ltd Wireless House Westfield Industrial Estate Midsomer Norton Bath BA3 4BS United Kingdom Tel: +44 (0) 1761 409 500
Test commissioned by:	Mr Richard McMahon
Date EUT received:	9th October 2014
Test date(s):	9th to the 20th October 2014
EMC measurement site:	Hursley EMC Services Limited Trafalgar House, Trafalgar Close, Chandlers Ford, Hampshire

3.2 EUT Description

The EUT is an internet connected AtoN (Aid to Navigation) Transceiver. The Coast Station is suitable for shore locations and may transmit position and other key data to surrounding maritime AIS equipment, as well as to remote locations over the internet.

3.3 EUT Support

- Virgin SuperHub (Wi-Fi), Model: 272-1154-01, s/n 2HA535V212D1B
- SRT CS100 Coast Station, s/n 001
- 30dB attenuators
- HEMCS GPS receiver & repeater
- HP Compaq nx6110 Laptop, s/n CNU616112G
- HP Laptop Power Supply, s/n 57BC30AU4SG0P3
- GPS Antenna (x2)

3.4 EUT Test Exerciser

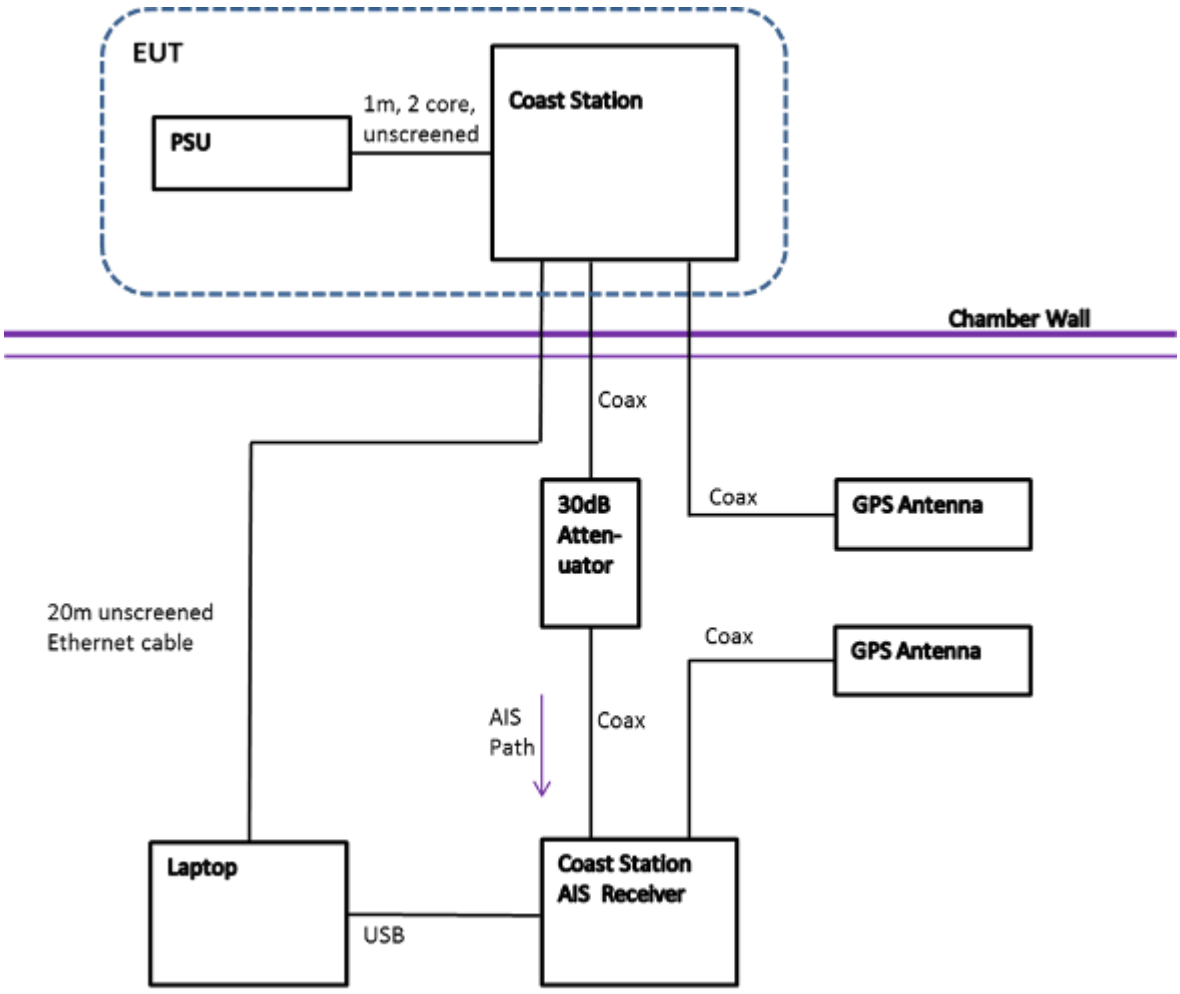
The EUT was set to transmit its position every 10 seconds alternating from channel A and channel B. The AIS receiver will log all transmissions it receives from the EUT to a laptop via Tera Term. The logging is time-stamped in order to check that these transmissions are occurring on time throughout the testing.

The EUT was also connected to the laptop via Ethernet or Wi-Fi. The laptop had a second Tera Term window open connected via TCP/IP directly logging the EUT serial data. Again this logging was time-stamped in order to check for connection drop-outs.

The power supply providing the DC power to the EUT was powered at 230V/50Hz.

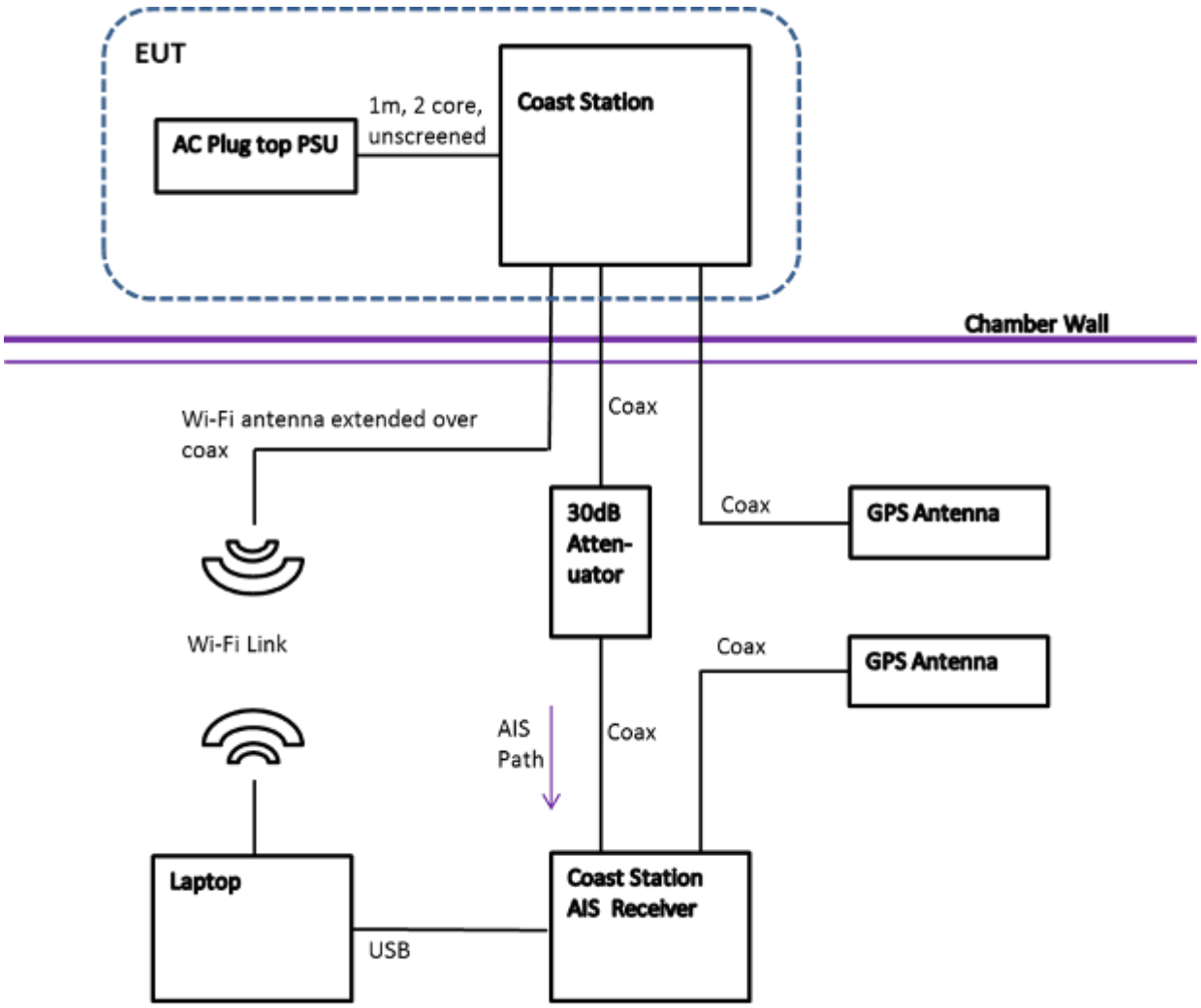
3.5 EUT Test Configuration

Radiated immunity – Ethernet mode



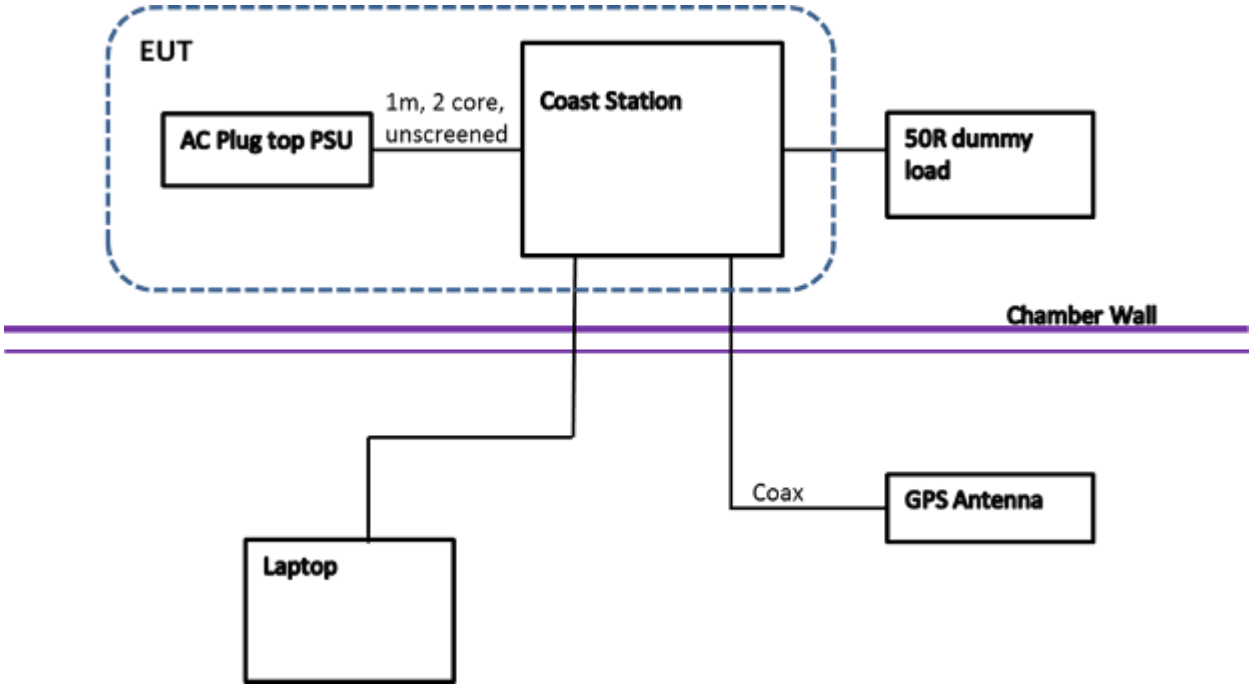
EUT Test Configuration (continued)

Radiated immunity – WiFi mode



EUT Test Configuration (continued)

Emissions



3.6 Environmental Test Conditions

Temperature	21 to 22º Celsius
Relative Humidity	45 to 52%
Atmospheric Pressure	992 to 1015 millibars

3.7 EMC Test Equipment

#ID	CP	Manufacturer	Type	Serial Nø	Description	Calibration due date
003	1	Rohde & Schwarz	ESH-3	872994/027	Test receiver (9kHz-30MHz)	19/09/2015
007	1	HP	8568B	1921A00797	Spectrum analyser	Internal
030a	1	KeyTek	TPC-2	1407181	Omnitip probe for #30 Zap	11/08/2015
040	1	HP	8593EM	3536A00137	Spectrum analyser (9kHz-26.5GHz)	10/10/2015
047	3	Rohde & Schwarz	HFH2-Z2	879021/22	Loop antenna (9kHz-30MHz)	05/08/2017
050	1	HP	8447D	1937A02341	Pre-amplifier (30-1000MHz)	Internal
068	1	EM	CWS500C	1001-07	Conducted immunity simulator	13/02/2015
070	1	HP	8449B	3008A00481	Pre-amplifier (1.0-26.5GHz) + 0.5m cable	05/12/2014
116	1	Rohde & Schwarz	ESH-3 Z2	M458	Pulse limiter BNC type	04/02/2015
117	1	KeyTek	EMC Pro	9711274	Immunity tester	08/07/2015
126	0	Schaffner	NSG1007	55090	Power source (5kW)	Internal
147	1	Rohde & Schwarz	ESH3 Z5	846695/011	Single phase (LISN / AMN)	06/06/2015
152	1	Fischer	801-M2-16	9867	CDN mains 2xwire	06/11/2014
170	1	Fischer	FCC150-50	336	Adapter (100Ω)	Internal
171	1	Fischer	FCC150-50	337	Adapter (100Ω)	Internal
187	1	Fischer	F-203I-23	379	EM injection clamp (10k-1GHz)	26/03/2015
207	1	Fischer	801-M2-16	08003	CDN 2xwire	20/11/2014
213	1	Fischer	801-M3-16	1051	CDN 3W 16A	20/11/2014
249	1	EMC Partner	H1000	157	Harmonics & flicker analyser	30/06/2015
254	1	KeyTek	Pro CCL	A000103416	Capacitive clamp	Internal
390	0	Schwarzbeck	STLP9128D	9128D-060	RES antenna Saturn	Internal
452	3	CHASE	CBL 6141	4013	Pink 30M-2G Antenna	02/10/2015
455	1	Schwarzbeck	8158	cat5-8158-0055	ISN	27/11/2014
466	2	Schwarzbeck	BBHA 9120 571	571	1-10GHz Horn	29/01/2015
552	1	Rohde & Schwarz	ESCI7	1166595007	7GHz Receiver	17/04/2015
554	1	Rohde & Schwarz	ESH3	872079/120	Conducted Receiver	17/09/2015
555	1	Milmega	500W Amp	0	80-1000 MHz	Internal

CP = Interval period [year] prescribed for external calibrations

Note: 'Calibration due date' means that the instrument is certified with a UKAS or traceable calibration certificate. 'Internal' means internally calibrated using HEMCS procedures

4.0 EMISSION RESULTS

4.1 Radiated Disturbance

A profile scan was taken at a distance of three metres on eight azimuths of the EUT in both the vertical and horizontal polarities of the antenna in a semi-anechoic chamber. Tests were carried out with the transmitter ready to transmit but not transmitting.

Using the data obtained from the chamber profile-scan as an engineering guide, the EUT was then transferred onto the turntable in the Open Area Test Site. The antenna was positioned at a distance of three metres from the periphery of the EUT. Radiated emissions were then systematically maximised by revolving the EUT and adjusting the antenna in polarity and height. The highest emissions are presented here.

4.1.1 Data, 30 to 6000 MHz

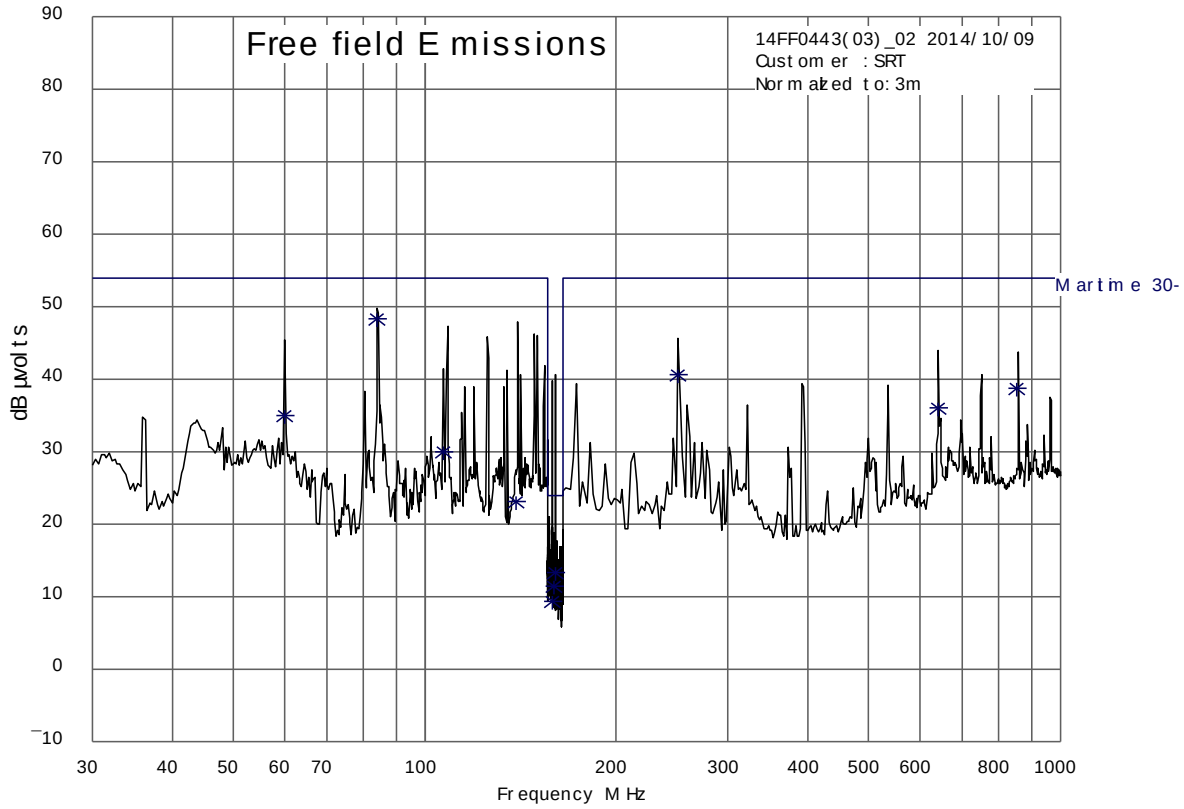
Emission frequency (MHz)	Measured quasi-peak value (dBµV/m)	Measured quasi-peak value including uncertainty budget	Specified quasi-peak limit (dBµV/m)	Status
59.999	34.95	39.15	54.0	Pass
84.004	48.33	52.53	54.0	Pass
106.677	30.06	34.26	54.0	Pass
139.212	23.22	27.42	54.0	Pass
158.491	9.46	13.66	24.0	Pass
159.637	11.42	15.62	24.0	Pass
160.050	13.38	17.58	24.0	Pass
249.998	40.57	44.77	54.0	Pass
640.000	36.14	40.34	54.0	Pass
853.370	38.75	42.95	54.0	Pass

The uncertainty of measurement: ± 4.2dBµV for a 95% confidence level has been added to the measured result.

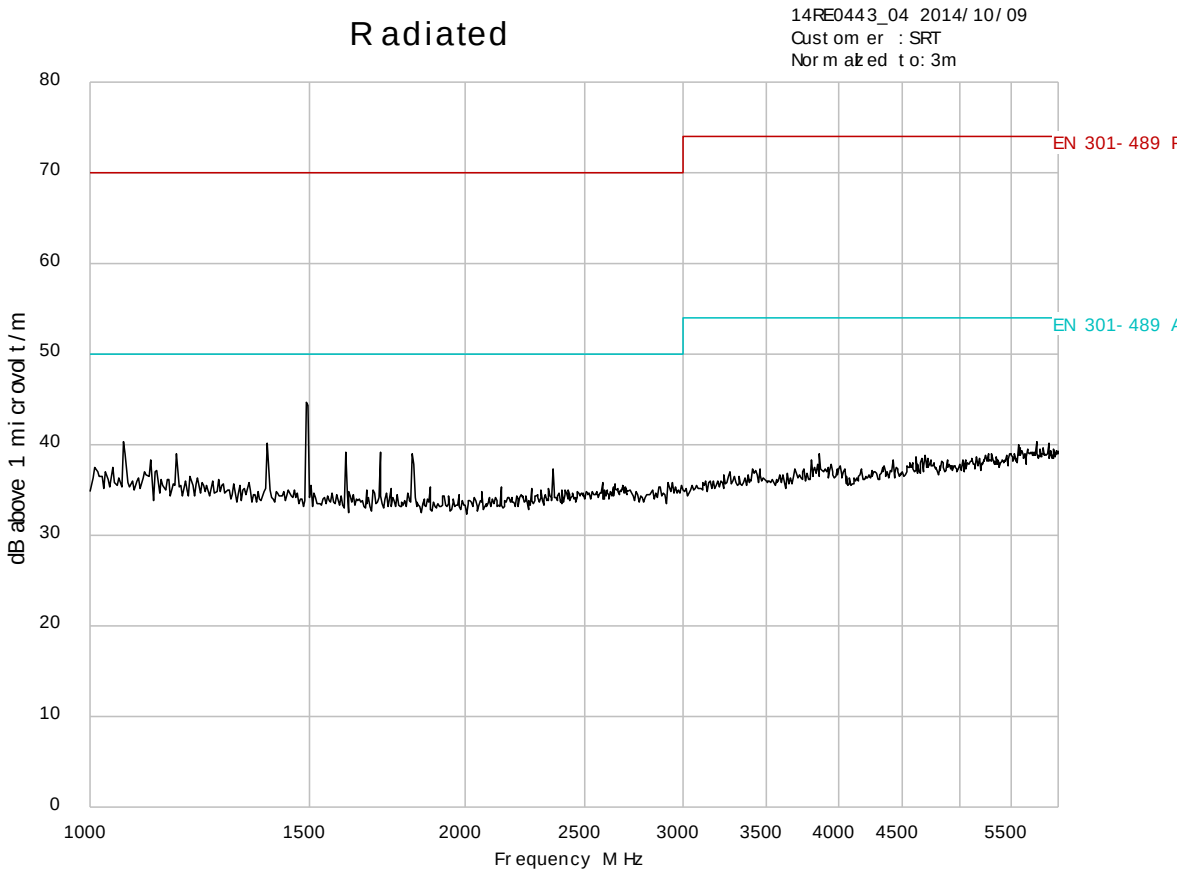
The measurements reported are the highest emissions relative to the EN 60945 limit and take into account the antenna, cable loss factors and uncertainty budget. Measurements made according to the EN 60945 test standard and Hursley EMC Services test procedure RAD-01.

TEST ENGINEERS: Rob St John James & Richard Pennell

4.1.2 Radiated Emission Plot, 30 to 1000 MHz



4.1.3 Radiated Emission Plot, 1.0 to 6.0 GHz



4.1.4 Radiated H-Field, 150 kHz to 30 MHz

A profile scan was taken at a distance of three metres with a 360^{o} azimuth scan of the EUT in a semi-anechoic chamber. The tests were repeated for three orientations of the loop antenna.

The sample was then re-measured in an anechoic chamber; the pre-scan results were used as a guide at three metre. There were no frequencies found within the laboratory's ≤12dB criterion and so no further measurements were necessary.

4.1.5 Data

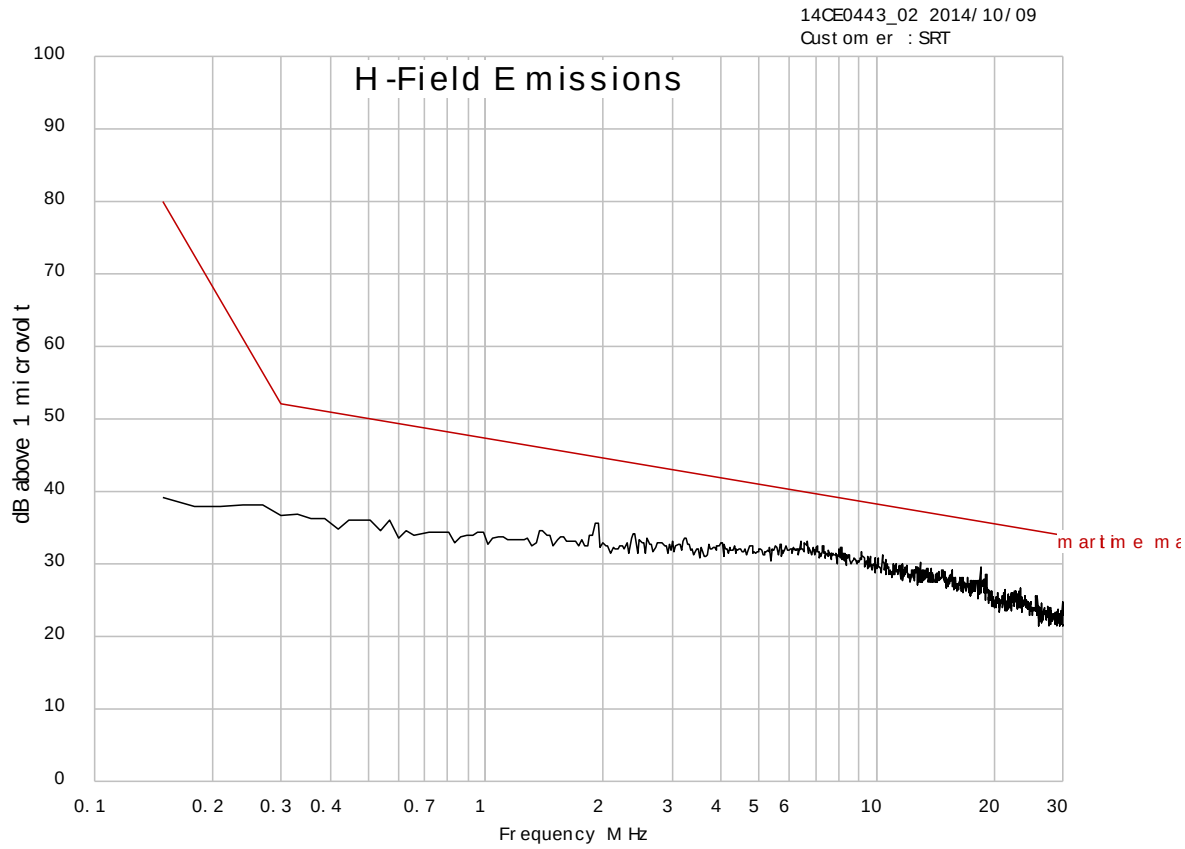
Emission frequency (MHz)	Measured quasi-peak value (dBµV/m)	Measured quasi-peak value including uncertainty budget	Specified quasi-peak limit (dBµV/m)	Status
No significant peaks found within the specified limit.				Pass

The uncertainty of measurement: ± 4.2dBµV for a 95% confidence level has been added to the measured result.

The measurements reported are the highest emissions relative to the EN 60945 limit and take into account the antenna, cable loss factors and uncertainty budget. Measurements made according to the EN 60945 test standard and Hursley EMC Services test procedure MAR-01.

TEST ENGINEERS: Rob St John James & Richard Pennell

4.1.6 Profile


14CE0443_02 2014/10/09
Customer : SRT
H-Field Emissions
dB above 1 microvolt
Frequency MHz
100
90
80
70
60
50
40
30
20
10
0
0.1
0.2
0.3
0.4
0.7
1
2
3
4
5
6
10
20
30

4.2 Conducted Disturbance

A filtered 230V mains supply was fed to the EUT via a 50Ω/50µH Artificial Mains Network (AMN). The AMN was bonded to a conductive ground plane. Line and neutral phases were measured separately.

A spectrum analyser was set to scan between 10 kHz and 30 MHz to record the peak emission profiles. The worst-case peaks were then measured using a quasi-peak receiver and compared to the EN 60945 limit. Measurements made according the EN 60945 test standard and Hursley EMC Services test procedure CON-02. The worst-case results are shown here.

4.2.1 Data

Neutral

	Quasi-peak value (dBµV)			
Frequency (MHz)	**Measured**	**Measured quasi-peak value including uncertainty budget**	Limit	**Status**
0.052	47.70	50.92	67.87	Pass
0.074	48.60	51.82	61.97	Pass
0.102	38.20	41.42	56.64	Pass
0.123	30.40	33.62	53.39	Pass
0.128	30.90	34.12	52.69	Pass
0.397	27.30	30.52	50.00	Pass
23.438	24.64	27.86	50.00	Pass

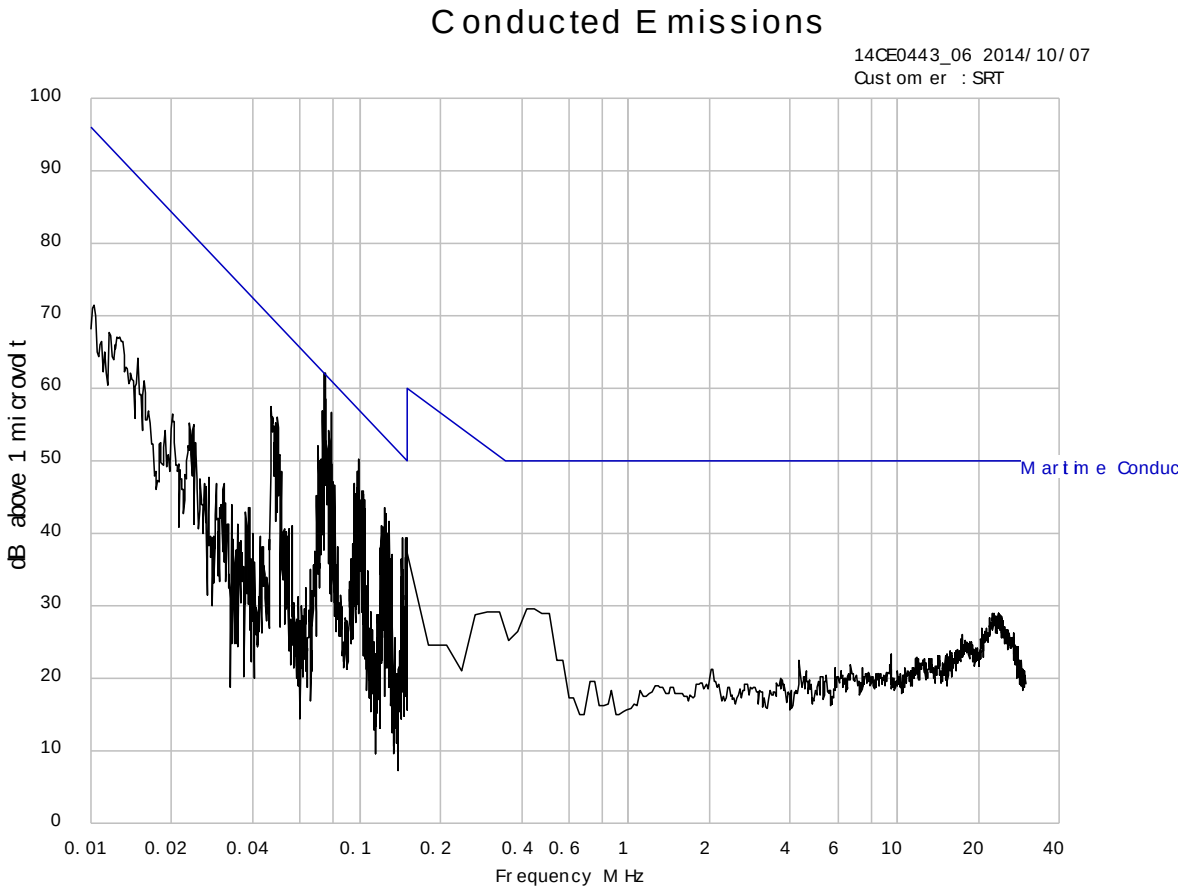
Line

	Quasi-peak value (dBµV)			
Frequency (MHz)	**Measured**	**Measured quasi-peak value including uncertainty budget**	Limit	**Status**
0.022	47.30	50.52	82.54	Pass
0.053	47.50	50.72	67.81	Pass
0.073	47.30	50.52	62.20	Pass
0.100	36.70	39.92	56.88	Pass
0.106	30.00	33.22	55.96	Pass
0.158	48.10	51.32	59.42	Pass
0.436	26.30	29.52	50.00	Pass
23.957	25.46	28.68	50.00	Pass

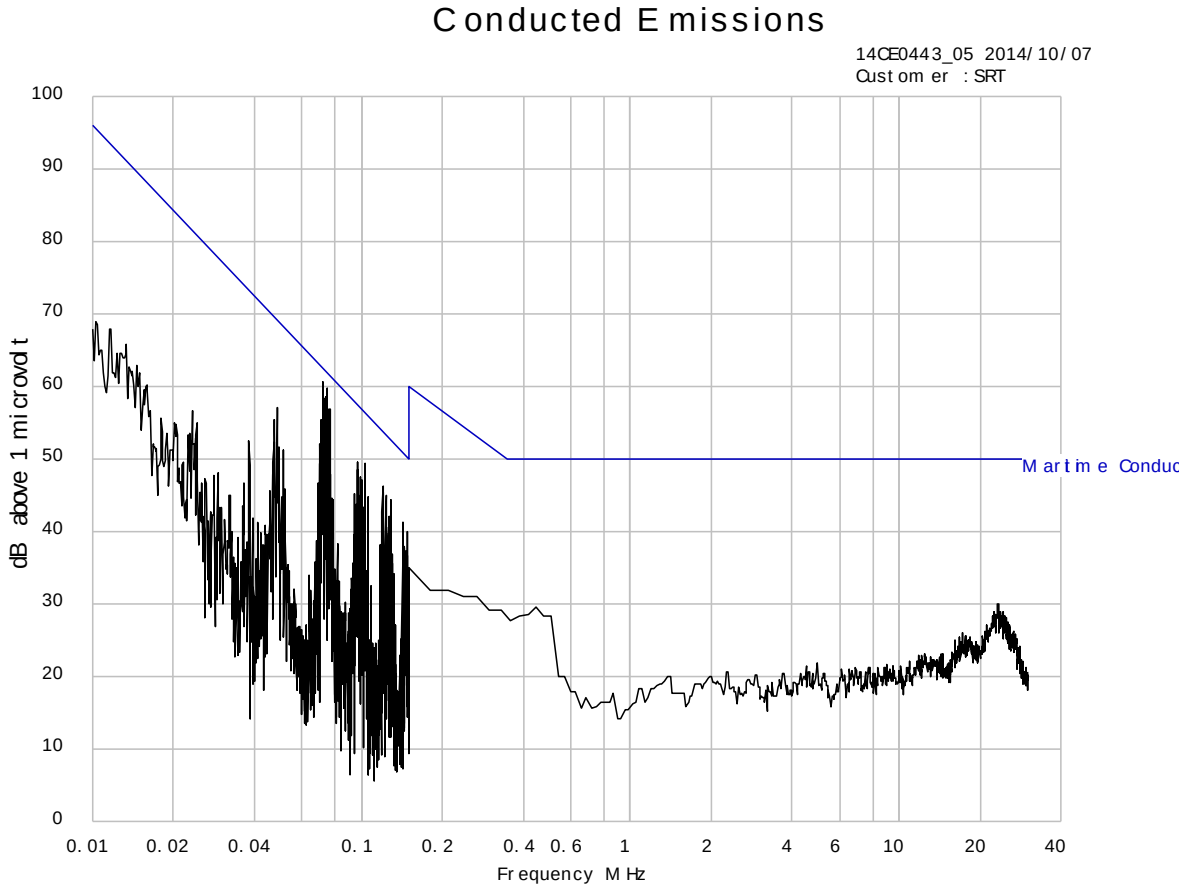
Uncertainty of measurement: ± 3.22 dBµV for a 95% confidence level has been added to the measured result.

TEST ENGINEERS: Rob St John James & Richard Pennell

4.2.2 Profile; Neutral



4.2.3 Profile; Line



4.3 Conducted Disturbance, Telecommunication Line

The conducted emissions were measured in a partially screened room in order to eliminate ambient noise. The signal port cable was unscreened and as a result the voltage measurement was made by using an Impedance Stabilisation Network (ISN). The ISN was bonded to the ground plane and the signal fed into the receiver.

A spectrum analyser was set to scan between 0.15MHz and 30.0MHz to record the peak emission profile. The worst-case peaks were then measured using an average and/or quasi-peak receiver and compared to the EN 55022 / CISPR 22 Class B telecoms limits. Measurements made according to the EN 55022 / CISPR 22 test standard and Hursley EMC Services test procedure CON-02.

The worst-case quasi-peak results, with the EUT powered at 230V/50Hz, are recorded below.

4.3.1 Data; Ethernet Cable

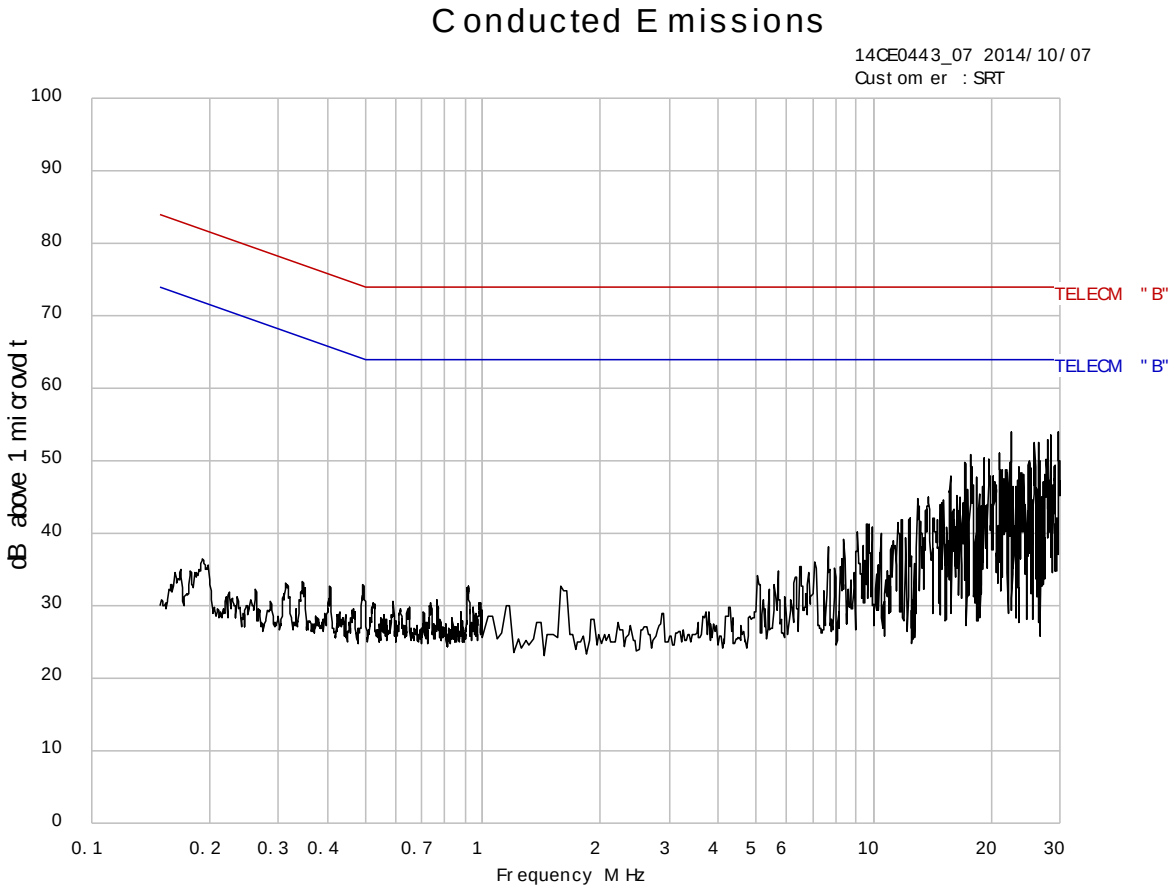
	Quasi-peak value (dBµV)			
Frequency (MHz)	**Measured**	**Measured quasi-peak value including uncertainty budget**	**Limit**	**Status**
0.200	24.80	28.02	81.60	Pass
0.350	26.10	29.32	76.97	Pass
1.021	27.40	30.62	74.00	Pass
1.703	23.10	26.32	74.00	Pass
5.214	14.11	17.33	74.00	Pass
10.018	19.00	22.22	74.00	Pass
18.165	14.30	17.52	74.00	Pass
23.029	13.53	16.75	74.00	Pass
29.166	16.88	20.1	74.00	Pass

Uncertainty of measurement: ± 3.22 dBµV for a 95% confidence level has been added to the measured result.

The emissions reported are the highest relative to the Class B limit; the measured results meet the conducted limits with a significant pass margin. When quasi-peak results are at least 10dB below the quasi-peak limit average results are not required; the results meet the quasi-peak and average limits. The emissions profile from the cable is shown on the next page.

TEST ENGINEERS: Rob St John James & Richard Pennell

4.3.2 Profile; Ethernet Cable



Note: The limits shown are the quasi-peak limit (higher Line) and average limit (lower line)

5.0 IMMUNITY RESULTS

5.1 Performance Criteria

General performance criteria for immunity testing are defined below:-

Criterion A:	The apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. If the performance level or the permissible level is not specified by the manufacturer then either of these may be derived from the EUT description and documentation and what the user may reasonably expect from the apparatus if used as intended. Wi-Fi: No unintended transmissions, no loss of communication.
Criterion B:	The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. In some cases the performance level may be replaced by a permissible loss of performance. During the test degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible level is not specified by the manufacturer then either of these may be derived from the EUT description and documentation and what the user may reasonably expect from the apparatus if used as intended. Wi-Fi: No unintended transmissions, any loss of communication shall automatically recover.
Criterion C:	Temporary loss of function is allowed provided the loss of function is self-recoverable or can be restored by the operation of the controls, or by any operation specified in the instructions for use.

Note: All immunity tests were applied above the specification level to include the uncertainty attributed to each test.

5.2 Electrostatic Discharge

TEST METHOD	**IEC 61000-4-2** **REFERENCING PROCEDURE: ESD-03**

TEST DETAILS

Test severity, <u>contact discharge</u>	**± 6.0 kV, 50 strikes per point. Total of 200 strikes (minimum).**
Test severity, <u>air discharge</u>	**± 8.0 kV, 10 strikes for each selected point**
Exerciser program during test	**Referencing section 3.4**
Specified test criterion	**Criterion 'B'**
EUT performance criterion	**Criterion 'A'**

RESULTS

Contact, Indirect

SPECIFIED VOLTS	REFERENCE PLANE @ 10cm	STATUS
± 4.0 kV	**Horizontal and vertical; front, rear and sides**	**PASS**
± 6.0 kV	**Horizontal and vertical; front, rear and sides**	**PASS**

Contact, Direct To EUT

SPECIFIED VOLTS	TEST POINTS	STATUS
± 2.0 kV	**Case and connector shells; see illustration on next page**	**PASS**
± 4.0 kV		**PASS**
± 6.0 kV		**PASS**

Air Discharge (Insulating, Slots & Apertures)

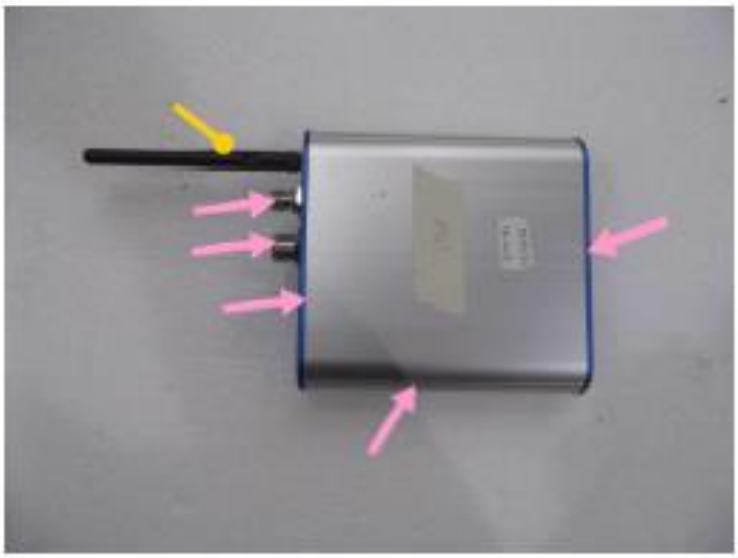
SPECIFIED VOLTS	TEST POINTS	STATUS
± 2.0 kV	**See illustration on next page**	**PASS**
± 4.0 kV		**PASS**
± 8.0 kV		**PASS**

UNCERTAINTY: Specified as less than 5%. The level applied was 5% higher than the upper levels stated above to take into account the uncertainty for this test.

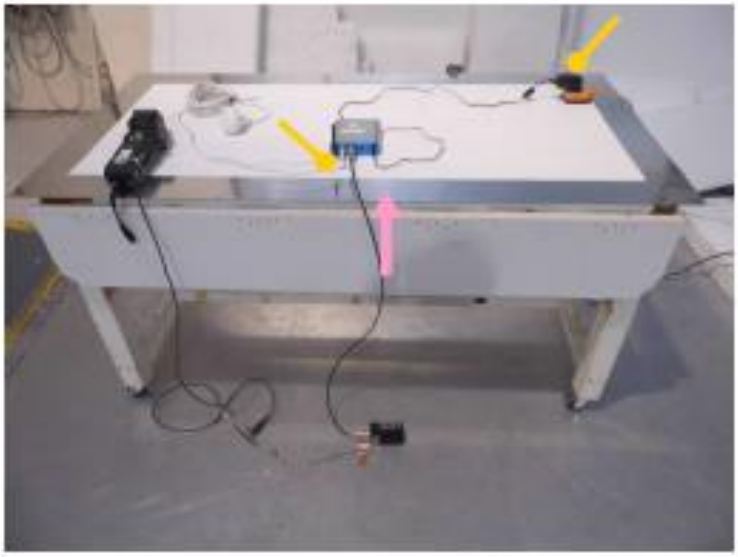
COMMENT: The EUT met the specified test criterion.

TEST ENGINEERS: Rob St John James & Richard Pennell

5.2.1 Electrostatic Discharge Test Points



Arrow indicates Contact Discharge → / → Air discharge



5.3 Radiated RF Interference

TEST METHOD	**IEC 61000-4-3** **REFERENCING PROCEDURE: RES-02**

TEST DETAILS

Test severity levels,	• **10.0 V/m; 80 to 2000 MHz swept frequency** • **3.0 V/m; 2.0 to 2.7 GHz** • **80% amplitude modulation 400 Hz** • **1% increment, 3 seconds dwell time and 9 seconds dwell time from 1.0 GHz**
Exerciser program during test	**Referencing section 3.4**
Specified test criterion	**Criterion 'A'**
EUT performance criterion	**Criterion 'A'**

RESULTS

TEST POINTS	ANTENNA POLARITIES	FIELD LEVEL SPOT FREQUENCY	STATUS
Front	**Horizontal & vertical**	**10.0 & 3.0 V/m**	**PASS**
Side, left	**Horizontal & vertical**	**10.0 & 3.0 V/m**	**PASS**
Side, right	**Horizontal & vertical**	**10.0 & 3.0 V/m**	**PASS**
Rear	**Horizontal & vertical**	**10.0 & 3.0 V/m**	**PASS**

UNCERTAINTY: Estimated uncertainty is 20%. The field level has been applied at level higher of 12 V/m to take into account uncertainties.

COMMENT: The exclusion band was ±5% of the GPS frequency (1570 MHz), Wi-Fi Band (2.45 - 2.485GHz) ±10MHz and ±5% of the AIS frequency band (156.025 to 162.025 MHz). In test no exclusion bands were used. The EUT met the specified test criterion.

TEST ENGINEERS: Rob St John James & Richard Pennell

5.4 Fast Transient Bursts

TEST METHOD	IEC 61000-4-4 REFERENCING PROCEDURE: FTB-01

TEST DETAILS

Test severity	• **± 1.0 kV All Ports** **5/50ns Tr/Td 5kHz Repetition Rate**
Exerciser program during test	**Referencing section 3.4**
Specified test criterion	**Criterion 'B'**
EUT performance criterion	**Criterion 'A'**

RESULTS

Injection Via Clamp

PORT	TEST VOLTAGE	STATUS
All ports	**± 1.0 kV**	**PASS**

UNCERTAINTY: Specified as less than 10% but estimated as less than 5%. The level applied was 5% higher than the levels stated above to take into account the uncertainty for this test.

COMMENT: The EUT met the specified test criterion.

TEST ENGINEERS: Rob St John James & Richard Pennell

5.5 Surge, AC Port

TEST METHOD	**IEC 61000-4-5** **REFERENCING PROCEDURE: SUR-02**

TEST DETAILS

Test severity level	• **± 1.0 kV Line to Line** • **± 2.0 kV Line to Earth** **Phase Angles: 0, 90, 270 degrees** **1.2/50us Tr/Td** **60s event intervals**
Exerciser program during test	**Referencing section 3.4**
Specified test criterion	**Criterion 'B'**
EUT performance criterion	**Criterion 'A'**

RESULTS

TEST VOLTAGES	COUPLING MODES	STATUS
± 1.0 V	**Line to Line**	**PASS**
± 2.0 kV	**Line to Earth**	**PASS**

UNCERTAINTY: Specified as less than 10% but estimated as less than 5%. The level applied was 5% higher than the upper levels stated above to take into account the uncertainty for this test.

COMMENT: No deviations observed or measured.

TEST ENGINEERS: Rob St John James & Richard Pennell

5.6 Conducted RF Field

TEST METHOD	**IEC 61000-4-6** **REFERENCING PROCEDURE: CES-02**

TEST DETAILS

Test severity level	• **3.0V rms, 80% amplitude modulation 400 Hz 0.15 to 80 MHz** • **10V rms spot frequencies at: 2, 3, 4, 6.2, 8.2, 12.2, 12.6, 16.5, 18.8, 22, 25 MHz, the dwell at each frequency was 60 seconds.**
Exerciser program during test	**Referencing section 3.4**
Specified test criterion	**Criterion 'A'**
EUT performance criterion	**Criterion 'A'**

RESULTS

TEST VOLTAGE	TEST POINTS	COUPLING METHOD	STATUS
3.0V & 10.0V	**AC Input**	**CDN**	**PASS**

RESULTS – Signal Port

TEST VOLTAGE	TEST POINTS	COUPLING METHOD	STATUS
3.0V & 10.0V	**AIS & GPS**	**150-50 ohm Adapter**	**PASS**
3.0V & 10.0V	**All other signal ports**	**EM-Clamp**	**PASS**

UNCERTAINTY: Estimated uncertainty is < 5%. The applied voltage has been applied at higher level of 4 or 12V to take into account uncertainties.

COMMENT: The EUT met the performance criterion.

TEST ENGINEERS: Rob St John James & Richard Pennell

5.7 Power Line Disturbance

TEST METHOD	IEC 61000-4-11 REFERENCING PROCEDURE: PLD-01

TEST DETAILS	Specified test types & levels (voltage shift @ zero phase crossing)	Specified criteria
	Dips: 100% reduction for ½ cycle	B
	Dips: 100% reduction for 1 cycle	B
	Dips: 30% reduction for 500ms	C
	Interrupt: 100% reduction for 5s	C
	Interrupt: 100% reduction for 5s	C
Exerciser program during test	Referencing section 3.4	

RESULTS

Applied test types & levels	Test point	Nominal operation frequency / voltage	Performed criteria	Status
-100% x ½ cycle	AC Input	240V / 50Hz & 100V/60Hz	A	PASS
-100% x 1 cycle			A	PASS
-30% x 500ms			A	PASS
-100% x 5s			C	PASS
-100% x 60s			C	PASS

UNCERTAINTY: Specification level is 5% but estimated as less than 1%.

COMMENT: The EUT reset and continued after the test. The EUT met the performance criteria.

TEST ENGINEERS: Rob St John James & Richard Pennell

5.8 PSU Short Term Variance

TEST METHOD	IEC 1000-4-11 REFERENCING PROCEDURE: PLD-01

TEST DETAILS

Test Severity Level	• **± 20% Voltage with** • **± 10% Frequency shift** **Voltage shift @ zero phase crossing**
Exerciser program during test	**Referencing section 3.4**
Specified test criterion	**Criterion 'B'**
EUT performance criterion	**Criterion 'A'**
Nominal AC mains rating	**240V/50Hz**

RESULTS

TEST VOLTAGE	TEST POINTS AC Mains 100V/60Hz and 240V/50Hz	STATUS	CRITERIA
+20% voltage for 1.5s with a frequency shift of +10% for 5s	**AC Mains Input**	**PASS**	**A**
-20% voltage for 1.5s with a frequency shift of -10% for 5s	**AC Mains Input**	**PASS**	**A**

UNCERTAINTY: Specification level is 5% but estimated as less than 1%. The under voltage was applied 1% under the nominal levels and the over voltage was applied 1% over the nominal levels to take into account the uncertainty for this test.

COMMENT: No performance degradation was observed or measured.
The EUT met the performance criteria.

TEST ENGINEERS: Rob St John James & Richard Pennell

6.0 PHOTO LOG (TYPICAL)

Emissions:

Radiated disturbance

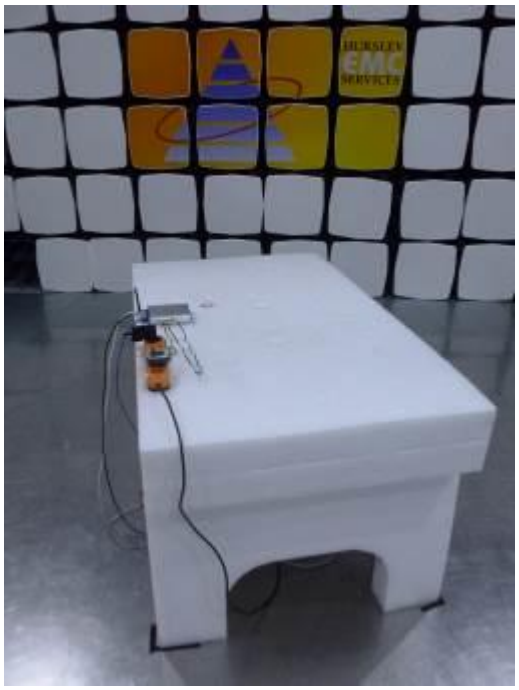
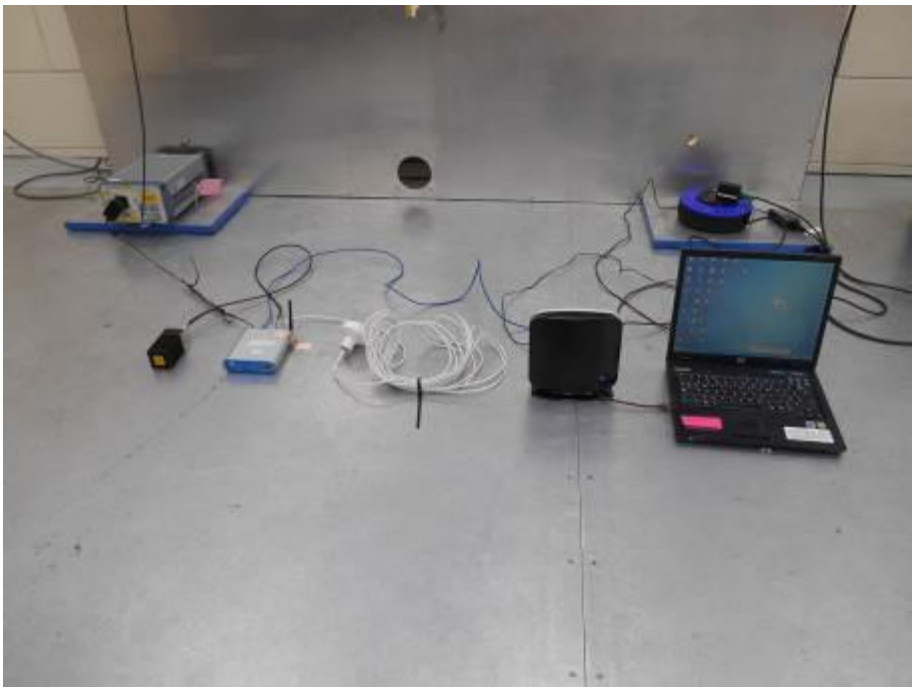


Photo Log (continued)

Immunity:

Conducted disturbance



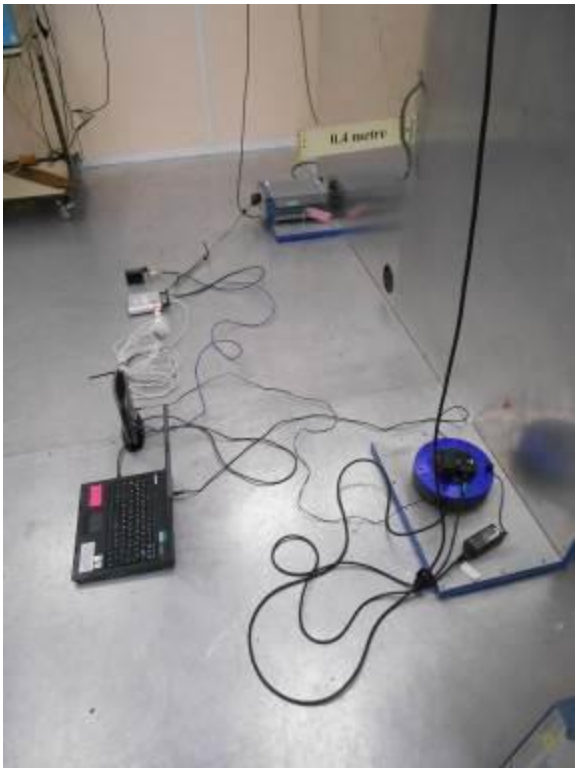


Photo Log (continued)

Immunity:

Electrostatic discharge (set-up)

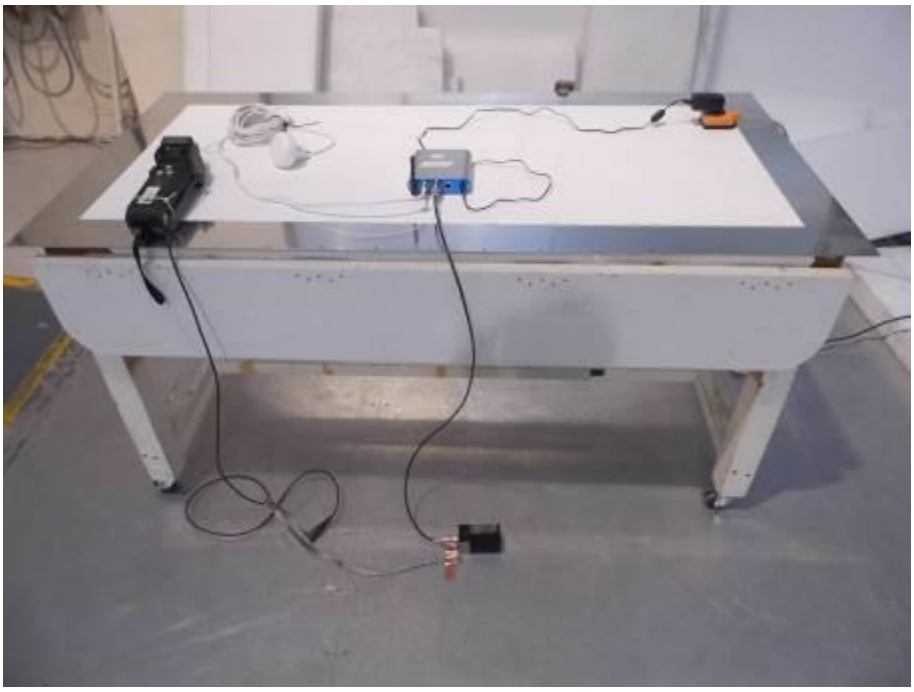


Photo Log (continued)

Immunity:

Conducted RF field

Photo Log (continued)

Immunity:

Radiated RF field

Photo Log (continued)

Immunity:

Fast burst transients

Photo Log (continued)

Immunity:

Surge