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# Report On

FCC and Industry Canada Testing of the  
em-trak Marine Electronics Ltd

B100 Class B AIS

In accordance with FCC CFR 47 Part 15B and ICES-003

COMMERCIAL-IN-CONFIDENCE

FCC ID: YYG-411-0002

IC ID: 9384A-4110002A

Document 75912008 Report 09 Issue 2

April 2011



Product Service

TÜV SÜD Product Service Ltd, Octagon House, Concorde Way, Segensworth North,  
Fareham, Hampshire, United Kingdom, PO15 5RL  
Tel: +44 (0) 1489 558100. Website: [www.tuvps.co.uk](http://www.tuvps.co.uk)

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**REPORT ON**

FCC and Industry Canada Testing of the  
em-trak Marine Electronics Ltd  
B100 Class B AIS

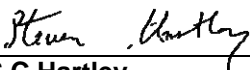
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**PREPARED FOR**

em-trak Marine Electronics Ltd  
Forum 3,  
Parkway, Solent Business Park,  
Whiteley, Fareham,  
Southampton  
PO15 7FH

**PREPARED BY**

  
\_\_\_\_\_  
**S C Hartley**  
EMC Engineer

**APPROVED BY**

  
\_\_\_\_\_  
**K F Archer**  
Authorised Signatory

**DATED**

07 April 2011

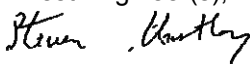
**This report has been up-issued to Issue 2 to amend typographical errors.**

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**ENGINEERING STATEMENT**

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47 Part 15B and ICES-003 The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

  
\_\_\_\_\_  
S C Hartley





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## **SECTION 1**

### **REPORT SUMMARY**

FCC and Industry Canada Testing of the  
em-trak Marine Electronics Ltd B100 Class B AIS



## 1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Marine Electronics Ltd B100 Class B AIS to the requirements of FCC CFR 47 Part 15B and ICES-003.

Objective	To perform FCC and Industry Canada Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	em-trak Marine Electronics Ltd
Model Number(s)	B100
Serial Number(s)	Not Serialised (TSR0025)
Software Version	1295_07FEB2011
Hardware Version	1
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 15B: 2010 ICES-003: 2004
Incoming Release Date	Declaration of Build Status 17 February 2011
Disposal Reference Number Date	Returned with Client 75912008/001 30 March 2011
Order Number Date	POR002006 25 March 2011
Start of Test	30 March 2011
Finish of Test	30 March 2011
Name of Engineer(s)	S C Hartley
Related Document(s)	ANSI C63.4 2003 CISPR 22:02 :2006




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**1.2 BRIEF SUMMARY OF RESULTS**

A brief summary of results in accordance with FCC CFR 47 Part 15B and ICES-003, is shown below.

Configuration 1 - As supplied							
Section	Spec Clause		Test Description	Mode	Mod State	Result	Base Standard
	FCC	ICES					
2.1	15.109	7.1	Radiated Emissions (Enclosure Port)	Rx	0	Pass	ANSI C63.4

## 1.3 DECLARATION OF BUILD STATUS

<b>Manufacturer</b>	em-trak Marine Electronics Ltd
<b>Country of origin</b>	England
<b>UK Agent</b>	SRT Marine Technology Ltd
<b>Technical Description</b>	Class B CSTDMA AIS Transponder
<b>Model No</b>	B100
<b>Part No</b>	411-0002
<b>Serial No</b>	01
<b>Drawing Number</b>	LD3566
<b>Build Status</b>	Mod 0
<b>Software Issue</b>	1295_07FEB2011
<b>Hardware Issue</b>	01
<b>FCC ID</b>	YYG-411-0002
<b>Industry Canada ID</b>	9384A-4110002A
<b>Highest Internally Generated/Used Frequency</b>	29.255 MHz
<b>Signature</b>	
<b>Date</b>	17 February 2010

**1.4 PRODUCT INFORMATION**

**1.4.1 Technical Description**

The Equipment Under Test (EUT) was an em-trak Marine Electronics Ltd B100 Class B AIS. A full technical description can be found in the manufacturer’s documentation.

**1.4.2 Test Configuration**

EUT operated continuously in Receive Mode (No MMSI, awaiting a GPS Lock). Receiving on Channels AIS 1 & Channel AIS 2.

The VHF Port was terminated in to a 25W/50Ω Load.

The USB Cable was connected but was un-terminated.

The GPS Port was connected to a BJTEK MA700 Antenna, via 10m Cable.

Configuration 1: As Supplied

The EUT was configured in accordance with FCC CFR 47 Part 15B and ICES-003.

**1.4.3 EUT Cable / Port Identification**

Port	Max Cable Length specified	Usage	Type	Screened
DC & NMEA0183	1.5m	Power & NMEA	Multi Core	No
VHF (Terminated for testing)	>10m	VHF	Coaxial	Yes
USB	2m	USB	Cat 5	No
NMEA 2000	unpopulated	Not Used	-	-
GPS	10m	Earth	Coaxial	Yes

**1.4.4 Modes of Operation**

Modes of operation of each EUT during testing were as follows:

Mode 1 - Rx

Information on the specific test modes utilised are detailed in the test procedure for each individual test.



## **1.5 TEST CONDITIONS**

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated in a shielded enclosure, test laboratories or an open test area as appropriate.

The EUT was powered from a 12V DC supply.

FCC Accreditation  
90987 Octagon House, Fareham Test Laboratory

Industry Canada Accreditation  
IC2932B-1 Octagon House, Fareham Test Laboratory

## **1.6 DEVIATIONS FROM THE STANDARD**

No deviations from the applicable test standards or test plan were made during testing.

## **1.7 MODIFICATION RECORD**

No modifications were made to the EUT during testing.

**SECTION 2**

**TEST DETAILS**

FCC and Industry Canada Testing of the  
em-trak Marine Electronics Ltd B100 Class B AIS

**2.1 RADIATED EMISSIONS (ENCLOSURE PORT)**

**2.1.1 Specification Reference**

FCC CFR 47 Part 15B: Clause 15.109  
ICES-003, Clause 7.1

**2.1.2 Equipment Under Test**

em-trak B100 Class B AIS, S/N: Not Serialised (TSR0025)

**2.1.3 Date of Test and Modification State**

30 March 2011 - Modification State 0

**2.1.4 Test Equipment Used**

The major items of test equipment used for the above tests are identified in Section 3.1.

**2.1.5 Test Method and Operating Modes**

The test was applied in accordance with the test method requirements of ANSI C63.4.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1

**2.1.6 Environmental Conditions**

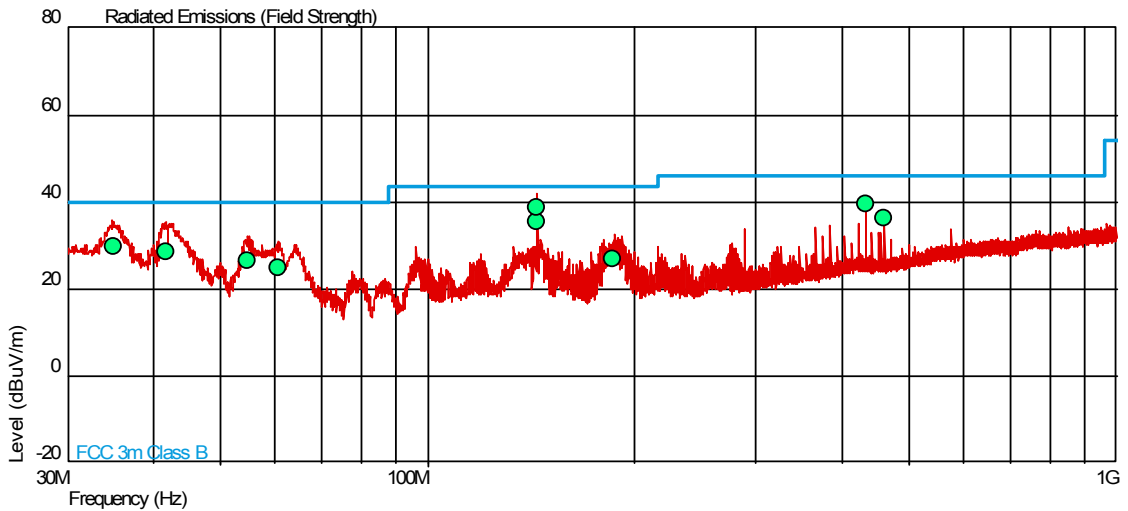
	30 March 2011
Ambient Temperature	20°C
Relative Humidity	30%
Atmospheric Pressure	1009mbar

**2.1.7 Test Results**

For the period of test the EUT met the Class B requirements of FCC CFR 47 Part 15B and ICES-003 for Radiated Emissions (Enclosure Port).

The test results are shown below.

Configuration 1 - Mode 1



Frequency (MHz)	QP Level (dBµV/m)	QP Level (uV/m)	QP Limit (dBµV/m)	QP limit (uV/m)	QP Margin (dBµV/m)	QP Margin (uV/m)	Angle (deg)	Height (m)	Polarity
34.925	29.8	30.9	40.0	100	-10.2	-69.1	94	1.00	Vertical
41.595	28.7	27.2	40.0	100	-11.3	-72.8	203	1.00	Vertical
54.638	26.4	20.9	40.0	100	-13.6	-79.1	360	1.00	Vertical
60.813	24.8	17.4	40.0	100	-15.2	-82.6	233	1.00	Vertical
144.000	38.7	86.1	43.5	150	-4.8	-63.9	167	1.00	Vertical
144.000	35.3	58.2	43.5	150	-8.2	-91.8	210	1.95	Horizontal
185.276	26.8	21.9	43.5	150	-16.7	-128.1	0	1.00	Vertical
432.010	39.4	93.3	46.0	200	-6.6	-106.7	36	1.03	Horizontal
460.796	36.1	63.8	46.0	200	-9.9	-137.2	142	1.00	Horizontal

**SECTION 3**

**TEST EQUIPMENT USED**

**3.1 TEST EQUIPMENT USED**

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
<b>Section 2.1 EMC - Radiated Emissions</b>					
Antenna (Bilog)	Schaffner	CBL6143	287	24	19-Jan-2012
Screened Room (5)	Rainford	Rainford	1545	24	3-Feb-2014
Mast Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Turntable/Mast Controller	EMCO	2090	1607	-	TU
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	9-Sep-2011

TU – Traceability Unscheduled

**3.2 MEASUREMENT UNCERTAINTY**

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	Frequency / Parameter	MU
Radiated Emissions, Bilog Antenna, AOATS	30MHz to 1GHz Amplitude	5.2dB*
Radiated Emissions, Horn Antenna, AOATS	1GHz to 40GHz Amplitude	6.3dB*
Conducted Emissions, LISN	150kHz to 30MHz Amplitude	3.2dB*
Conducted Emissions, ISN	150kHz to 30MHz Amplitude	2.1dB
Substitution Antenna, Radiated Field	30MHz to 18GHz Amplitude	2.6dB
Discontinuous Interference	150kHz to 30MHz Amplitude	3.0dB*
Interference Power	30MHz to 300MHz Amplitude	3.0dB*
Radiated E-Field Susceptibility	10MHz to 6GHz Test Amplitude	2.0dB†
Conducted Susceptibility RF	50kHz to 1000MHz Amplitude	3.1dB•
	EM Clamp Method of Test	1.2dB•
	CDN Method of Test	1.1dB•
	BCI Clamp Method of Test	1.2dB•
Conducted Susceptibility LF	DC to 150kHz	1.0%†
Power Frequency Magnetic Field	50Hz/60Hz Amplitude	0.45%
Magnetic Emissions	9kHz to 30MHz Amplitude	3.4dB*
Magnetic Field/Flux iaw EN 50366	10Hz to 400kHz	2.64%
Harmonics and Flicker	The test was applied using proprietary equipment that meets the requirements of EN 61000-3-2 and EN 61000-3-3	—
Mains Voltage Variations and Interrupts	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-11	—
Fast Transient Burst	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-4	—
Electrostatic Discharge	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-2	—
Surge	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-5	—
Vehicle Transients	The test was applied using proprietary equipment that meets the requirements of ISO 7637-1 and 2	—
Compass Safe Distance	Azimuth Accuracy	0.10°

Worst case error for both Time and Frequency measurement 12 parts in 10<sup>6</sup>.

- \* In accordance with CISPR 16-4-2
- † In accordance with UKAS Lab 34
- In accordance with EN61000-4-6: 2009

**SECTION 4**

**ACCREDITATION, DISCLAIMERS AND COPYRIGHT**



#### 4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA  
(Not UKAS Accredited).

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