

REPORT ON

EMC Compliance

Of the em-trak Marine Electronics Limited

Class B AIS Transceiver em-trak B100

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1. HISTORY

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3. CONFORMANCE DECLARATION

Document Title: em-trak B100 EMC Compliance Report

Number: LD3773

Issue: 1

Report On: EMC Compliance
Of the em-trak Marine Electronics Limited
Class B AIS transceiver em-trak B100

We, SRT Marine Technology Ltd of Wireless House, Westfield Industrial Estate, Midsomer Norton, Bath, BA3 4BS declare under our sole responsibility that the product em-trak B100, being a Class B AIS transceiver categorized as protected as defined in specification IEC62287-1:2010, is conformant against Clause's 9.2, 9.2, 10.3, 10.4, 10.5, 10.6, 10.7, 10.8, 10.9 and 11.2 of specification 6 IEC60945:2002 by the declarations of conformity contained within this report LD3773



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Approved By: Neil Peniket
Chief Operating Officer

5th April 2011

Date:



SRT
Marine Technology

4. SUMMARY

The information contained in this document is intended to show compliance of em-trak Marine Electronics Limited em-trak B100 against the applied specification.

Applicant:	SRT Marine Technology Ltd. Wireless House First Avenue Westfield Industrial Estate Midsomer Norton Bath BA3 4BS UK
Equipment under test:	Marine AIS (Automatic Identification system) Class B transponder
Type:	em-trak B100
Manufacturer:	em-trak Marine Electronics Limited Forum 3, Parkway, Solent Business Park, Whiteley, Fareham, Southampton, PO15 7FH United Kingdom

4.1. Introduction

This report LD3773 Issue 1 presents conformity information against IEC60945:2002 requirements of Clauses 9.2, 9.2, 10.3, 10.4, 10.5, 10.6, 10.7, 10.8, 10.9 and 11.2

4.2. Requirement Specification

IEC 60945:2002 MARITIME NAVIGATION AND RADIOCOMMUNICATION EQUIPMENT
AND SYSTEMS – Clauses 9.2, 9.2, 10.3, 10.4, 10.5, 10.6, 10.7, 10.8, 10.9 and 11.2

4.3. Brief summary of compliance

IEC60945:2002 Clause Number	Conformance	Mode	Compliant
9.2	Conducted Emissions (DC Power Port)	1	PASS
9.2	Conducted Emissions (DC Power Port)	2	PASS
9.2	Conducted Emissions (AC Power Port)	1	N/A
9.2	Conducted Emissions (AC Power Port)	2	N/A
9.3	Enclosure Port Magnetic Emissions – Field Strength	1	N/A
9.3	Enclosure Port Magnetic Emissions – Field Strength	2	PASS
9.3	Radiated Emissions (Enclosure Port)	1	N/A
9.3	Radiated Emissions (Enclosure Port)	2	PASS
10.3	Immunity to Radio Frequency Common Mode (AC Power Port)	1	N/A
10.3	Immunity to Radio Frequency Common Mode (AC Power Port)	2	N/A
10.3	Immunity to Radio Frequency Common Mode (DC Power Port)	1	PASS
10.3	Immunity to Radio Frequency Common Mode (DC Power Port)	2	N/A
10.3	Immunity to Radio Frequency Common Mode (Signal, Control and Telecommunications Port)	1	PASS
10.3	Immunity to Radio Frequency Common Mode (Signal, Control and Telecommunications Port)	2	N/A
10.4	Immunity to Radio Frequency electromagnetic Field (Enclosure Port)	1	PASS
10.4	Immunity to Radio Frequency electromagnetic Field (Enclosure Port)	2	N/A
10.5	Immunity to Fast Transient Bursts Common Mode (AC power port)	1	PASS
10.5	Immunity to Fast Transient Bursts Common Mode (AC power port)	2	N/A
10.5	Immunity to Fast Transient Bursts Common Mode (signal, control and telecommunications port)	1	N/A
10.5	Immunity to Fast Transient Bursts Common Mode (signal, control and telecommunications port)	2	N/A
10.6	Immunity to Surges (AC power port)	1	N/A
10.6	Immunity to Surges (AC power port)	2	N/A
10.7	Immunity to Power Supply Short Term Variation (AC Power Ports)	1	N/A

IEC60945:2002 Clause Number	Conformance	Mode	Compliant
10.7	Immunity to Power Supply Short Term Variation (AC Power Ports)	2	N/A
10.8	Immunity to Interruptions (AC Power Port)	1	N/A
10.8	Immunity to Interruptions (AC Power Port)	2	N/A
10.8	Immunity to Interruptions (DC Power Port)	1	PASS
10.8	Immunity to Interruptions (DC Power Port)	2	N/A
10.9	Immunity to Electrostatic Discharge (Enclosure Port)	1	PASS
10.9	Immunity to Electrostatic Discharge (Enclosure Port)	2	N/A
11.2	Compass Safe Distance (Enclosure Port)	1	PASS
11.2	Compass Safe Distance (Enclosure Port)	2	N/A

Mode 1 – Receiving GPS and transmitting position (at standard transmit interval)

Mode 2 – No GPS signal; not transmitting

4.4. UUT information

HW Version: V1.0
SW version 1271_17DEC2010 & 1285_06JAN2011

4.5. Verification information

The verification detailed in this report was performed at TÜV SÜD Product Service Ltd, Octagon House, Concorde Way, Segensworth North, Fareham, Hampshire, United Kingdom, PO15 5RL and is documented in document 75912008 Report 01.

All verification was performed on the COBALT module.

The COBALT module is an AIS Class B module that performs all functionality for AIS communications. The COBALT module is surrounded by an EMC shielded.

The em-trak B100 is a COALT module placed inside of an environmental protection enclosure. The enclosure itself is created of material that is invisible to RF and as such has no affect on any EMC characteristics of the device.

Throughout this document are the details of how certification requirements for compliance against all EMC clauses of IEC60945:2002 as required in Table 21 of IEC62287-1:2010; for the em-trak B100 have been achieved and demonstrate compliance the application of results from the COBALT module or specifically tested on the em-trak B100

5. TEST RESULTS

5.1. Conducted Emissions (DC Power Port)

5.1.1. Specification Reference

IEC60945: Table 5, Clause 9.2 and 5.3

5.1.2. Test Method and operation mode

The test was applied in accordance with the test method requirements of CISPR 16-1

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

Mode 1 – Receiving GPS and transmitting position (at standard transmit interval)

Mode 2 – No GPS signal; not transmitting

5.1.3. Results

The results for this test are detailed in document 75912008 Report 01

5.1.4. Results Applicability Description

The testing was performed on COBALT; and was performed with data leads of 600mm, the em-trak units data leads are a length of 85mm resulting in the testing for COBALT being a more stringent test than if it had been performed on the em-trak B100 itself.

The results for COBALT are applicable to em-trak B100 as the testing on COBALT was more stringent than the constrained of the em-trak B100 device and both contain identical functionality.

5.2. Enclosure Port Magnetic Emissions – Field Strength

5.2.1. Specification Reference

IEC60945: Table 5, Clause 9.2 and 5.3

5.2.2. Test Method and operation mode

The test was applied in accordance with the test method requirements of CISPR 16-1

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

Mode 2 – No GPS signal; not transmitting

5.2.3. Results

The results for this test are detailed in document 75912008 Report 01

5.2.4. Results Applicability Description

The testing was performed on COBALT; the COBALT unit is surrounded by an EMC shield which protects the unit from external signals and protects other limits all signals being radiated by the unit. The em-trak B100 enclosure has no RF properties and as such does not affect any radiated or absorbed signals of the device.

COBALT testing was performed with data leads of 600mm long where, em-trak B100 data leads are a length of 85mm. The testing on the COBALT unit was more subjective to radiating or absorbing signals.

The results for COBALT are applicable to em-trak B100 as the testing on COBALT was more stringent than the constrained of the em-trak B100 device and both contain identical functionality.

5.3. Radiated Emissions (Enclosure Port)

5.3.1. Specification Reference

IEC60945: Table 5, Clause 9.2 and 5.3

5.3.2. Test Method and operation mode

The test was applied in accordance with the test method requirements of CISPR 16-1

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

Mode 2 – No GPS signal; not transmitting

5.3.3. Results

The results for this test are detailed in document 75912008 Report 01 & document 75912008 THC 10

5.3.4. Results Applicability Description

The testing was performed on COBALT; the COBALT unit is surrounded by an EMC shield which protects the unit from external signals and protects other limits all signals being radiated by the unit. The em-trak B100 enclosure has no RF properties and as such does not affect any radiated or absorbed signals of the device.

COBALT testing was performed with data leads of 600mm long where, em-trak B100 data leads are a length of 85mm. The testing on the COBALT unit was more subjective to radiating or absorbing signals.

The results for COBALT are applicable to em-trak B100 as the testing on COBALT was more stringent than the constrained of the em-trak B100 device and both contain identical functionality.

To show that there is no affect to radiated or absorbed signals when a COBALT module is placed into an em-trak B100 enclosure; testing in conformance with IEC60945: 9.2 was performed on the em-trak B100 and the corresponding test house certificate (document 75912008 THC 10) supplied.

5.4. Immunity to Radio Frequency Common Mode (DC Power Port)

5.4.1. Specification Reference

IEC60945: Table 6, Clause 10.3 and 5.3

5.4.2. Test Method and operation mode

The test was applied in accordance with the test method requirements of CISPR 16-1

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

Mode 1 – Receiving GPS and transmitting position (at standard transmit interval)

5.4.3. Results

The results for this test are detailed in document 75912008 Report 01

5.4.4. Results Applicability Description

The testing was performed on COBALT; the COBALT unit is surrounded by an EMC shield which protects the unit from external signals and protects other limits all signals being radiated by the unit. The em-trak B100 enclosure has no RF properties and as such does not affect any radiated or absorbed signals of the device.

COBALT testing was performed with data leads of 600mm long where, em-trak B100 data leads are a length of 85mm. The testing on the COBALT unit was more subjective to radiating or absorbing signals.

The results for COBALT are applicable to em-trak B100 as the testing on COBALT was more stringent than the constrained of the em-trak B100 device and both contain identical functionality.

5.5. Immunity to Radio Frequency Common Mode (Signal, Control and Telecommunications Port)

5.5.1. Specification Reference

IEC60945: Table 6, Clause 10.3

5.5.2. Test Method and operation mode

The test was applied in accordance with the test method requirements of CISPR 16-1

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

Mode 1 – Receiving GPS and transmitting position (at standard transmit interval)

5.5.3. Results

The results for this test are detailed in document 75912008 Report 01 & document 75912008 THC 10

5.5.4. Results Applicability Description

The testing was performed on COBALT; the COBALT unit is surrounded by an EMC shield which protects the unit from external signals and protects other limits all signals being radiated by the unit. The em-trak B100 enclosure has no RF properties and as such does not affect any radiated or absorbed signals of the device.

COBALT testing was performed with data leads of 600mm long where, em-trak B100 data leads are a length of 85mm. The testing on the COBALT unit was more subjective to radiating or absorbing signals.

The results for COBALT are applicable to em-trak B100 as the testing on COBALT was more stringent than the constrained of the em-trak B100 device and both contain identical functionality.

5.6. Immunity to Radio Frequency Electromagnetic Field (Enclosure Port)

5.6.1. Specification Reference

IEC60945: Table 6, Clause 10.4

5.6.2. Test Method and operation mode

The test was applied in accordance with the test method requirements of CISPR 16-1

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

Mode 1 – Receiving GPS and transmitting position (at standard transmit interval)

5.6.3. Results

The results for this test are detailed in document 75912008 Report 01

5.6.4. Results Applicability Description

The testing was performed on COBALT; the COBALT unit is surrounded by an EMC shield which protects the unit from external signals and protects other limits all signals being radiated by the unit. The em-trak B100 enclosure has no RF properties and as such does not affect any radiated or absorbed signals of the device.

COBALT testing was performed with data leads of 600mm long where, em-trak B100 data leads are a length of 85mm. The testing on the COBALT unit was more subjective to radiating or absorbing signals.

The results for COBALT are applicable to em-trak B100 as the testing on COBALT was more stringent than the constrained of the em-trak B100 device and both contain identical functionality.

5.7. Immunity to Fast Transient Bursts Common Mode (Signal, Control and Telecommunications Port)

5.7.1. Specification Reference

IEC60945: Table 6, Clause 10.5

5.7.2. Test Method and operation mode

The test was applied in accordance with the test method requirements of CISPR 16-1

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

Mode 1 – Receiving GPS and transmitting position (at standard transmit interval)

5.7.3. Results

The results for this test are detailed in document 75912008 Report 01

5.7.4. Results Applicability Description

The testing was performed on COBALT; the COBALT unit is surrounded by an EMC shield which protects the unit from external signals and protects other limits all signals being radiated by the unit. The em-trak B100 enclosure has no RF properties and as such does not affect any radiated or absorbed signals of the device.

COBALT testing was performed with data leads of 600mm long where, em-trak B100 data leads are a length of 85mm. The testing on the COBALT unit was more subjective to radiating or absorbing signals.

The results for COBALT are applicable to em-trak B100 as the testing on COBALT was more stringent than the constrained of the em-trak B100 device and both contain identical functionality.

5.8. Immunity to Interruptions (DC Power Port)

5.8.1. Specification Reference

IEC60945: Table 6, Clause 10.8

5.8.2. Test Method and operation mode

The test was applied in accordance with the test method requirements of CISPR 16-1

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

Mode 1 – Receiving GPS and transmitting position (at standard transmit interval)

5.8.3. Results

The results for this test are detailed in document 75912008 Report 01

5.8.4. Results Applicability Description

The testing was performed on COBALT; the COBALT unit is surrounded by an EMC shield which protects the unit from external signals and protects other limits all signals being radiated by the unit. The em-trak B100 enclosure has no RF properties and as such does not affect any radiated or absorbed signals of the device.

COBALT testing was performed with data leads of 600mm long where, em-trak B100 data leads are a length of 85mm. The testing on the COBALT unit was more subjective to radiating or absorbing signals.

The results for COBALT are applicable to em-trak B100 as the testing on COBALT was more stringent than the constrained of the em-trak B100 device and both contain identical functionality.

5.9. Compass Safe Distance (Enclosure Port)

5.9.1. Specification Reference

IEC60945: Table 6, Clause 11.2

5.9.2. Test Method and operation mode

The test was applied in accordance with the test method requirements of CISPR 16-1

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

Mode 1 – Receiving GPS and transmitting position (at standard transmit interval)

5.9.3. Results

The results for this test are detailed in document 75912008 Report 01

5.9.4. Results Applicability Description

The testing was performed on COBALT; the COBALT unit is surrounded by an EMC shield which protects the unit from external signals and protects other limits all signals being radiated by the unit. The em-trak B100 enclosure has no RF properties and as such does not affect any radiated or absorbed signals of the device.

COBALT testing was performed with data leads of 600mm long where, em-trak B100 data leads are a length of 85mm. The testing on the COBALT unit was more subjective to radiating or absorbing signals.

The results for COBALT are applicable to em-trak B100 as the testing on COBALT was more stringent than the constrained of the em-trak B100 device and both contain identical functionality.

5.10. Immunity to Electrostatic Discharge (Enclosure Port)

5.10.1. Specification Reference

IEC60945: Table 6, Clause 10.9

5.10.2. Test Method and operation mode

The test was applied in accordance with the test method requirements of CISPR 16-1

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

Mode 1 – Receiving GPS and transmitting position (at standard transmit interval)

5.10.3. Results

The results for this test are detailed in document 75912008 Report 01

5.10.4. Results Applicability Description

The testing was performed on COBALT; the COBALT unit is surrounded by an EMC shield which protects the unit from external signals and protects other limits all signals being radiated by the unit. The em-trak B100 enclosure has no RF properties and as such does not affect any radiated or absorbed signals of the device.

All metal connections to the COBALT unit are by either the VHF port or the GPS port.

Testing on the COBALT unit was performed at both of the metal points; VHF port and GPS port. When the COBALT module is placed into the em-trak enclosure the two points, VHF port and GPS port are the same reference point.

The results for COBALT are applicable to em-trak B100 as the testing on COBALT was performed at the same points at which the same testing would have been performed on the em-trak B100 unit.